V.A. ALEXEYEV, M.V. MARKOV, R.A. BIRDSEY

STATISTICAL DATA ON FOREST FUND OF RUSSIA AND CHANGING OF FOREST PRODUCTIVITY IN THE SECOND HALF OF XX CENTURY

Ministry of Natural Resources of Russian Federation
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Contains statistical data on area and growing-stock volume of forest lands in Oblasts, Krays and Republics of Russian Federation, for the period 1961-1998. Positive dynamics of average growing stock for coniferous, deciduous hardwood and deciduous softwood tree stands by stand-age groups were disclosed. The impact of main anthropogenic and natural factors, including Climate Change, on dynamics of productivity in forests of Russia is discussed. Errors in statistical data of the state forest fund accounts were analyzed and estimated.

Vladislav A. Alexeyev Dr. Sci., Prof. of Ecology, Director of the SPb Forest Ecological Center and Principal Investigator of the SPb Research Institute of Forestry, MNR of Russia. E-mail: alexeyev@mail.rcom.ru

Richard A. Birdsey Ph.D. Program Manager, Global Change Research USDA Forest Service
E-mail: rbirdsey@fs.fed.us

Maxim V. Markov Research Associate of the SPb Research Institute of Forestry, MNR of Russia and the SPb Forest Ecological Center. E-mail: SPBFRIin@NM10043.spb.edu

Reviewed by

I.V. Shutov, Dr. of Sci., Prof., Corresponding member of the RAAS

R.F. Treyfeld, Ph.D., Main engineer of the Northwestern Forest Inventory Enterprise

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PREFACE

Developing of the Russian-American project on dynamics of phytomass and carbon storage in forests of Russia has challenged of necessity to study of dynamics of growing stock and productivity of forest stands in the second half of 20th century. For this goal the authors used the published statistical data on area and growing-stock volume of forest lands in Oblasts, Krays and Republics of Russian Federation in the period 1961-1998. Since such data have independent meaning and were practically "terra incognito" not only for the foreign researches but also for the most of Russian specialists, we included them in Tables of the Appendix. During the course of the work, we found that the statistical data contain a number of errors. It is extremely complicated research and led us to conclusions, connected with problem of improving the quality of the statistical accounts.

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CONTENTS

ABBREVIATIONS

AGS	- average growing stock
CO_2	- carbon dioxide
CH_4	- methane
CPSU	- Communist Party of Soviet Union
FFS	- Federal Forest Service of Russian Federation
FIP	- forest inventory and planning of forest management
Goskomles	- State Forestry Committee of USSR
IIASA	- International Institute for Applied Systems Analysis
N_2O	- nitrous oxide
RAS	- Russian Academy of Sciences
RAAS	- Russian Academy of Agricultural Sciences
RF	- Russian Federation
RSFSR	- Russian Soviet Federative Socialistic Republic
USSR	- Union of Soviet Socialistic Republic
UNFCCC	- United Nations Framework Convention Climate Change
SFFA	- State Forest Fund Account
SPb	- Saint Petersburg
SPFEC	- Saint Petersburg Forest Ecological Center
WMO	- World Meteorological Organization

Weights and Measures - Metric System

INTRODUCTION

Due to human economic activities (primarily fossil fuel combustion and partly felling of forests), the concentration of greenhouse gases in the atmosphere is increasing. An intensive enlarge is occurring in the concentration of carbon dioxide (CO_2), methane (CH_4) and some other radiatively active gases. The increasing concentrations of these greenhouse gases is causing global climate warming.

In 1800, the concentration of CO_2 in the Earth's atmosphere was 280 ppm (280 parts per 1 million), or 0.028 volume percent. With industrial development, the CO_2 content in the air grew, and reached 0.0315% by 1957 (*Schimel, 1995*). In 1998 it had already amounted to 0.0366% (*Keeling,* quoting according to *Joyce and Birdsey, 2000*). So, if the CO_2 concentration has increased by 12.5% for the first 157 years of industrial development, then its share in the atmosphere for the last 40 years grew 5 times as fast and has risen by 13.1%. A complete description and explanation of the global change is published in the General report of the Inter-governmental groups of experts on climate changes (*WMO.., 2003*).

If the CO_2 build-up in the atmosphere and the climate warming continue at the current rate, then it is believed that by the end of the 21st century our planet will experience an increase of the mean temperature by 1.5-5.8°C (*WMO.., 2003*), thawing of the Arctic ice pack and a rise in the world ocean level (*Houghton, 1995, WMO.., 2003*), and an intensification of the frequency of floods, fires and droughts in many forest and agricultural areas (*Budyko et al., 1991; Houghton, 1995, WMO.., 2003*).

For the last 100 years, an unprecedented increase of air temperature has been recorded. For Russia as a whole, it has been +0.6°C, differing slightly by various regions (*Gruza et al., 2001*). The number of aerosols having nitrogen and sulfur oxides has grown considerably (*Houghton et al., 1996*).

An imminent ecological catastrophe can only be averted by means of combined efforts of all countries in stabilizing of the content of CO_2 and other greenhouse gases in the Earth's atmosphere. Understanding of this fact has resulted in the appearance of the Framework Convention on Climate Change (*UNFCCC, 1992*) and the Kyoto Protocol (*UNFCCC, 1998*).

Two measures are proposed to counteract observed increases in greenhouse gases and climate change: reducing industrial emissions of CO_2, and sequestering CO_2 from the atmosphere including the use of forests to preserve or increase carbon in forest ecosystems. It is possible to increase the area of forests to sequester more atmospheric CO_2, and to protect existing forest areas from disturbances that release stored carbon to the atmosphere. Carbon sequestration in forests may also become enhanced naturally, based on the knowledge that the present-day concentration of CO_2 limits photosynthesis of plants and that an increase of the CO_2 content in the atmosphere stimulates organic substance formation, thus intensifying and accelerating the process of carbon uptake from the atmosphere.

Numerous experiments with woody plants under controlled growing conditions have shown that doubling of CO_2 content will increase their aboveground and underground mass by approximately 70% (*Joyce and Birdsey, 2000; Medlyn et al., 2001, etc.*). No direct extrapolation of the data from these experiments to forest ecosystems is possible due to differences in the plant age, availability of competitive relations in forest communities, influence of a number of natural and anthropogenic stresses, and processes of mortality and decay of the organic created by increased CO_2 (*Korner, 2000*). Nevertheless, the use of experimental data with seedlings and saplings is widely applied in the development of prognostic models (*Joyce and Nungesser, 2000*).

There are far fewer investigations performed or based on natural data, but they show evidence that global climate change has already affected the productivity of North hemisphere forests (*Spiecker et al., 1996; Myneni et al., 1997; Joyce and Birdsey, 2000; Mund et al., 2002, etc.*).

Information about changes in Russian forest productivity in connection with Global Change is scanty. The following observations have been recently reported.

As a result of 60-year observations of permanent sample plots in coniferous forests of the Leningrad Oblast, an increase of their productivity has been revealed, which manifests itself, in particular, in mature tree stands that seem to have exhausted their ontogenetic capabilities (*Sennov, 1999*).

An increasing of growth in mature and overmature stands has been noted in this region in the Vepsskiy forest reserve (*Fedorchuk et al., 1998*) and in the Sieverskiy leskhoz* (*Knieze et al., 2000*).

In forest-tundra stands of the Kola peninsula, an increase of pine annual radial rings has been detected, being especially noticeable during last decades (*Alekseev and Soroka, 2001, 2002*).

An increase in productivity of mature and overmature stands in the majority of taiga and sub-taiga regions of the European Russia (*Knieze et al., 2000*), and stands of all ages in the Northwestern regions of Russia (*Alexeyev et al., 2000*) has been noted. The conclusions in the last two reports have been obtained by determination of the average growing stock volume from the data of the USSR and Russian Forest Fund Accounts (*Main.., 1962; Goskomles of USSR, 1968, 1976b, 1981, 1987, 1991; Federal.., 1995a, 1999*).

But there is an opposite point of view. For example, N.N. Moiseyev is convinced that in spite of the growth of CO_2 content by 20-21% in the 20th century, "biota has not responded by any noticeable increase in its mass" (*Moiseyev, 1999, p. 41*).

Among foreign publications, an article by R. Myneni et al. (*2001*), concludes that there has been a considerable increase in the carbon storage in Russian forests during recent decades. The results of this research were obtained by analysis of satellite information and require additional verification.

The official analytical report on Russian forest resources (*Yatskevich et al., 2001*) has noted an increase of the proportion of high-productivity forest stands for the period from 1966 to 1998. This conclusion was made on the basis of changes in forest site quality class of the stocked forests. The quantitative assessment of the reported forest productivity gain is missing. The reported changes are attributed by the report's authors to the positive forest management activities of the Russian forestry enterprises.

Specialists from the International Institute of Applied Systems Analysis (IIASA) processed aggregate statistical data on the Russian forest fund and revealed an increase in the productivity of forest stands of various stand groups, except mature coniferous forests (*Shvidenko, Nilsson, 1996*). In another publication, the same authors add young coniferous stands to the number of forests showing that productivity decreased during the last decades (*Nilsson, Shvidenko, 1998*).

Considering that the last three articles are completely disconnected with the discussion of Global Change, then it is not difficult to conclude that the available knowledge is deficient for understanding the causes of productivity changes in the Russian forests.

The lack of full-scale investigations of the Russian forest productivity dynamics in the context of global change has resulted in our continuation of a project to collect and process regional statistical data on the country's forest fund, which we previously used to study carbon storage in forest ecosystems (*Alexeyev and Birdsey, 1994*). For this current publication we have stated two main tasks:

1. Based on the published statistical information on Russian forests for 1961-1998, reveal the dynamics and quantitatively determine changes in productivity of forest stands;

2. Discover how the forest stand response to global change correlates with the influence of other natural and anthropogenic factors concurrently affecting the forests.

In order to solve these problems, we used data on the areas and growing stock volume, forest site quality classes, clear cut and intermediate felling operations, and burned and dead or declining forest dynamics published in statistical reference books on the USSR and Russian Forest Fund as well as other reference materials.

The matters directly connected with the dynamics of carbon storage in forest ecosystems will be considered separately as a continuation of the research being published now and the works done before (*Alexeyev and Birdsey, 1994, 1998; Alexeyev et al., 2000; Tarasov and Birdsey, 2001*).

* Leskhoz is the Russian forestry enterprise. The American analogue of leskhoz is a National Forest.

Chapter 1

SOURCES OF INFORMATION ON FORESTS

The information sources on the matters in question include data about Forest Management projects, data from the State Forest Fund Account (SFFA) of Russia and statistical reference books on the Russian Forest Fund.

1.1. Forest Management Projects

Forest Management Projects are developed by the forest inventorists for organizing of leskhozes and planning the forestry activity for these enterprises The process of field forest inventory and planning of forest management (FIP) is repeated for each leskhoz in 10-12 (15-20)* years

Information of the FIP is the most detailed and reliable in the case of intensively working leskhozes. For those studying the forest carbon budget within the Kyoto Protocol framework, the most valuable data are collections of inventory descriptions including the characteristics of every forest site of a leskhoz territory.

The following data are included in forest inventory descriptions:

- area of the site,
- tree stand composition by layers and species,
- age of the forest-forming species (absolute and by age groups),
- average height of the layer and species comprising the tree stand,
- average diameter of species comprising the tree stand,
- site quality class,
- type of forest (according to dominant tree species and dominant species of lower layers),
- type of forest habitat conditions (on the basis of soil-hydrological characteristics),
- relative density of stand,
- growing-stock volume by species (in tens of cubic meters),
- standing-dead trees and coarse woody debris stock (in tens of cubic meters).

In addition, data on the understory are also given (composition, age, height, number of items per hectare) and the soil type name.

Direct use of the original forest inventory database is convenient for calculations of carbon storage at the leskhoz and their districts level. On the scale of Russia, information of this level cannot be used for studying forest dynamics due to a vast volume of data, difficult accessibility, and diversity of timing of the FIP for different leskhozes.

The Forest Management Projects include data for Forms 1, 2 and 3 of the SFFA.

1.2. Computer database of the State Forest Fund Accounts

The SFFA computer database contains data on forests of all Russian fund holders on the leskhoz level (*Goskomles of USSR, 1982a, Federal.., 1997*). Its basis are data on forests, which are managing by FFS of Russia. The data are grouped into Forms 1, 2 and 3. In addition, the state database also contains information of Forms 1 and 2 prepared by other agencies having forest at their disposal. Data is included about each of the more than1800 leskhozes. Before 1998, the state accounts of the forest fund were updated once every 5 years. Since 1999, it has been updated annually.

Form 1 contains data on "distribution of the forest fund area by land categories, forest groups by use (I, II and III) and protection categories of the group I forests" united into a table. The table contains data on the total area of lands, the forest lands and the non-forest lands of the forest fund.

Forest lands include two categories of areas: stocked area (including forest plantations) and non-stocked area. Following are attributes of non-stocked area: forest plantations without closed canopy, forest nurseries, woodlands and the so-called "reforestation fund" comprising burned area, dead stands, cutover area, grassy clearings and barrens.

* Recurring of the FIP is depended from activity of forestry in the leskhoz. The more active enterprise the more often is producing of the FIP

The composition of non-forest land consists of land designed for the state needs (routes of power transmission lines, gas pipelines, oil pipelines, etc.), for the forestry needs (roads, cuttings, farmsteads, gardens, arable land, hayfields, pastures) as well as water and land being unsuitable for forest growth (swamps, sands, glaciers, ledge rocks, stony placers, etc.).

Form 2 "Distribution of forest area and growing-stock volume by dominant species and age groups" is devoted to descriptive characteristics of stocked land. Dominant tree and shrub species are divided into main forest-forming species and their groups (coniferous, deciduous hardwood, deciduous softwood), other tree and shrub species.

Primary forest-forming species include 22 main tree species (or genus):

Coniferous - Scots pine (*Pinus sylvestris.*), spruce (*Picea* sp.), fir (*Abies* sp.), larch (*Larix* sp.), cedar (*Pinus sibirica* and *P. korainensis*), tree-like juniper (*Juniperus* sp.);

Deciduous hardwood - oak (*Quercus* sp.) with subdivision into long-boled and short-stemmed), beech *Fagus* sp.), hornbeam (*Carpinus betulus*), ash (*Fraxinus excelsior*), maple (*Acer* sp.), elm (*Ulmus* sp.), stone birch (*Betula ermanii*), saxaul (*Haloxylon* sp.), locust (*Acacia* sp.);

Deciduous softwood - birch (*Betula* sp.), aspen (*Populus tremula*), grey alder (*Alnus incana*) and black alder (*Alnus glutinosa*), lime (*Tilia* sp.), poplar (*Populus* sp.) and treelike willows (*Salix alba, S. acutifolia, S. caprea*).

The group "other species" includes 24 tree species: apricot (*Armeniaca* sp.), corkwood (*Phellodendron amurense*), eastern hornbeam (*Ostrya virginica*), honeylocust (*Gleditschia triacanthos*), pear (*Pyrus* sp.), zelkova (*Zelkowa carpinifolia*), cork oak (*Quercus suber*), half-timbering (*Celtis* sp.), catalpa (*Catalpa* sp.), chinquapin (*Castanea* sp.), wing-nut (*Pterokarpia fraxinofolia*), almond (*Amigdalus* sp.), European walnut (*Juglans regia*), Manchurian walnut (*Juglans mandschurica*), mountain-ash (*Sorbus* sp.), box-tree (*Buxus* sp.), cherry plum (*Prunus divaricata*), yew (*Taxus* sp.), pistachio-tree (*Pistacia vera*), bird cherry tree (*Padus avium*), cherry-tree (*Ceresus avium*), mulberry-tree (*Morus* sp.), eucommia (*Eucommia ulmoides*), apple (*Malus* sp.).

Shrubs include 15 main species: bamboo (*Sasa* sp.), dwarf birch (*Betula nana, B. Middendorfii,* etc.), spindle tree (*Euonymus* sp.), hawthorn (*Crataegus* sp.), tamarisk (*Tamarix* sp.), dogwood (*Cornus* sp.), calligonum (*Calligonum* sp.), bushy willows (*Salix purpurea, S. cinerea* et. al.), krummholz of sibirica pine (*Pinus pumila*), hazel (*Corylus* sp.), Russian olive (*Eleagnus angustifolia*), juniper (*Juniperus* sp.), rhododendron (*Rhododendron* sp.), currant (*Ribes* sp.), dog-rose (*Rosa canina, R. acucularia,* etc.).

For each of the above-listed woody species (or genus), the area covered by their stands and the growing-stock volume (including bark) are given. Also included are parameters for age groups with subdivision into young stands (age classes I and II), middle-aged, maturing, mature and overmature stands.

The areas by leskhozes are given in hectares and the growing-stock volume is shown in hundreds of cubic meters. For aggregated documentation (by regions of the Russian Federation, etc.), the areas are given in thousands of hectares (with one decimal place), and the growing-stock volume is shown in millions of cubic meters (with two decimal places).

Form 3 contains 12 important sections, four of which we will mention.

Section 1 includes "Information about forest fund and forests not included into the forest fund on the territory of an administrative unit". The content of this section is a conglomeration of data from Forms 1 and 2.

Section 7 includes "Distribution of stands by densities and forest site quality classes". This section contains data on the areas of groups of stands (coniferous, deciduous hardwood and softwood) and age groups in accordance with data of the latest forest management activities. The areas of stands with the productivity of site quality class II and higher are combined. The areas of forests in site quality class Va and lower are also combined.

Section 8 "Characteristic of hydromelioration fund of stocked forests". The section contains data on tree stands growing on excessively wet sites, on which, according to national concepts available, it is necessary to perform drainage or the drainage has already been performed.

Section 11 "Knowledge about the forest fund and other forests (not included in the forest fund)". This

section contains a table about level of the forest inventory technique. The table includes data about: (1) areas arranged by the FIP in period 1-10 years ago, 11-15 years, 16-20 years, 21 years and over, (2) areas, studied by forest inventory methods including remote sensing, and (3) areas, covered by visual aerial survey in the 1950s.

Even a very brief enumeration of the above-mentioned information, which is available and being kept in database of the SFFA, gives evidence of its paramount importance.

Unfortunately, the aggregation of forest management level data adopted in accordance with instructions on the order of state account of forests (Goskomles of USSR, 1982a, Federal.., 1997) has resulted in a loss of important data.

The following data have been lost:

- on absolute age of tree stand;
- on age structure of tree stand;
- on species composition of mixed forests;
- on forest types and forest habitat conditions;
- on forests of site quality class I and higher.

The rules of state forest account are not identical for various agencies having forests under their control. As a result, not all data for the country's forests are comparable with each other.

It is important to note that the main part of the forest management information has been changed as a result of the data updating process (data "modernization") being performed directly at leskhozes. In accordance with specially elaborated state inventory rules (*Goskomles of USSR, 1982a, Federal.., 1997*), any forest fund changes occurring in the period between successive FIP shall be corrected by specialists of the leskhozes. The corrected data of leskhozes are submitted to the forest department of the appropriate region of Russia, analyzed, subjected to aggregation and then supplied to the Forest Service of Russia where, after additional processing, they become part of the computer database bank "The Forest Fund of Russian Federation".

It is necessary to note that part of the database is produced not by forest inventory specialists but by specialists of leskhozes and other forestry enterprises.

The database of the SFFA bank is perhaps the best approach to estimation of the dynamics of growing-stock volume and forest carbon on the national scale as well on the scale of administrative territories (Oblasts, Krays, Republics).

For the overwhelming majority of scientists around the world, the information of the SFFA bank was inaccessible before 1998. Beginning in October 1998, in accordance with the decree of the Russian Government and the order by the Russian Forest Service, one can buy practically any information about the Russian forest fund and its parts. However, according to the evidence of persons being interested in this matter (*Sukhikh and Utkin, 2000*), the cost of information is occasionally close to the full cost of data collection and subsequent data processing.

According to the order by the Russian Forest Service, information about areas and growing-stock volume on level of the administrative territories as well as data on the areas of cutover patches and dead tree stands can be obtained gratuitously.

1.3. Statistical reference books on the forest fund of Russia

Statistical reference books on the Russian forest fund were published once every five years, beginning in 1951. They contain reduced and truncated data of state forest accounts.

The most important information losses as compared with the SFFA data:

- No data are published on the stocked area and growing-stock volume by main species with subdivision by age groups. For administrative territories such data have not been published after 1961. For the whole country such data have been published for the former USSR only.
- No full-scale data are published on forests managed by various government agencies. This data has not been published since 1988, both for administrative regions and for the whole country. As a result, even the most general data on Russian forests remain unknown. As one can judge by some publications, even persons in charge of preparation and publication of statistical reference books do not know this information.
- Some forest age classes and groups have been combined. So, the data on areas and growing stock of mature and overmature stands are combined into

one group beginning from 1973. The data on young stands of age classes I and II are combined into one group beginning from 1988;

- The detail and completeness of data published in reference books are not identical. Owing to this fact, it is impossible to compare statistical data over time for a number of cases. For example, the data on areas and growing stock of land covered with forests includes long-term leased areas for 1961, 1993 and 1998 (*Main.., 1962; Federal.., 1995a, 1999*). In the remaining cases, similar data are given only for territories under control of the Forest Service (*Goskomles of USSR, 1968, 1976b, 1981, 1987 and 1991*). Individual tabular data given in reference books on leased forests are either incomplete by agency.

There are many other examples of data limitations that should be known by users of this information. We recommend that readers become familiar with the list given in the excellent analytical article by *V.I. Sukhikh and A.I. Utkin (2000)*.

The data on forest fund are given in reference books separately by administrative territories and some territorial subdivisions, including by the European-Urals and Asian parts of Russia and by economic regions, which have ceased to exist.

The published statistical reference books are in most cases the only accessible database for the research work on forest fund dynamics and determination of carbon dynamics.

Chapter 2

FOREST FUND AND AVAILABLE INFORMATION ABOUT FORESTS

In this study we used database of published statistical reference books for the period 1961-1998 (*Main.., 1962; Forestry.., 1962; Goskomles of USSR, 1968, 1976a, 1976b, 1981, 1982a, 1986a, 1987, 1990, 1991; Dynamics.., 1989; Federal.., 1995a, 1999*) and part of computer database of the SFFA-1998. Some data from these sources are included in the Appendix (Tables 2A-10A).

2.1. General information about the Forest Fund

All lands covered with forests, lands not covered with forests but intended for forestry, and non-forest lands within designated forest areas of the Russian Federation (the former Russian Soviet Federation Socialistic Republic - RSFSR), are included in of the forest fund.

Before 1997 in Russia, as was the case in the USSR, a *single* forest fund existed. The Forest Code of the Russian Federation was adopted in 1997, which separated forest lands into the *forest fund* and *"forests not included in the forest fund" (Federal..,, 1998)*. As in the main forest fund, lands of these forests are subdivided into lands covered with forest (forest stands and shrubs), forest lands not covered with trees, and non-forest lands. In other words, "forests not included in the forest fund" also form a separate forest fund, though small compared with the main forest fund. This new category includes the urban forests and forests transferred to the Ministry of Defense.

So, two forest funds have existed in Russia since 1997: the state forest fund and the forest fund belonging to two departments and called "forests not included in the forest fund". The total area of the second fund is 6.2 million hectares (0.53% of the main forest fund area).

The distribution of lands managed by the different agencies is shown in Table 2.1. The majority of Russian forest lands (about 93%) are under control of the Russian Forest Service.

2.2. Inventory of forests

The Russian forests occupy a vast territory (Table 2.1). Accounting inventory of these forests has required almost a century of efforts from forest inventory specialists and has been completed only recently.

Before 1914, field forest inventory with arranging of forestry in the fiscal forests of the Russian empire was conducted over an area of 106 million ha; in addition, 25.6 million ha was covered by field inventory (*Faas, 1919*). According to plans at that time, it was expected that all stocked lands of Russia would be managed by 1928.

But the times have changed. New rules of forest inventory and forestry were established when the USSR was formed. Before 1951, the FIP in the Russian Republic was performed on 19.4 million ha, from 1951 to 1956 - on 126.1 million ha, from 1956 to 1960 - on 163.5 million ha. Detailed information about inventory of forests in the RSFSR for 1951, 1956, and 1961 have been openly published in the statistical reference book "Forest Fund of RSFSR" (*Main.., 1962*).

By 1961, FIP covered 309.1 million ha. The remaining area (801.6 million ha) was inventoried primarily using a visual aerial survey method. According to this reference book, 90.4% of forests in the European-Urals territory of Russia were managed by 1961 with field forest inventory (Table 2.2). Only in two Oblasts (Archangel and Murmansk), a part of the low-productive Northern and Forest-Tundra forests was surveyed from air.

As for the Asian part of Russia, until 1961 FIP was carried out on only 16% of its forest fund. The Far East forests have been studied least of all. For example, the FIP was performed on 1.4 % of the territory of Yakutia and by 0.7% in forests of the Magadan Oblast (Table 2.2). The remaining lands of the forest fund were surveyed in the 1950s by means of visual aerial survey methods and needed additional study.

As of 01 January 1966, it was noted in the published statistical data that FIP in the RSFSR has been performed on an area of 389.5 million ha (*Goskomles.., 1968*). No other data about studying of forested lands have been published since then.

According to the SFFA computer database, as of 01 January 1998, information about the forestry fund was as follows:

In the European-Urals part of Russia, 95.2% of forests managed by the Forest Service has had multiple FIP, 3.9% of the territory has been subjected to field inventory without FIP, and 0.9% has remained at the level of visual aerial survey (Table 2.2). The same ratio of areas inventoried by various methods is also being observed on the whole European-Urals territory of the forest fund.

In the Asian part of Russia, 55.4% of the total forest fund area and 54.8% of the area under umbrella of the Forest Service have been inventoried and managed by field methods. The forest inventory based on remote sensing has been performed on 38.7 and 39.3% respectively, and the results of visual aerial survey performed in 1950s on 5.9 % of the territory. As in 1961, forests of this part of the country have been studied differently up to the present time. By the beginning of the 1990s, some Oblasts have been fully covered with FIP whereas the inventory of others has been carried out mainly by detailed remote sensing methods (Table 2.2).

The reliability of data on the forest fund lands and growing stock on territories covered with forests is to a considerable extent determined by the forest inventory technique.

In case of field forest inventory, according to state regulations (*Goskomles.., 1986b, Federal.., 1995b*), the permissible value of systematic error over all forest estimation parameters, including the forest growing stock, shall not exceed 5%. However, special investigations show that inventories of operational forests typically underestimate the growing-stock volume of mature tree stands by 5-15% (*Lebkov, 1965; Filippov, 1975, Fedosimov, 1986, etc.*).

On the other hand, in visual aerial surveys carried out primarily in low-productive Northern forests of the Asian part of Russia in 1950s, the volume of growing stock appears to be overestimated. By the estimates of specialists, the average overestimation of growing-stock volume in reserves equals about 20-25% (*Alexeyev and Birdsey, 1994; Shvidenko et al., 1996; Shvidenko and Nilsson, 1996*). The lack of reliability of the visual aerial survey method was very well known; therefore, the same areas have been subjected to repeated inventory combining more progressive remote sensing methods with field inventory of key forest areas.

The use of remote sensing methods began in the 1960s and was widely used in the 1970-1980s (*Sukhikh, 2001*). The accuracy of determination of the area and growing stock of forest territories equals ±3% with the reliability level of 95% (*Sukhikh et al., 1979*). As it was noted (*Sukhikh et al., 1979; Shvidenko and Nilsson, 1997*), the method does not result in a systematic error.

For the majority of regions in the Asian part of Russia, the 1960s data are incomparable with the present-day data due to insufficient detailed forest inventory. This makes it very difficult to estimate changes accurately.

The consideration of data on the available information about Russian forests could be finished at this point, except that staff members of the IIASA have published other, sharply different data on areas managed by the FIP in the Soviet time (*Shvidenko and Nilsson, 1997; Nilsson and Shvidenko, 1998*). For example, these authors suppose that by 01 January 1961 the FIP in forests of European Russia was fulfilled on 36% of the area, and in Asian Russia - on 9% of the area. Such statements contradict published reference books and render unreliable their "reconstructed" data on growing stock of Russia.

Table 2.1. **Areas (million ha) and growing stock (billion m^3) in Russian forests by land-management category for 01st January 1998***

Land management	Total area	Forest area	Stocked area	Growing stock
		Forest Fund		
Federal (National) forests	1172.3	877.0	769.8	81.33
Forest Service	1110.6	823.6	718.7	74.32
State Committee of Ecology (preserves)	18.9	11.7	10.9	1.40
Agricultural Ministry	42.5	41.4	39.9	5.56
Ministry of Education	0.4	0.4	0.3	0.05
		Forests not included in Forest Fund		
Ministry of Defense	4.9	3.9	3.5	0.42
Municipal forests	1.3	1.1	1.0	0.11
Total	**1178.6**	**882.0**	**774.3**	**81.86**

*Compiled from *Forest Fund of Russia, 1999.*

Table 2.2. **Level of knowledge about the forest fund under Forest Service management**
(Data for 01st January 1961 and 1998)

Administrative territory	Total area 01.01.1961, million ha	FIP, %	Inventory, %	Air visual survey, %	Total area 01.01.1998, million ha	FIP, %	Inventory, %	Air visual survey, %
1. Kaliningrad Oblast	0.25	92.0	8.0	0.0	0.27	100.0	0.0	0.0
2. Archangel Oblast	26.28	98.8	0.0	1.2	27.44	100.0	0.0	0.0
3. Vologda Oblast	8.17	100.0	0.0	0.0	8.65	100.0	0.0	0.0
4. Murmansk Oblast	9.83	69.7	0.0	30.3	9.47	83.1	0.0	16.9
5. Rep. of Karelia	14.58	99.6	0.4	0.0	14.76	100.0	0.0	0.0
6. Komi Republic	38.17	67.9	0.0	32.1	37.95	81.4	18.6	0.0
7. Leningrad Oblast	4.41	99.8	0.2	0.0	4.59	100.0	0.0	0.0
8. Novgorod Oblast	1.88	99.5	0.5	0.0	2.74	99.8	0.2	0.0
9. Pskov Oblast	1.24	99.2	0.8	0.0	1.40	99.0	1.0	0.0
10. Bryansk Oblast	0.79	100.0	0.0	0.0	0.81	100.0	0.0	0.0
11. Vladimir Oblast	1.08	100.0	0.0	0.0	1.08	100.0	0.0	0.0
12. Ivanovo Oblast	0.85	100.0	0.0	0.0	0.81	100.0	0.0	0.0
13. Tver Oblast	2.47	99.6	0.4	0.0	2.53	100.0	0.0	0.0
14. Kaluga Oblast	0.71	100.0	0.0	0.0	0.73	100.0	0.0	0.0
15. Kostroma Oblast	3.5	100.0	0.0	0.0	3.59	100.0	0.0	0.0
16. Moscow Oblast	1.63	100.0	0.0	0.0	1.71	100.0	0.0	0.0
17. Orel Oblast	0.11	100.0	0.0	0.0	0.13	100.0	0.0	0.0
18. Ryazan Oblast	0.85	100.0	0.0	0.0	0.81	100.0	0.0	0.0
19. Smolensk Oblast	0.75	100.0	0.0	0.0	1.01	100.0	0.0	0.0
20. Tula Oblast	0.26	100.0	0.0	0.0	0.28	100.0	0.0	0.0
21. Yaroslavl Oblast	0.91	100.0	0.0	0.0	0.97	100.0	0.0	0.0
22. Nizhni Novgorod Obl.	3.14	100.0	0.0	0.0	3.13	100.0	0.0	0.0
23. Kirov Oblast	6.01	99.8	0.2	0.0	6.21	100.0	0.0	0.0
24. Rep. of Marii El	1.24	100.0	0.0	0.0	1.21	100.0	0.0	0.0
25. Rep. of Mordovia	0.58	100.0	0.0	0.0	0.59	100.0	0.0	0.0
26. Chuvash Republic	0.6	100.0	0.0	0.0	0.59	100.0	0.0	0.0
27. Belgorod Oblast	0.21	100.0	0.0	0.0	0.22	100.0	0.0	0.0
28. Voronezh Oblast	0.39	100.0	0.0	0.0	0.40	100.0	0.0	0.0
29. Kursk Oblast	0.21	100.0	0.0	0.0	0.22	100.0	0.0	0.0
30. Lipetsk Oblast	0.15	100.0	0.0	0.0	0.16	100.0	0.0	0.0
31. Tambov Oblast	0.33	100.0	0.0	0.0	0.34	100.0	0.0	0.0
32. Astrakhan Oblast	0.21	100.0	0.0	0.0	0.18	100.0	0.0	0.0
33. Volgograd Oblast	0.51	96.1	3.9	0.0	0.56	99.5	0.5	0.0
34. Samara Oblast	0.7	100.0	0.0	0.0	0.60	100.0	0.0	0.0
35. Penza Oblast	0.83	100.0	0.0	0.0	0.86	100.0	0.0	0.0
36. Saratov Oblast	0.54	100.0	0.0	0.0	0.52	100.0	0.0	0.0
37. Ulyanovsk Oblast	0.95	100.0	0.0	0.0	0.95	100.0	0.0	0.0
38. Rep. of Kalmykia	0	0.0	0.0	0.0	0.06	100.0	0.0	0.0
39. Rep. of Tatarstan	1.13	100.0	0.0	0.0	1.14	100.0	0.0	0.0
40. Krasnodar Kray	1.45	99.3	0.7	0.0	1.53	100.0	0.0	0.0

Table 2.2. Continued

Administrative territory	Total area 01.01.1961, million ha	FIP, %	Inventory, %	Air visual survey, %	Total area 01.01.1998, million ha	FIP, %	Inventory, %	Air visual survey, %
41. Stavropol Kray	0.46	97.8	2.2	0.0	0.50	100.0	0.0	0.0
42. Rostov Oblast	0.31	83.9	16.1	0.0	0.32	99.1	0.9	0.0
43. Rep. of Daghestan	0.42	100.0	0.0	0.0	0.44	100.0	0.0	0.0
44. Kabardino-Balkarian R.	0.14	100.0	0.0	0.0	0.22	98.9	1.1	0.0
45.R. of Northern Ossetia	0.19	100.0	0.0	0.0	0.19	100.0	0.0	0.0
46. Chechen-Ingush Rep.	0.36	100.0	0.0	0.0	0.38	100.0	0.0	0.0
47. Kurgan Oblast	1.14	100.0	0.0	0.0	1.31	100.0	0.0	0.0
48. Orenburg Oblast	0.53	100.0	0.0	0.0	0.57	100.0	0.0	0.0
49. Perm Oblast	10.45	99.9	0.1	0.0	10.14	100.0	0.0	0.0
50. Sverdlovsk Oblast	13.75	99.9	0.1	0.0	13.63	100.0	0.0	0.0
51. Chelyabinsk Oblast	2.54	100.0	0.0	0.0	2.66	99.9	0.1	0.0
52. Rep. of Bashkortostan	5.64	98.4	1.6	0.0	5.68	100.0	0.0	0.0
53. Udmurtian Republic	1.61	100.0	0.0	0.0	1.61	100.0	0.0	0.0
54. Altai Kray	6.83	82.0	0.0	18.0	8.56	98.6	1.4	0.0
55. Kemerovo Oblast	5.13	100.0	0.0	0.0	4.82	100.0	0.0	0.0
56. Novosibirsk Oblast	4.33	80.6	0.0	19.4	4.49	100.0	0.0	0.0
57. Omsk Oblast	3.94	67.8	0.0	32.2	3.94	100.0	0.0	0.0
58. Tomsk Oblast	27.54	53.3	0.0	46.7	26.72	100.0	0.0	0.0
59. Tyumen Oblast	98.97	13.8	0.0	86.2	89.62	86.0	13.5	0.5
60. Krasnoyarsk Kray	145.36	13.8	0.0	86.2	159.78	30.2	69.0	0.9
61. Irkutsk Oblast	69.33	23.0	0.0	77.0	67.85	76.2	0.0	23.8
62. Chita Oblast	32.14	36.6	0.0	63.4	31.89	99.1	0.9	0.0
63. Rep. of Buryatia	27.62	35.7	0.0	64.3	27.17	98.0	0.0	2.0
64. Rep. of Tuva	11.47	18.4	0.0	81.6	11.00	55.9	17.0	27.1
65. Primorie Kray	11.54	73.7	0.0	26.3	11.86	100.0	0.0	0.0
66. Khabarovsk Kray	76.71	21.8	0.0	78.2	75.83	58.8	20.2	21.0
67. Amur Oblast	31.3	29.0	0.0	71.0	30.73	100.0	0.0	0.0
68. Kamchatka Oblast	44.1	2.3	0.0	97.7	43.98	100.0	0.0	0.0
69. Magadan Oblast	74.93	0.7	0.0	99.3	71.80	0.8	99.2	0.0
70. Sakhalin Oblast	7.22	85.2	0.0	14.8	6.94	100.0	0.0	0.0
71. R. of Yakutia (Sakha)	256.68	1.4	-	98.6	254.76	32.3	61.0	6.7
European-Urals Russia	175.44	90.4	0.2	9.4	178.83	95.2	3.9	0.9
Asian Russia	935.14	16.1	0.0	83.9	931.74	54.8	39.3	5.8
Russia	1110.58	27.8	0.0	72.2	1110.57	61.3	33.6	5.1

*The data for the RSFSR forest fund as of 01.01.1961 have been compiled from the statistical reference-book (Main.., 1962, pp. 41-44). The figures as of 01.01.1998 have been taken from the SFFA computer database.
**The information about forest fund-98 characterises the territory of regions within the borders being compared with those in 1961.

Chapter 3

DYNAMICS OF AREA AND GROWING STOCK OF THE FORESTS OF RUSSIA AND OF THE FEDERAL FOREST SERVICE

3.1. Dynamics of area and growing stock in the forest fund of Russia

Unlike data from the Soviet period when USSR forests were characterized completely, the data on forests of present-day Russia are extremely scanty overall (Table 3.1). The data on growing stock that is published in reference books do not even allow determination of the country's average growing stock by tree groups (Table 3.1).

For the period of Russia's existence as a sovereign state, such important characteristics of the forest fund (and the forest funds of RF regions) as composition, area and growing stock of forests, distributed by age groups, have not been published.

For the whole of Russia and its administrative territories, data on areas and growing stock of forests by tree stand groups have not been published and still remain unknown.

The lack of data noted above is apparent also in the analytical report about forest resources of Russia (*Yatskevich et al., 2001*) and the article by *A.Z. Shvidenko, V.V. Strakhov and S. Nilsson (2000)*.

At the same time, forests of the Russian Forest Service are characterised in the reference-books with far more details.

The consequence of the lack of data are:

- Authors are compelled to study the dynamics of the country's forest productivity from the data of the Forest Service.
- As more than 90% of forest lands are managed by the Forest Service, the characteristics of average growing stock of these forests are representative for the Russian forest fund on the whole. However these characteristics cannot be extrapolated to the average growing stock of tree stands managed by other fund holders.

3.2. Dynamics of forest fund areas under Federal Forest Service management

Hereafter, all forest data relate to the forest fund under control of the federal Forest Service and its regional departments.

The dynamics of forest fund areas of the FFS are shown in Table 3.2, and the regional data are given in Table 2A and 4A. As seen from the data in these tables, practically all area categories (and, accordingly, the growing stock) vary from one SFF account to another.

One of the main reasons for changes in the total area of land within the boundaries of the forest fund and subdivisions within the forest fund is that boundaries have been updated by using of the newest methods of the forest inventory. Boundary changes are taking place to a larger extent in the Asian part of Russia.

Another important reason for change of the area is the transfer of lands to another use or, on the contrary, transfer of new lands into the forest fund. These changes are connected with state affairs and are carried out within the framework of powers vested in the country's government or the administration of federation subjects based on legislative acts and other regulatory documents.

The transfer of forest lands from one category into another can also be caused by felling of forests, by natural or artificial restoration, and by fires and other natural and anthropogenic reasons.

The situation at the regional level shows that stocked areas both increase and decrease (Table 2A and 3A).

The areas of coniferous stands have increased in 57 administrative regions. On the whole, they have risen by 4% (19.4 million hectares). The reduction of coniferous stands has occurred in 12 regions. Most of all, coniferous stands have been lost in the Krasnoyarsk Kray (6.3 million ha), the Amur Oblast (1.4 million ha), the Perm Oblast (0.6 million ha) and the Chita Oblast (0.7 million ha).

On the whole, the areas of tree stands managed by the Russian Forest Service have increased over the last 37 years in all groups of stands (coniferous, deciduous hardwood and softwood).

3.3. Dynamics of growing stock

The data on volume of growing stock are shown in Tables 3.2, 4A, and 5A. The growing stock varies more than area changes from one account to another and from one region to another. This is because growing stock depends not only on the areas but also on climatic and soil growth conditions, forest stand composition, age dynamics, as well as many natural and anthropogenic factors that affect forest ecosystem functioning.

The decrease of coniferous growing stock has been noted in 18 administrative regions (Tables 4A, 5A). The largest reduction of growing stock has occurred in the Murmansk Oblast (by 21%), the Perm Oblast (by 31%), the Amur Oblast (by 24%), the Magadan Oblast (by 42%), the Krasnodar Kray (by 34%), the Krasnoyarsk Kray (by 20%) and the Republic of Sakha (by 22%).

In the overwhelming majority of the rest of the administrative territories, in spite of intensive clearcutting of coniferous forests, the growing stock has increased. Among administrative regions with increased growing stock are the Archangel Oblast, the Republic of Karelia and the Komi Republic.

The growing stock of deciduous hardwood on the whole Forest Service area has increased by 230 million m^3. However in 10 administrative territories the growing stock decreased by 42.7 million m^3, with the biggest losses being suffered by Bashkortostan (17.2 million m^3).

The largest increase in the growing stock has occurred in deciduous softwood (51%). At the same time, in the Tambov Oblast, the Astrakhan Oblast and in the Krasnoyarsk Kray, a decrease of stock of deciduous softwood has taken place. The decrease in the Krasnoyarsk Kray was 31 million m^3.

In spite of considerable changes occurring in the regional growing stock of forests for the period from 1961 to 1998, the total storage of wood in stocked areas has changed little (Table 3.2).

Conclusions of sections 3.1 - 3.3:

- For the period from 1961 to 1998, the growing stock of the forested areas under the Russian Forest Service has remained at the same level;
- Growing stock of coniferous stands has decreased considerably (by 5.1 billion m^3), whereas stock of deciduous hardwood and softwood stands has increased by 0.23 billion m^3 and 4.43 billion m^3 respectively;
- During this period both the areas and the growing stock increased and decreased in various administrative regions, making it impossible to draw conclusions about changes in forest productivity. To reach this goal it is necessary to determine and analyze the dynamics of average growing stock

3.4. Dynamics of site quality classes of tree stands

In the forestry and geobotany the classification of site quality classes is widely used for describing the productivity of tree stands. The concept of site quality classification is based on the fundamental strategy of the vital form of a tree, namely, the striving of trees for height growth to occupy the vertical space. This strategy continues up to full development of the biological maturity of trees.

In spite of the tremendous value of the classification, the knowledge of site quality classes does not provide the knowledge of real productivity since this depends not only on the tree height but also on other factors such as stand density and other parameters.

For this reason, we cannot use data of site quality dynamics for direct determination of dynamics of tree stand productivity.

Apart from this, the data on the distribution of forest area by productivity classes are not always published in statistical reference books. So, the reference books for 1961 and 1993 contain no data on site quality classes. The book for 1983 contains forest productivity data only by economic regions (*Goskomles of USSR, 1986a*). In the other publications where site quality data is present, the classes are combined. The "II and over" and "Va and below" site quality classes are always combined. In addition, different reference books have arbitrary combinations of the site quality classes. For example, for

1966 classes IV and V are combined (*Goskomles of USSR, 1968*), while for 1973 and 1978 classes III, IV and V are combined (*Goskomles of USSR, 1976a, 1982a*).

In order to make the data of this books comparable and given the limitations of the available data, the authors had to combine the data on site quality classes IV and V for 1998. In addition, the distribution the tree stands area over site quality classes were calculated in relative units.

The results of the data compilation are given in Tables 6A and 7A. Changes that occurred in forests of the European-Urals part of Russia are shown in condensed form in Table 3.3. The data provide evidence that the areas of high site quality classes in coniferous and especially in deciduous softwood have increased.

The authors of the analytical report about the Russian forest resources suggest that the increasing share of stands with higher site quality classes is the result of excellent management of the FFS. They conclude that increasing stand productivity is the consequence of "permanent substitution for tree stands growing in unsuitable conditions by tree stands for which these conditions are most favorable. This happened by the production of forest plantations, the facilitation of natural reforestation by economically valuable species, and thinning in order to grow most productive stands" (*Yatskevich et al., 2001, p. 159*).

It is difficult to agree with the opinion of the authors of this paper. Without discussing here the different scale of positive and negative forest management measures, we note that the biggest positive changes have occurred in deciduous softwood, which is not the object of forest management. On the contrary, in deciduous hardwood, which is the most important forest group for the country, there was a tendency for decreasing productivity (Table 3.3, 6A, 7A). In addition, the increasing area of higher site quality classes occurred in regions where forest management to improve stand conditions was not practiced.

What can be real reason of increasing of stand's productivity?

One known factor causing productivity increase over large areas is global climate change. The fact that in this case stands under management by forest industry activity cannot show the influence of global processes is not surprising, because the local impact can be stronger than the positive planetary changes.

Another factor to consider as a cause of increasing productivity is the return of the best forest sites felled earlier to the category of stocked area. This is possible in cases when heavy logging machinery has not strongly damaged the soil of harvested area (*Perevoznikova, 1996*). Unfortunately, the decreasing of young stand's productivity is more common (*Tyurin, 1995*).

And finally, in individual cases, the positive influence of global change on the productivity of forests can really be strengthened by forestry activities, in particular, by producing forest plantations and by drainage of excessively wet forest ecosystems.

The published statistical data and the SFFA show the site quality classes of the coniferous and the deciduous stands without information about their age. This is an additional reason why we cannot to use this important characteristic as proof of the forest productivity change.

3.5. Dynamics of average growing stock of tree stands and age groups

3.5.1. Dynamics of average growing stock of tree stands with no account of age groups

Often the forestry specialists and forest scientists use the values of average growing stock (AGS), without indication of age group, as a general indicator of stocking. However when these values are used for characteristics of temporary dynamics of the AGS it is not quite correct because in the same time period it usually happens that the area is also changing.

The data on AGS calculated without indication of age groups ("the general AGS") are given in Tables 3.1. and 3.2.

On the whole, the general AGS for the stocked area of Russia, as it was shown earlier (*Shvidenko et al., 2000*), was gradually decreasing from 111.4 in 1961 to 105.7 m^3 in 1998 (Table 3.1.). These parameters closely match the data for lands under management of the Forest Service (Table 3.2.).

The stocked area includes tree stands and shrub communities, which have considerably lower grow-

ing stock than the tree stands. As can be seen from the materials of Table 3.2., the deletion of shrubs from calculation has noticeably increased the AGS value.

In European Russia, areas of shrub communities are not large, and one can neglect them during calculations of AGS. In Asian Russia, the shrub areas in many administrative territories represent a considerable part of the forest fund (Table 3A). For such regions, it is expedient to make calculations separately for tree stands and for shrubs.

As shown in Table 3.2, in forests under management of the Forest Service, the general AGS has decreased over 37 years by 6.2% (from 120.2 to 112.7 m^3). The decrease of the general AGS has occurred only in coniferous stands and has amounted to 11.6% (from 128.5 to 113.6 m^3). The general AGS of deciduous hardwood has increased during the period 1961 to 1998 by 10.4% (from 98.8 to 109.1 m^3). The general AGS of deciduous softwood has increased during this period by 29.5% (from 84.5 to 109.4 m^3).

Due to a different geographical location of Oblasts, Krays and Republics, the absolute values of the AGS differ from one another very strongly, by more than 5 times. The smallest values (< 40 m^3/ha) are observed at the present time with tree stands of the Murmansk Oblast, the Magadan Oblast and the Republic of Kalmykia; and the largest values (> 200 m^3/ha) - with forests of the Moscow Oblast, the Kaluga Oblast, the Krasnodar Kray and the Stavropol Kray.

3.5.2. Dynamics of average growing stock by tree stand and age groups

Based on the published materials of statistical reference-books, the AGS of the Russian administrative territories were calculated by stand groups (coniferous, deciduous hardwood and softwood) and by age groups (middle-aged, maturing, mature and overmature). The data differ essentially from the general AGS. For the best visual understanding, they are shown in charts (Fig. 1-71*).

An example of smooth dynamics of the AGS changes during the 37-year period is the data by deciduous softwood stands in the Vladimir Oblast (Fig. 11B). The chart shows that a uniform growth of AGS has taken place in deciduous softwood of the Oblast during the period under investigation. As no soil or stand-improving measures have been applied in birch and aspen forests of the Oblast, the forest productivity growth can be fully attributed to Global Change processes.

The review of charts shows that smooth dynamics of the AGS are the exception rather than the rule as it must be in the main part of tree stands before age of harvest.

The charts reveal that published initial statistical data contain numerous mistakes practically in every administrative territory. Therefore, the consideration of the productivity dynamics requires a preliminary analysis of reasons for changing of the AGS and a search for errors and mistakes.

This analysis used the initial and some additional data to help determine or at least to propose a reason (or reasons) for mistakes. As additional information, we used statistical data on the clear-cut and intermediate harvest (Table 8A), data on the dynamics of burned and dead forest stands (Table 9A), and information on the drainage of forest ecosystems (Table 10A).

Also used were reference data to determine a possible variation of AGS in species and age groups during 5-year periods between the accounts (*Antanaitis, Zagreyev, 1981; Zagreyev et al., 1992*). In individual cases, other additional data helped to understand the feasibility and reasons for deviations that were shown.

Heavily unreliable regional data of the AGS dynamics are not shown on the figures. This is reason of absence of chart data for the Republic of Kalmykia, the Chechen-Ingush, and the North-Ossetia republics.

Main conclusions of chapter 3

- Many of the changes in average growing stock have been caused by reasons having nothing to do with real changes occurring in forests.
- It is expedient to search for reasons causing real changes of trends in the dynamics of AGS.

*The lines connecting the points with actual data by 5-year intervals between accounts do not reflect the real change of the AGS in that period. They are denoted for the convenience of review of the data presented and indicate only the change tendency.

Table 3.1. **Dynamic of area, storage and average growing stock of the forest fund of Russia**

Category of area and tree stand	Year of the forest fund account								Changing for 37 years	
	1961	1966	1973	1978	1983	1988	1993	1998	1998-1961	% to 1961
					Area, million ha					
Total area of Forest Fund	1163.8	1161.9	1161.4	1188.2	1187.7	1182.6	1180.9	1178.6	14.8	1.3
Forest area	848.1	863.01	862.1	873.3	880.5	884.1	886.5	882	33.9	4.0
Nonstocked area	152.6	157.41	132.4	123.1	113.9	113	123	107.7	-44.9	-29.4
Stocked area	696	705.6	729.7	750.2	766.6	771.1	763.5	774.3	78.3	11.3
Tree stands	no p. d.*	659.7	684.3	701.7	711.6	709	no p. d	no p. d	i. e**.	i. e.
Coniferous	no p. d	509.5	531.8	545.4	554	552	no p. d	no p. d	i. e.	i. e.
Deciduous hardwood	no p. d	18.9	20.8	19.9	20.1	19.8	no p. d	no p. d	i. e.	i. e.
Deciduous softwood	no p. d	131.3	131.7	136.4	137.5	137.2	no p. d	no p. d	i. e.	i. e.
Shrubs, krummholz et al.	no p. d	46	45.4	48.5	55.1	62.1	no p. d	no p. d	i. e.	i. e.
Non-forest area	315.7	298.9	299.3	314.9	307.2	298.5	294.3	296.6	-19.1	-6.1
					Storage, billion m^3					
Stocked area	77.5	77	78.7	80.7	81.9	81.6	80.7	81.9	4.4	5.7
Tree stands	no p. d	75.9	77.7	79.6	80.7	80.3	no p. d	no p. d	i. e.	i. e.
Coniferous	no p. d	63.4	64	64.8	65.1	64	no p. d	no p. d	i. e.	i. e.
Deciduous hardwood	no p. d	1.7	2	2	2.1	2	no p. d	no p. d	i. e.	i. e.
Deciduous softwood	no p. d	10.8	11.7	12.9	13.5	14.2	no p. d	no p. d	i. e.	i. e.
Shrubs, krummholz et al.	no p. d	1.1	1	1.1	1.3	1.4	no p. d	no p. d	i. e.	i. e.
					Average growing stock, m^3					
Stocked area	111.4	109.1	107.9	107.6	106.9	105.9	105.7	105.7	-5.7	-5.1
Tree stands	i. e.	115	113.6	113.5	113.4	113.2	i. e.	i. e.	i. e.	i. e.
Coniferous	i. e.	124.4	120.3	118.7	117.4	116	i. e.	i. e.	i. e.	i. e.
Deciduous hardwood	i. e.	92.5	96	98.7	103.6	102.7	i. e.	i. e.	i. e.	i. e.
Deciduous softwood	i. e.	82.2	89.2	94.8	98.3	103.4	i. e.	i. e.	i. e.	i. e.
Shrubs, krummholz et al.	i. e.	23.3	21.1	22.4	23.1	22.3	i. e.	i. e.	i. e.	i. e.

*no p. d. - no published data.
**i. e. - impossible estimate

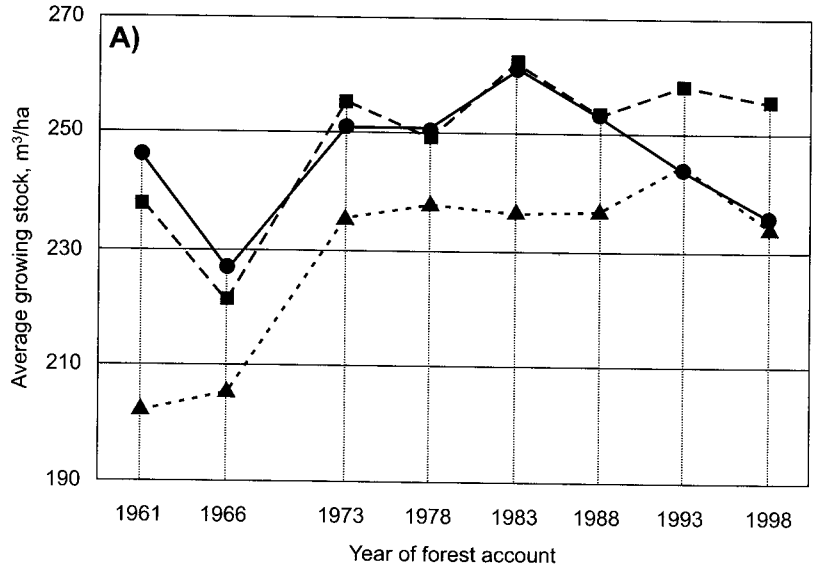
Table 3.2. **Dynamic of area, storage and average growing stock in the forest fund under management of Russian Forest Service (including area for long-term lease)**

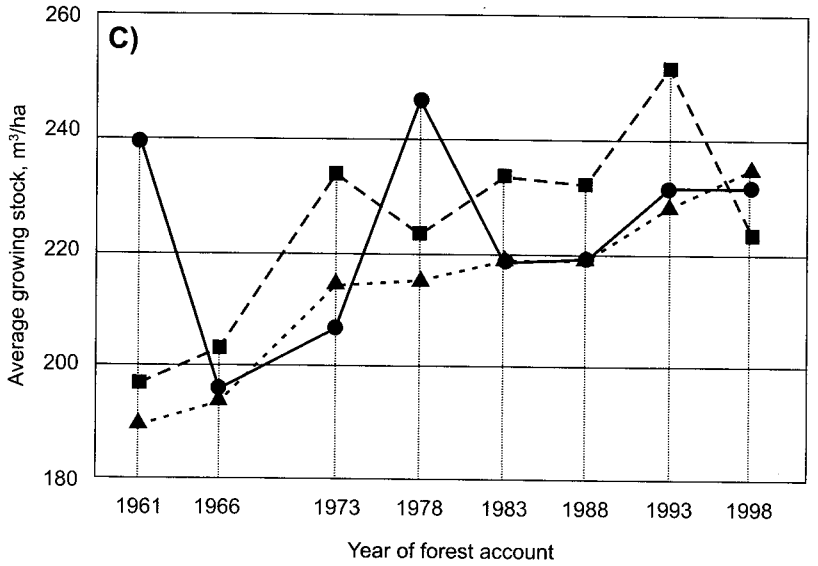
Category of area and tree stand	Year of the forest fund account								Changing for 37 years	
	1961	1966	1973	1978	1983	1988	1993	1998	1998-1961	% to 1961
					Area, million ha					
Total area of Forest Fund	1110.6	1105.6	1103.4	1123	1119.7	1095.9	1110.5	1110.6	0	0.0
Forest area	799.1	no p. d*	807.3	814.1	819.2	849.6	825.2	823.6	24.5	3.1
Nonstocked area	147.2	no p. d	128.2	119.8	110.7	136.1	119.4	104.9	-42.3	-28.7
Stocked area	652	657.4	679.1	694.3	708.5	713.6	705.8	718.7	66.7	10.2
Tree stands	608.3	612.5	634.2	646.4	651.9	652.9	638.2	645.9	37.6	6.2
Coniferous	489.3	488.1	508.3	519.2	523.5	526.1	507.7	508.7	19.4	4.0
Deciduous hardwood	16.5	16.4	17.6	17.3	17.5	17.1	17.3	17.5	1	6.1
Deciduous softwood	102.5	108	108.2	109.9	110.9	109.7	113.2	119.7	17.2	16.8
Shrubs, krummholz et al.	43.7	44.9	44.9	47.8	56.6	60.7	67.6	72.8	29.1	66.6
					Storage, billion m^3					
Stocked area	74.13	73.47	no p. d	74.7	75.37	74.65	73.03	74.32	0.19	0.3
Tree stands	73.14	72.42	73.01	73.65	74.09	73.31	71.64	72.79	-0.35	-0.5
Coniferous	62.85	61.23	61.01	61.15	61.31	60.16	57.68	57.79	-5.06	-8.1
Deciduous hardwood	1.63	1.64	1.8	1.77	1.8	1.82	1.86	1.91	0.28	17.2
Deciduous softwood	8.66	9.56	10.2	10.74	10.98	11.33	12.1	13.09	4.43	51.2
Shrubs, krummholz et al.	0.98	1.05	no p. d	1.05	1.29	1.34	1.39	1.53	0.55	56.1
					Average growing stock, m^3					
Stocked area	113.7	111.8	i. e.**	107.6	106.4	104.6	103.5	103.4	-10.3	-9.1
Tree stands	120.2	118.2	115.1	113.9	113.7	112.3	112.3	112.7	-7.5	-6.2
Coniferous	128.5	125.4	120	117.8	117.1	114.4	113.6	113.6	-14.9	-11.6
Deciduous hardwood	98.8	100	102.1	102.6	102.9	106.5	107.6	109.1	10.3	10.4
Deciduous softwood	84.5	88.5	94.3	97.7	99	103.3	106.9	109.4	24.9	29.5
Shrubs, krummholz et al.	22.5	23.4	i. e.	21.9	22.7	22	20.5	21.1	-1.4	-6.2

*no p. d. - no published data.
**i. e. - impossible estimate

Table 3.3. **Changing of area of site quality classes of tree stand groups in European Russia from 1961 to 1998***

Site quality class	Tree stand group and year of account					
	Coniferous		Deciduous hardwood		Deciduous softwood	
	1966	1998	1966	1998	1966	1998
II and >, million ha	**11.3**	**16.5**	**2.0**	**1.7**	**15.7**	**23.7**
%	*13.4*	*18.5*	*33.7*	*33.1*	*39.1*	*51.8*
III, million ha	**14.2**	**13.1**	**2.1**	**1.8**	**12.3**	**11.8**
%	*16.9*	*14.6*	*35.9*	*34.9*	*30.6*	*25.8*
IV-V, million ha	**44.9**	**44.7**	**1.7**	**1.5**	**10.0**	**8.1**
%	*53.3*	*50.1*	*28.6*	*29.6*	*25.0*	*17.8*
Va-Vb, million ha	**13.8**	**15.1**	**0.1**	**0.1**	**2.1**	**2.1**
%	*16.4*	*16.9*	*1.7*	*2.4*	*5.3*	*4.6*
Total, million ha	**84.1**	**89.4**	**6.0**	**5.2**	**40.1**	**45.7**
%	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*





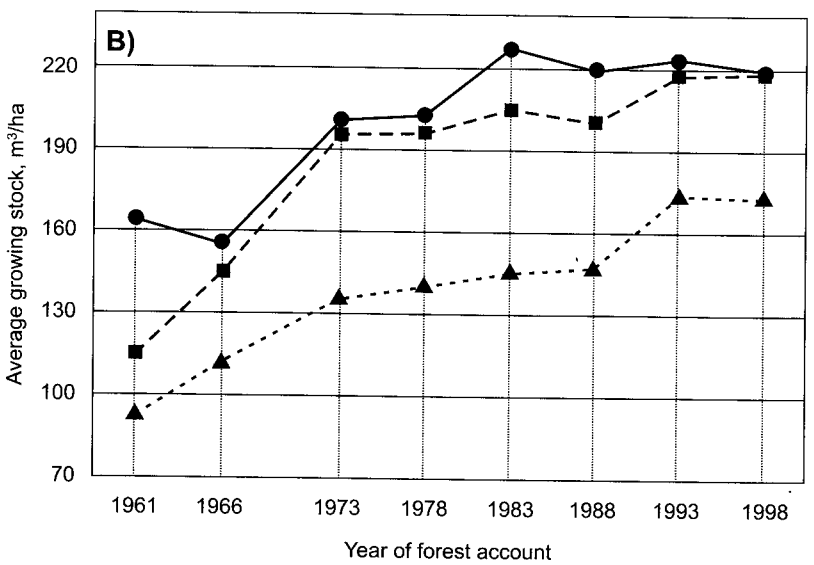


Fig. 1. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Kaliningrad Oblast by age groups.

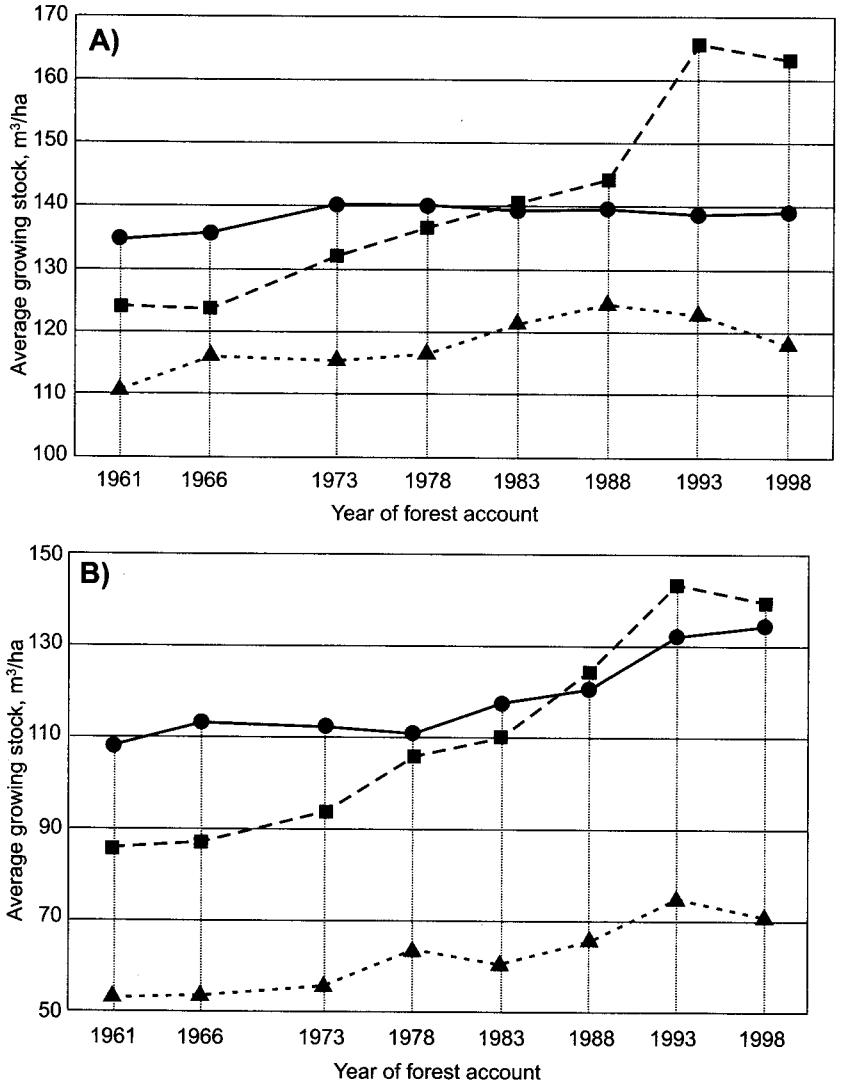


Fig.2. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Archangel Oblast by age groups.

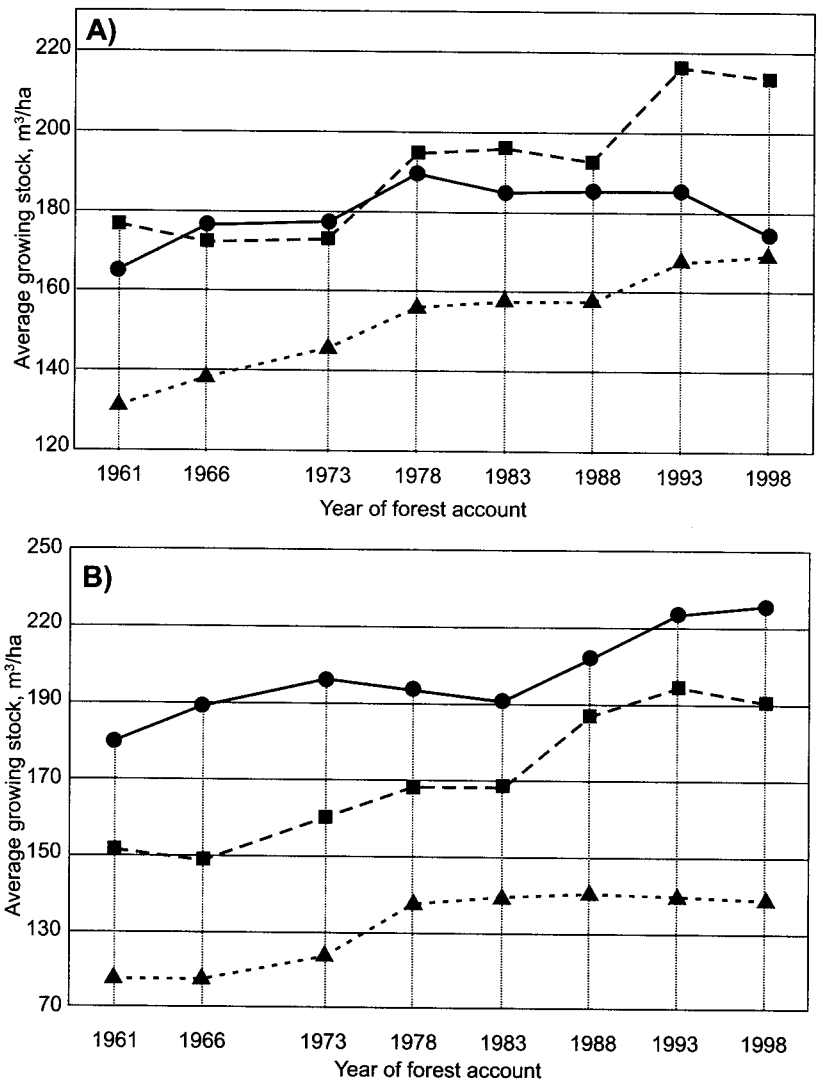
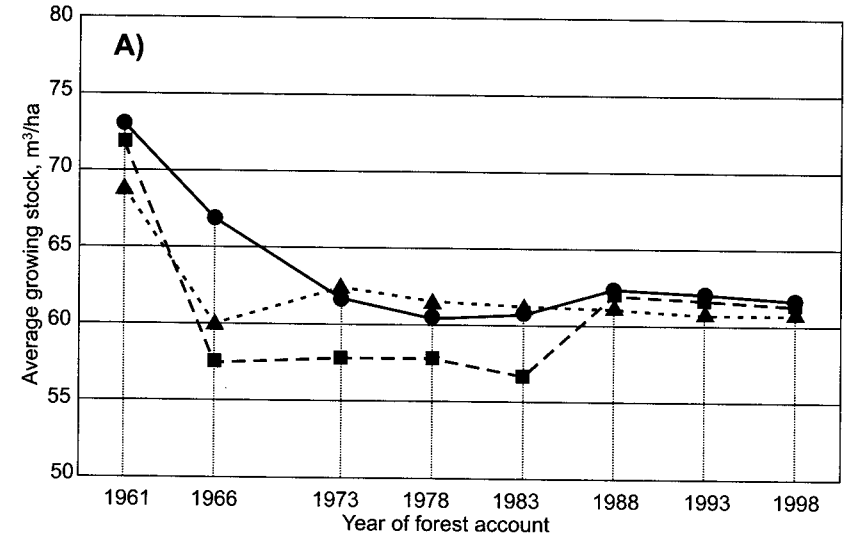


Fig.3. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Vologda Oblast by age groups.

middle-aged — maturing — mature and overmature — middle-aged — maturing — mature and overmature



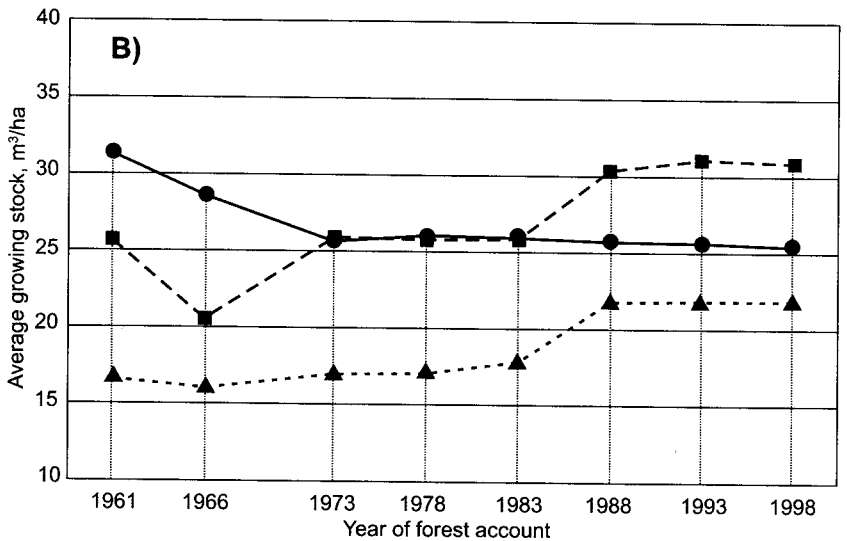
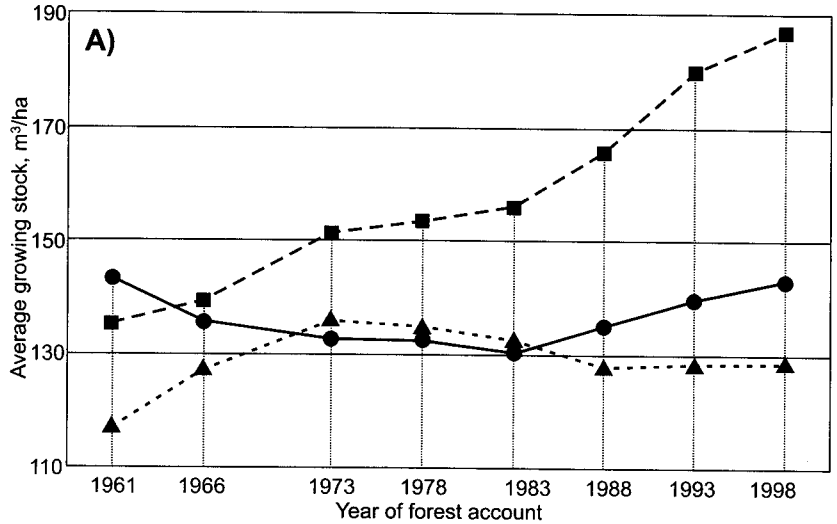


Fig. 4. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Murmansk Oblast by age groups.



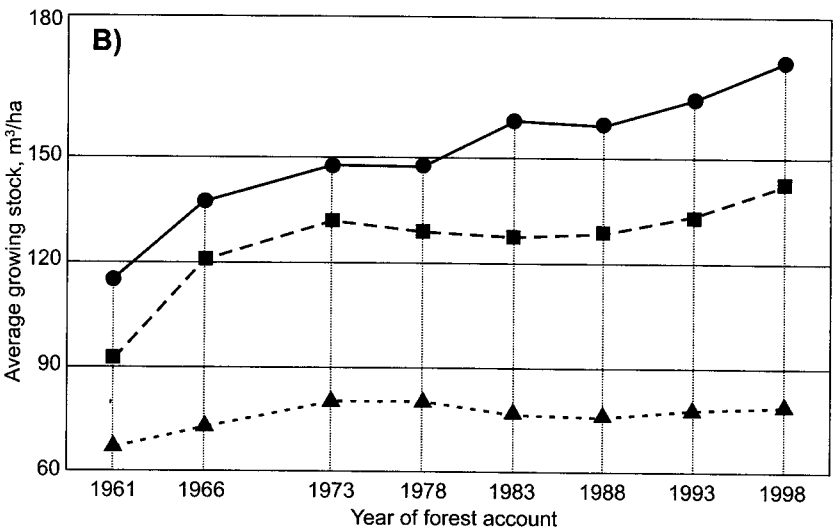
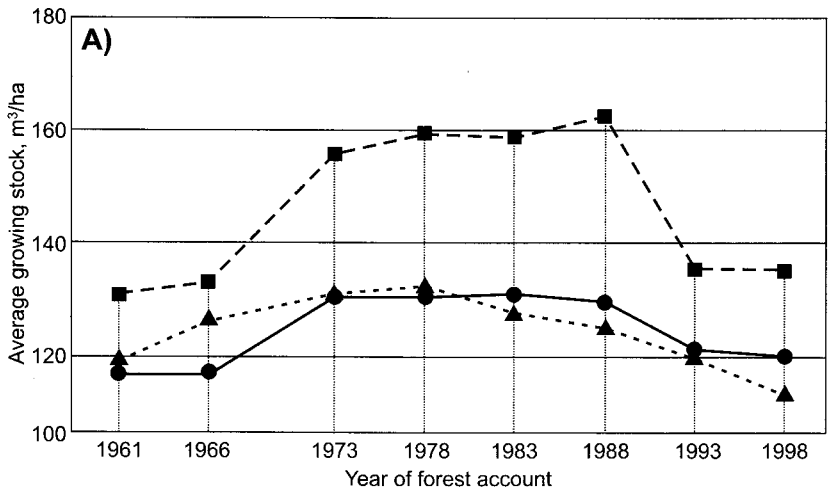


Fig. 5. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Republic of Karelia by age groups.

middle-aged — maturing — mature and overmature

middle-aged — maturing — mature and overmature



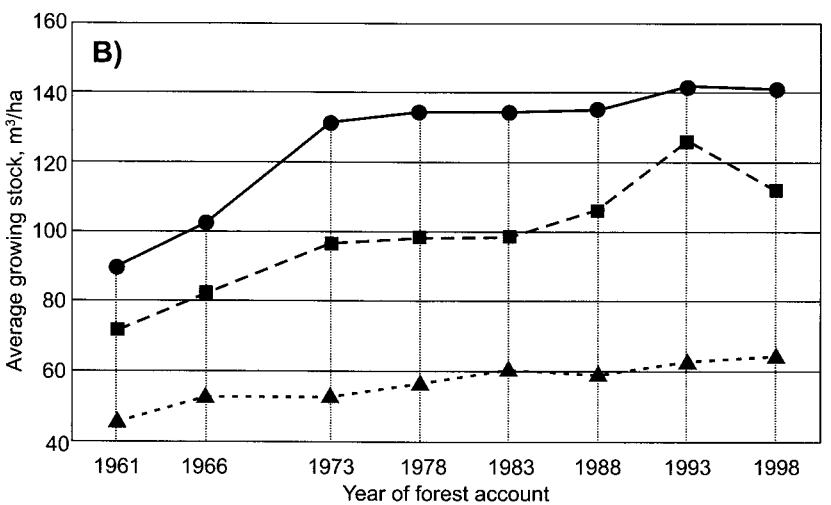
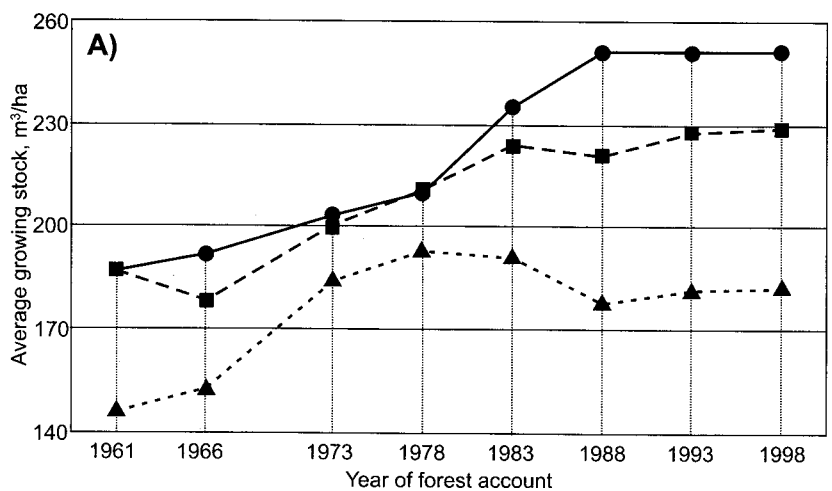


Fig. 6. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Komi Republic by age groups.



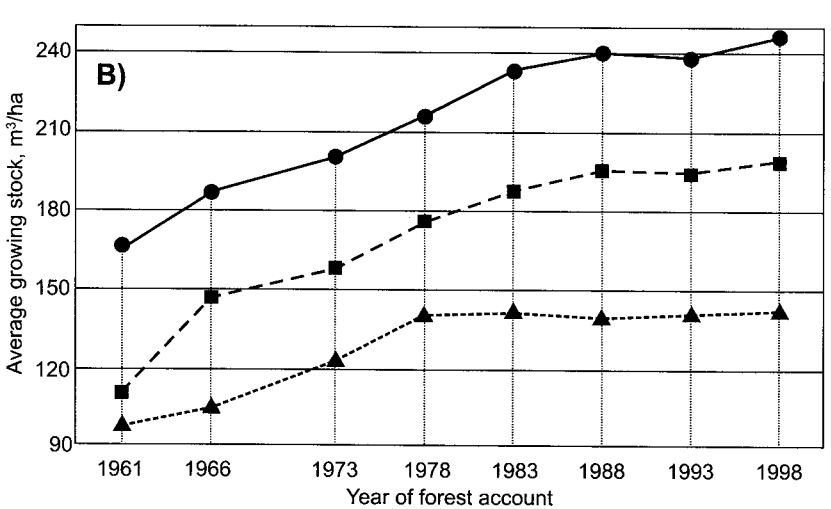
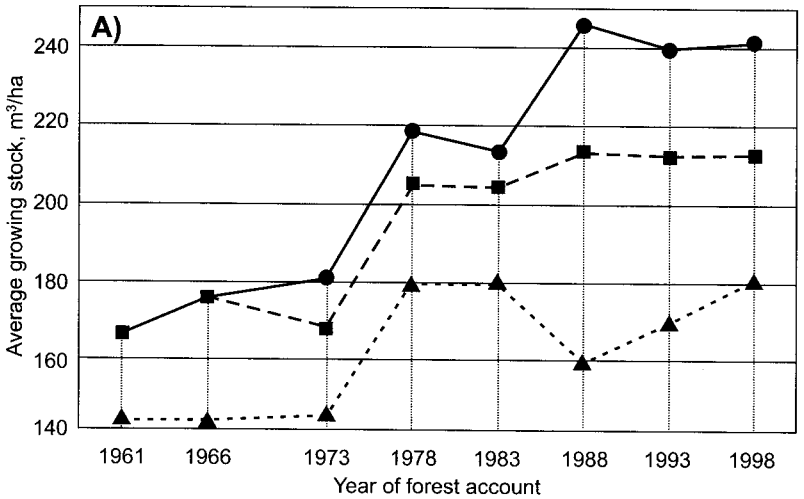


Fig. 7. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Leningrad Oblast by age groups.

middle-aged — maturing — mature and overmature — middle-aged — maturing — mature and overmature



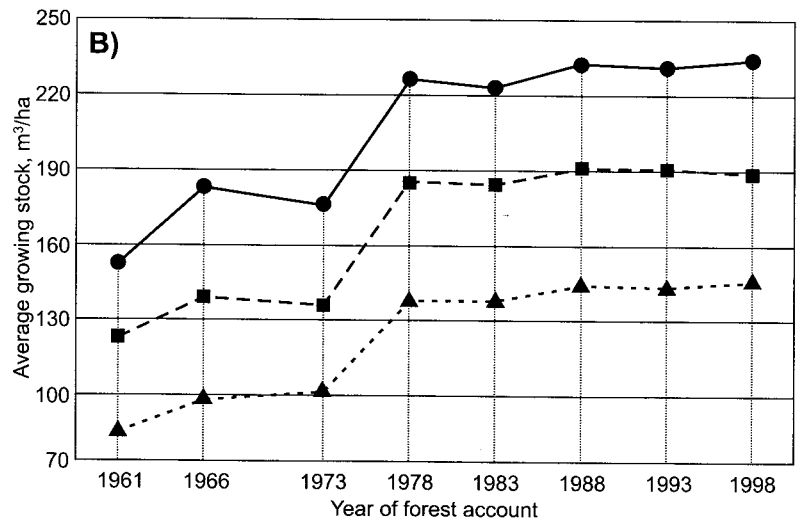
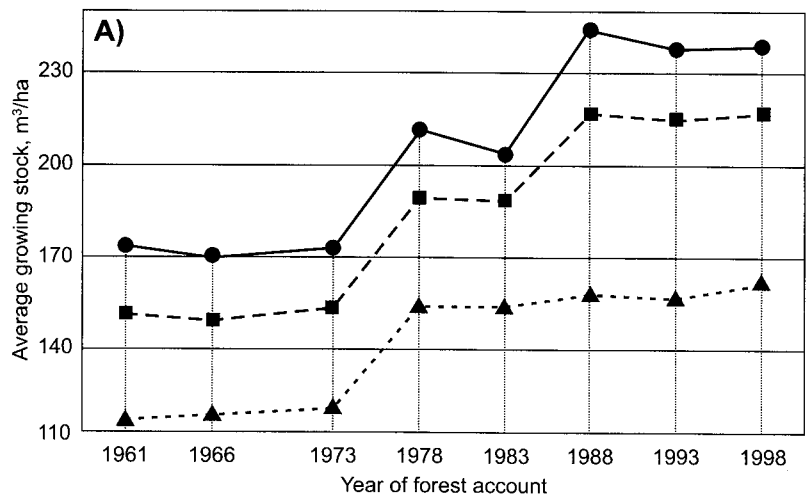


Fig. 8. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Novgorod Oblast by age groups.



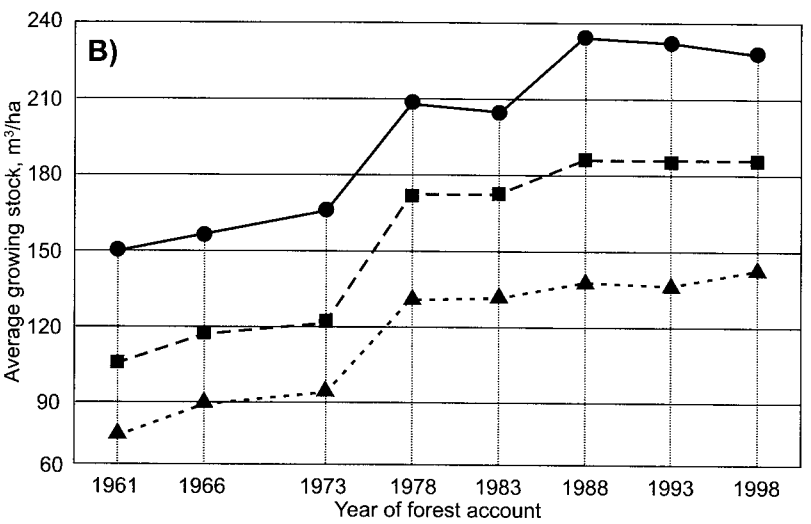
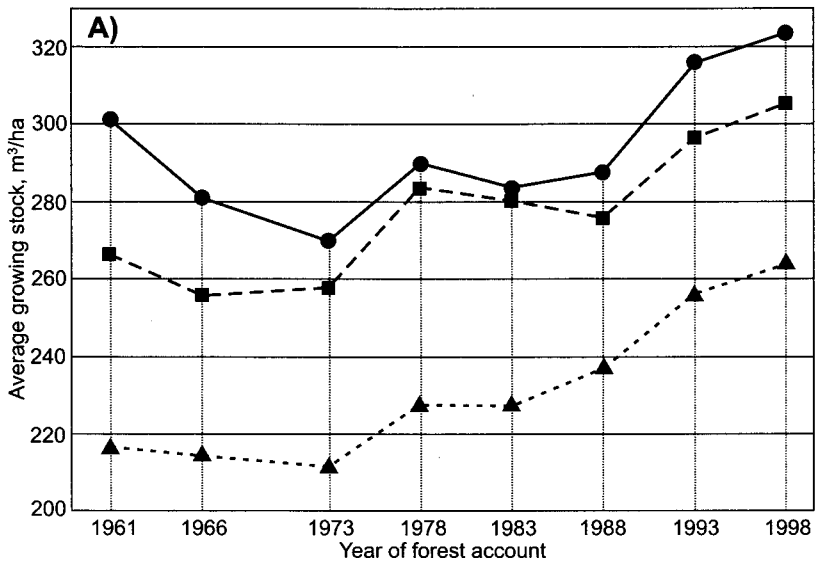
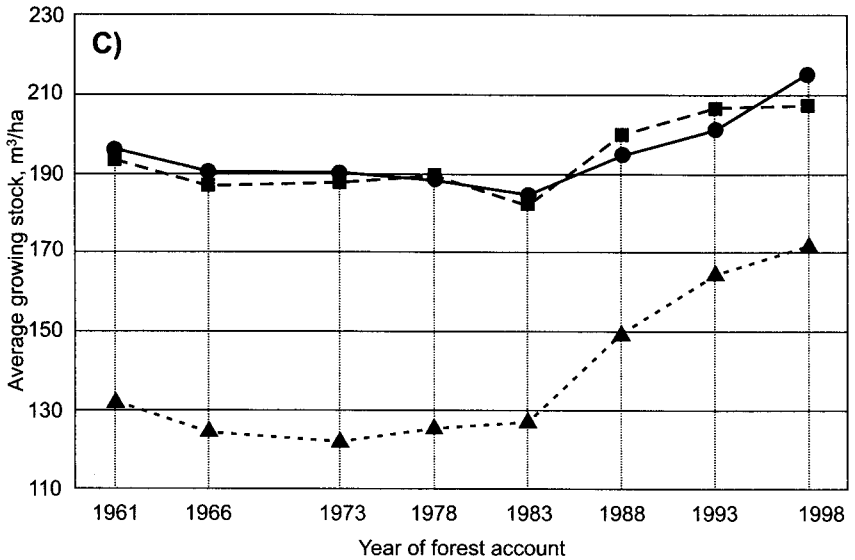


Fig. 9. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Pskov Oblast by age groups.

middle-aged — maturing — mature and overmature

middle-aged — maturing — mature and overmature





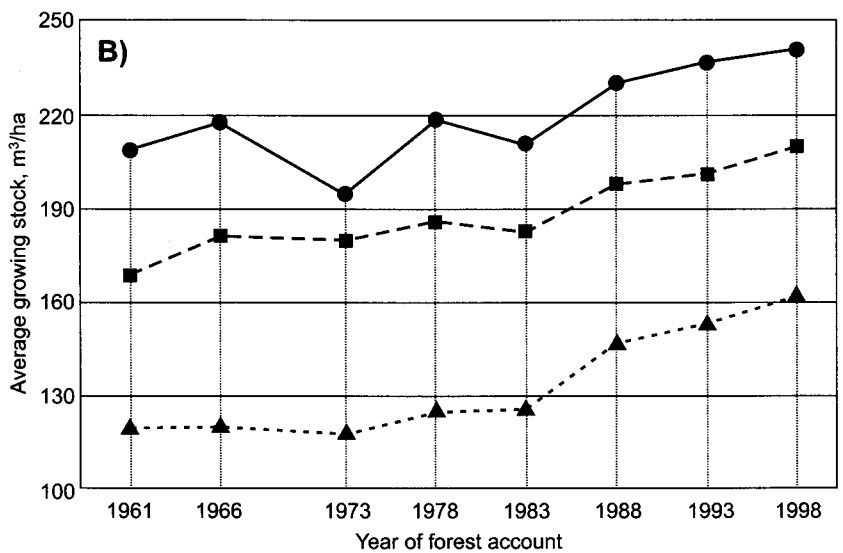
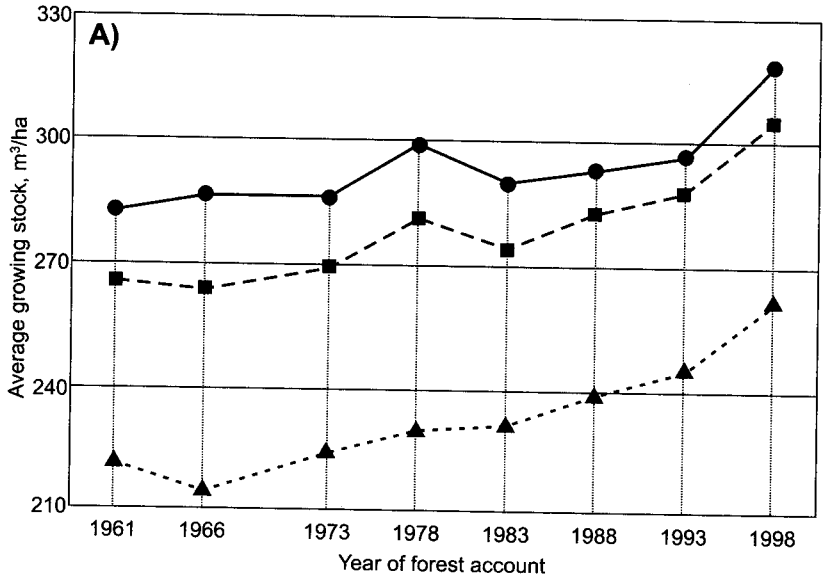
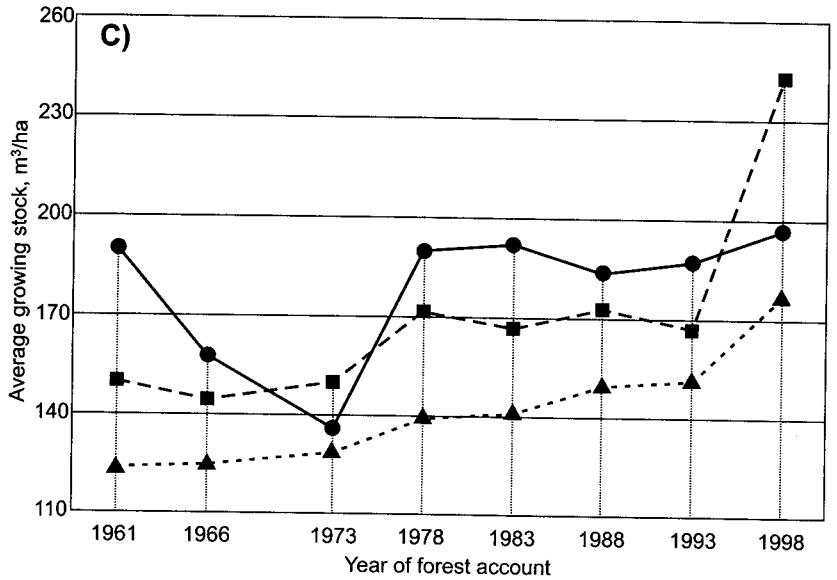


Fig. 10. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Bryansk Oblast by age groups.

middle-aged — maturing — mature and overmature





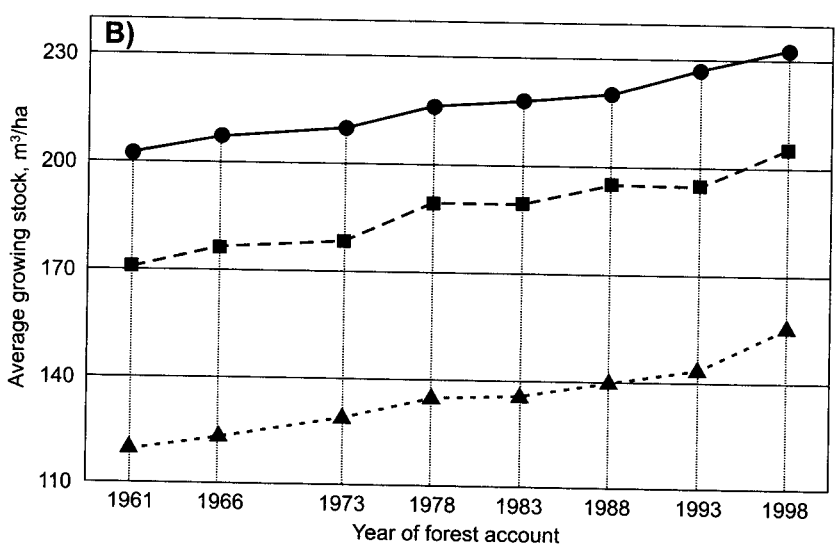


Fig. 11. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Vladimir Oblast by age groups.

middle-aged — maturing — mature and overmature

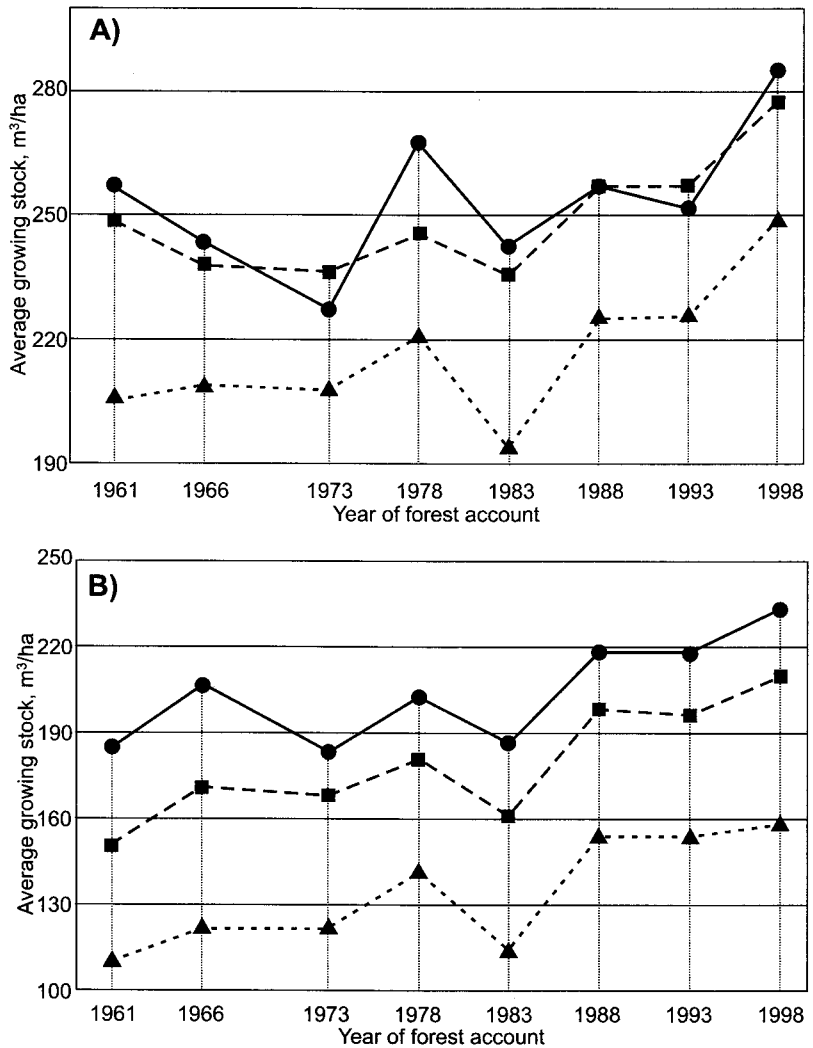


Fig. 12. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Ivanovo Oblast by age groups.

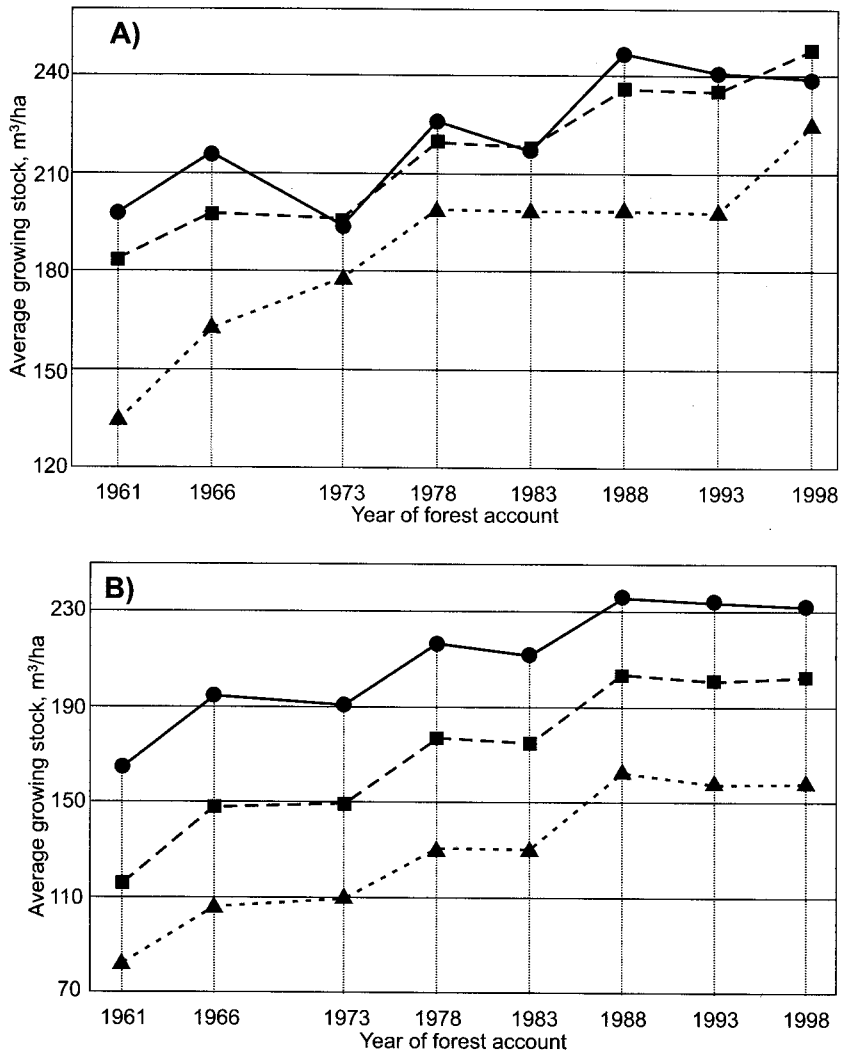


Fig. 13. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Tver Oblast by age groups.

middle-aged — maturing — mature and overmature — middle-aged — maturing — mature and overmature

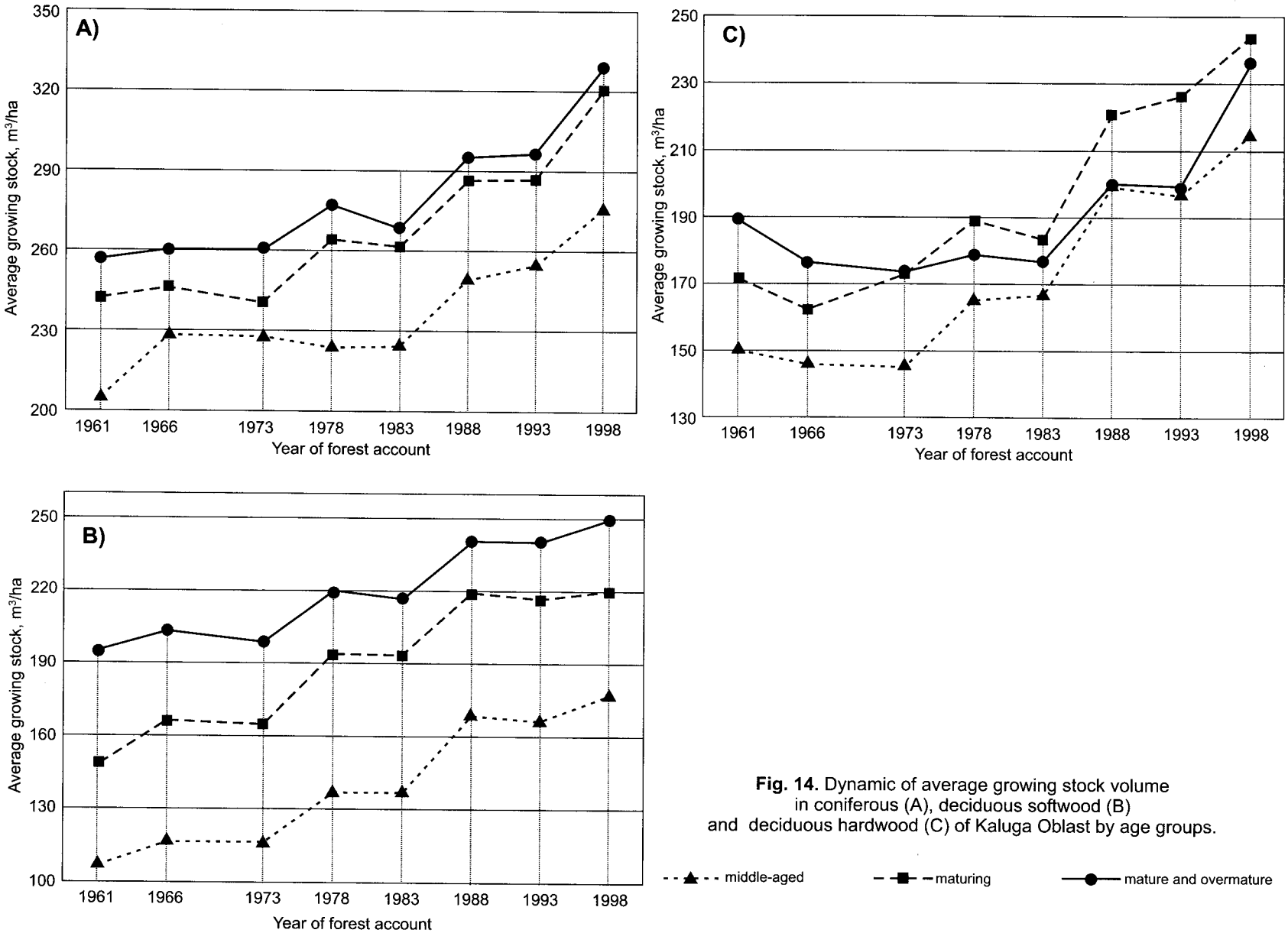


Fig. 14. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Kaluga Oblast by age groups.

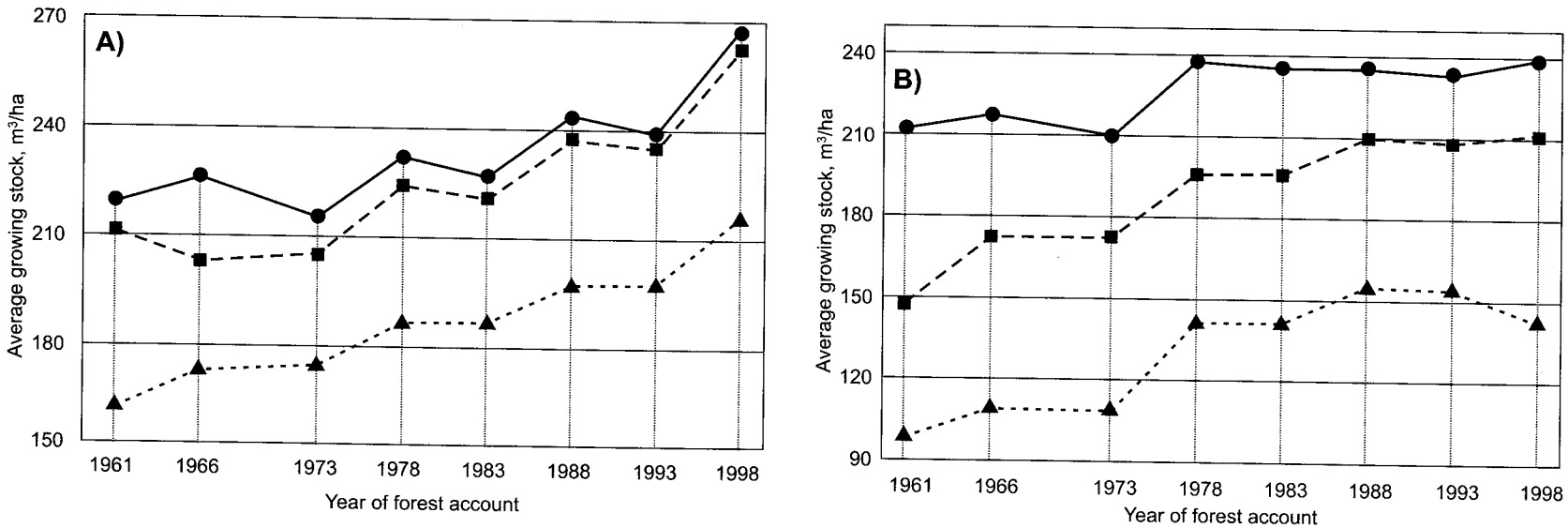
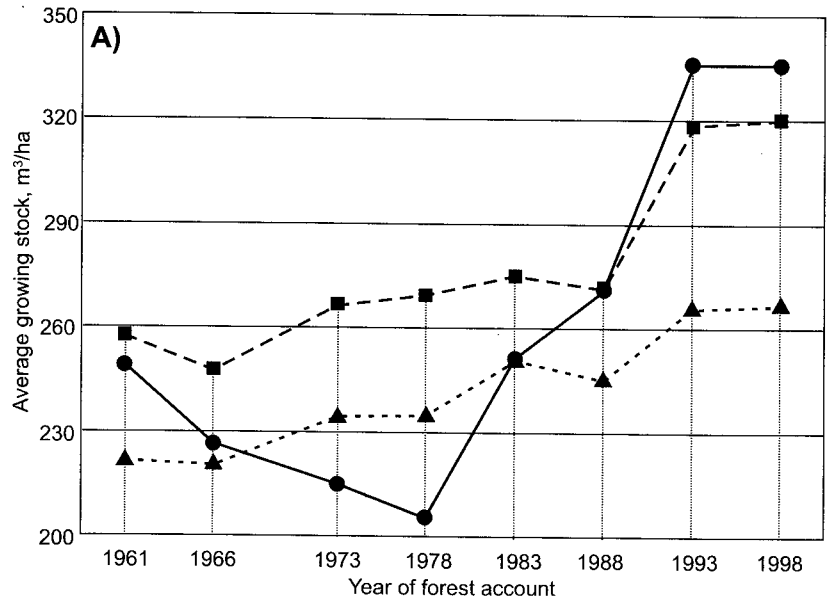
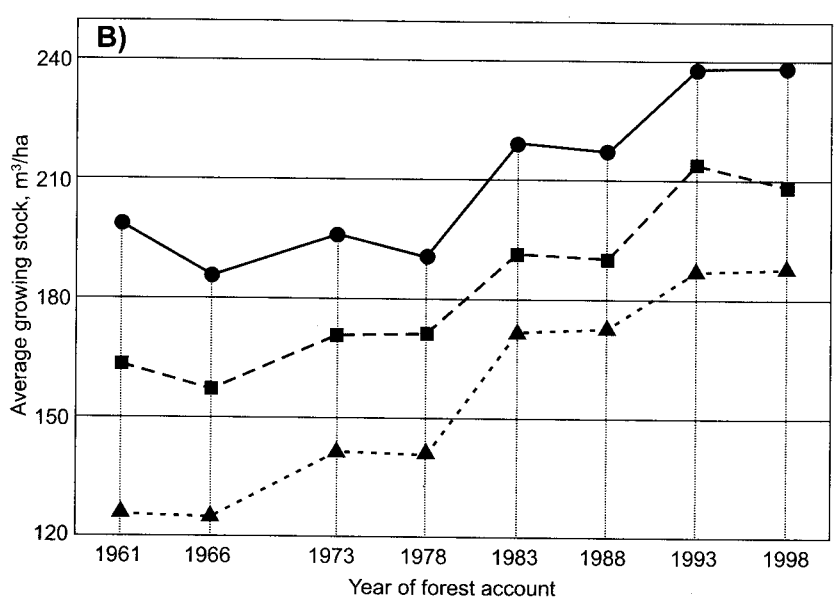


Fig. 15. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Kostroma Oblast by age groups.





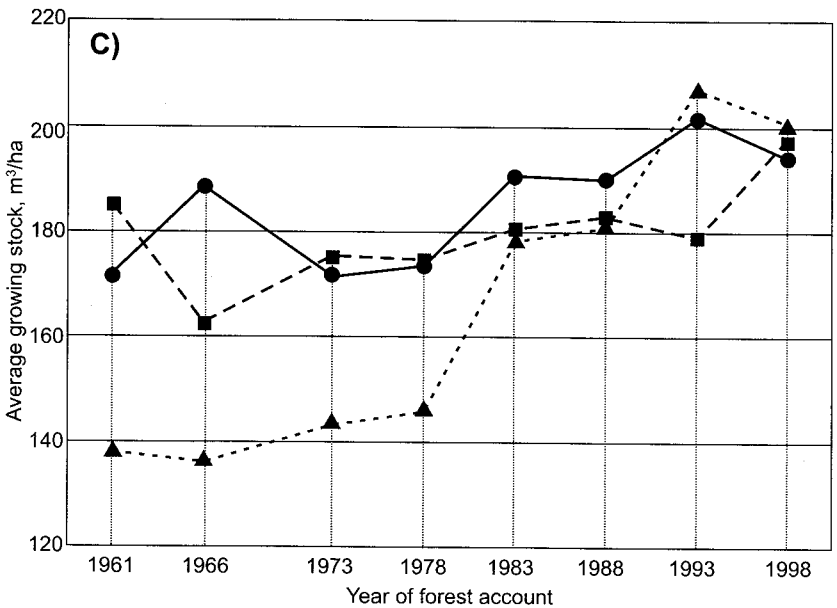
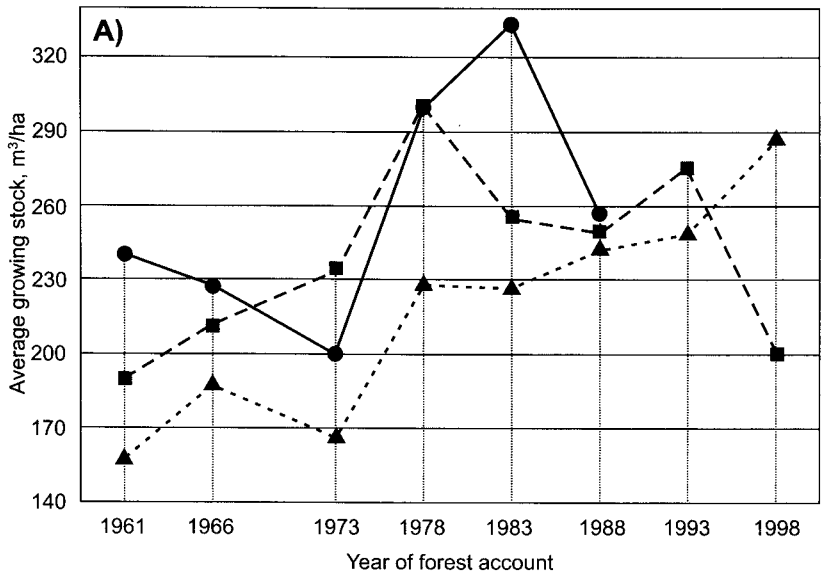
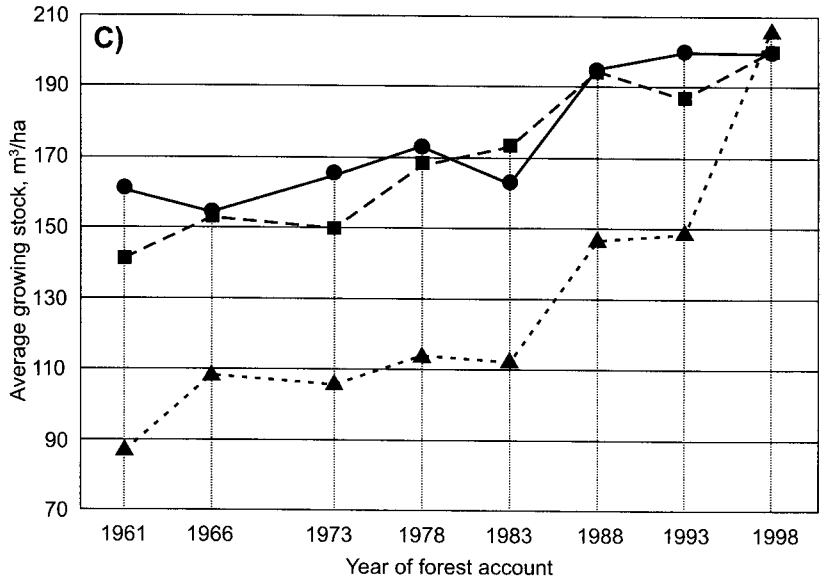


Fig. 16. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Moscow Oblast by age groups.

middle-aged — maturing — mature and overmature





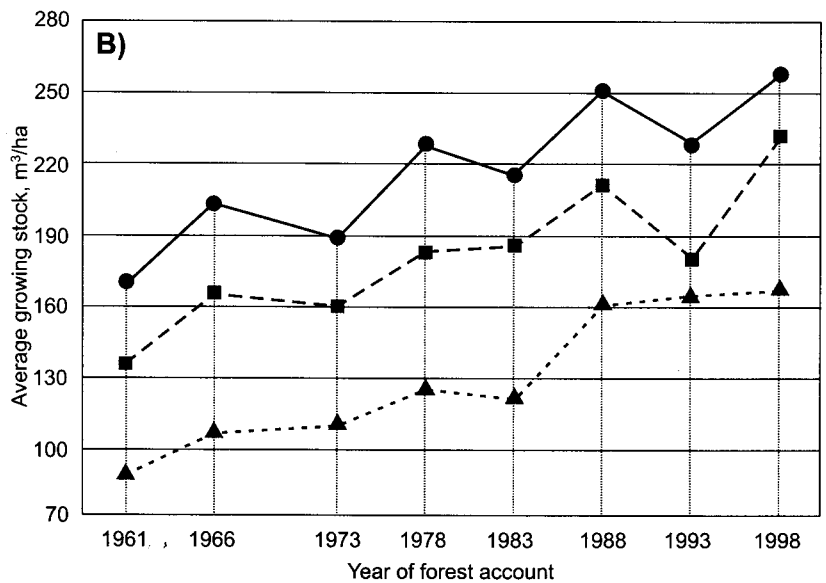
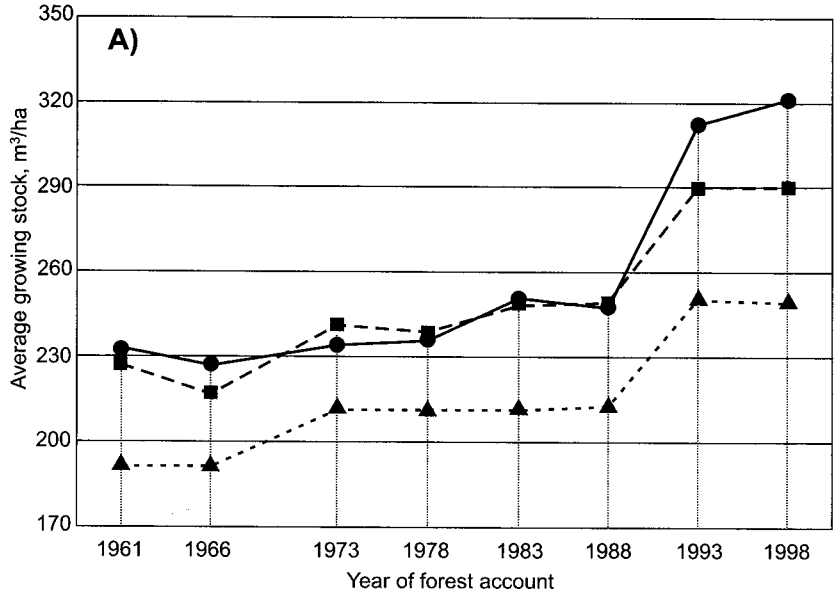
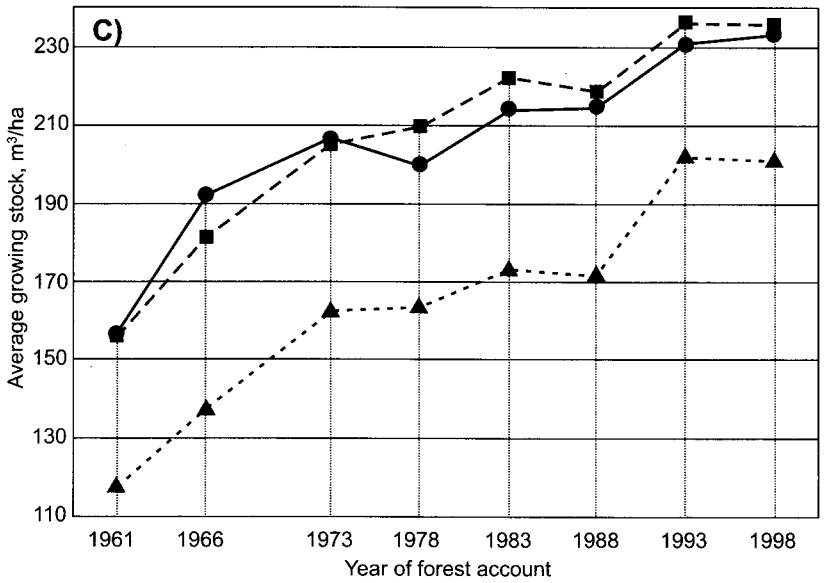


Fig. 17. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Orel Oblast by age groups.

middle-aged — maturing — mature and overmature





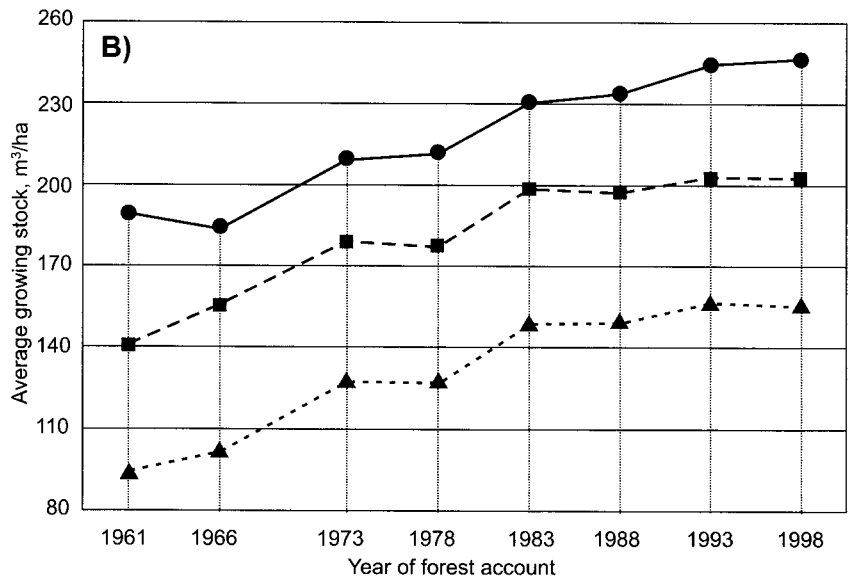


Fig. 18. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Ryazan Oblast by age groups.

middle-aged — maturing — mature and overmature

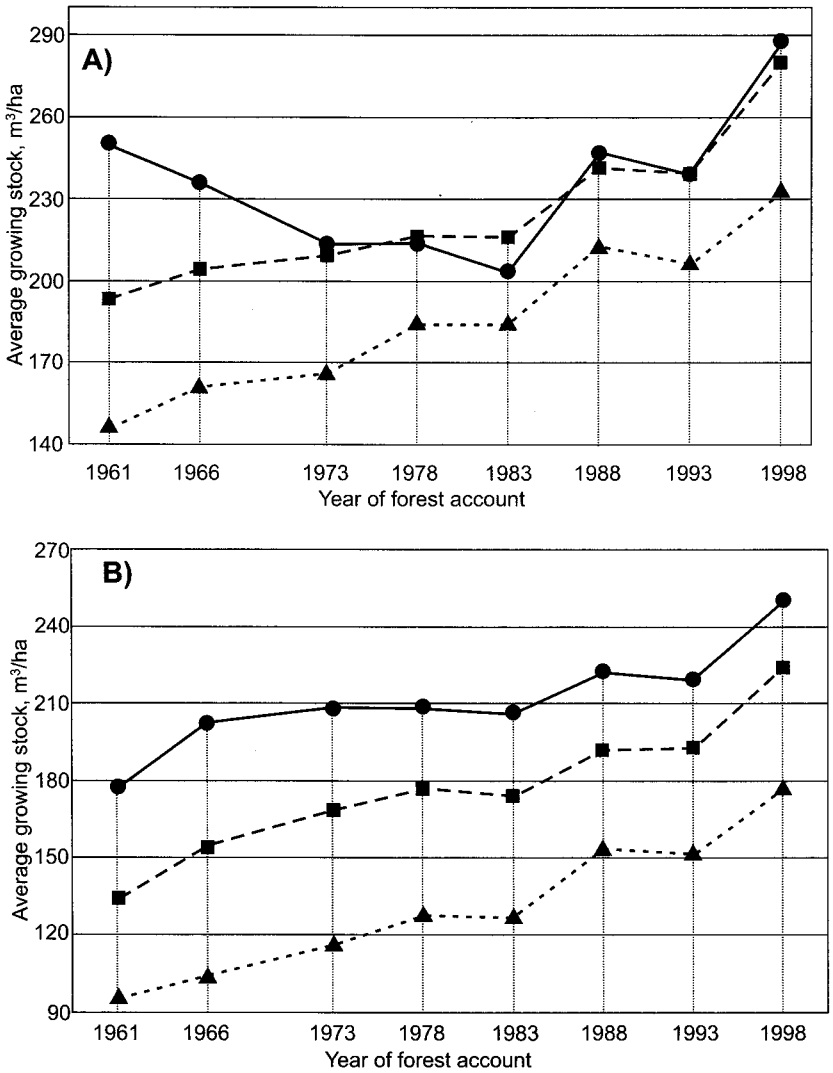


Fig. 19. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Smolensk Oblast by age groups.

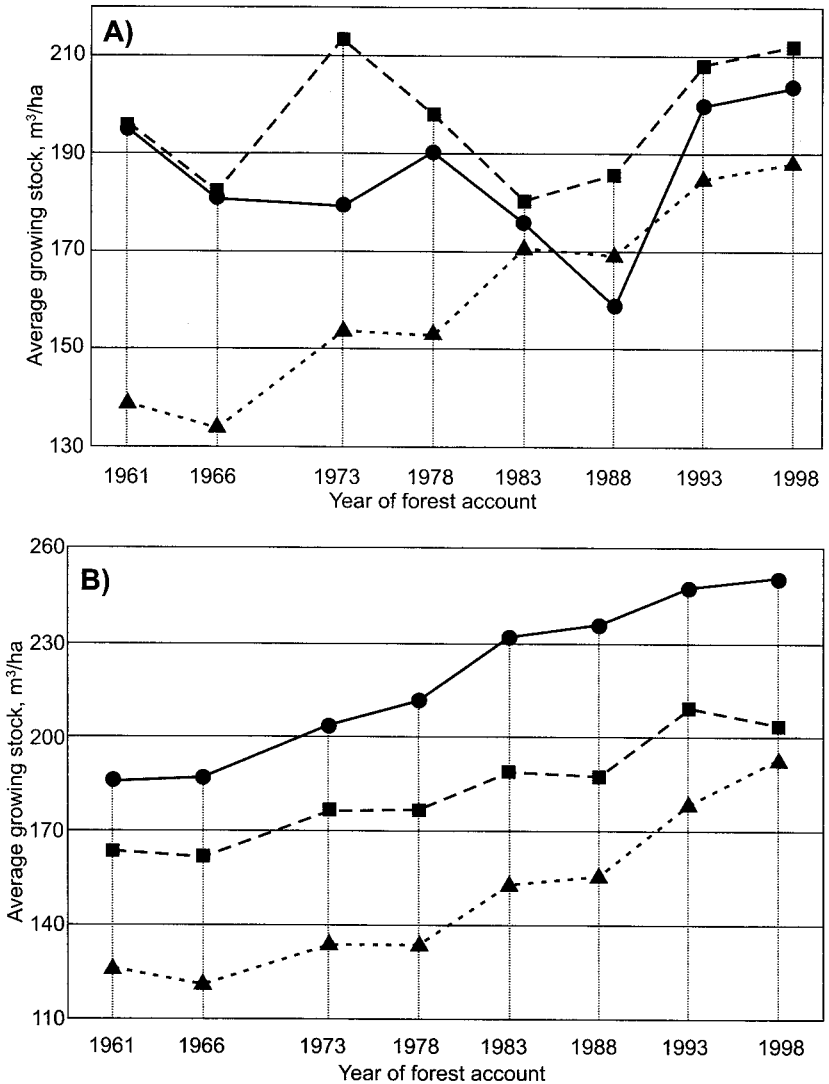


Fig. 20. Dynamic of average growing stock volume in deciduous softwood (B) and deciduous hardwood (A) of Tula Oblast by age groups.

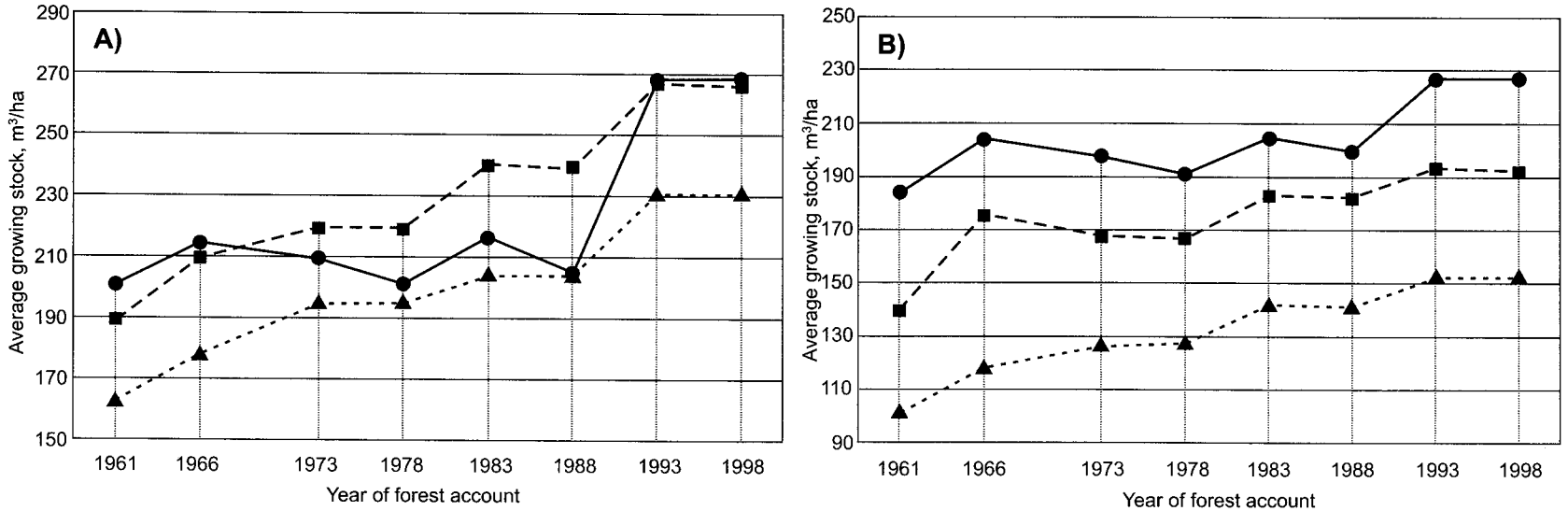
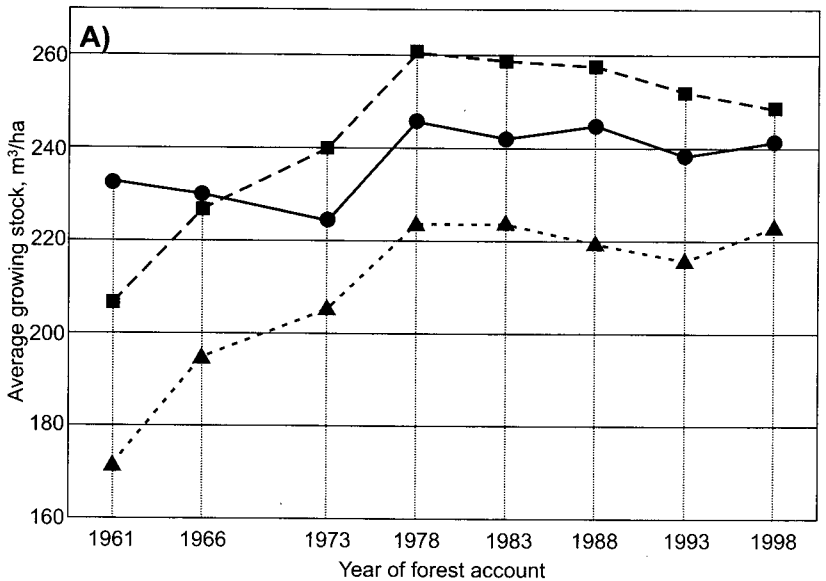
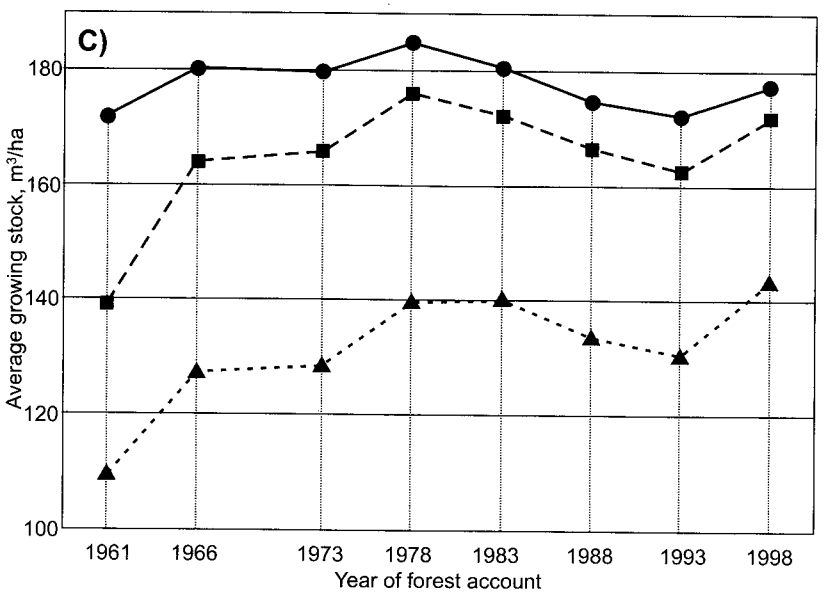


Fig.21. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Yaroslavl Oblast by age groups.





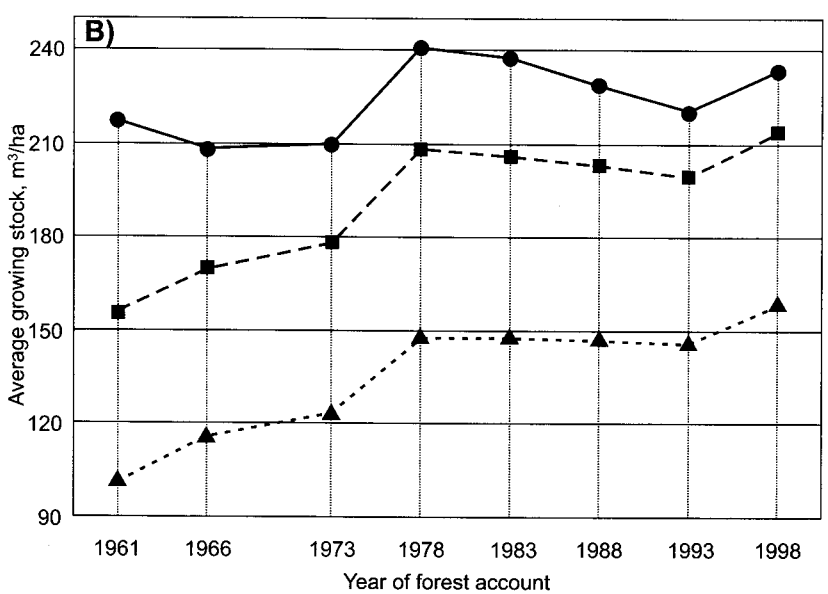
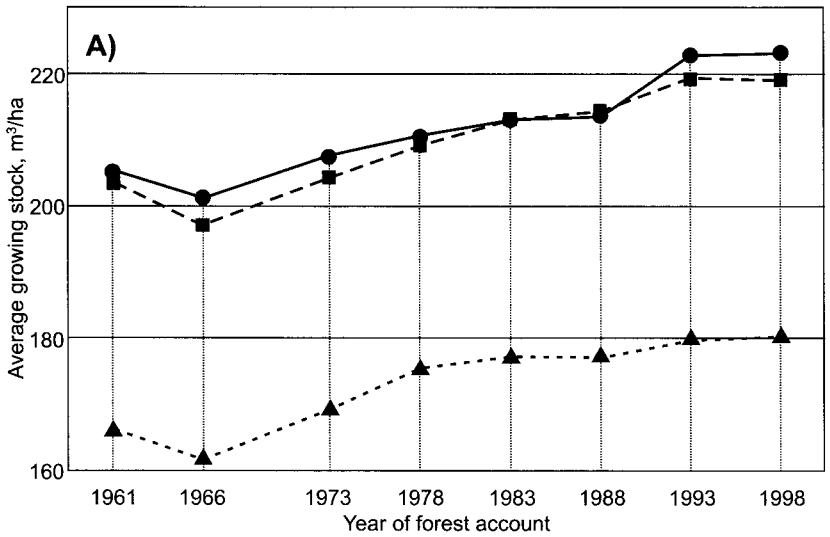


Fig. 22. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Nizhni Novgorod Oblast by age groups.

middle-aged — maturing — mature and overmature



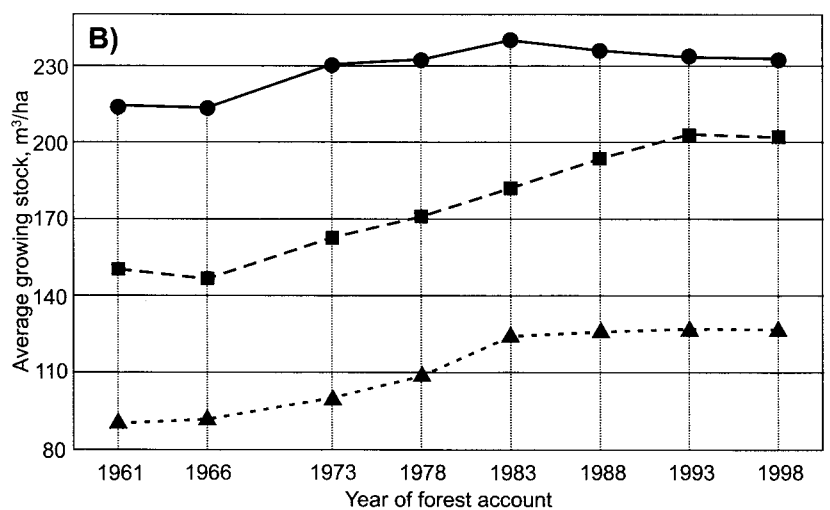
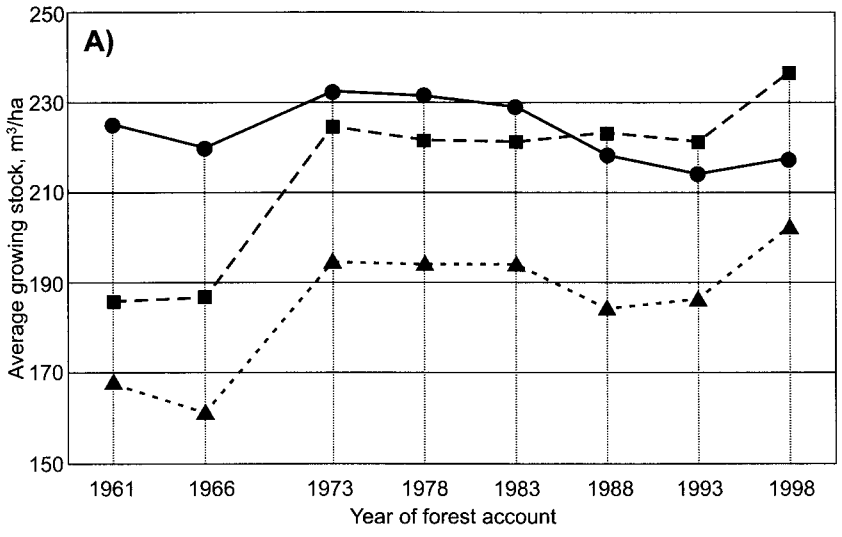


Fig. 23. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Kirov Oblast by age groups.



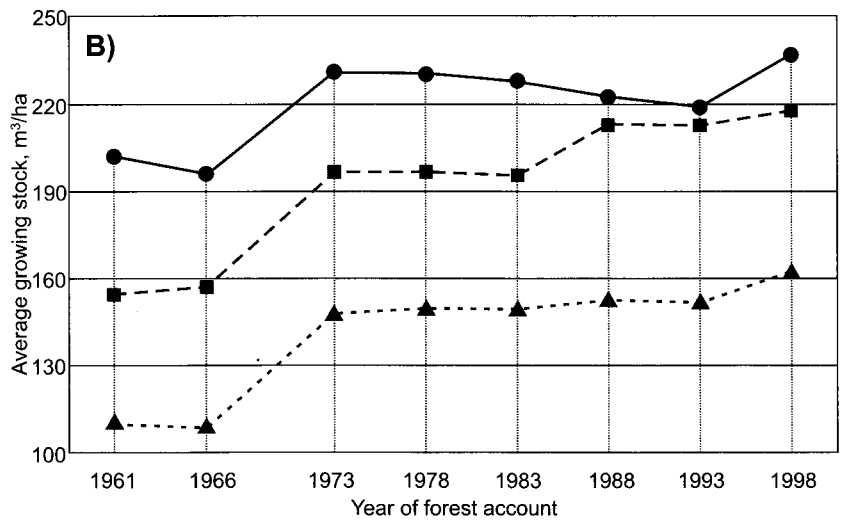
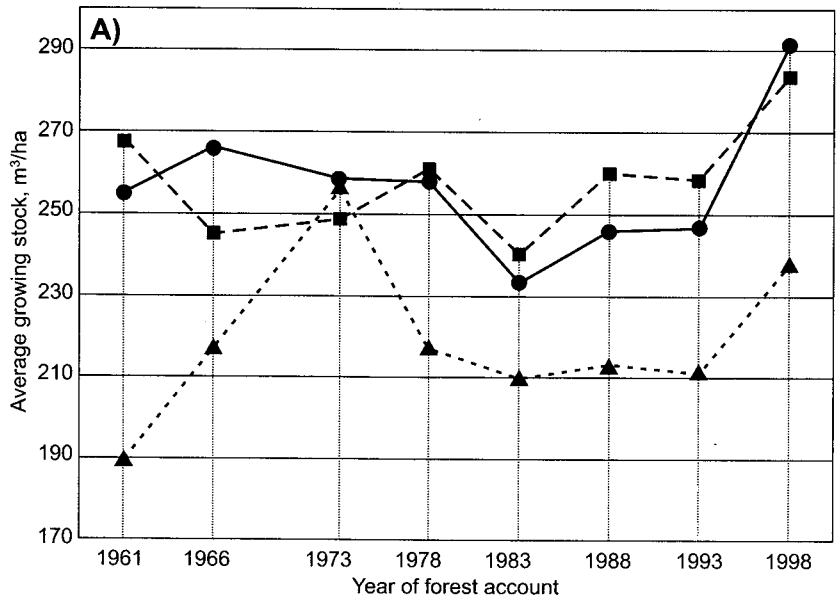
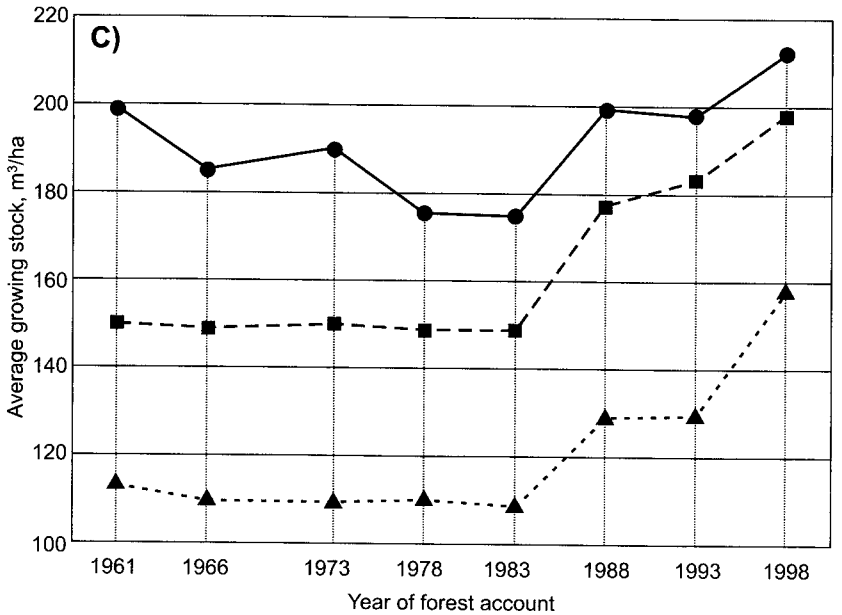


Fig. 24. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Republic of Marii El by age groups.

middle-aged — maturing — mature and overmature

middle-aged — maturing — mature and overmature





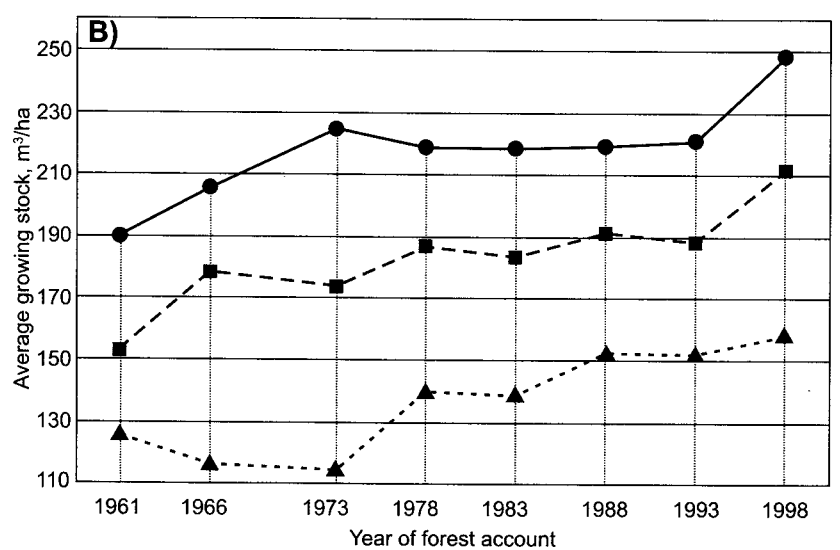
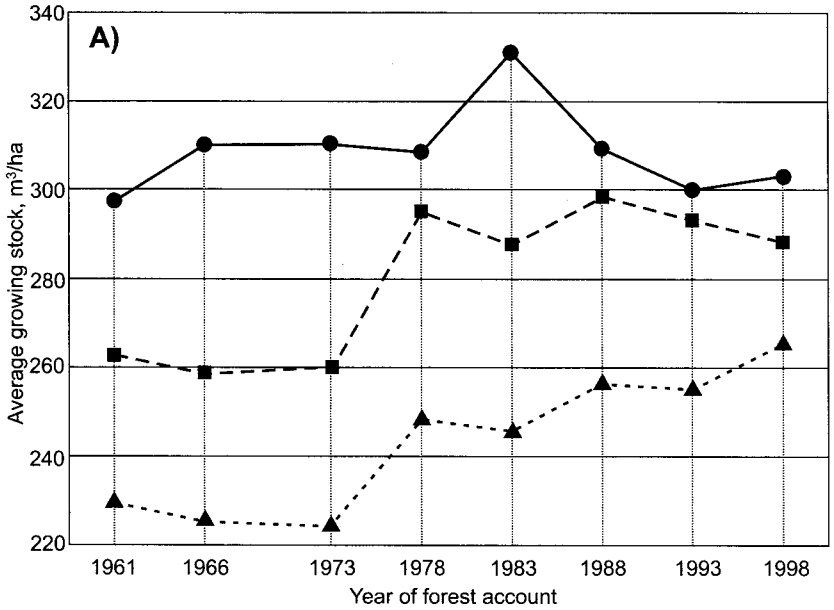
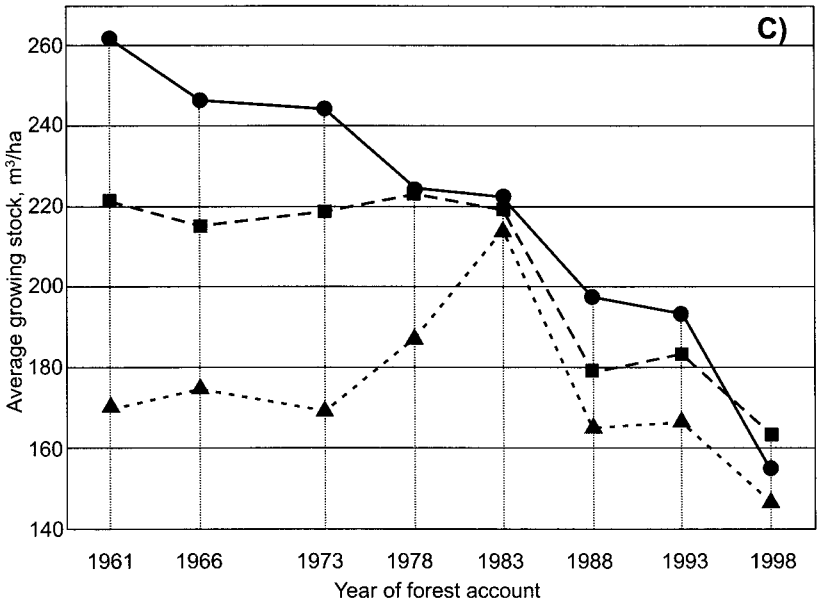


Fig. 25. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Republic of Mordovia by age groups.

middle-aged — maturing — mature and overmature





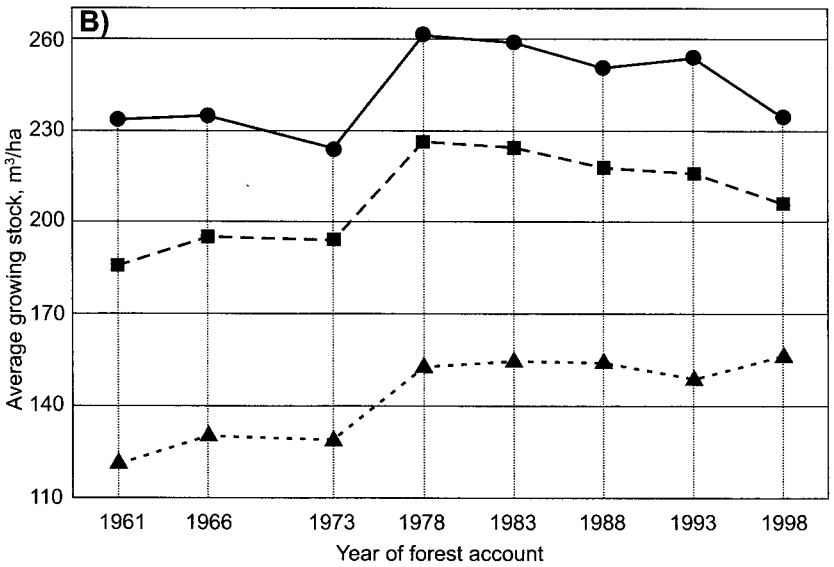


Fig. 26. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Chuvash Republic by age groups.

middle-aged — maturing — mature and overmature

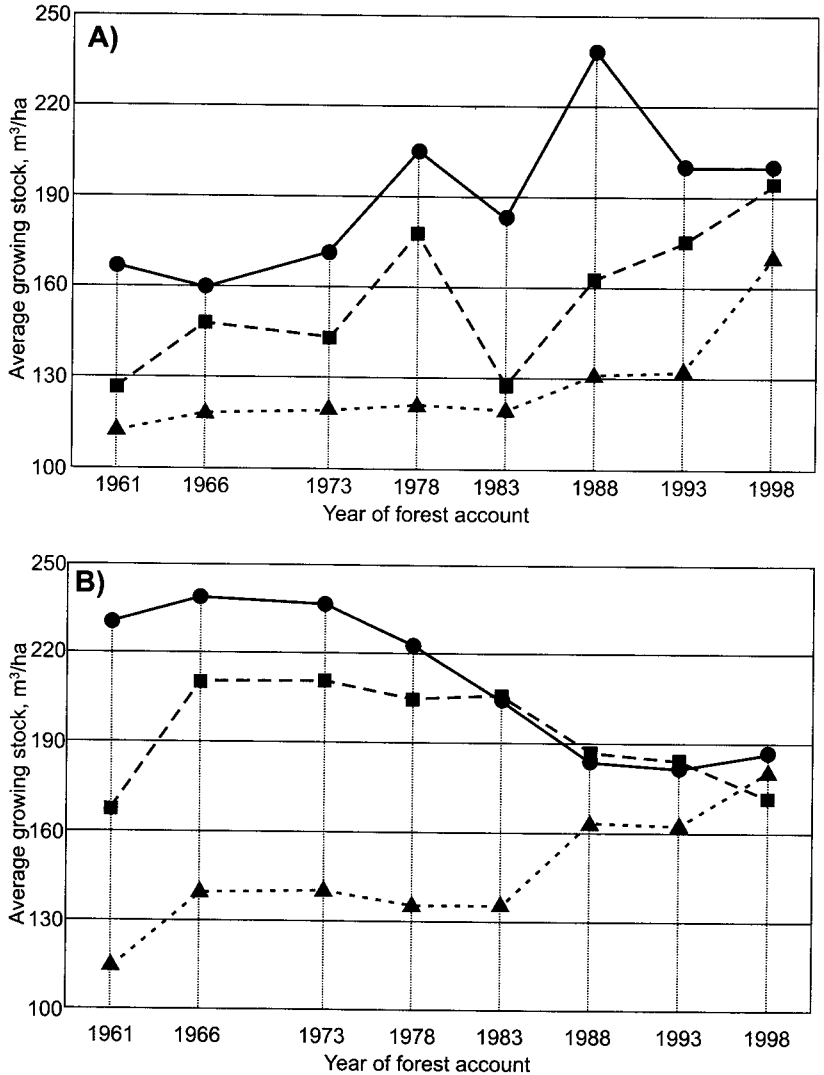


Fig. 27. Dynamic of average growing stock volume in deciduous softwood (A) and deciduous hardwood (B) of Belgorod Oblast by age groups.

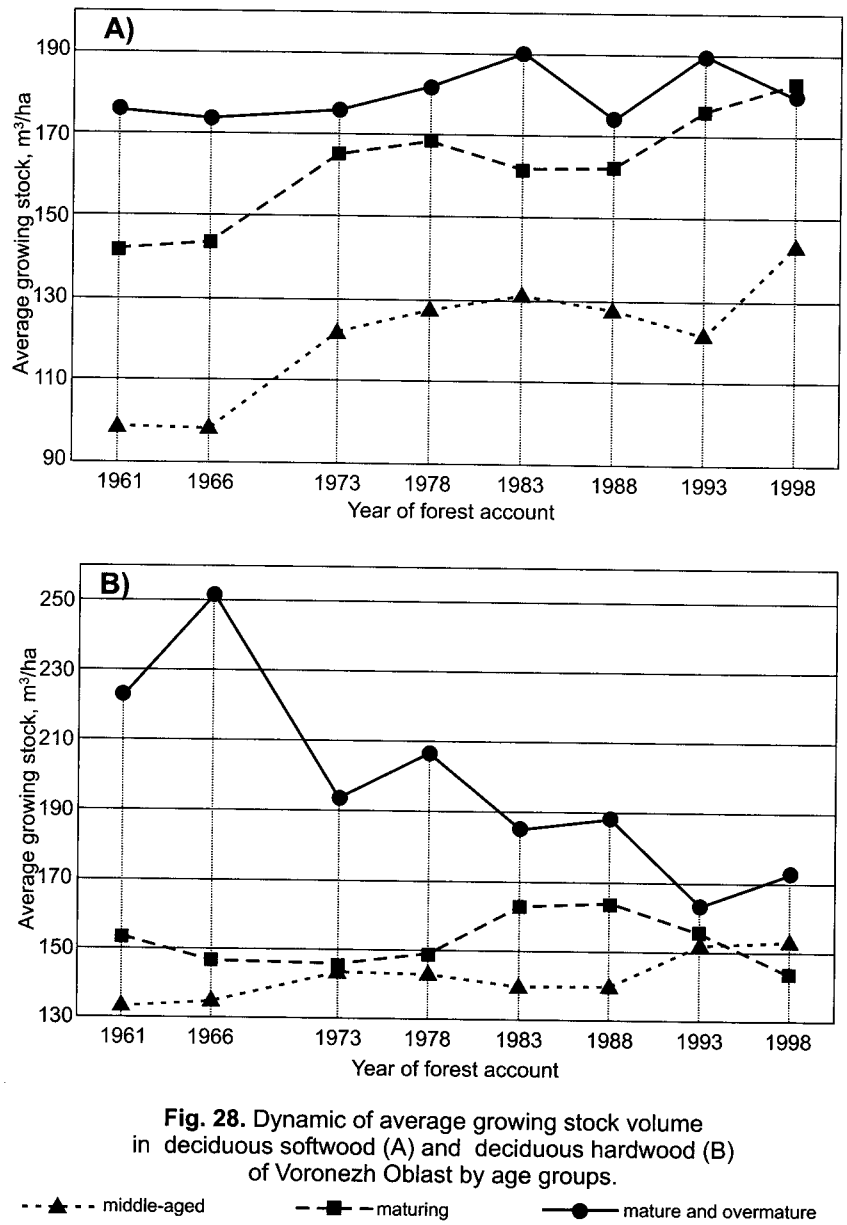
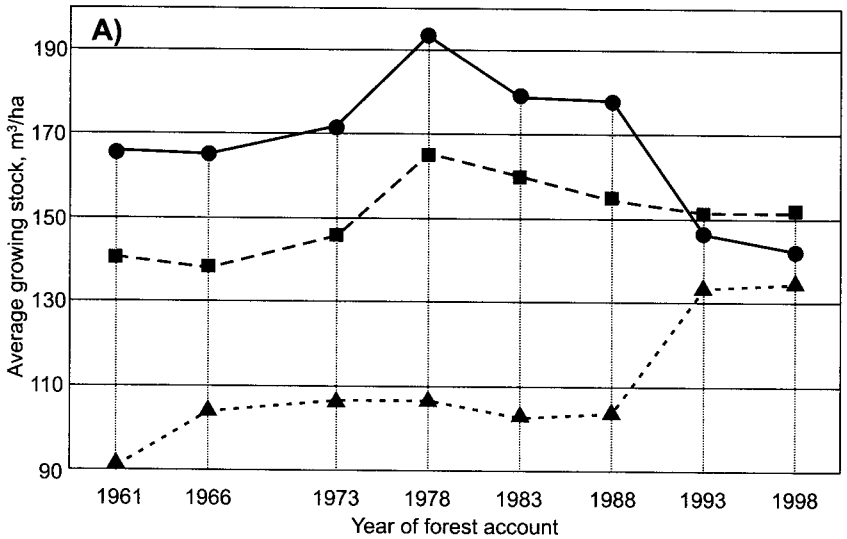


Fig. 28. Dynamic of average growing stock volume in deciduous softwood (A) and deciduous hardwood (B) of Voronezh Oblast by age groups.



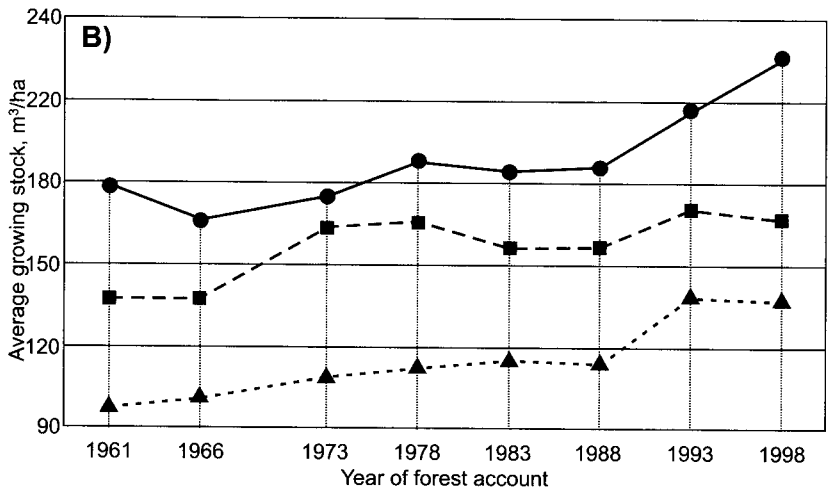


Fig.29. Dynamic of average growing stock volume in deciduous softwood (B) and deciduous hardwood (A) of Kursk Oblast by age groups.

middle-aged — maturing — mature and overmature

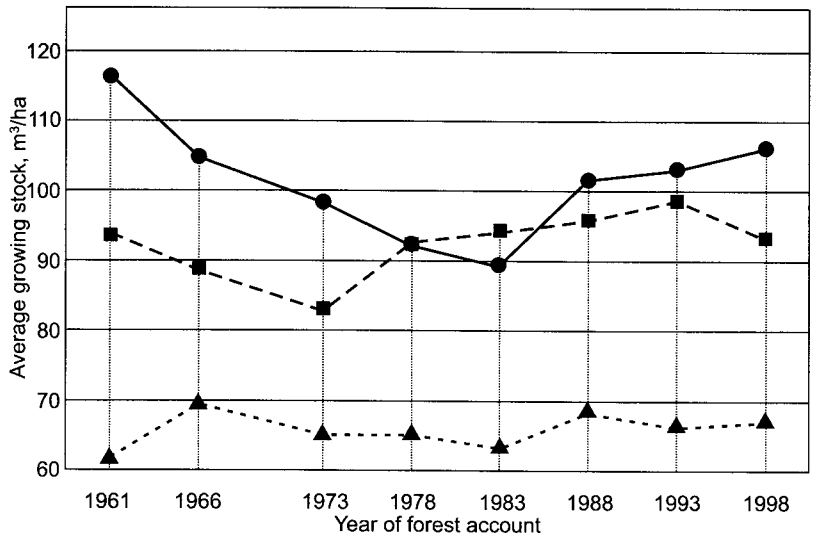


Fig. 32. Dynamic of average growing stock volume in deciduous softwood of Astrakhan Oblast by age groups.

middle-aged — maturing — mature and overmature

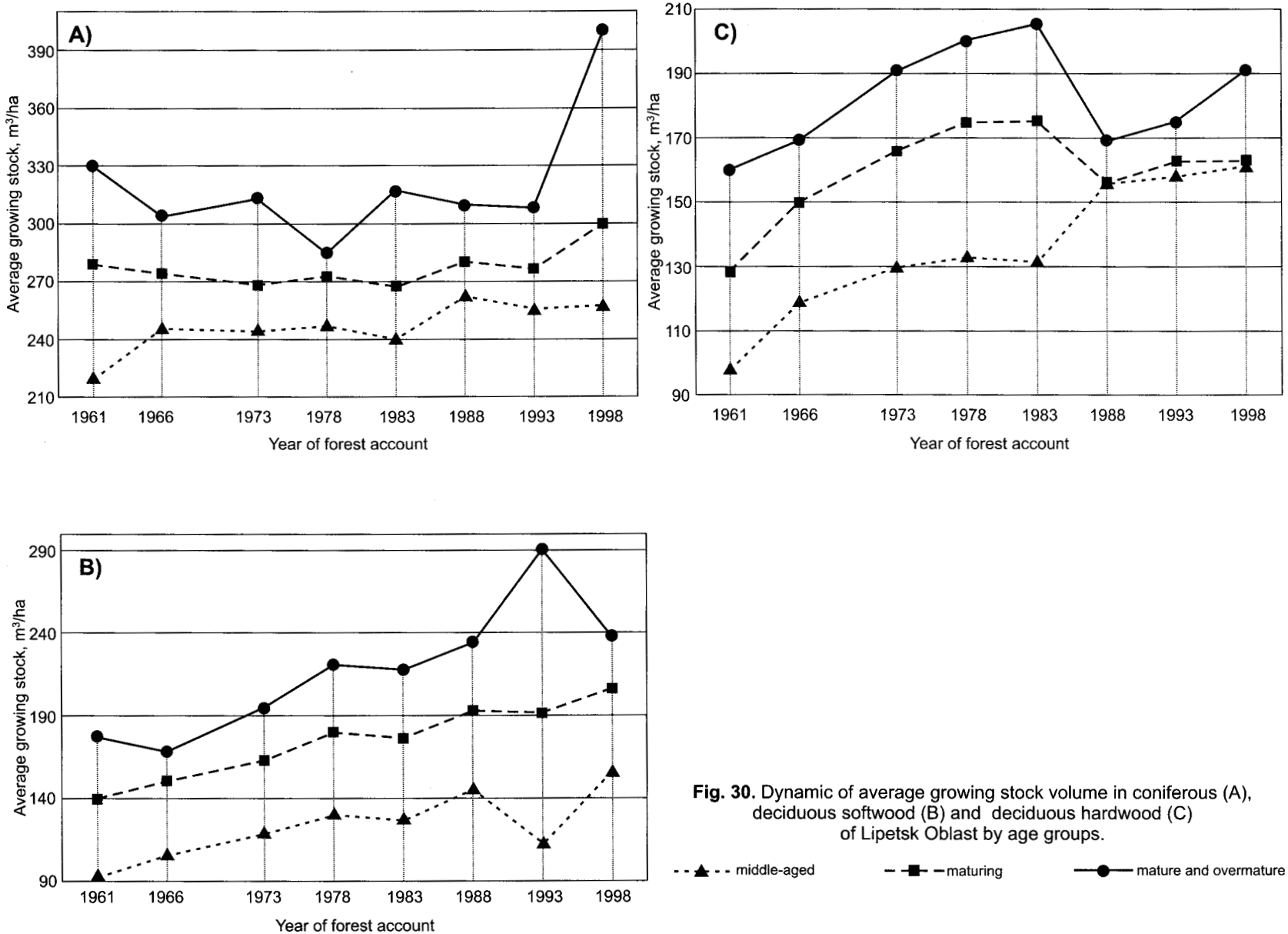
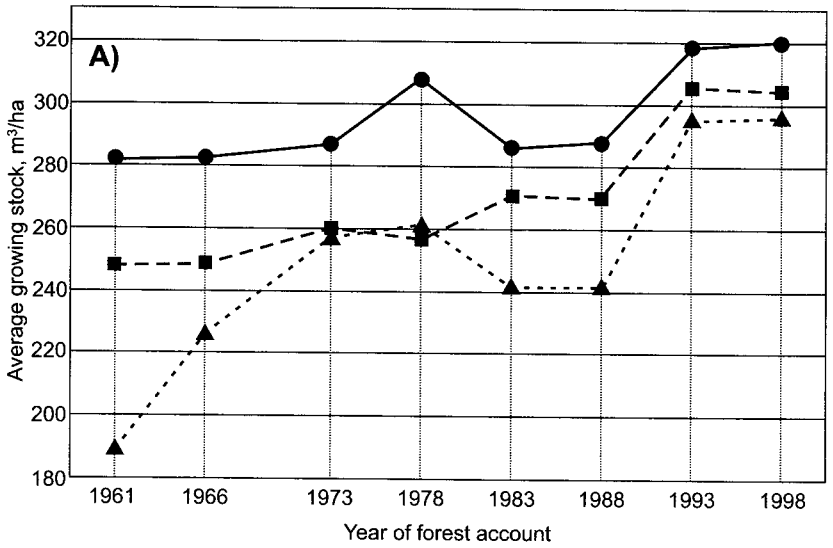
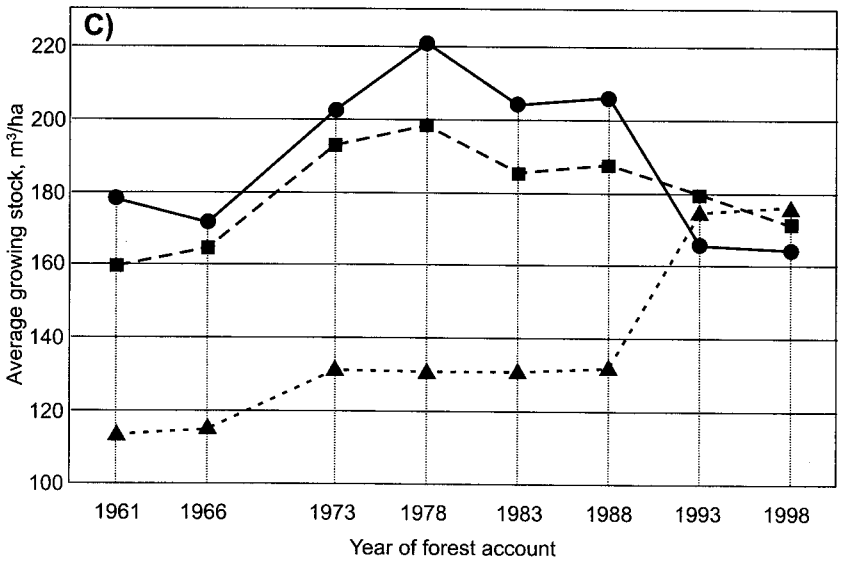


Fig. 30. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Lipetsk Oblast by age groups.





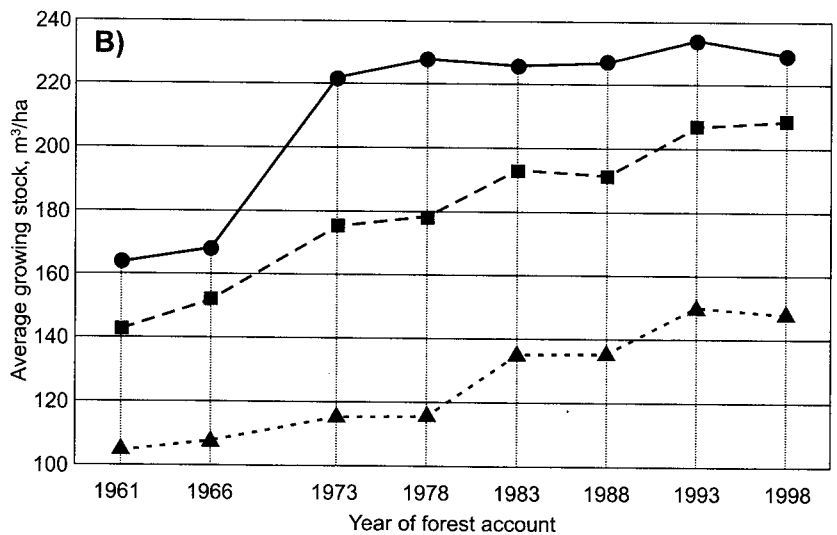


Fig. 31. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Tambov Oblast by age groups.

middle-aged — maturing — mature and overmature

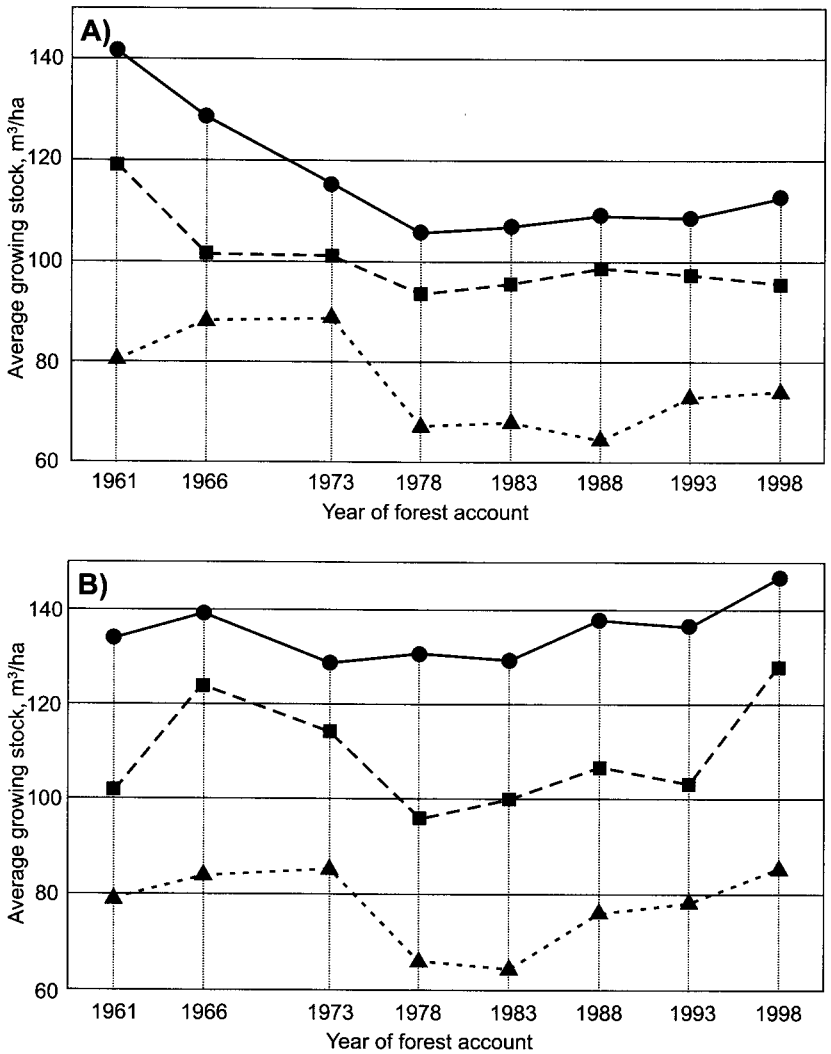


Fig. 33. Dynamic of average growing stock volume in deciduous softwood (B) and deciduous hardwood (A) of Volgograd Oblast by age groups.

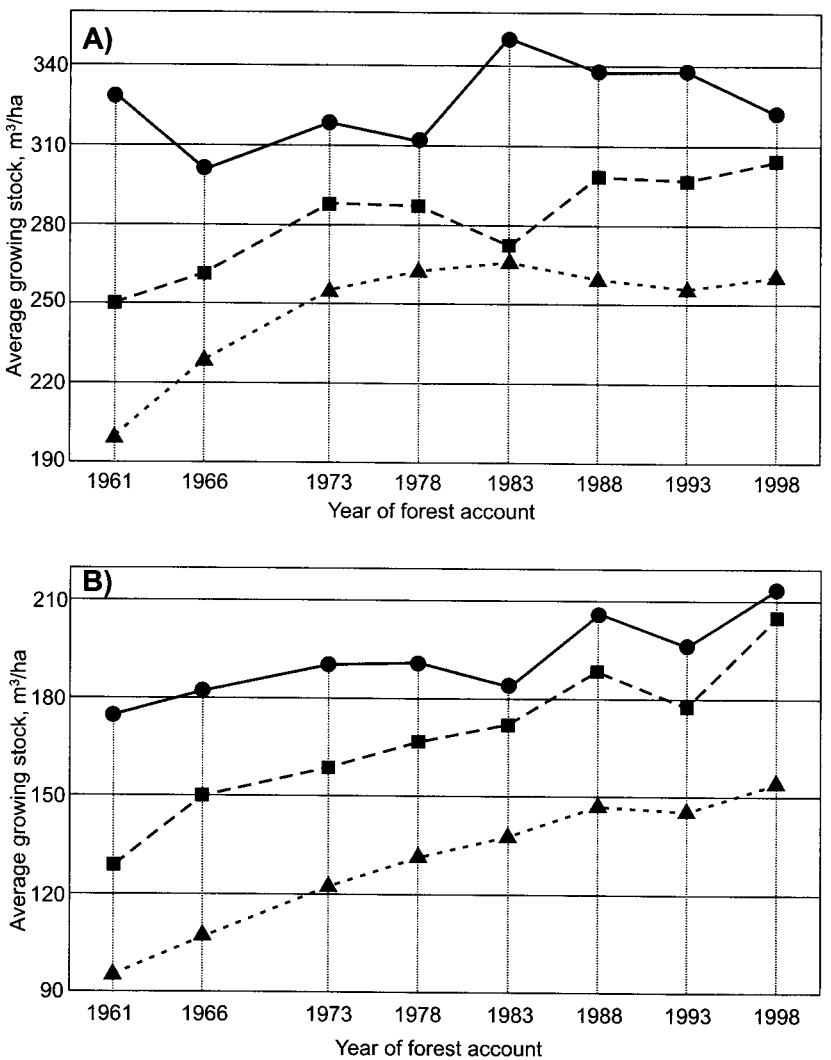
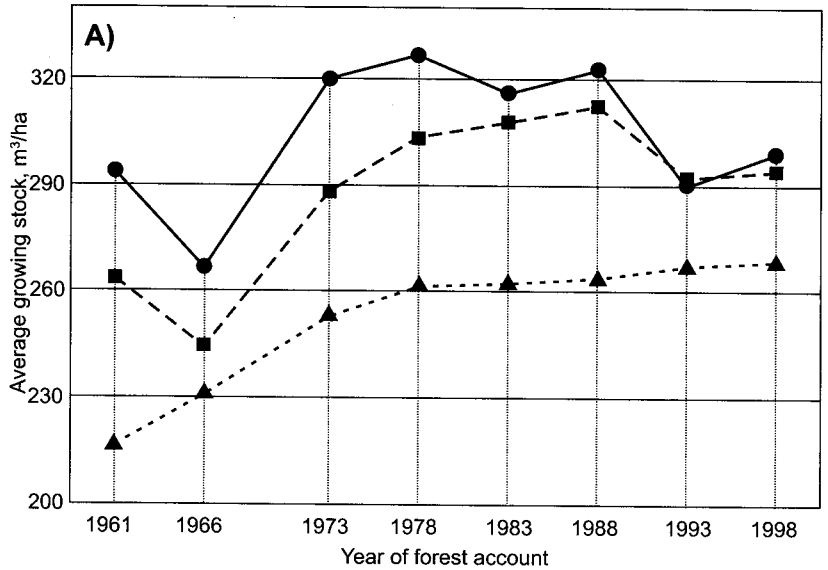
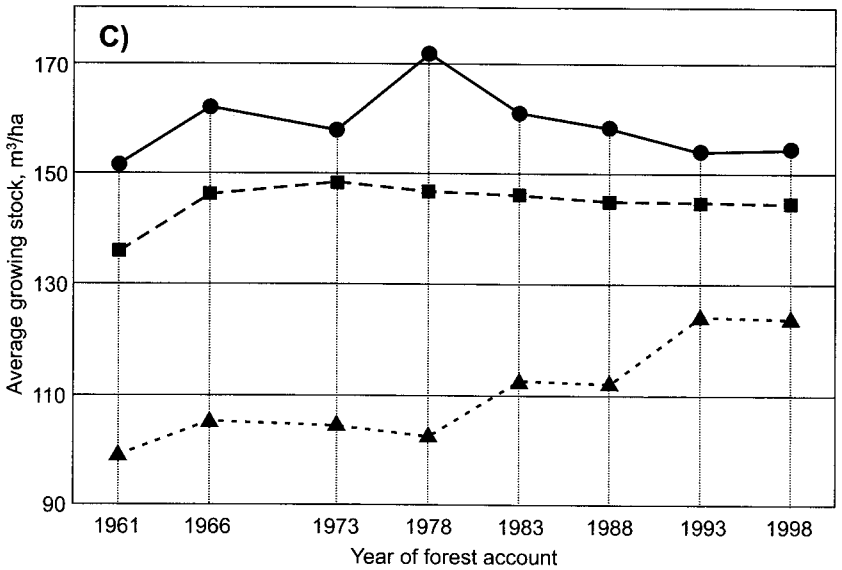


Fig. 34. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Samara Oblast by age groups.





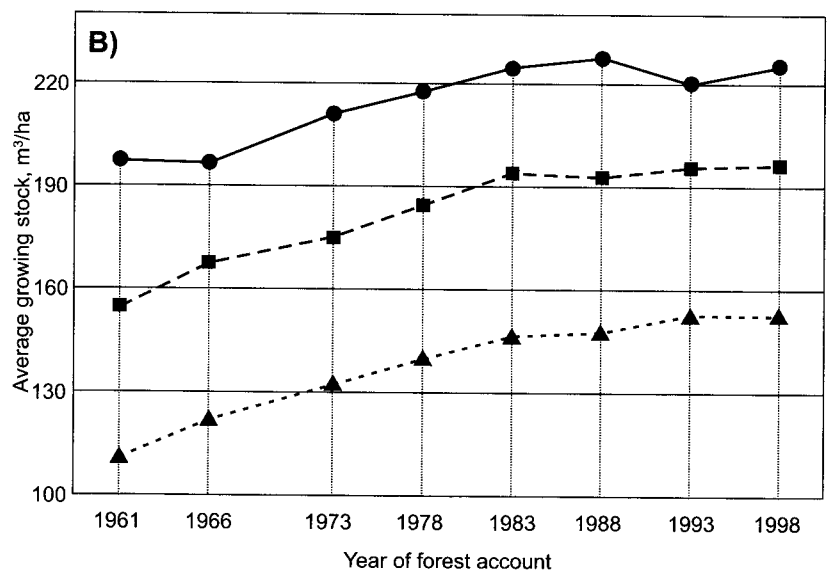
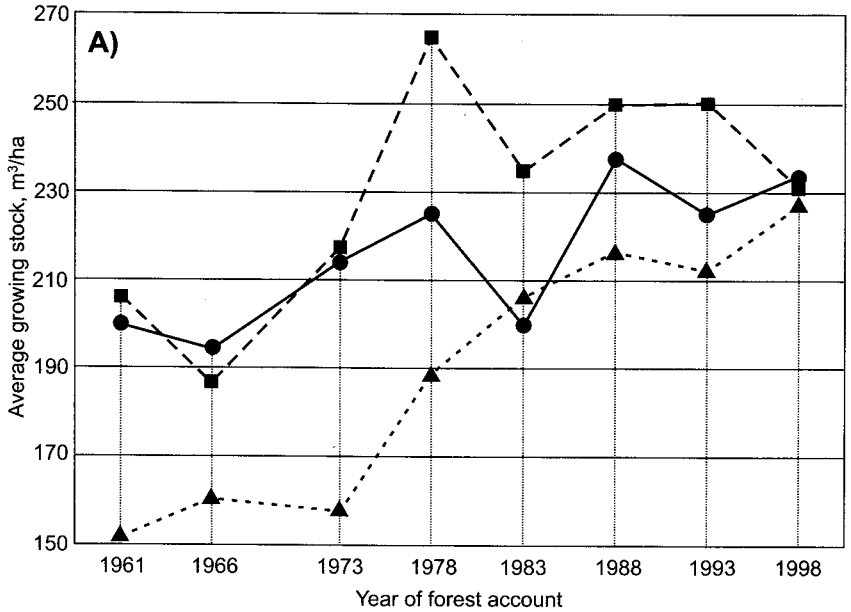
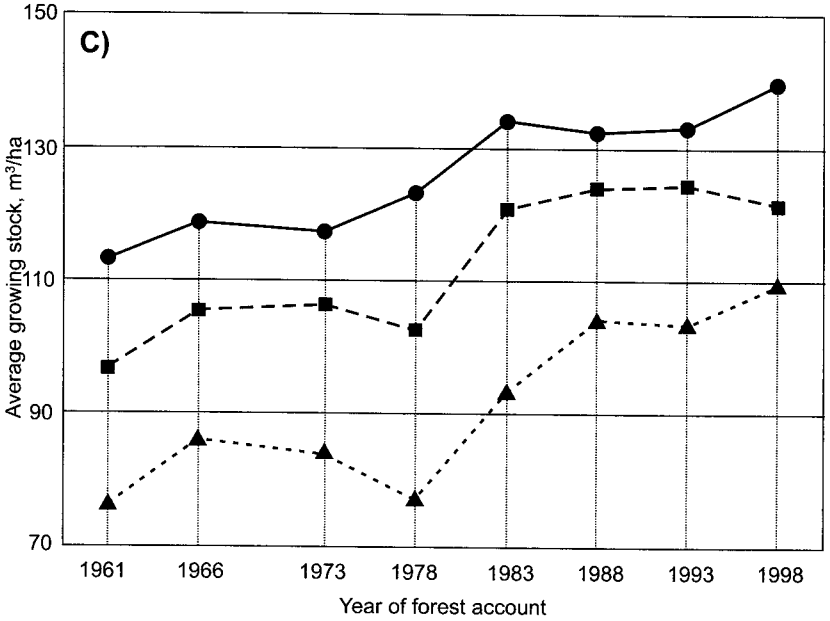


Fig. 35. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Penza Oblast by age groups.

middle-aged — maturing — mature and overmature





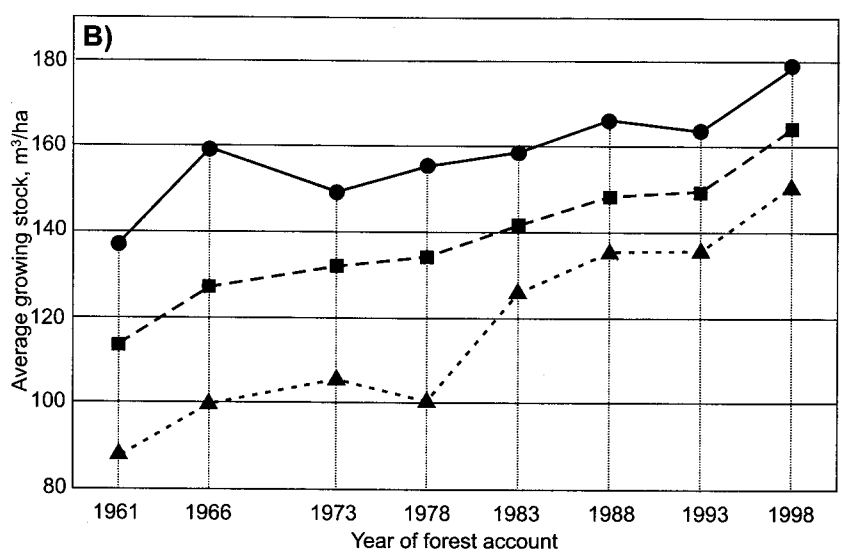
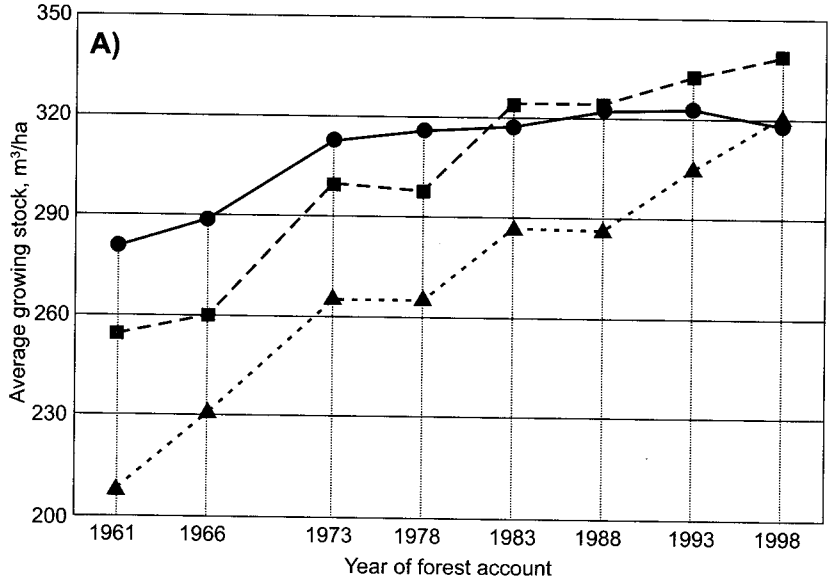
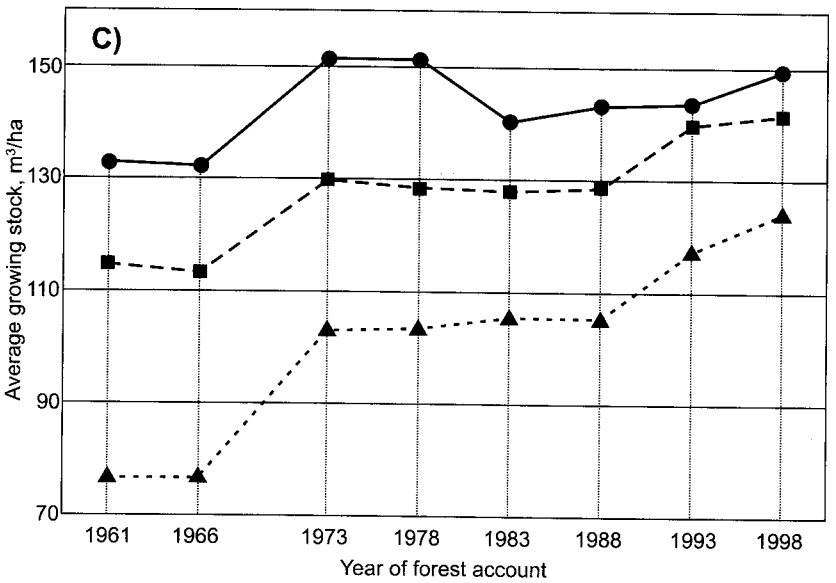


Fig. 36. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Saratov Oblast by age groups.

middle-aged — maturing — mature and overmature





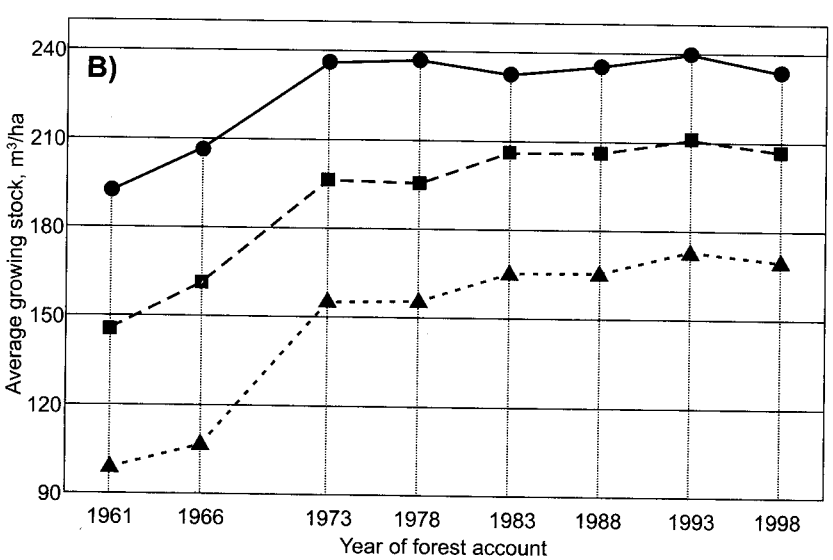
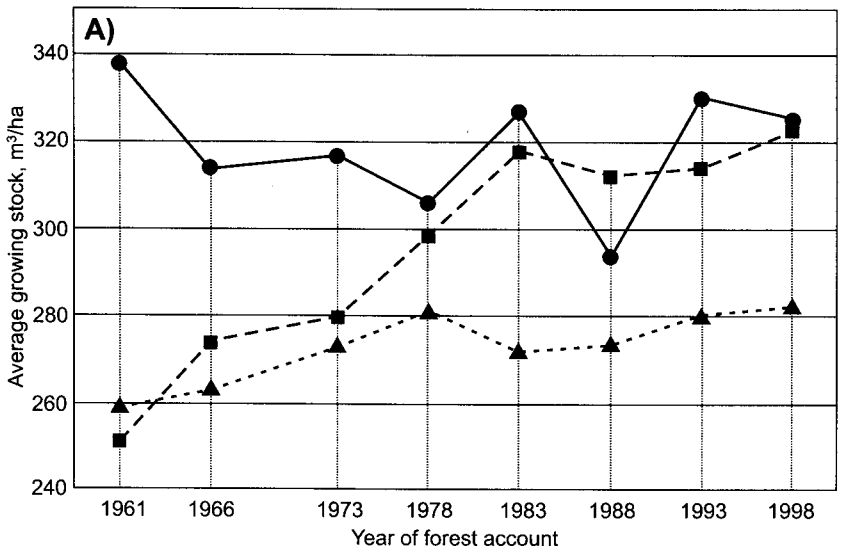
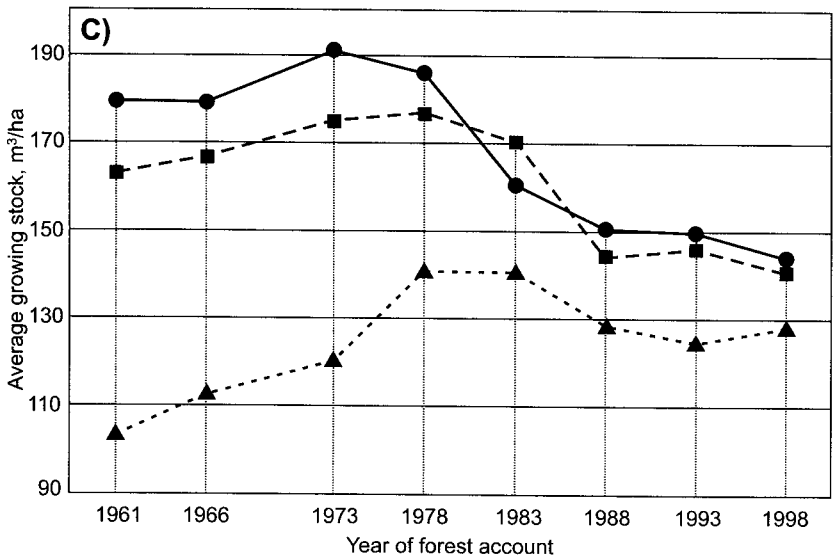


Fig. 37. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Ulyanovsk Oblast by age groups.

middle-aged — maturing — mature and overmature





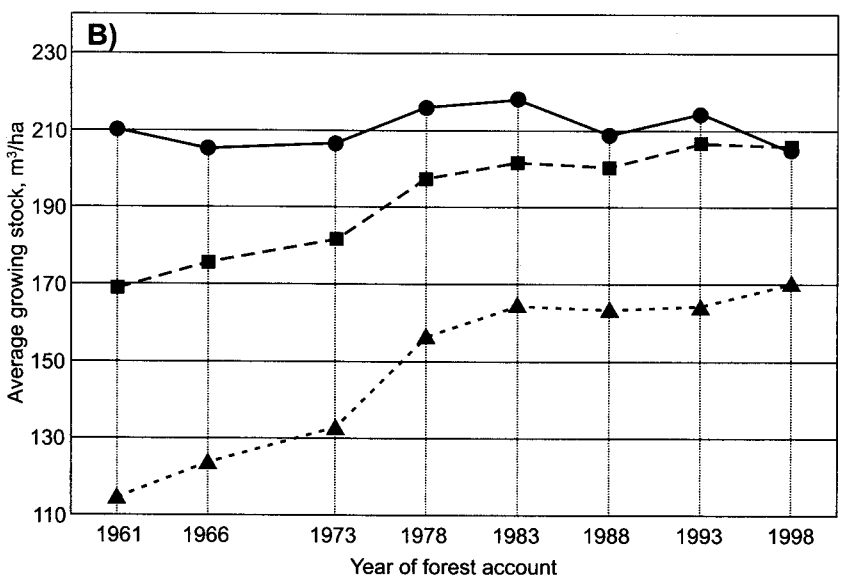


Fig. 39. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Republic of Tatarstan by age groups.

middle-aged — maturing — mature and overmature

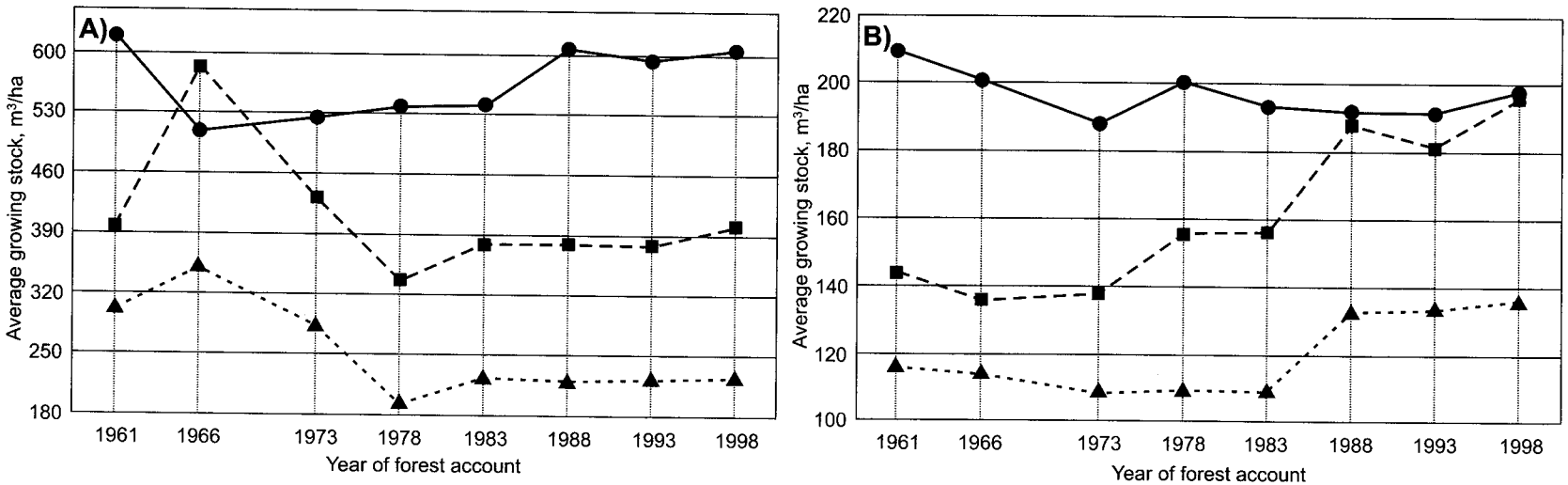
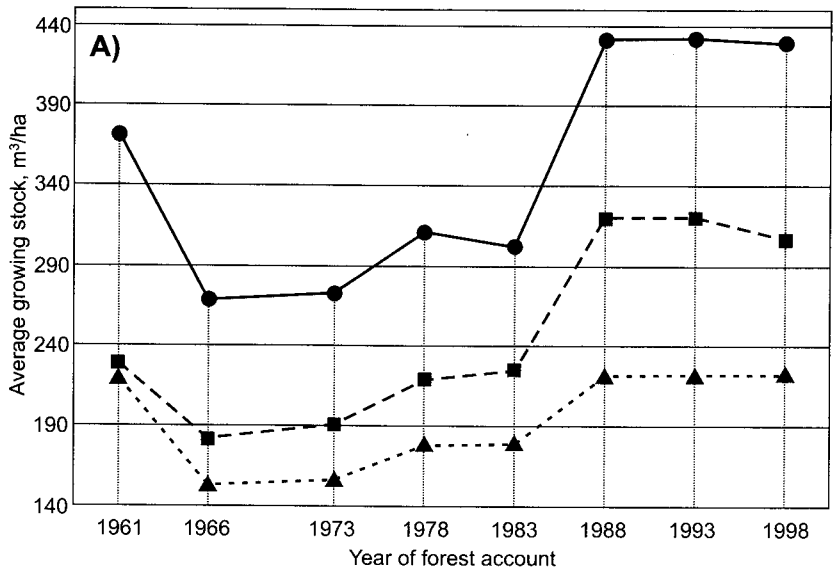
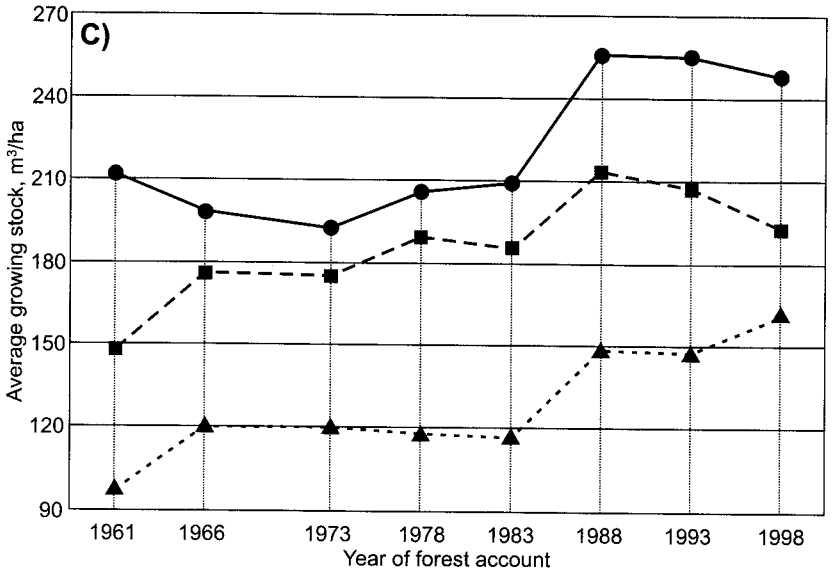


Fig. 40. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Krasnodar Kray by age groups.





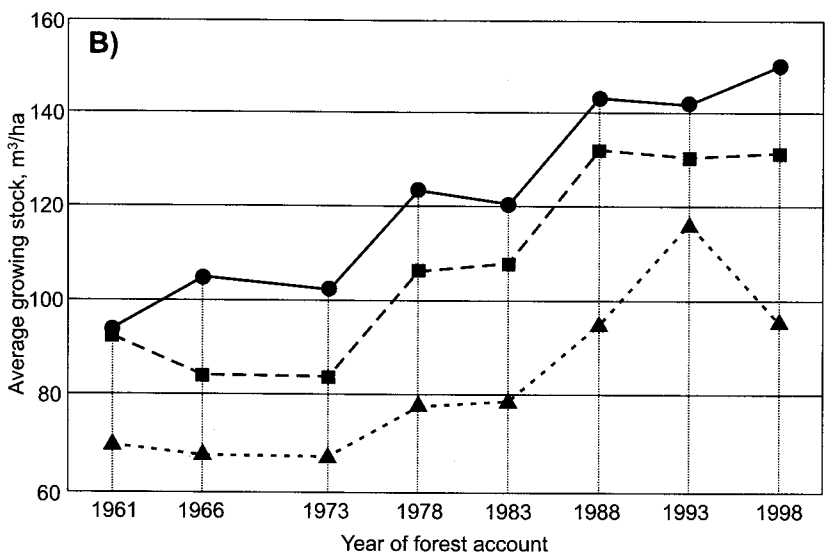


Fig. 41. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Stavropol Kray by age groups.

middle-aged — maturing — mature and overmature

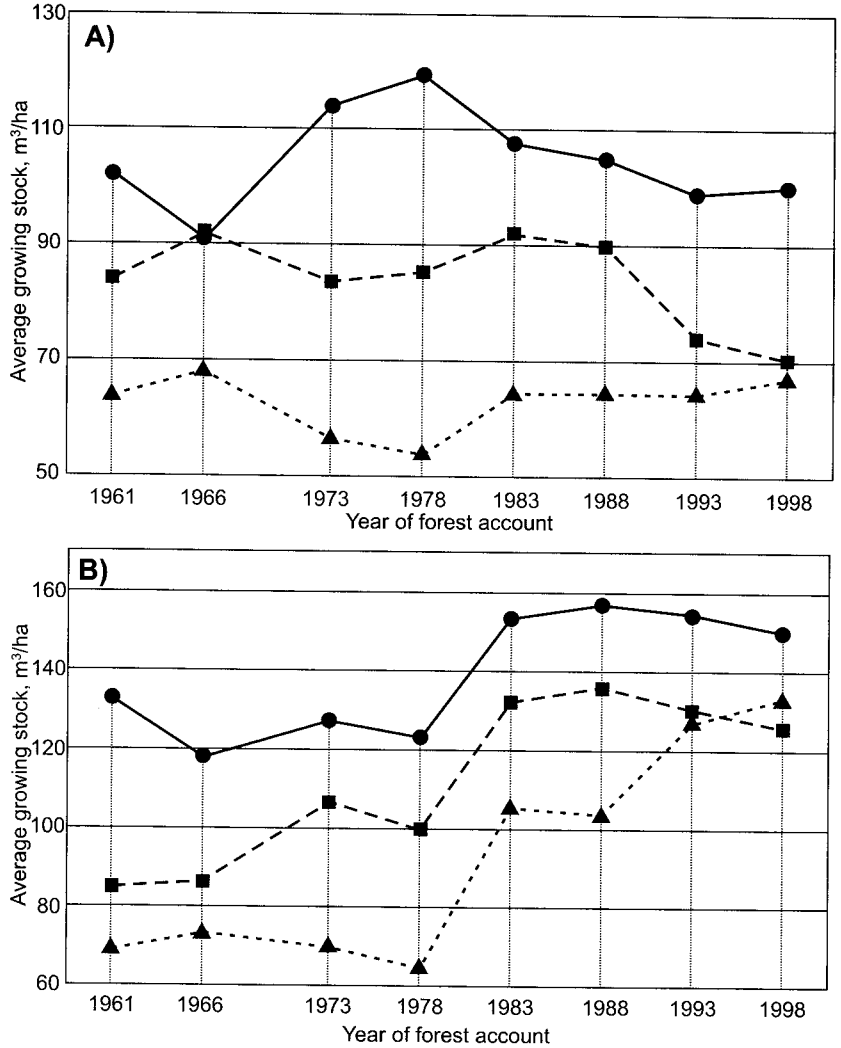


Fig. 42. Dynamic of average growing stock volume in deciduous softwood (B) and deciduous hardwood (A) of Rostov Oblast by age groups.

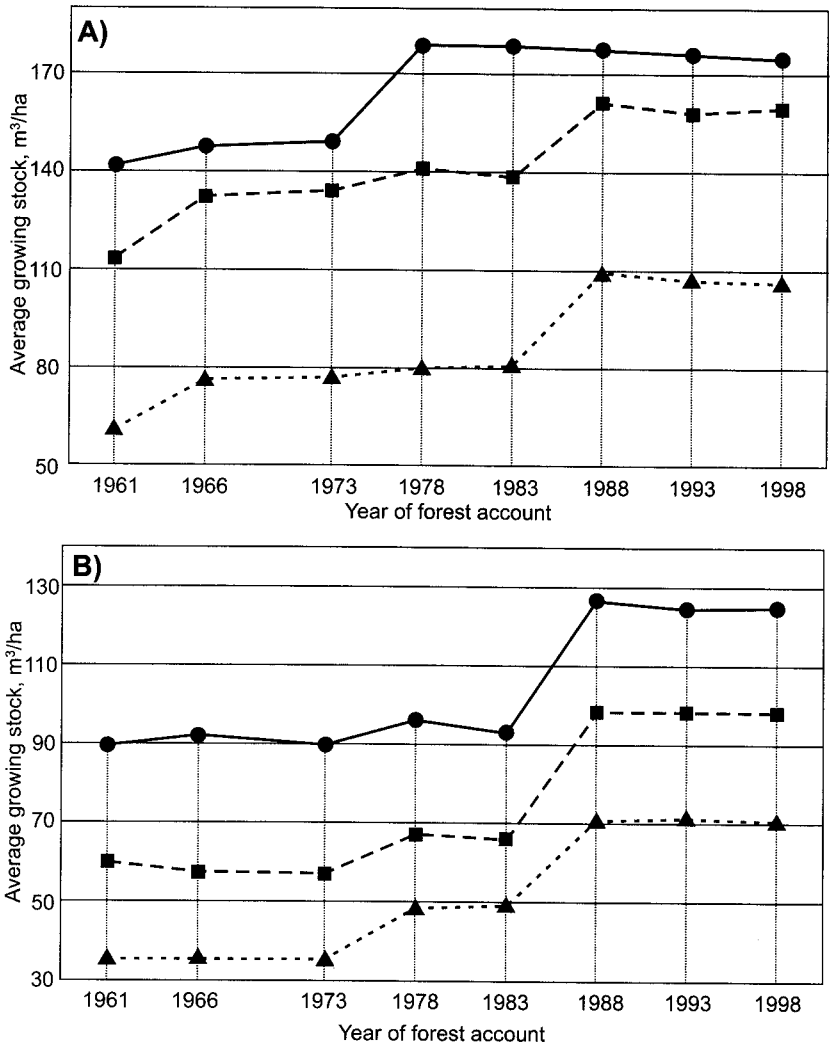


Fig. 43. Dynamic of average growing stock volume in deciduous softwood (B) and deciduous hardwood (A) of Republic of Dagestan by age groups.

middle-aged — maturing — mature and overmature

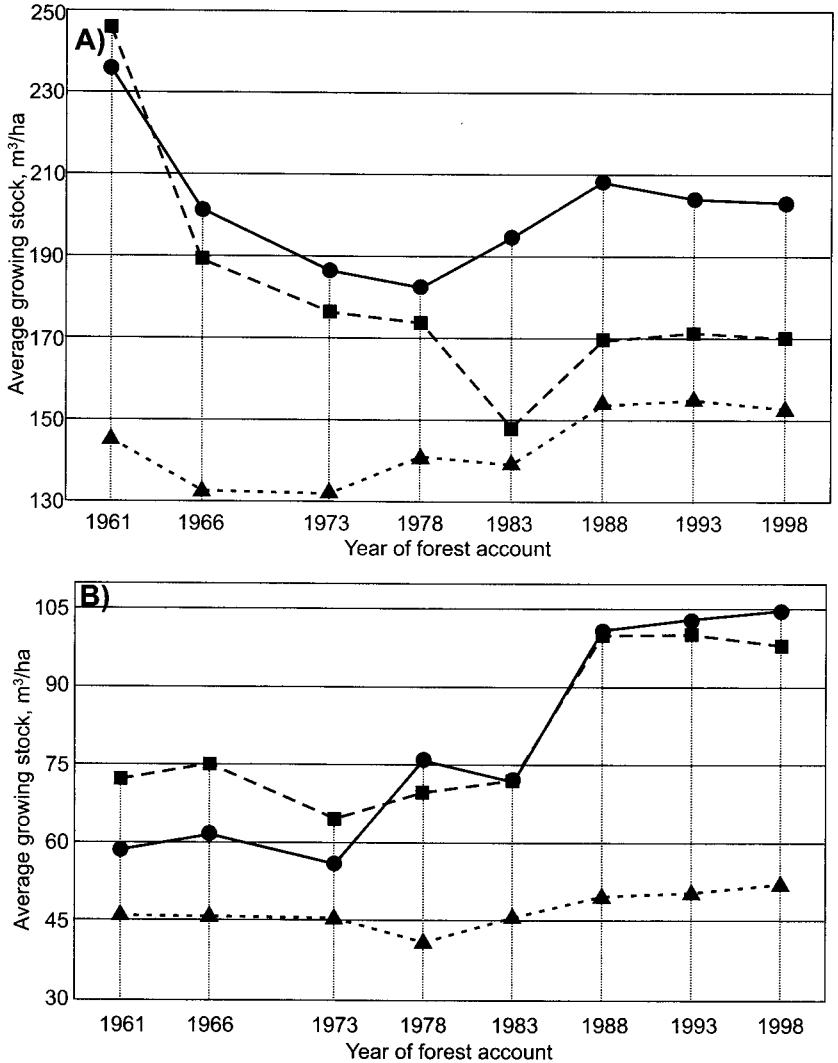


Fig. 44. Dynamic of average growing stock volume in deciduous softwood (B) and deciduous hardwood (A) of Kabardino-Balkarian Republic by age groups.

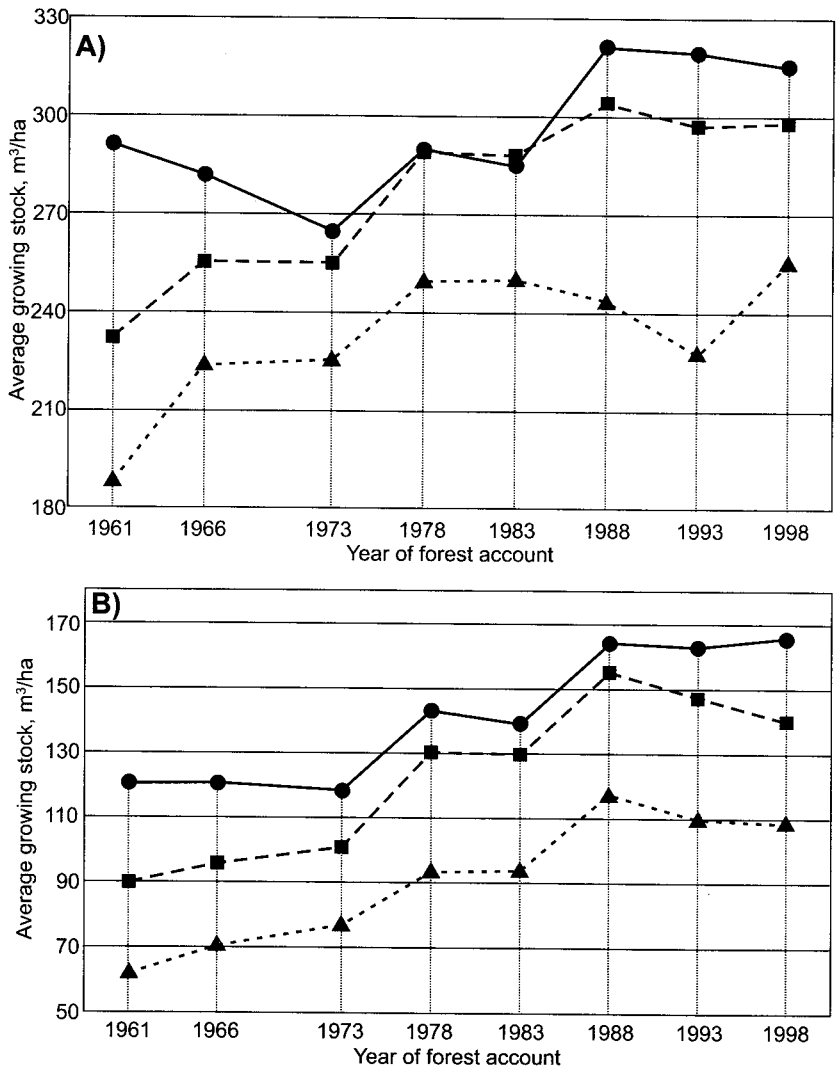


Fig. 47. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Kurgan Oblast by age groups.

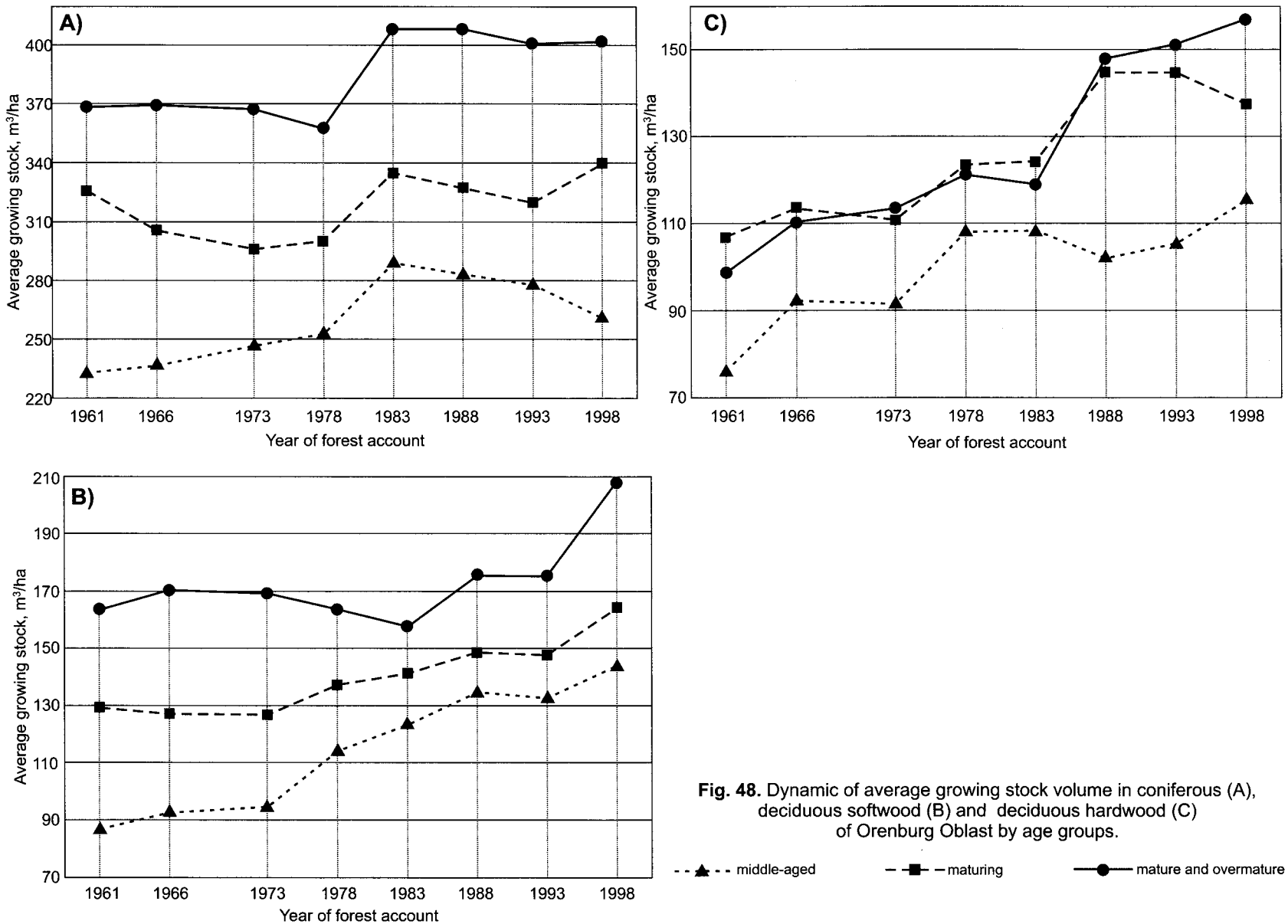


Fig. 48. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Orenburg Oblast by age groups.

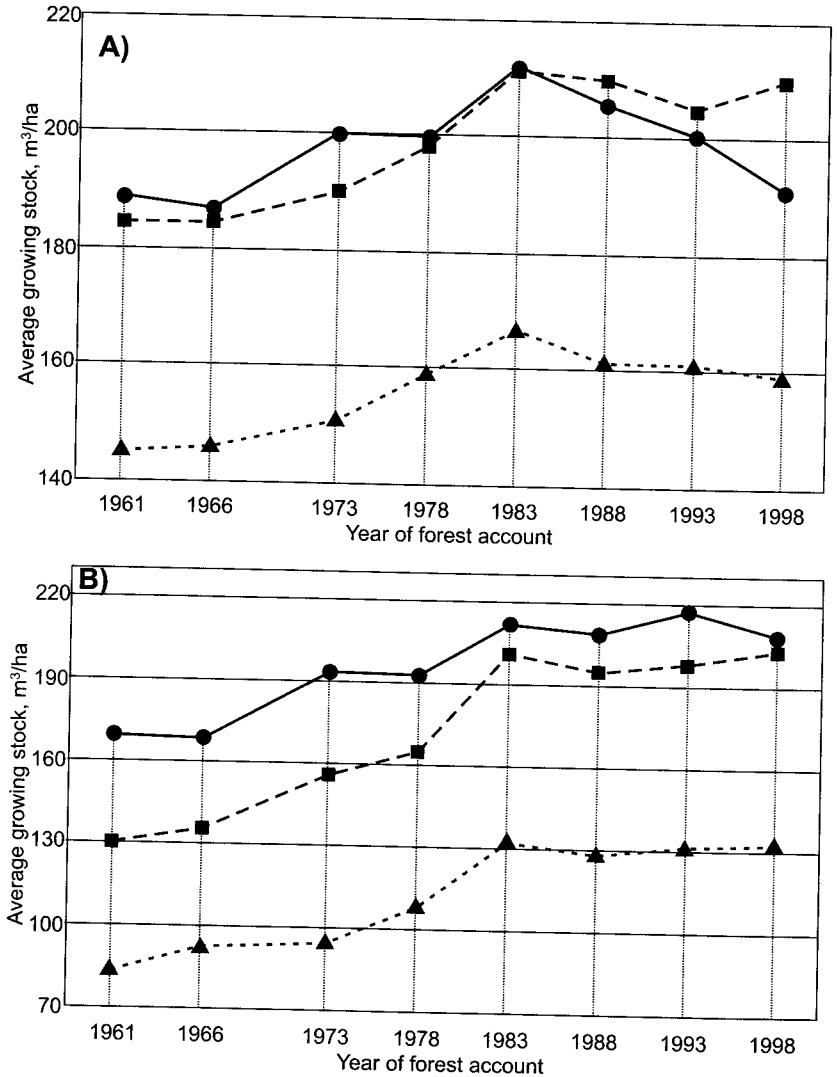


Fig. 49. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Perm Oblast by age groups.

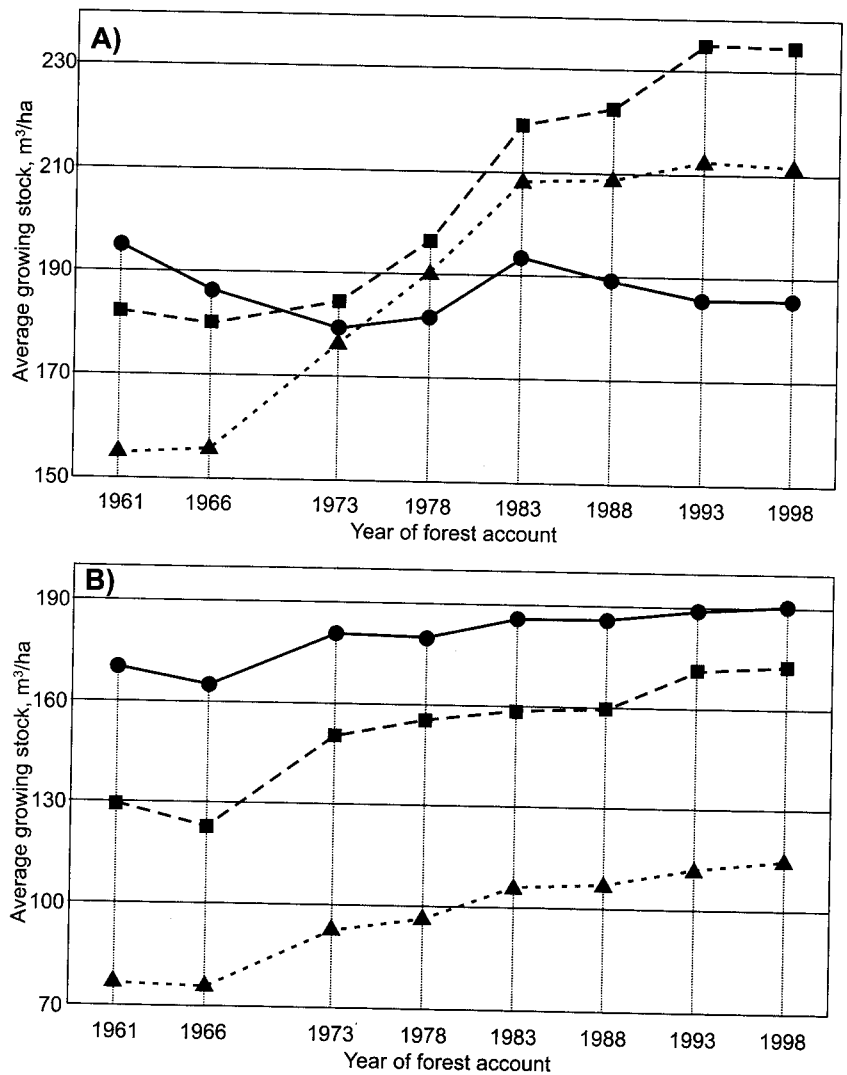
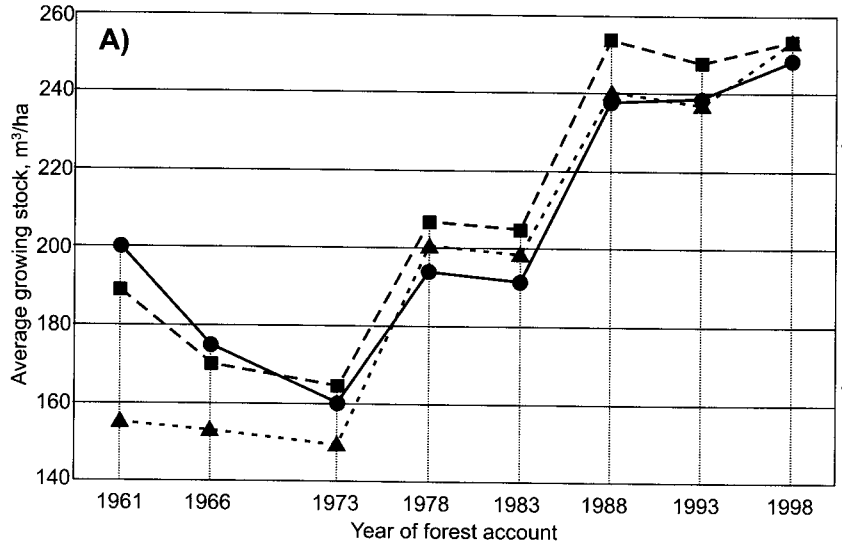


Fig. 50. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Sverdlovsk Oblast by age groups.



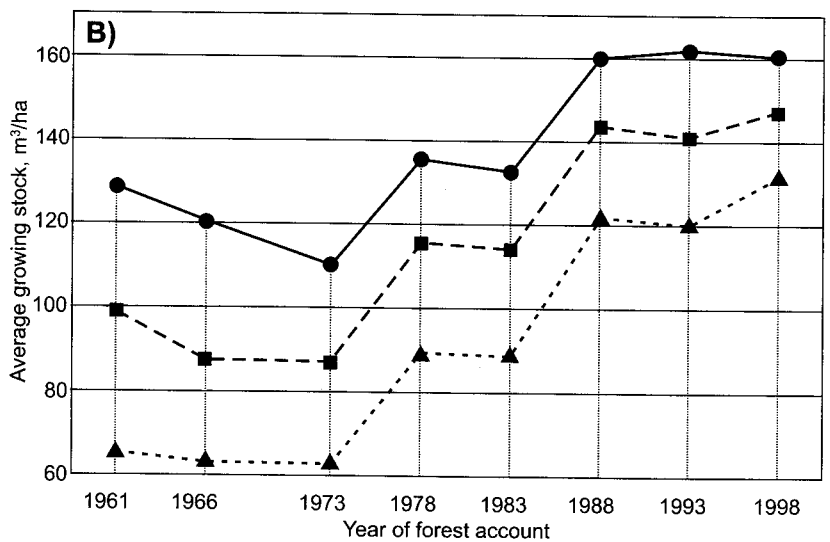
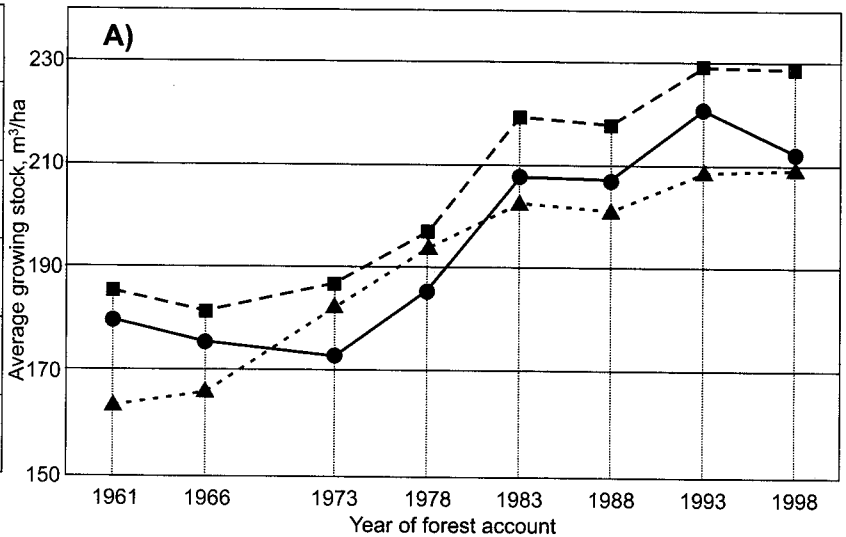


Fig. 51. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Chelyabinsk Oblast by age groups.



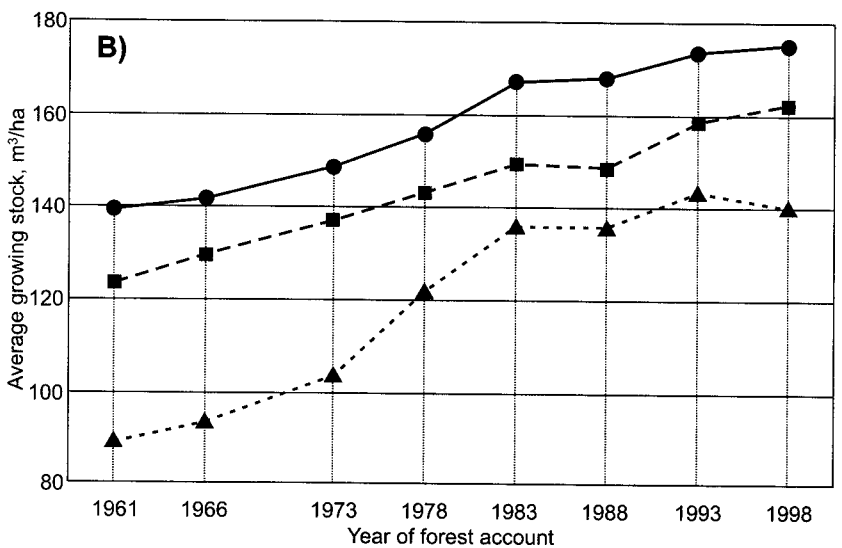
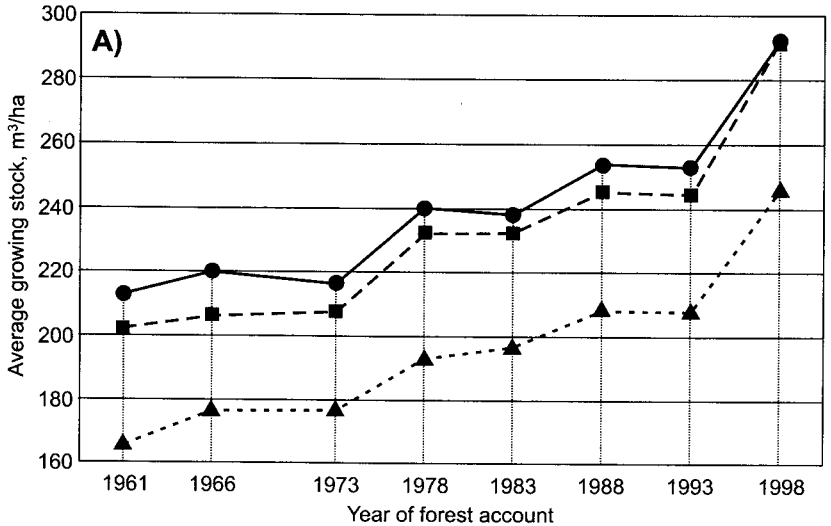


Fig. 52. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Republic of Bashkortostan by age groups.

middle-aged — maturing — mature and overmature



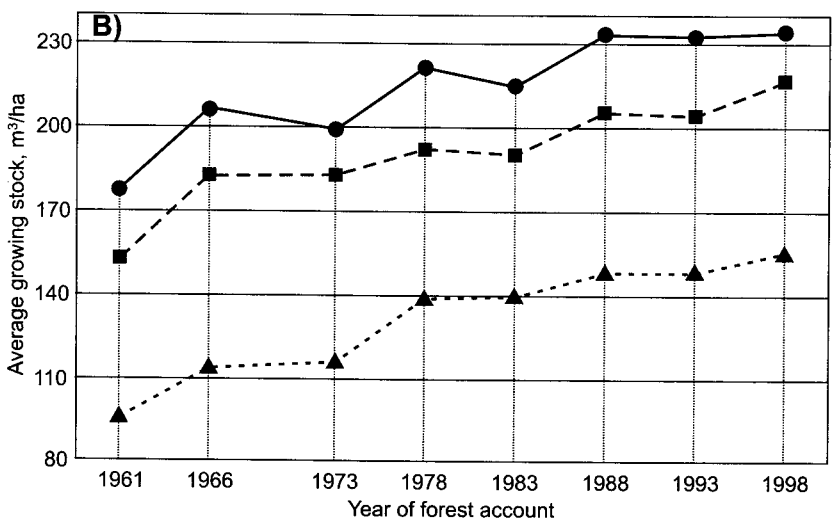
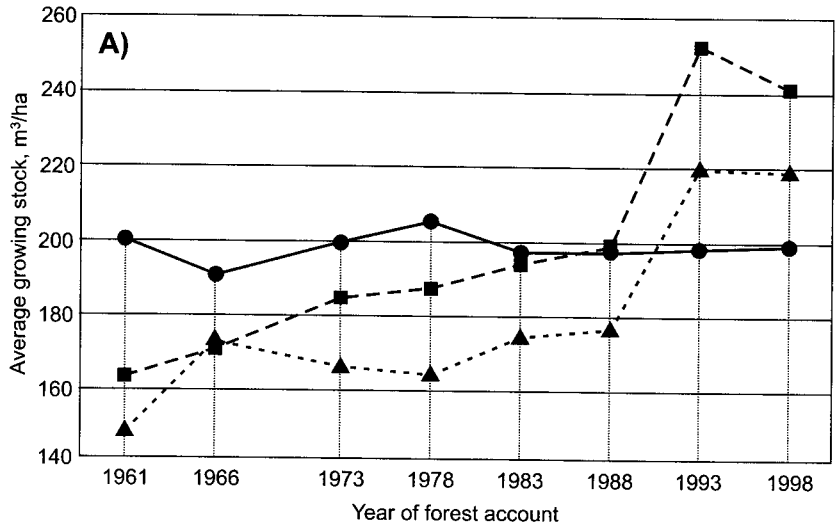


Fig. 53. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Udmurtian Republic by age groups.

middle-aged — maturing — mature and overmature



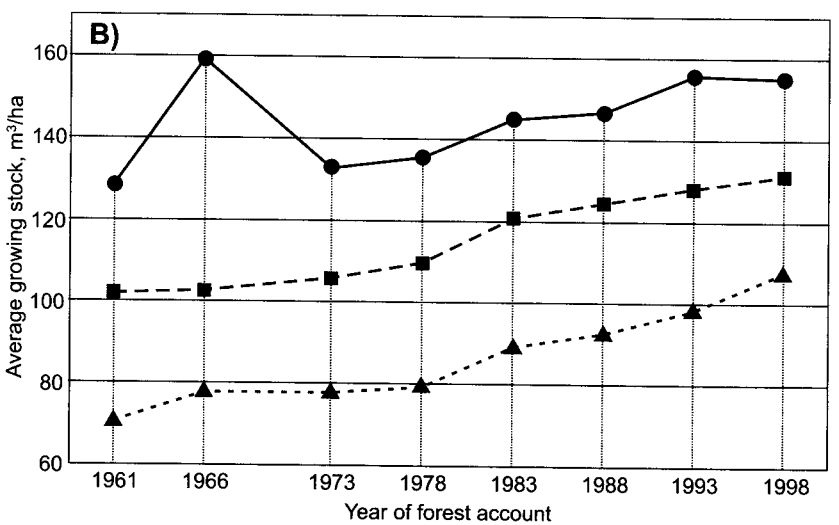
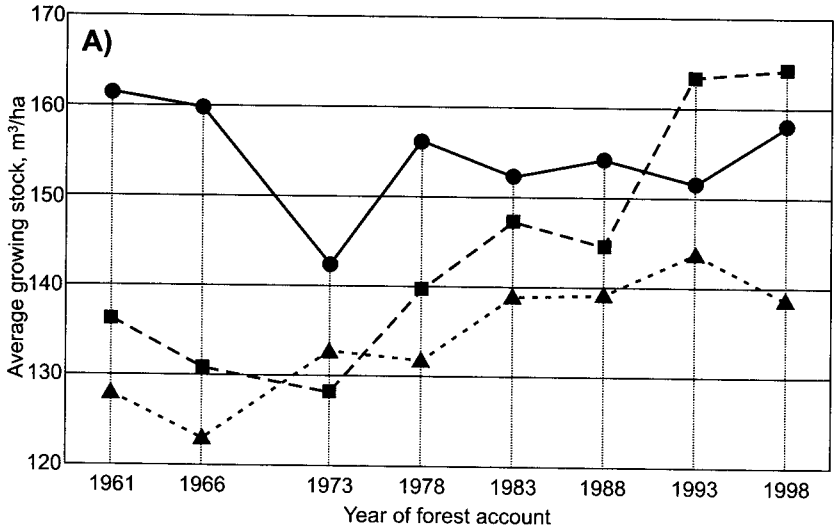


Fig. 54. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Altai Kray by age groups.

middle-aged — maturing — mature and overmature



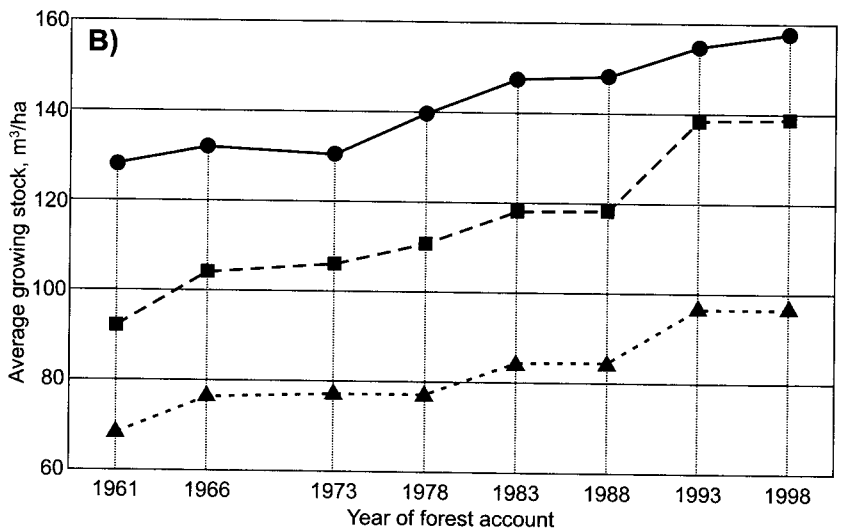
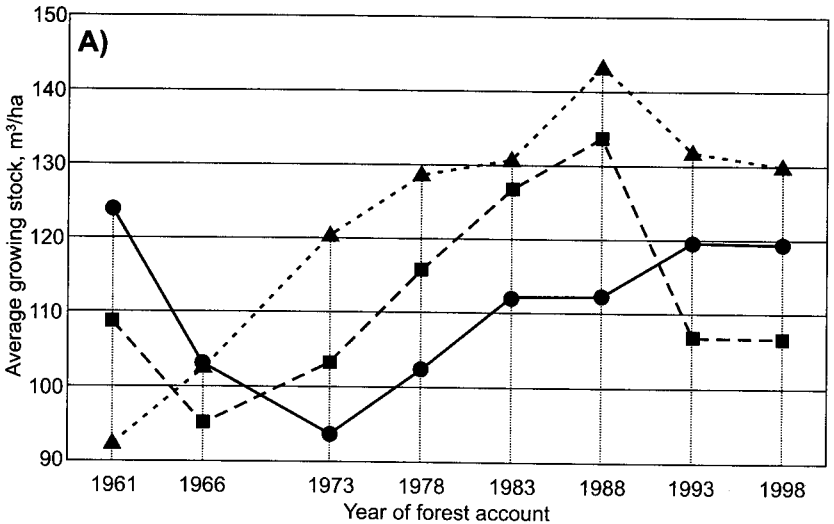


Fig. 55. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Kemerovo Oblast by age groups.

middle-aged — maturing — mature and overmature



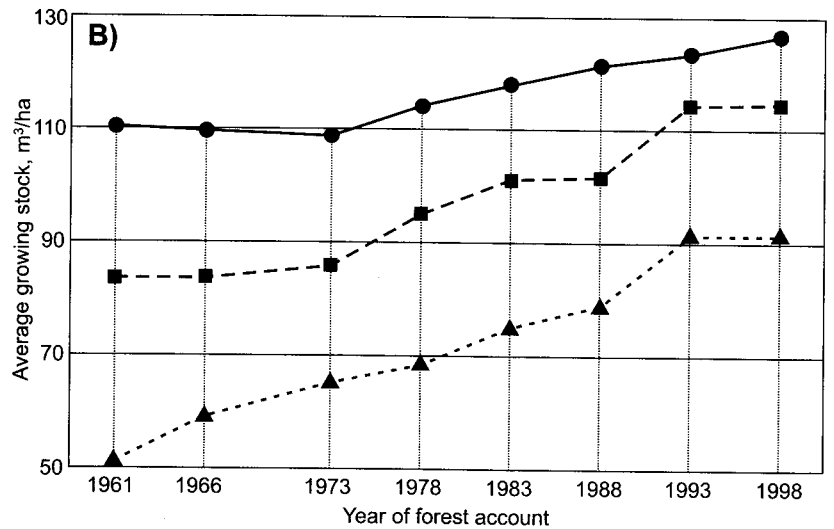
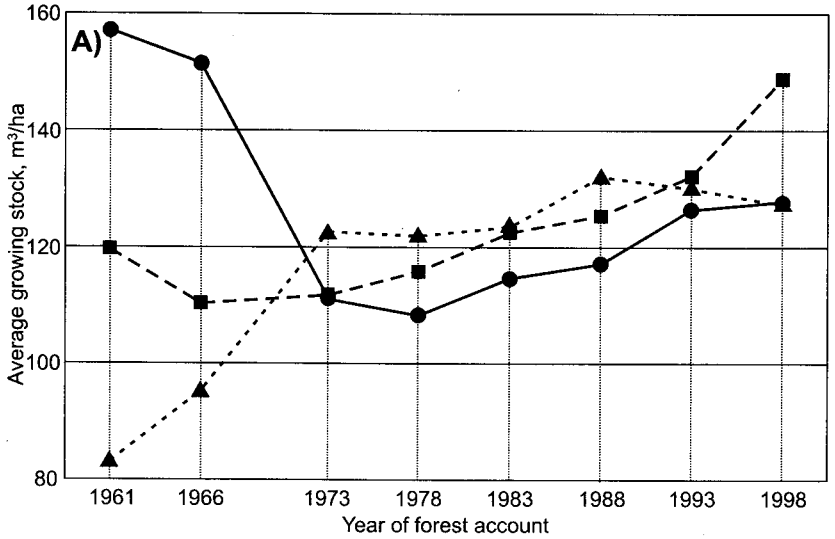


Fig. 56. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Novosibirsk Oblast by age groups.

middle-aged — maturing — mature and overmature



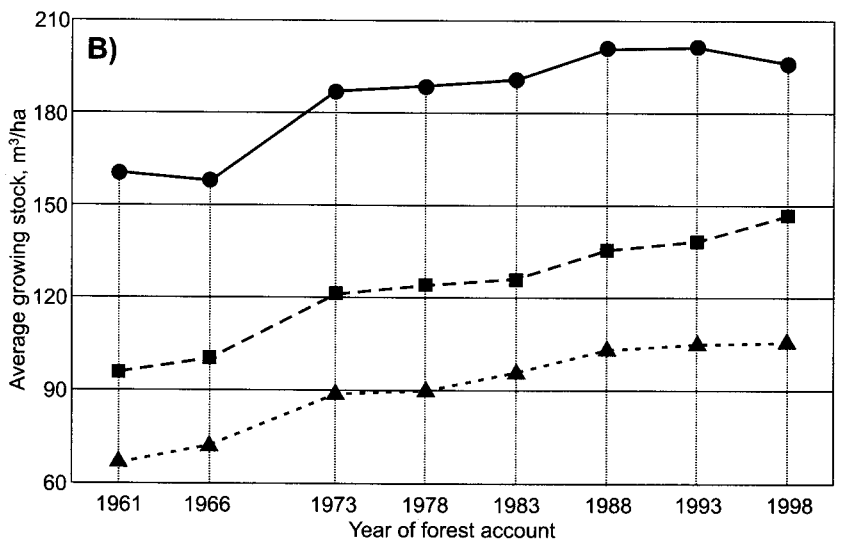
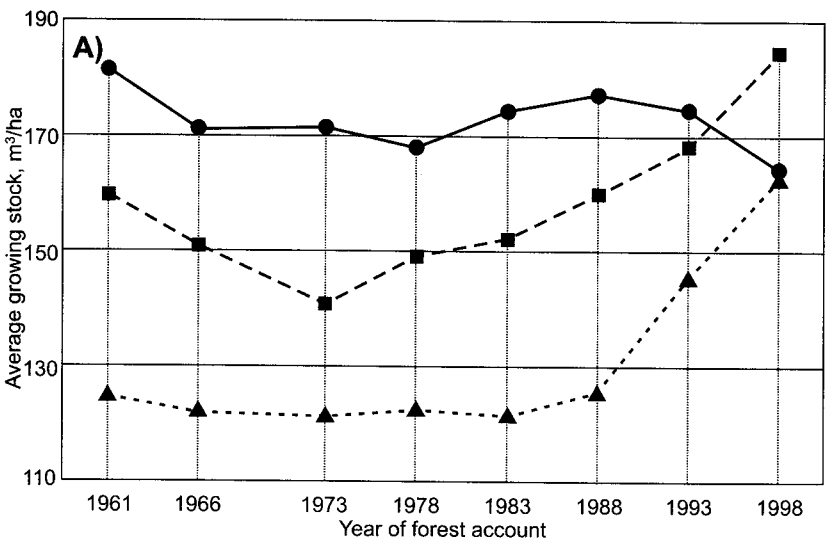


Fig. 57. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Omsk Oblast by age groups.



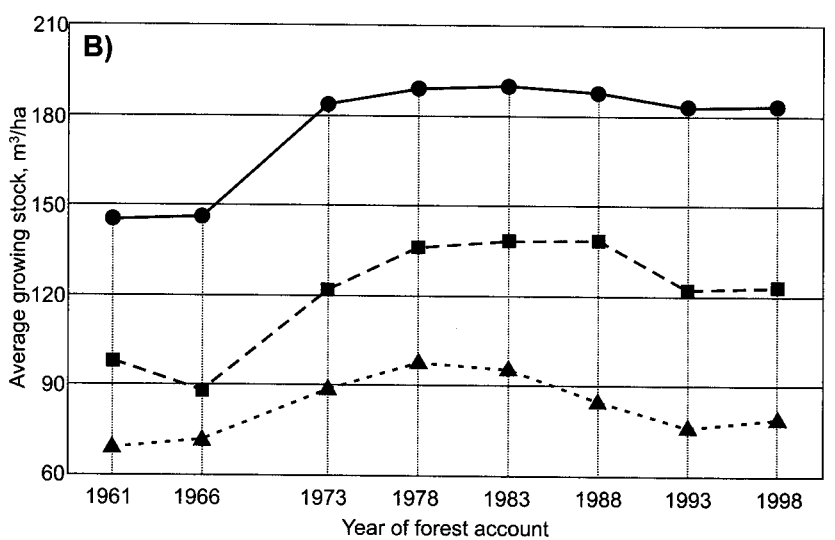
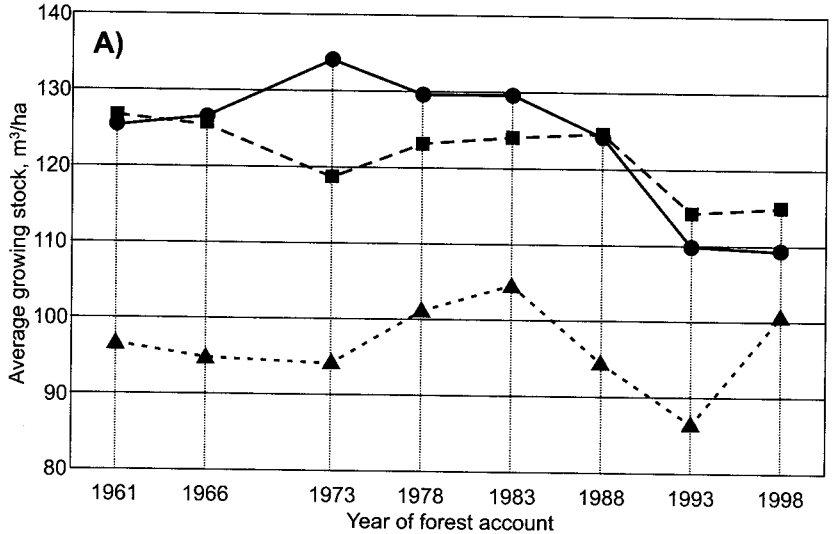


Fig. 58. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Tomsk Oblast by age groups.

middle-aged — maturing — mature and overmature — middle-aged — maturing — mature and overmature



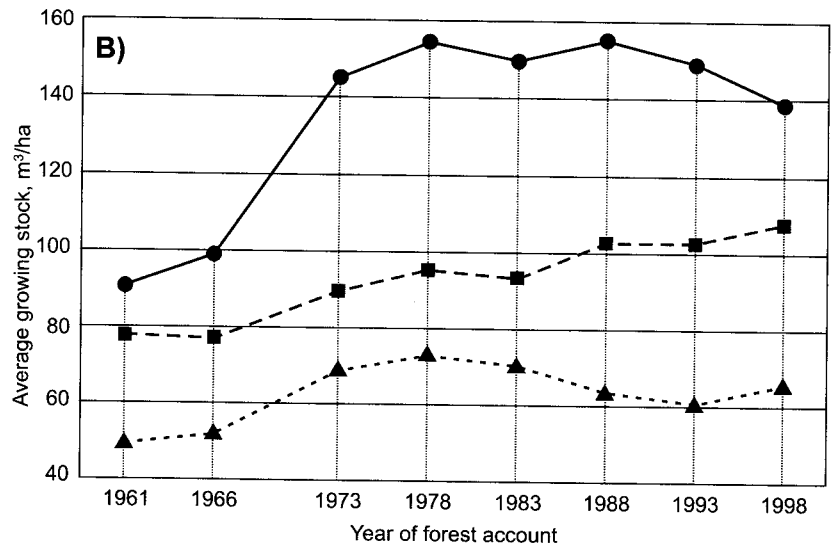
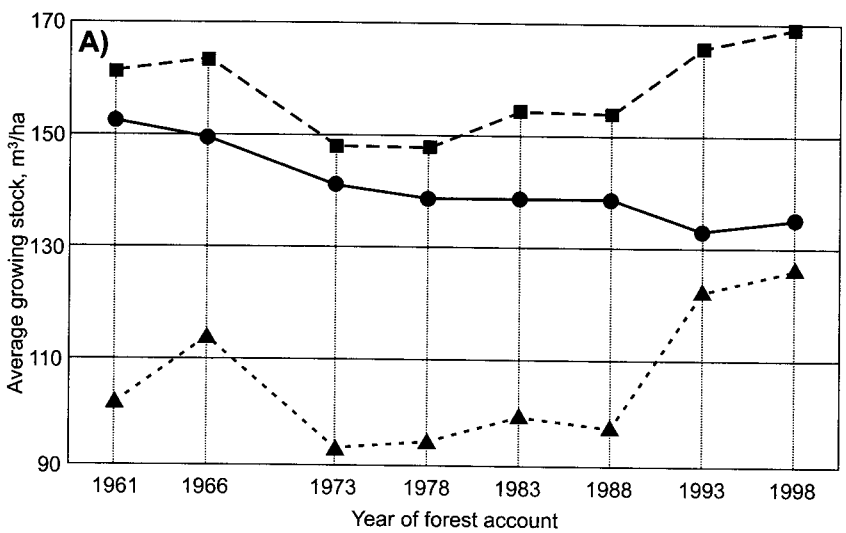


Fig. 59. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Tyumen Oblast by age groups.

middle-aged — maturing — mature and overmature



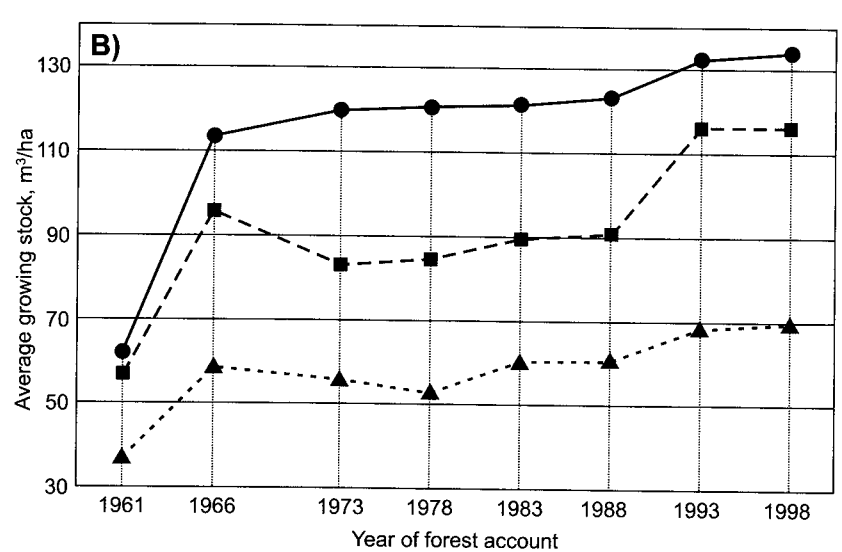
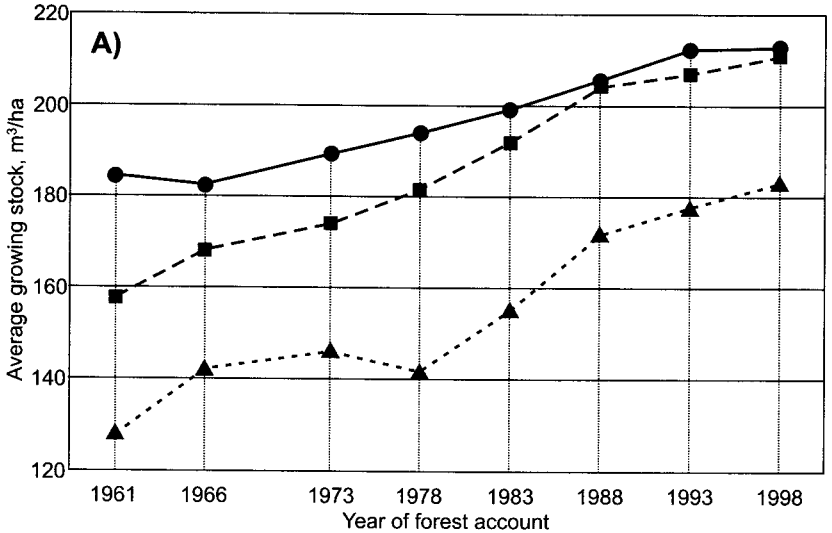


Fig. 60. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Krasnoyarsk Kray by age groups.

middle-aged — maturing — mature and overmature



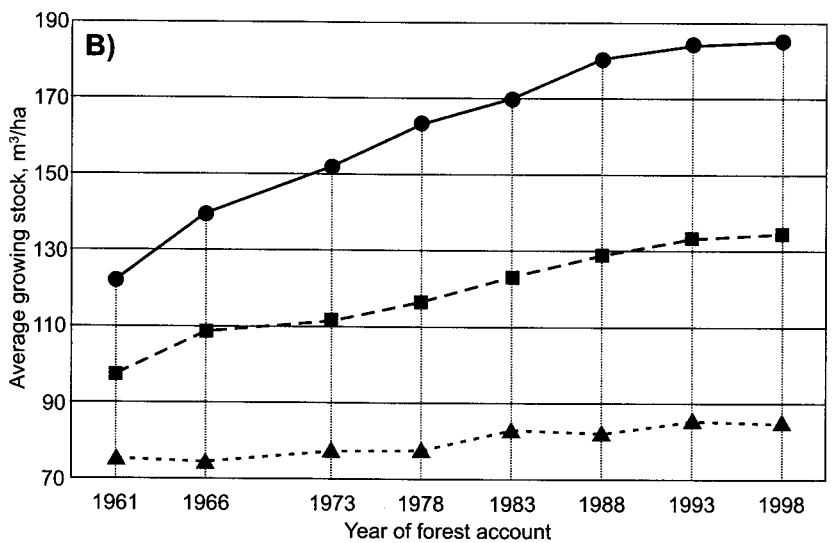
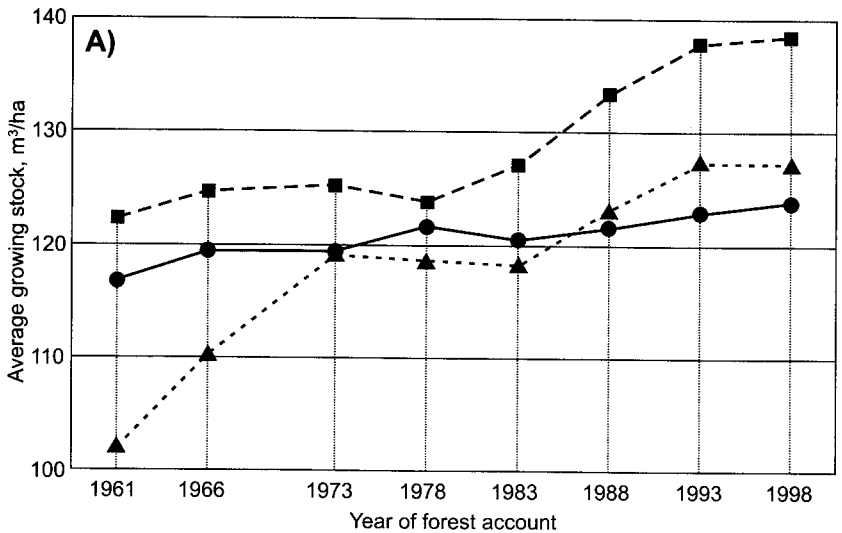


Fig. 61. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Irkutsk Oblast by age groups.

middle-aged — maturing — mature and overmature



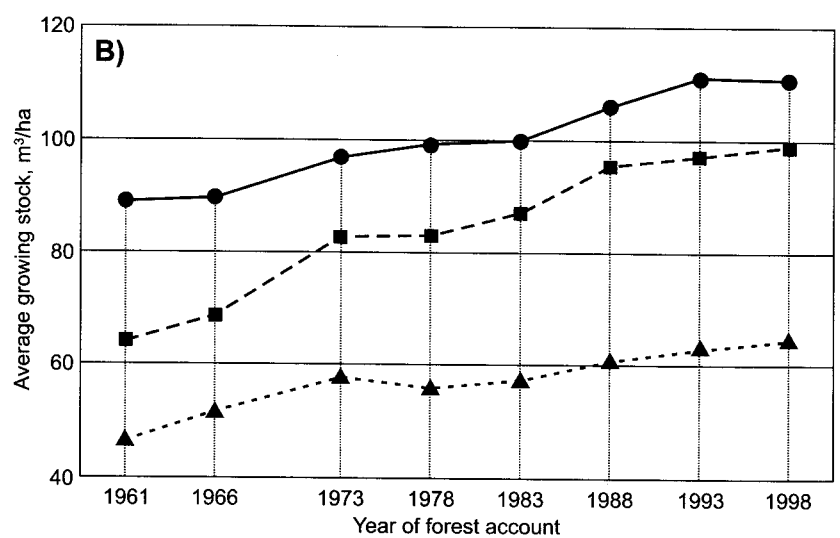


Fig. 62. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Chita Oblast by age groups.

middle-aged — maturing — mature and overmature

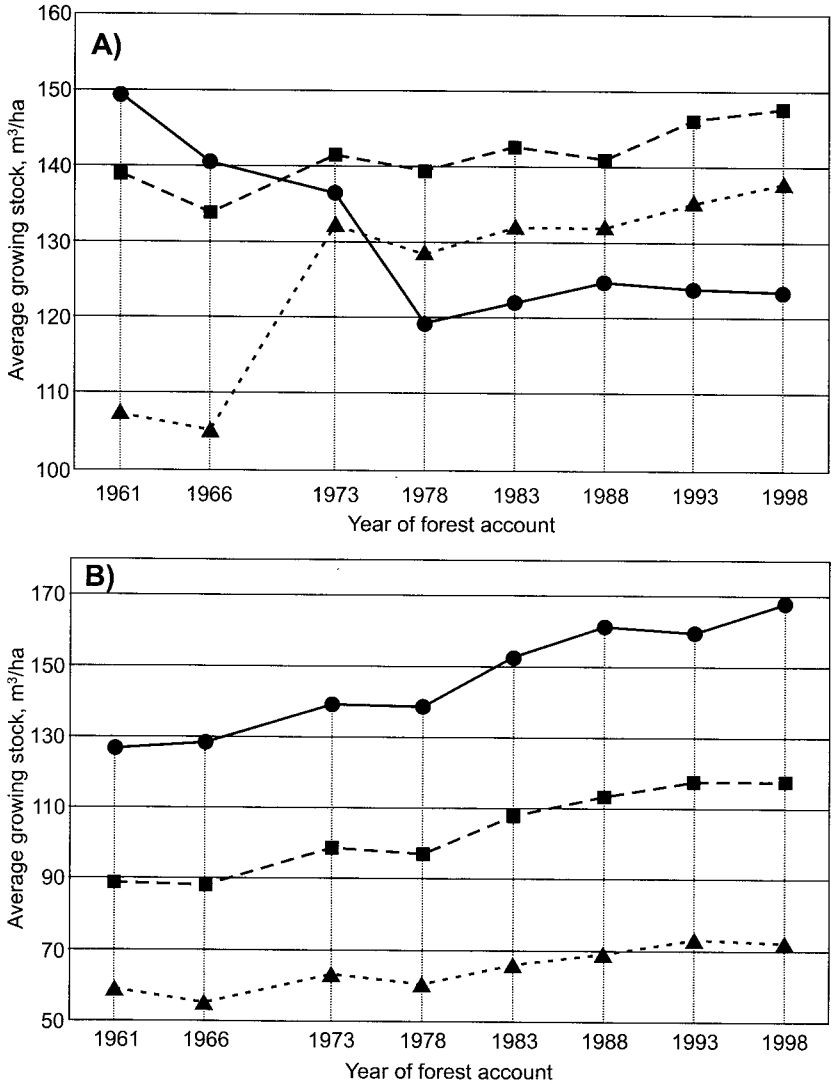


Fig. 63. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Republic of Buryatia by age groups.

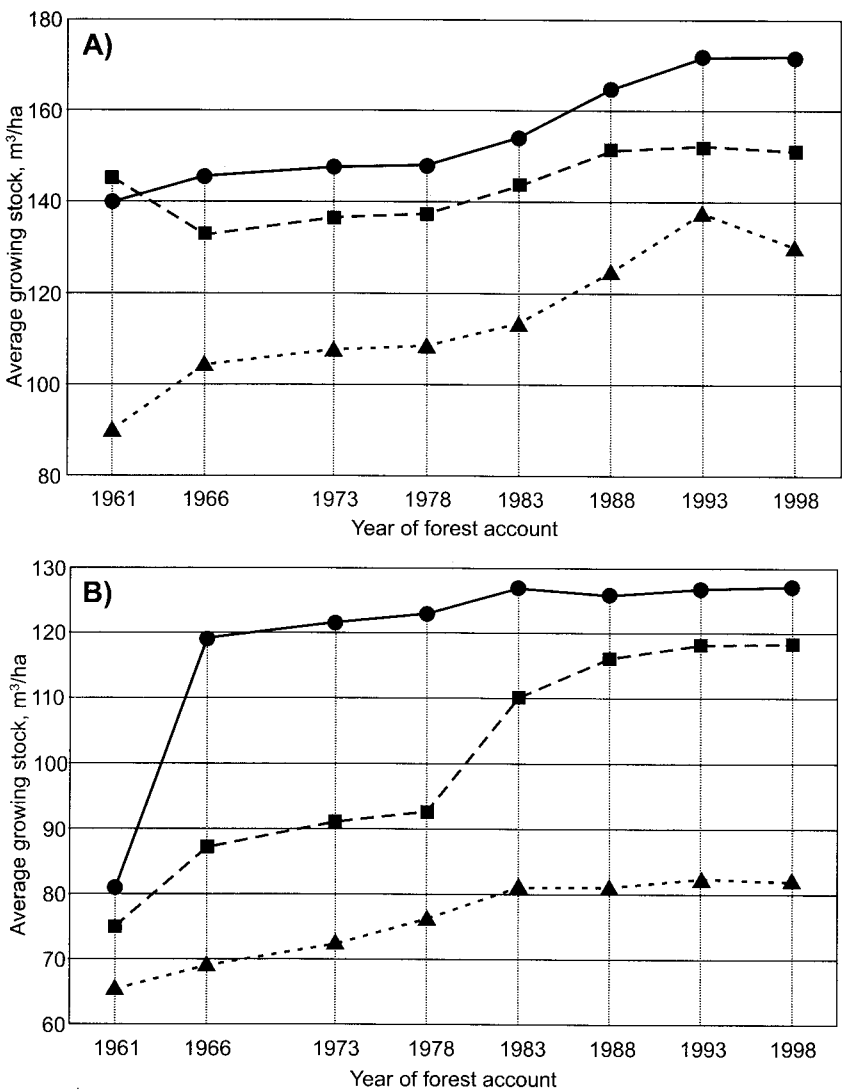
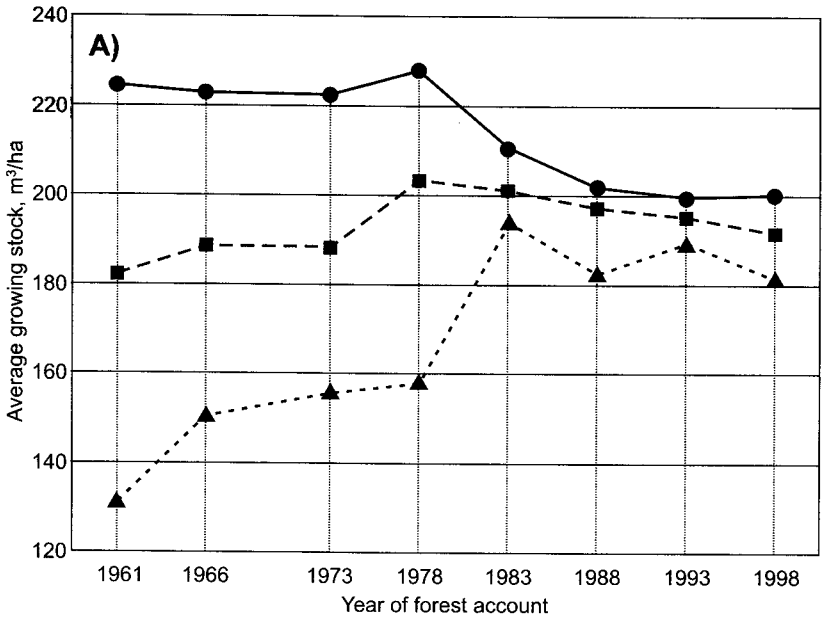
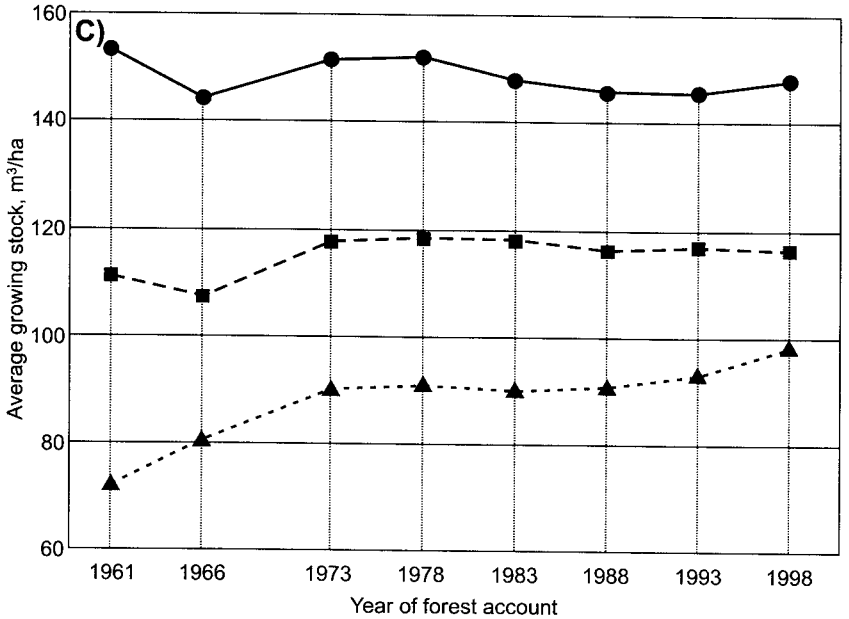


Fig. 64. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Republic of Tuva by age groups.





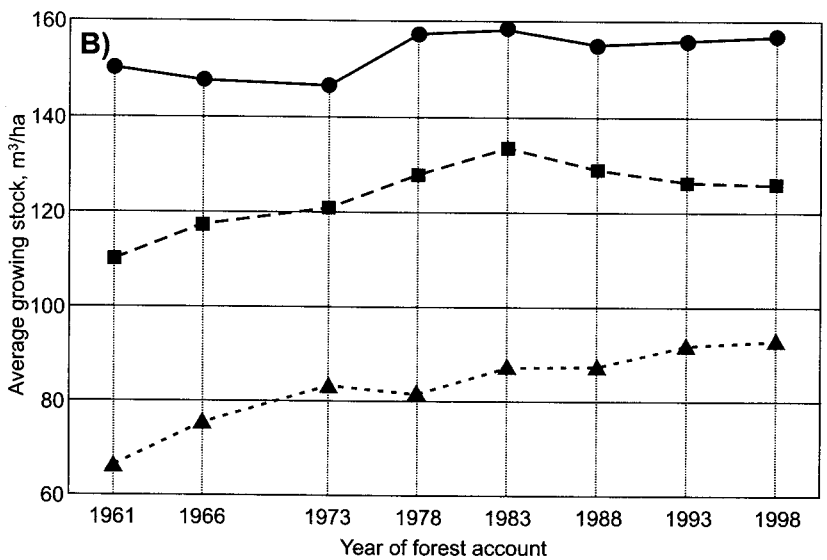
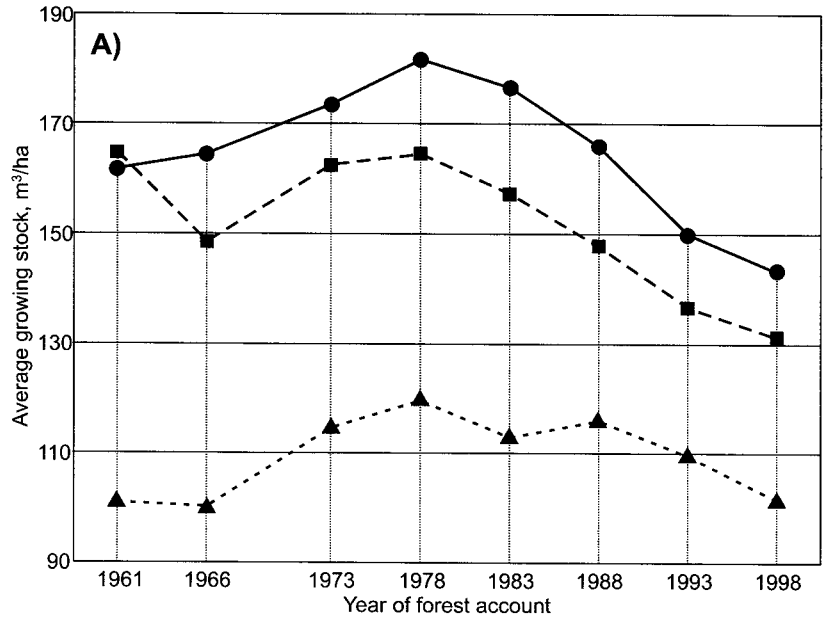
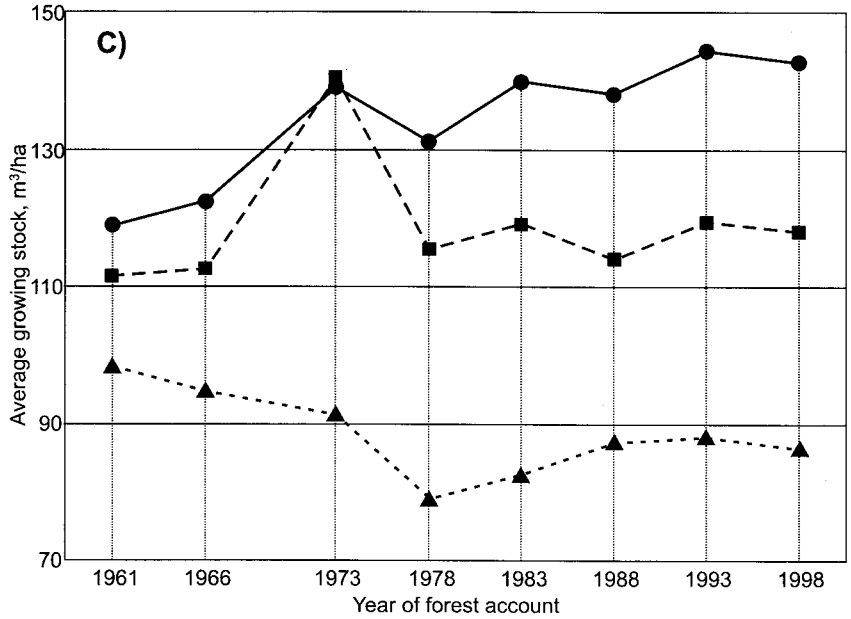


Fig. 65. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Primorie Kray by age groups.

middle-aged — maturing — mature and overmature





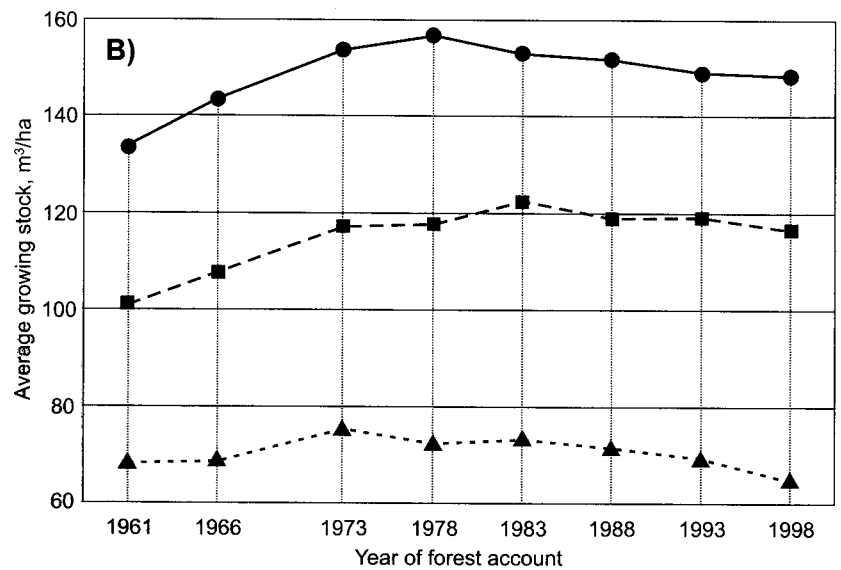
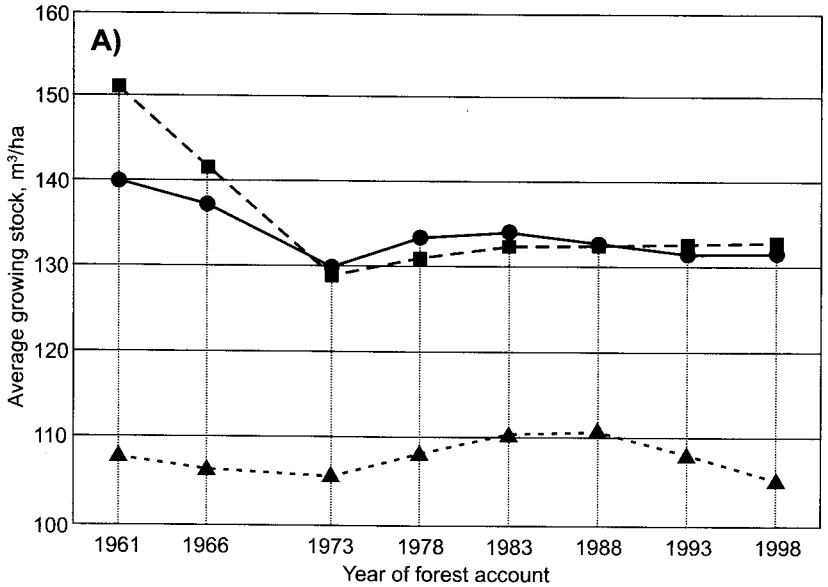
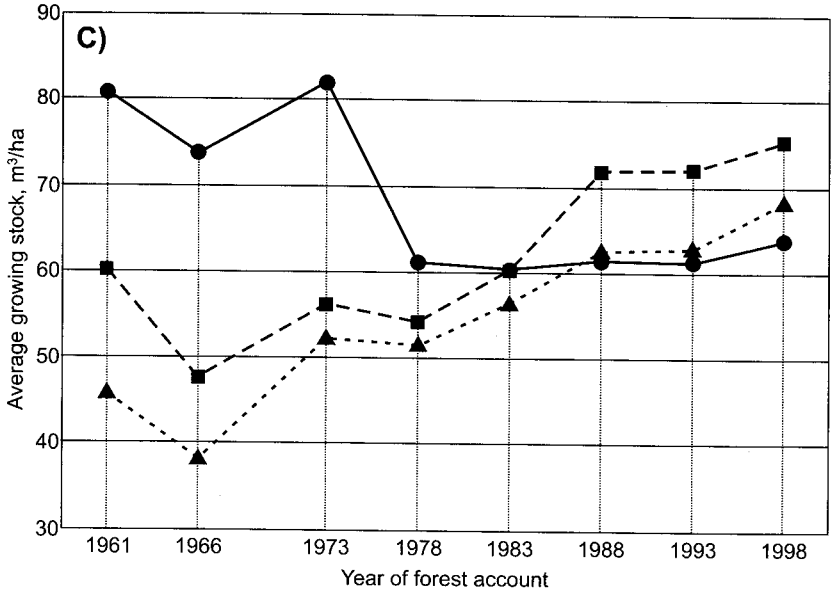


Fig. 66. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Khabarovsk Kray by age groups.

middle-aged — maturing — mature and overmature





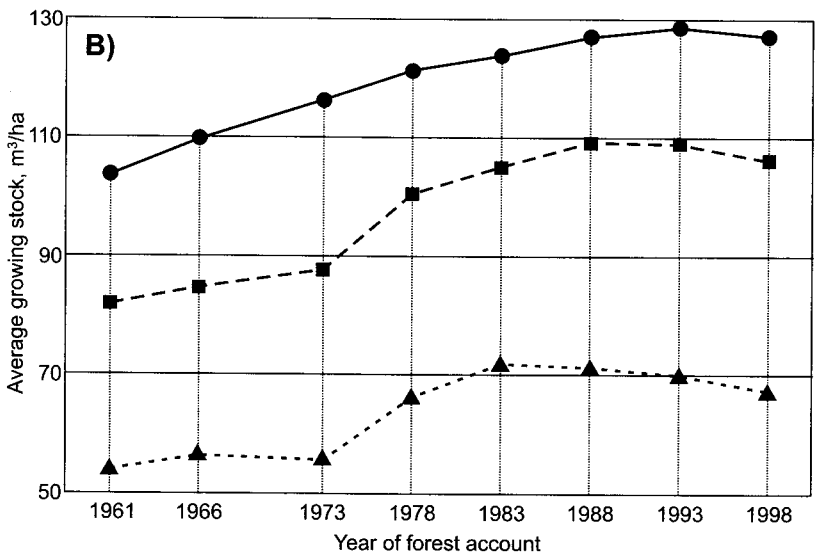
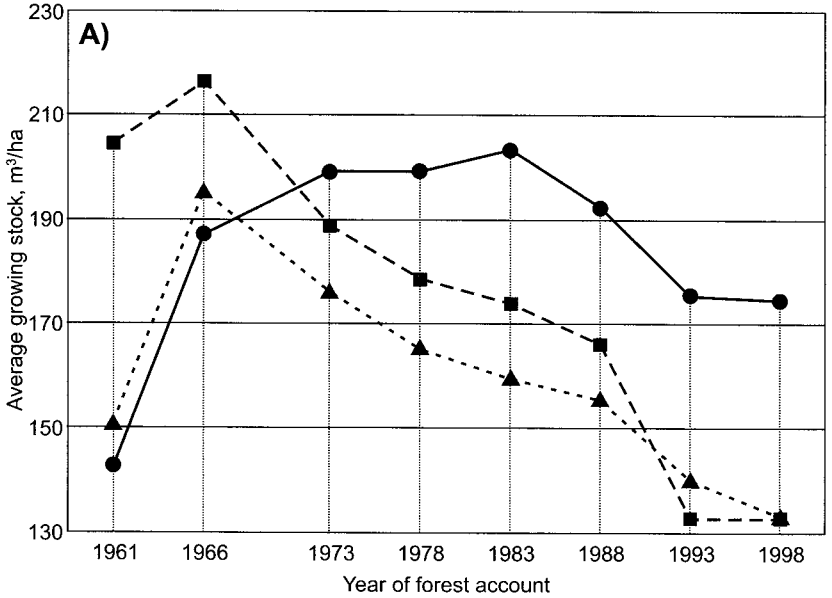
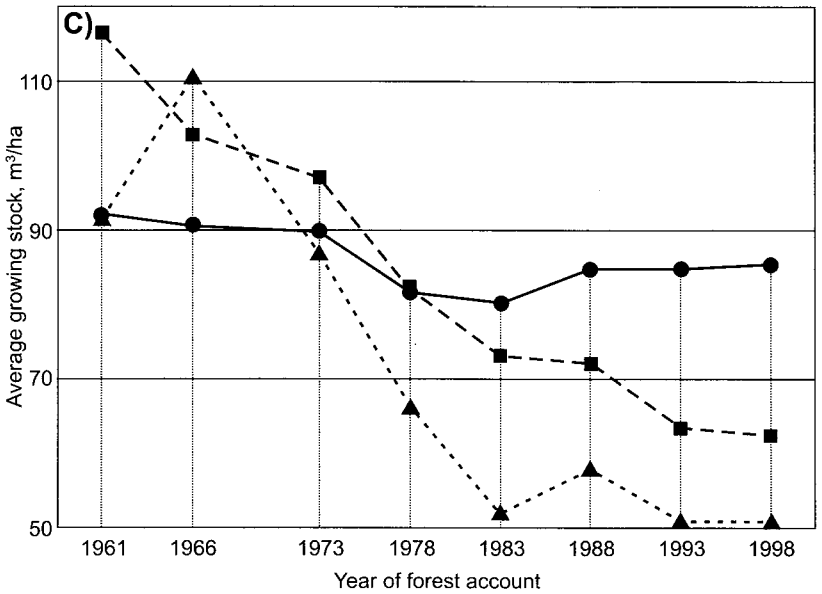


Fig. 67. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Amur Oblast by age groups.

middle-aged — maturing — mature and overmature





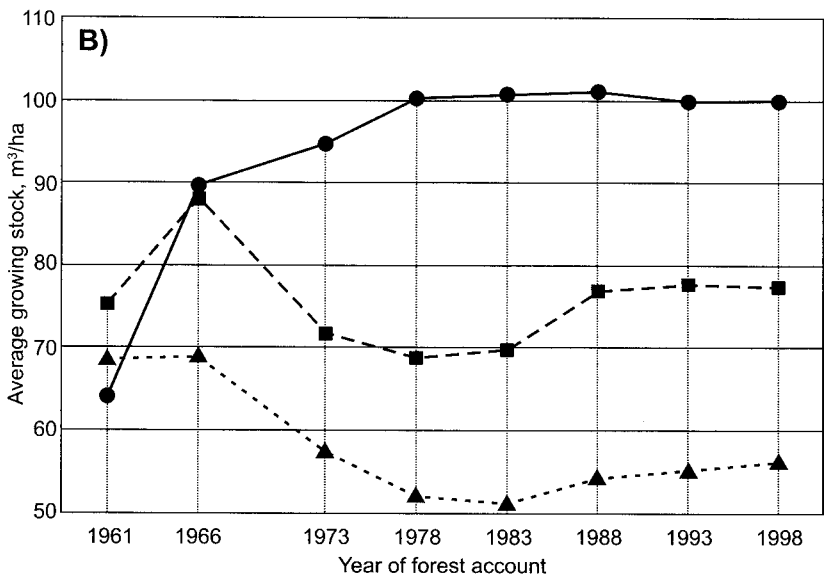


Fig. 68. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Kamchatka Oblast by age groups.

middle-aged — maturing — mature and overmature

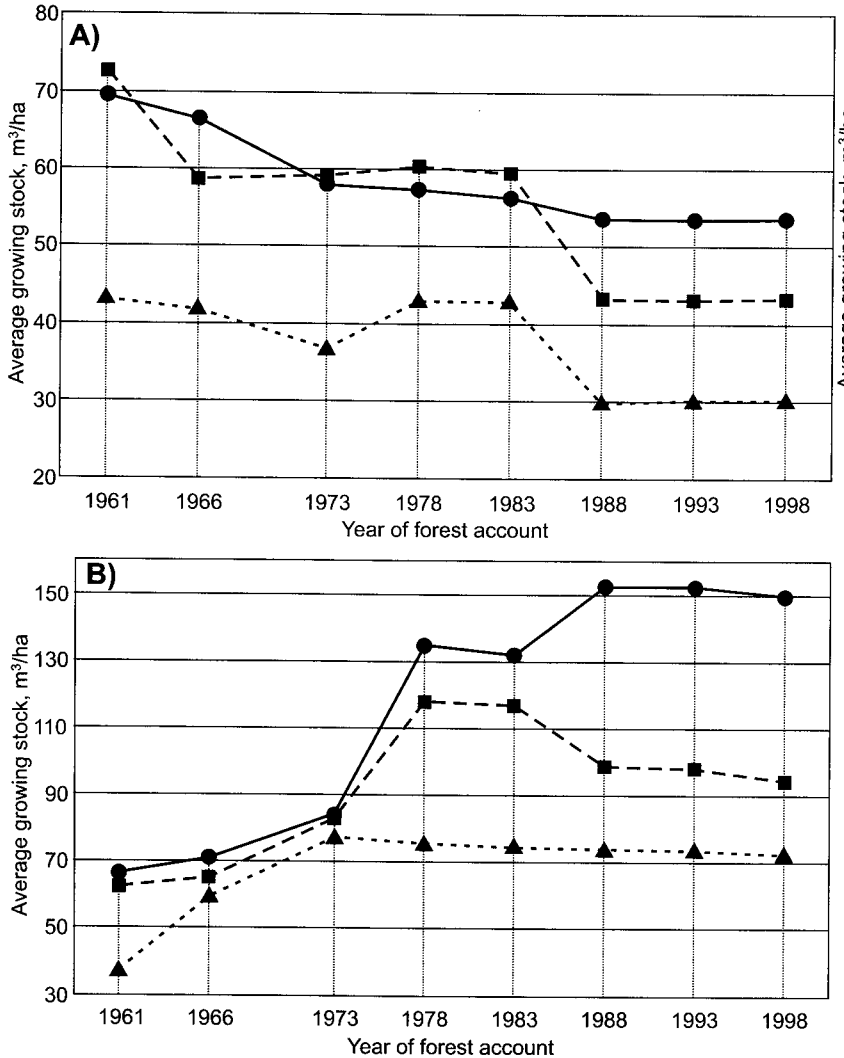


Fig. 69. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Magadan Oblast by age groups.

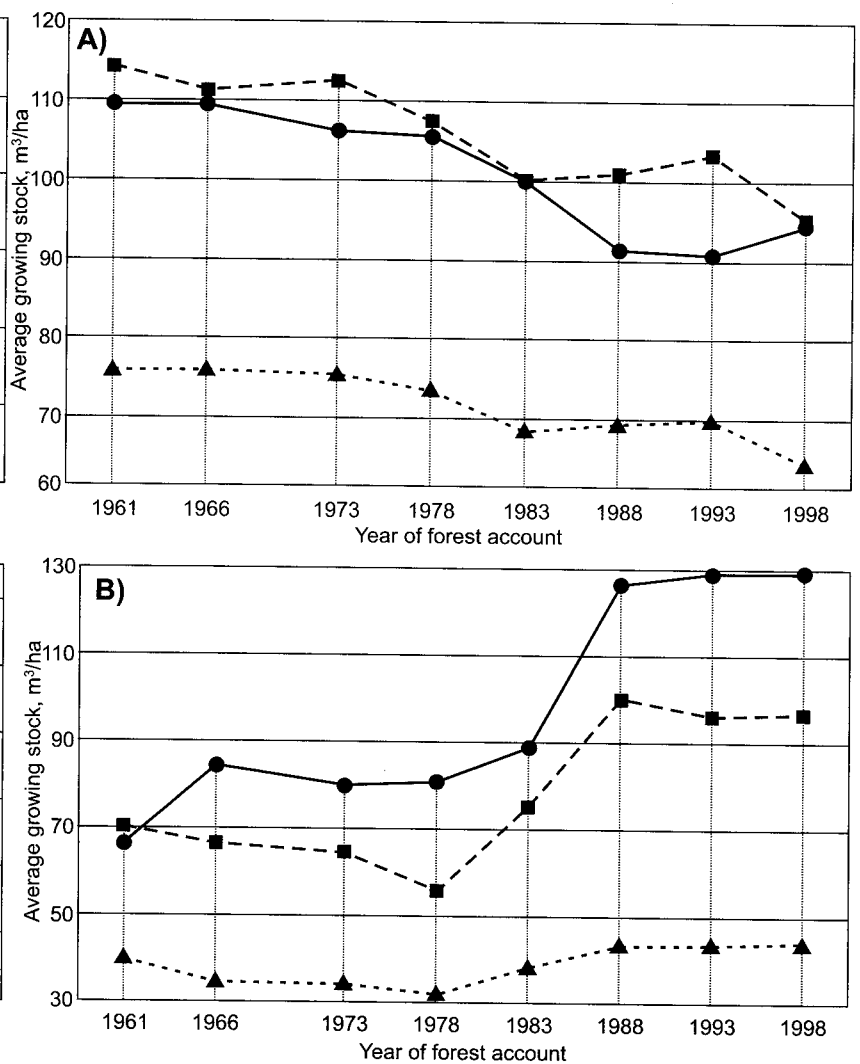
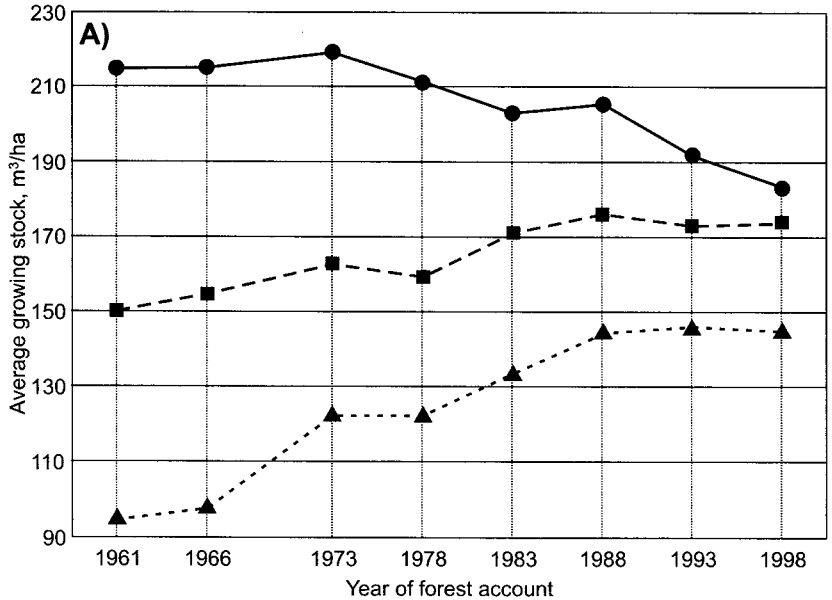
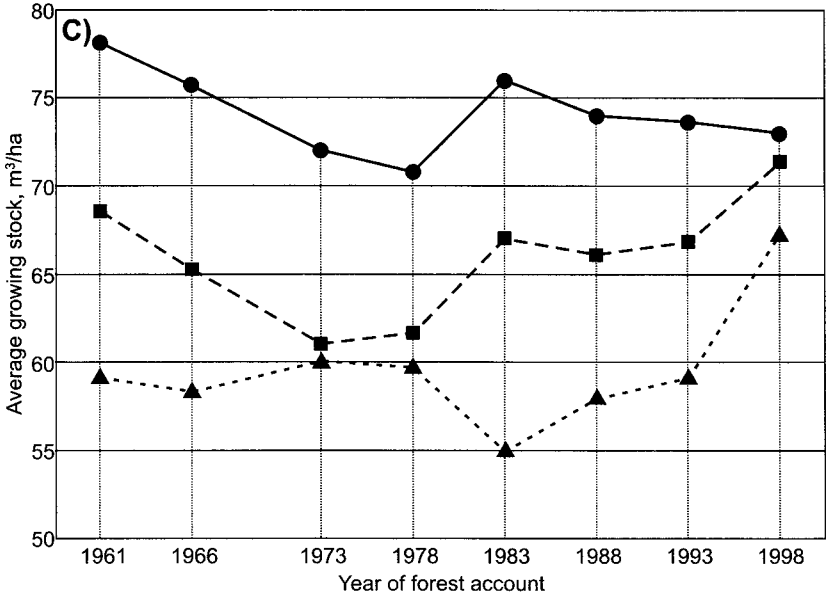


Fig. 71. Dynamic of average growing stock volume in coniferous (A) and deciduous softwood (B) of Republic of Sakha by age groups.





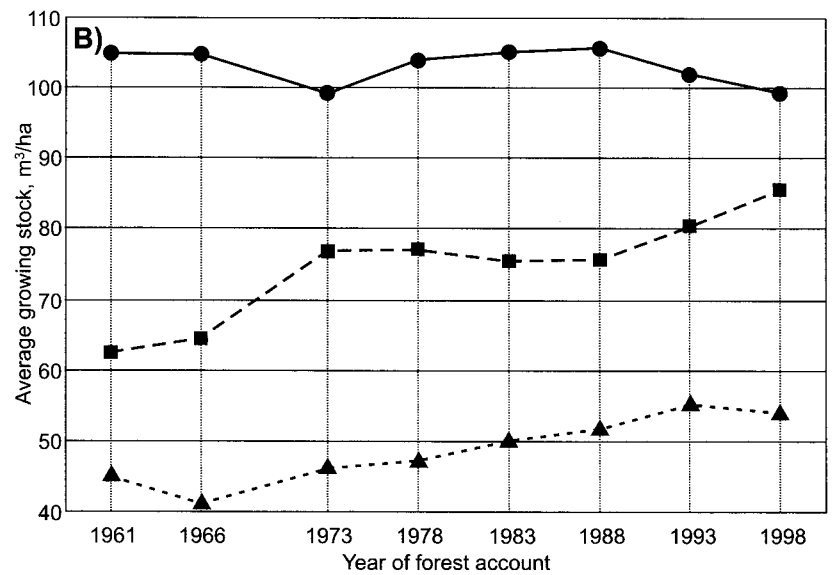


Fig. 70. Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Sakhalin Oblast by age groups.

middle-aged — maturing — mature and overmature

Chapter 4

CAUSES OF POSSIBLE VARIATIONS, INACCURACIES AND ERRORS IN THE AVERAGE GROWING STOCK

Among the causes of temporal variations of AGS of tree stands are biotic and abiotic factors resulting in direct or indirect change of forest area and stock. Although the total list of causes is large, for the purpose of comparing net productivity of stands this list may be reduced to six groups of factors, which are discussed in the following sections.

4.1. Current changes in AGS of stands

There is a continuous change of growing stock in forest communities. To avoid dependence of the group of time-related causes, within a time period being investigated, data for each forest-forming species must be compared in the same absolute age (or narrow intervals thereof).

The best information for these purposes would be forest inventory data on growing stock of forest forming species by *age classes*, but no reports of such data according to administrative regions are available.

It is also possible to obtain comparable estimates of AGS using data according to *age groups*, provided that calculations are performed for large areas with sufficient averaging of data. Narrower age-group intervals and less differences of growing stock within intervals will produce more reliable comparisons for different years of the SFFA.

If the areas of stands are small, the absolute age of a forest stand within an age group under analysis can vary in the accounts for different years because of insufficient data for averaging. Accordingly, the rates of the AGS can vary to an extent that they will be no longer comparable.

Of major significance are even small differences in absolute age of forest stands within a group of young stands compared in different years of the SFFA. Young stands have very large differences (5 to 7 times) in their growing stocks in the beginning and at the end of the age class, especially when young stands of the 1st and 2nd age class are united in one group.

As an example of age changes in relative values of current growing stock of forest stands, Table 4.1 includes a condensed version of tabular data by V.V. Zagreyev (*Zagreyev et al., 1992, Table 145*) for several forest-forming species of Russia. It must be taken into account that tree stands with the relative density less than 1,0 have lower increment rate as shown in Table 4.2 (*Zagreyev et al., 1992, Table 146*).

4.2. Global climate change

The increasing carbon dioxide concentration of the atmosphere, increasing air temperature, changes in atmospheric precipitation and humidity, and deposition of aerosol particles of nitrogen oxides have direct and indirect influence on the intensity of physiological processes of plants, and affects their growth. These factors have several possible influences.

4.2.1. Increase of carbon dioxide content in the atmosphere

As is well known, the organic mass of plants is formed during the process of photosynthesis from CO_2 and water. The present-day CO_2 concentration in the atmosphere of the Earth is 3 to 4 times lower than the photosynthesis saturation level. Therefore, a steadily increasing CO_2 concentration intensifies formation of organic mass in the trees and forest stands.

Different kinds of plants have different responses to an increased CO_2 concentration (*Mokronosov, 1999; Karnosky et al., 2001; Medlyn et al., 2001*). On average, the seedlings and saplings of wood species increase their aboveground and belowground mass by approximately 2/3 when CO_2 concentration is doubled, reacting not only by changing their photo-

synthesis rate, but also by increasing leaf area (Reviews: *Joyce and Birdsey, 2000; Medlyn et al., 2001*). In closed stands, where a compensation light point of canopy is already achieved (*Alexeyev, 1975*), a leaf index increase is not to be expected.

Considering that annual CO_2 density has increased from 1957 to 1998 by 13,1 % (*Joyce and Birdsey, 2000*) and assuming that intensification of mass production only occurs due to increasing photosynthesis without considering other factors, it may be estimated that during the last 50 years a 3-5 % increase in tree stand productivity has occurred and continues to occur at a rate of approximately 0,1 % per year. In addition there are data suggesting that an increased inflow of carbohydrates to roots has a beneficial effect on the mineral nutrition of arboreal plants and, thus, enhances even more the process of assimilation (*Johnson et al., 2001*). On the other hand, there is evidence that limitation of some factors necessary for optimum tree growth may reduce the photosynthesis effect of increased CO_2 (*Korner, 2000*).

4.2.2. Increasing aerosol deposition

Combustion of coal and oil results not only in growth of CO_2 concentration, but also in increasing formation of aerosols, including nitrous oxide (N_2O). The content of nitrogen aerosols in the atmosphere, with an annual increase of 0,25 %, has reached, by 1994, a value of 312 parts per billion (*Houghton, 1996, Кароль, 2002*). Deposition of nitrogen aerosols has regional differences. For example, in the Northern state of Maine, USA, it totals 2,5 kg / ha per year, whereas in Pennsylvania it exceeds 20 kg / ha (*Birdsey et al., 2000*). In Germany the regional effect of nitrogen aerosol deposition on increasing of forest productivity is estimated to be several times higher than that of CO_2 (*Mund et al., 2002*). It is difficult to estimate the importance of this factor for the forests of Russia because of the lack of domestic data on the territorial distribution and deposition of aerosols.

Oxides of nitrogen are weak pollutants. Areas near chemical plants that produce nitrogen fertilizers show a local eutrophication effect on forest ecosystems. Long-range western transfer of global-regional nitrogen deposition leads to some fertilizing effect in the forests of European and some parts of Asian Russia. The extent of this effect is not yet determined.

4.2.3. Increasing temperature

Some information on change of air temperature in different areas of Russia in the second half of the 20th century is given by G.V. Gruza and colleagues (*2001*). According to these data, the temperature in the European part of Russia from 1961 to the early 1980's was 0,5° higher than at the end of the pre-industrial period, but lower than the average temperature for the period of 1961 to 1990. From 1981 to 1995 it was higher than the average temperature for the previous 30 years.

The increase of temperature in the Northwest of European Russia from 1961 to 1993 was approximately 0,3° every 10 years, with the greatest increase seen in winter and early spring months (*Kobak, et al., 1999*), as was predicted (*Budyko, Groisman, 1991*). The increase of temperature in summer months was weaker (*Kobak, et al., 1999; Efimova and Strokina, 2002*). Average changes are related to an earlier transition of temperatures through 0°, +5° and +10°, with 0° transition increasing by 5-10 days for the last 100 years (*Mirvis, et al., 1996, Mirvis, 2002*). Temperature changes have a pronounced regional character (*Gruza, et al., 2001; Efimova, Strokina, 2002*).

The quantitative significance of the extension of the growing season in increasing of stand productivity is hard to determine since an early beginning of the warm season is frequently followed by return of cold weather, which results in a sharp lowering of photosynthetic efficacy of overall warming. Nevertheless, it may be assumed that an extended duration of vegetation plays a positive role in increasing productivity of tree stands (*Myneni et al., 2001*). The greatest effect of an extended growing season should be expected in the Northern areas; however, just in the regions of the European North of Russia, above latitude 61 North, negative trends of temperatures have been observed (*Gruza et al., 2001*).

4.2.4. Changing precipitation

The precipitation in the second half of the 20th century increased in various areas of Russia by 2-20 % (*Gruza et. al., 2001*). Depending on region, time and intensity of precipitation, the changes could have both positive and negative effect on forest productivity.

4.2.5. Other changes

Cloudiness, air humidity and solar radiation are changing according to climatologists (*Kobak et al., 1999; Israel et al., 2001*). However, it is still difficult at present to make a quantitative estimation of the influence of these factors.

Based on the present physiological and meteorological information for Russia, it is impossible to determine the magnitude of changing productivity. It is possible to say only that there has been a positive impact of Global change on Russian forests.

In regions with similar climatic changes, an increase in productivity should be approximately equal for the tree stands of all age groups and age classes. Differences between the forest forming species in Russia remain unknown because of the lack of appropriate investigations in the country. Nevertheless it is difficult to assume a big difference between evergreen and summer-green tree species.

Increasing production of organic substances, and global and regional climate changes, should increase growth of trees in height, shifting site quality classes higher. But has atmospheric fertilization begun to affect soil characteristics and hence, produced a *stable* increasing of productivity? This question still has no positive answer from soil scientists.

4.3. Anthropogenic and natural stresses

4.3.1. Influence of forest management

This complicated group of causes provides both positive and negative impacts on rates of AGS in forests of Russia.

Examples of the positive influence of management include assisted reforestation and drainage of excessively wet forest ecosystems.

Establishment of forest plantations (application of silviculture) is rather important for some regions. Overall, the proportion of forest plantations in Russian forest land is 2,1 %. In the European part of Russia the proportion of plantations in the stocked area is quite significant: from 1960 to 1998 it increased from 0,4 to 9,0 % (*Yatskevich et al., 2001*). Unfortunately, it is impossible to estimate the productivity effect of silviculture practices because after closing their canopy, plantations cease to be an object of attention and are no longer identified as a separate category in data of SFFA.

Drainage of excessively wet forests is carried out almost exclusively in the European part of Russia and occupies an insignificant area relative to the scale of the forest fund. There are 1,9 million ha of drainage systems built in Russia (1,3 % of stocked area in the European part of the country), while but 0,8 million ha of these need rebuilding of drainage network (Table 10A). Hydromelioration is widely distributed in some regions (such as Kaliningrad and Pskov Oblasts), but there is no assessment of the drainage activity in the statistical data.

Such ecological measures as fire fighting and fire protection of forests do not directly change forest growth processes, but play an important role in preserving forests from damage or premature destruction.

Clearcuts should be mentioned among the forest industry activities having a negative effect on the value of AGS. These have no direct influence on the change of a growing stock, since cleared land resulting from the harvest is transferred from the category of stocked land into the category of non-stocked land. However, the indirect influence of harvest is significant. Since highly productive forest stands are cut down first as most advantageous from the economic point of view, and this process goes for decades, there is a decrease in the relative area of most productive stands, and reduction of a region's AGS.

Thinning and other intermediate harvests can also have a significant impact on the AGS. These practices are widely carried out in forest-poor regions with high population density. These are performed in tree stands of all ages and sometimes cause a reduction in productivity instead of improvement. However, the growing stock in the middle-aged and maturing stands is much lower than usual, which, without taking into account the volume of cut trees, makes the determination of real change in forest productivity very difficult.

Understanding and taking into account the influence of management is only possible when comprehensive additional data on economic activities is available and only when the operating factor involves forest productivity changes throughout the administrative territory.

In our case the forest productivity analysis reveals only large-scale economic influences. The effect of

measures affecting only a small part of forest stands is not to be detected by a rough analysis. Revealing their role requires special research at a level of leskhozes and their districts.

4.3.2. Forest fires

Like clear cuts, the fires resulting in complete loss of stands have only an indirect influence on the change of the AGS because burned area is excluded from the stocked lands. The fires which only damage tree stands reduce their AGS; however, there is no reliable statistical data on the extent of this reduction (*Isaev, et al., 1995; Isaev, Korovin, 1997*).

The main burned areas are confined within the forests of Siberia and the Far East (Table 9A).

According to statistical data, the area of burned stands in European Russia is 25-130 times less than in Asian Russia (Table 9A).

4.3.3. Air pollution

Major sources of industrial pollution are located in Murmansk, Irkutsk Oblasts, and Krasnoyarsk Kray. The impact of their emissions which result in loss of forests is fixed in the official statistics. According to the forest fund of Russia (*Federal.., 1999*) by 01.01.98 the country has lost 1,6 million ha forests from several causes combined: atmospheric pollution, windfalls, insect outbreaks, and fungus diseases. Damage of forest stands resulting in reduction of growing stock is reflected in the forest management projects.

According to our research and expert estimations, the total loss and damage of the forest stands caused by the pollutants in Russia consist of approximately 5 million ha. The damage of the forest ecosystems (mainly due to destroying of lichen communities) reaches 15-20 million ha (*Alexeyev, Chmyr, 1997*).

S. Nilsson and A. Shvidenko suppose that 231.5 million ha stocked area with 27.3 billion m^3 of growing stock in Russia are at risk because of deposition of sulfur, and 87 million ha forests with a stock of 11.6 billion m^3 are exposed to critical deposition of nitrogen oxides (*Nilsson, Shvidenko, 1998*). These figures are absolutely unbelievable.

4.3.4. Insect outbreaks and fungus diseases

The negative role of this group of factors, most distinctly observed in forest ecosystems of Siberia and the Far East, is reflected in the SFFA data only in cases of complete stand destruction. Partial damage of stands and decreasing of growing stock in them is adjusted at time of forest inventory.

Data on fungus diseases are investigated less than insect outbreaks. In particular, there is evidence of epiphytoties by *Melampsorella caryophyllacearum* and *Durandiella sibirica* discovered in Kemerovo Oblast and Krasnoyarsk Kray (*Alexeyev, 1999; Alexeyev and Chabounine, 2000*), which were earlier mistaken for damage due to air pollution (*Kovalev, 1998*).

4.4. Changing proportion of area under stands of different ages

Dynamics of age class distributions inevitably arise from clear-cuts, fires, natural reforestation and artificial forestation, and from any natural and anthropogenic phenomena destroying or restoring a part of the tree stands.

It hardly needs to be proved that different proportions between the stand areas of different age can cause changes in general AGS. It is not so obvious that it is practically a permanent factor capable of causing huge shifts in general AGS.

For example, there has been a very large increase of total AGS in Orel Oblast because of changes in the proportion of different age groups in stocked areas (Table 4.3). In this case the different proportions are caused by the fact that during the World War II and soon thereafter, large-scale forest harvest was carried out in the forest-poor Orel Oblast (forest land percentage of territory is 7%), which, in the early 1960's, resulted in a large area of young stands (60 %) with small AGS. As a result, total AGS of stands in the Orel Oblast was also small. With the course of time and maturing of young stands, their share gradually decreased, and by 1998 fell to 20 % (Table 4.3), which is responsible for a sharp increase of the total AGS.

This example illustrates that use of general AGS for describing changes in productivity, as a rule, makes no sense without additional explanations. In each case there is a need to know the former and present ratio of the tree stand areas in different age groups.

Some studies use the **total** AGS to show changes that have occurred in forests over decades (*Shvidenko, Strakhov, Nilssen, 2000*), but failure to account for age groups makes their analysis of limited utility.

As for changes in the AGS and increasing stand productivity in Orel Oblast, the reported trends (Fig. 17) partly have errors, created by 5-year accounts and in reality are much lower than produced from the initial data (Tables 2A- 5A).

An important way to confirm changing productivity of forests could be data of site quality classes. However this parameter is given without connection with stand ages and its characteristics are not always reliable.

The main findings of section 4.4 are:

- dynamics of areas occupied by stands of different ages has important meaning for understanding changing of the AGS;
- the use of general (total) AGS for describing causes of changes in stand productivity has little meaning because in every separate case the value of the AGS is dependent on the proportional contribution of each stand-age group to the total growing stock.

4.5. Improving of knowledge about the forests

Available data and knowledge about forests in many parts of Russia have improved over time. Sometimes changes in estimated AGS are the result of improving data rather than a reflection of any particular change in forest characteristics. Improving knowledge may both increase and decrease the AGS at local, regional and national levels. Its influence is detected after initiation of forest management (or forest inventory) with application of new methods of study. Exclusion of its influence on parameters of productivity change is only possible by deduction from comparison of forest lands for which a consistent level of knowledge cannot be confirmed.

Based on Table 2.2, an assertion was made that forests in the Asian part of Russia are not investigated enough to reveal the causes of changes in their productivity. In this section is a review of how changes in field forest inventory and management as well as more accurate remote sensing methods have affected the estimates of growing stock in some regions of Siberia and Far East.

4.5.1. Krasnoyarsk Kray

Forests of Krasnoyarsk Kray have been compared for 37 years within boundaries of the USSR, since the data for the period of 1961 to 1988 are available only for the administrative territories which existed at that time.

By 1961, the field forest inventory had been completed on 13,8 % of the area of the forest fund of the Kray. By 1998 this value had risen to 30,2%. The most essential corrections to the area and growing stock of the Kray occurred in the periods between 1973-78 and 1988-93 (Tables 2A-5A).

In the latter case the area of forest lands was reduced by 4 million ha (Table 3A), the area of mature conifers decreased by 17,8 million ha, and their stock by decreased 2,6 billion m^3 (Table 4.4).

The area of clear-cuts, burned area, and forests lost from an outbreak of Siberian silkworm and pollutant emissions, does not exceed 4,3 million ha, i.e. the area by which the nonstocked lands of the region have increased (Table 3A).

Reduction of mature and overmature coniferous area (by 13,5 million ha) and increase of the shrub area by 5,8 million ha could only take place as a result of large-scale forest management and inventory, and improvement of knowledge of forests which had been badly investigated before. Given the changes that have occurred in development of forest knowledge in the Kray, the reference point for reliable data on changing tree stands for the whole Kray is 1993.

4.5.2. Republic of Sakha (Yakutia)

The forests of Yakutia have the highest percentage of forest area in the Asian part of Russia, and the second-highest percentage of growing stock after Krasnoyarsk Kray. By 1961 only 1,4 % of its forest fund area had been investigated by field methods. Since then most of the territory has been surveyed with the help of visual aerial estimation. Therefore, it is no wonder that during the following three decades the areas and stock of its forests were subject to almost continuous corrections, which is obvious from Tables 2A-5A.

Of course, these changes are also connected with real processes which developed in forests of Yakutia; however, the two kinds of changes cannot be

distinguished from each other based on the published reference books.

At present, forest management covers 32 % of the forest fund of Yakutia, and 61% of the forest fund has been investigated by progressive remote sensing methods (see Table 2.2). The potential for improving knowledge of forests in Yakutia is not yet exhausted.

As for the changes of AGS (Fig. 71), it is possible to suggest that some of the changes (for example, an incredible increase in the stock of deciduous softwood between 1983 and 1988), are connected not with the improvement of knowledge, but with errors in preparation of the SFFA data.

Extremely interesting are changes of the AGS of mature and overmature conifer forests for the period of 1978 to 1988 (Fig. 71). Taking into account the volumes of the harvest in these years (Table 8A), it can be assumed that annual volumes of stock destroyed by fires in this period, were approximately 5 times greater than volumes of the harvest.

4.5.3. Magadan Oblast

This Northern region has 22 million ha of stocked forest area, and more than 50 % (12,4 million ha) of that is classified as shrub communities, mostly the krummholz of *Pinus pumela*.

At the beginning of 1961, only 0,7 % of the forest fund area in Magadan Oblast was managed by field forest inventory. Until now this figure has increased only slightly to 0,8 %. The rest of the forest area is investigated via the remote sensing methods, that are incomparably better than the visual aerial survey, but still leave opportunities to further knowledge of tree stand characteristics in small locations.

Based on the initial data (Table 2A-5A) and Tables 4.5 and 4.6, it can be concluded that there is a very low level of knowledge of forests in Magadan Oblast.

Table 10 shows the relative distribution of the forest stand areas according to age groups, determined for different years of the accounts. It is clear that the distribution shown for 1966-83 was actually impossible. The areas of young stands were underestimated; the areas of mature and overmature forests were overestimated; and changes in age structures occurred too frequently to be real. The basic change in total AGS has little relationship to changes in the areas and stocks of mature and overmature coniferous forests (Table 11, Fig. 69). Rather, it is the result of unrealistic changes in the distribution of stand-age groups that occurred mainly between 1983 and 1988.

The example of Magadan Oblast illustrates the influence of the same reason as in Orel Oblast, but in this case an *increase* of the share of young stands and *decrease* of the share of mature and overmature stands are the apparent causes of reduction of the total AGS. However, in fact the change of proportion of the areas is caused by improving of knowledge in forests of the Oblast.

According to the data on changes of site quality classes, forest productivity in the region has decreased. Whether it is a result of fire activity or the changing "ratio of the areas", or is only a consequence of better knowledge of forests, remains unknown.

Is it possible to use the information on forests of Magadan Oblast for 1961-98 to reveal changes in the natural processes developed in the region? It is very doubtful that the information supports such an analysis.

4.5.4. Kamchatka Oblast

Like other regions of the Asian part of Russia, the forests of Kamchatka by the beginning of 1961 were investigated by visual aerial method (Table 2.2). But unlike many other territories, by 1998, all forest fund under management of Russian Forest Service, was investigated by field inventory methods, and 95,6 % of the areas had less than 10 year of the FIP. Thus it is possible to assume that tracking of changes in productivity is possible approximately since 1993.

Reference data (Tables 2A-5A) contains numerous errors in characteristics of the areas and stocks of conifers, deciduous hardwood and softwood stands of the Oblast in the period of 1961-1998. However of most interest are the data on the deciduous hardwood species represented in Kamchatka by only one species - stone birch (*Betula ermanii*), forming monodominant climax stands.

Forests of this species have no special economic significance for the forest industry and practically were not cut (Table 8A). Fires are rather rare because of monsoon climate, absence of spring and

autumn droughts, and short cool summer. The burned and dead forest stands occupy a small area (Table 9A). Local downfall of stone birch sometimes occurs as a result of volcanic eruptions, but the primary cause of death is aging, accompanied by cumulative development of internal decay in the trunk . The main regeneration process is natural seeding, which is aided by colonization of large fallen decayed trunks (*Alexeyev and Shamshin, 1972*). The forest stands have an absolute uneven-aged structure (*Shamshin, 1974*).

According to the data available in reference books (Tables 2A-5A), fragments of which are shown in Table 4.7, at the beginning of 1961 the areas of young, middle-aged and maturing stands of stone birch, taken together, occupied of 0,07% their total area. Other forests of this species (99,93%) are ascribed to mature and overmature stands.

The fallacy of these data is obvious. Half a century ago the forests of Kamchatka were assessed by visual aerial survey. It is well known that visual aerial survey of 1950's is not reliable.

Over the last 50 years more accurate field methods of forest inventory were developed. Each SFFA revealed new data on the stone birch forests and, in particular, about their age structure. Data on the existence of a somewhat greater amount of young, middle-aged and maturing stands have appeared. In the middle of the 1980's there was a change of characteristics of the areas and stock of deciduous hardwood forests (Tables 2A-5A), which entailed reduction and some stabilization of the AGS in the groups of middle-aged and maturing stands (Table 4.7 and Fig. 68).

At the same time, the actual proportions of age groups in the climax stone birch stands remains unknown, which, as a matter of fact, is reflected in statistical handbooks. Such a situation is typical not only for the birch forests and not only for Kamchatka. It is typical for all forested territories of the Asian Russia with climax forests.

There is another important reason to pay attention to the need for a different approach to the estimation of climax forests. An average age value of forests (in years) is often used in reference books and the scientific forest literature. In many cases it is a true value. But for the majority of forests of Siberia and Far East, where the proportion of the climax forest ecosystems is great, the calculation of average age without account of real age of the climax stands can not represent the true average age of forests. This situation creates difficulties in the long-term planning of forestry of Siberian forests.

The problem of the climax forests needs a special discussion. However, first of all, it is expedient to supplement the SFFA regulations with corrected rules of generalization of the forest inventory information on uneven-aged stands.

Returning to the question of the impact of improved knowledge on understanding the forests of Kamchatka, it is to be noted that this influence is significant and only data for the latest several years shows stable values of the AGS for all stand and age groups (Fig. 68).

Main findings of section 4.5:

- Changing data about forests in the main regions of Asian Russia for the period of 1961 to 1998 is primarily caused by improved knowledge of them. Other important factors are fires and activity of the forest industry. To distinguish the influence of global change on the background of the impact of these powerful and, at the same time, incompletely investigated factors, is difficult;
- The difference in level of scrutiny between the European and the Asian parts of the forest fund generates the need for separate accounting and analysis of the corresponding data;
- Getting reliable data for areas and stock of forests in Asian Russia is complicated by lack of information on the climax forests.

4.6. Technical causes

In addition to the many problems already discussed, there are some errors connected with preparation of the SFFA: misprints, data rounding stipulated by regulations, assumptions accepted as actual data, professional mistakes, and purposeful altering of statistical accounting.

The reliability of accounts of growing stock depends also on the Russian Forest Service regulations accepted on the basis of political, economical and social priorities of the country. For example, there have been changes to the rules for assigning mixed forest stands to this or that group of stands (*Goskomles of USSR, 1986b*). Before 1986, mixed forests were assigned to the group of coniferous for-

ests comprising 40% of Scots pine, spruce, fir or 30% of cedar; according to the new regulations the coniferous forests should really constitute not less than one-half of the total stock.

4.6.1. Influence of initial data rounding

The forest stand area in statistical reference books is given in thousand hectares (with one digit after the decimal point), and the stock are given in million cubic meters (with two digits after the decimal point). Fairly often such a rounding does not allow determining an AGS with accuracy of 1 m^3 per ha.

Here is a typical example for regions with small area of forests.

The initial data of the SFFA by leskhoz level permits estimation of the AGS of Orel Oblast with good accuracy. At the same time the data at the regional level are insufficient for determination the AGS according to the age groups due to rounding (the data obtained have a lot of minor and major errors, Table 4.8).

To reveal the occurrence of defects resulting in errors of assessment of AGS in administrative territories, their quantity for one account has been summed. In the reference book for 1998 (*Federal.., 1999*) 29 % of the estimates had errors due to rounding In 13 % of cases the error was between 1 and 9 %, in 11 % of cases the error rate was unacceptable (10 to 100 % and more), and in approximately 5 % of cases the calculation was impossible to do at all.

Due to rounding of initial data, there are errors in assessment of an AGS of 48 Oblasts, Krays and Republic of the Russian Federation, which could have been avoided if a better rounding system were used.

The data on the AGS assessment errors for all 8 accounts from 1961 to 1998 are given in Table 4.9. The number of errors is highest in young stands because of their small stocks.

4.6.2. Influence of inadequate averaging of data

In addition to the influence of data rounding, the values of the AGS being compared can be affected by inadequate averaging of age. This problem has a strong effect in the group of young stands for Oblasts with a small area of forests.

It is impossible to obtain direct evidence of the fact that the influence on the AGS differences in the adjacent SFFA is caused just by the factor of inadequate averaging of data, since similar errors can be caused by errors of updating. However, comparison of the frequency of errors in the group of young stands and in other age groups allows one to assume with a high probability that unsystematic change of the AGS in young stands from one account to another is related only to this cause.

Taking into account that the values of the AGS in young stands are affected by all kinds of technical errors such as rounding, averaging, and updating, this age group is not included in discussion of processes of the dynamics of productivity.

4.6.3. Influence of updating

As was mentioned above, the SFFA of Russia up to 01.01.98 were carried out every 5 years*. Each official account contains new forest management data (renewals of forest inventory and management were carried out every 10-15 years) and updated information, with the latter comprising the basic part of all data.

The updated correction of the areas, the stocks and the age of stands are less reliable than direct mensuration at the time of forest inventory. Moreover, the reporting leskhozes and regional forest departments have an opportunity to present the data in a way that appears advantageous to them.

It is impossible to see errors of updating directly in the absolute data on the areas and stocks. It is also impossible to determine errors in *the area* of tree stands using published reference data. Regarding growing stock, the volume and change of which are linearly related to the size and change of the stocked area, inconsistencies in their parameters can be only detected by comparison with the data of the next account.

Two methods can be suggested to detect errors and mistakes.

One of them involves using the criterion of mean volumes. It consists of determining the mean volumes of forest stands in a forest-forming area (or in a group of species) of the same age (or age group) and comparing them to the mean volumes of analo-

* The account of 1973 was executed after an interval of 7 years as seven-year planning had been introduced in the USSR in that period instead of five-year plans.

gous forest stands of a previous account and assessment of the extent of changes occurred. Disclosure of changes which cannot be explained by natural processes or economical activities or rounding and smoothing errors - is evidence of errors made on updating of registration data.

Most obvious are errors of *increase* of AGS when there are no causes of significant impact to improve forest productivity of a region within 5 years. But also in this case insignificant positive changes are possible due to replenishment of a given age group with maturing tree stands growing on more fertile soils and/or less exhausted by intermediate harvest.

Easier to detect are errors in the group of mature and overmature stands, because their current increment in this period of life is close to zero, and fluctuations of stocks are only possible within narrow limits. Other age groups require knowledge of expected rates of change of growing stock (or AGS) in tree stand ranges. A part of such data is shown in Tables 6 and 7.

More detailed information can be obtained from the tables of the stand growth dynamics and other special literature (*Antonaitis, Zagreyev, 1981; Zagreyev, et al., 1992*).

In principle, it is also possible to determine the errors *of decrease* of growing stock, but for this it is necessary to know absolute values of all factors affecting this process.

As an instance of obviously improbable changes between account periods, consider the data for stands of Chelyabinsk Oblast. Absolute changes of the AGS are shown in Fig. 51. More evident and convenient for comparisons is an examination of relative rates (in percentage) of the annual AGS changes (Table 4.10). Improbable changes are emphasized in the Table with bold type lettering. It is hard to believe that such significant unilateral changes in stand and age group could have happened accidentally.

The second method of error detection is based on the use of existing linkages between the area and stock of forest stands, which allows comparison of their simultaneous changes with the help of relative rates. Simultaneous display of the changes in areas and stocks is much more convenient for the analysis. This can be illustrated by the same example (Table 4.11). Like before, the most evident cases of updated errors are emphasized with bold type lettering.

For example, in the period of 1973 to 1978 the area of middle-aged coniferous tree stands increased by 13,5 % due to replenishment of this group with maturing young trees and the growing stock increased by 52,8 %. Increasing of productivity with such a huge change of stocks of all middle-aged stands within 5 years is highly unlikely.

Also improbable is the situation with results of harvest in coniferous forests for the period of 1973 to 1978. Within these years the area of mature and overmature stands decreased by 18,1 %, whereas the growing stock, on the contrary, increased by 2,5%. This could only take place if harvested stands had growing stock that was several times less than average, which is unlikely given that stands with the highest stocking are usually harvested preferentially. Similar situations in the same years have also been noted in the group of deciduous softwood forests.

How could such systematic mistakes happen? It should be recalled that in the Soviet times one of the important slogans of the Central Committee of the CPSU of the former USSR was the slogan of increasing productivity and rational use of the natural resources. This slogan was required to be fulfilled. Besides, in many cases the directors of leskhozes and heads of regional forest departments had to hide losses of stock, caused by fires and other natural and anthropogenic stresses.

The scale of coverup depended on many factors, including the experience of the officials. Repeated updating of the forest management information caused accumulated errors. Regular forest management helped to eventually resolve the errors, (or to reduce errors), but these were carried out 2 or 3 times less often than 5-year accounts and not at once on all forestry enterprises of region. This situation has prevented a radical improvement of statistical data.

It is likely that actions resulting in accumulation of systematic errors have caused most of the changes previously described as changes of productivity. If so, then also differences in trends of increasing productivity in the stands of different groups of species and age could be the results of cover-up activity.

With the help of graphs we have approximately counted the number of overestimates of a stock (includ-

ing accounting for possible influence of global climate change). In 8 accounts regarding the forests of the European-Urals part of Russia there were found approximately 200 appreciable errors of overstating of stock. Cases of decrease of a stock, as a rule, are justified. It should be emphasized that after collapse of the USSR, in the accounts of 1993 and 1998, the number of gross mistake has become several times less than before.

Main conclusions of Chapter 4:

- Comparison of general (total) AGS is meaningless for the temporal characterization of productivity of tree stands, since their value in each specific case depends on the proportion of areas with different-aged tree stands.
- Separate accounting of the AGS by tree stand and age groups allowed the discovery that stand productivity in most cases has considerably increased.
- One of the major causes of change of AGS in regions of the Asian Russia is the improving of knowledge on forests. Other important factors are fires and economic activities. To distinguish the influence of global change from the background of influence of powerful and, at the same time, poorly investigated factors mentioned above, is only possible by way of a rough approximation. For detailed study of changes of forest productivity in Siberia and Far East it is expedient to develop a project on the ground using the best investigated leskhozes.
- Taking into account that positive changes of AGS have taken place in forests of different ages and in most tree stands of the Russian Federation, i.e. have general character, global change of climate is very likely the principal cause of increasing forest productivity.
- The changes and accuracy of assessment of the AGS are essentially affected by a group of technical errors and mistakes:

a) because of rounding, the published statistical data on the forest areas and stocks do not allow determination of the AGS for all age groups in more than half of regions. To avoid errors, it is necessary to use a computer database on forests of Russia with original data that has not been rounded, or to carry out a research involving larger forest area ranges;

b) the natural variation of stock and mistakes arising due to *rounding* and inadequate *data averaging* do not allow estimation of the AGS of young stands with an admissible accuracy. This prevents the authors from including this age group in further estimates of productivity changes;

c) there are serious updating errors that took place during preparation of the SFFA data in almost every Oblast, Kray and Republic. Thus the data cannot be used for making reliable assessments of tree stand productivity changes during inter-account periods for each of the administrative territory, and compel analysis to be based on larger subdivisions of the forest fund.

- Different quality of knowledge of European and Asian the forest fund requires separate analysis of data.

Table 4.1. **Current change of growing stock in tree stands of different site quality and standard density, percent**

Age, years	Current change of growing stock by site quality classes			Age, years	Current change of growing stock by site quality classes		
	I	III	V		I	III	V
	Scots Pine				*Spruce*		
10	11.0	11.0	11.0	10	9.0	9.0	9.0
20	6.5	6.5	6.5	20	7.0	7.0	7.0
30	4.3	4.3	4.4	30	5.3	5.3	5.3
40	3.1	3.2	3.4	40	4.0	4.1	4.2
50	2.3	2.4	2.6	50	3.1	3.3	3.5
60	1.6	1.7	2.0	60	2.4	2.6	2.8
70	1.2	1.3	1.6	70	1.8	2.1	2.3
80	0.9	0.9	1.2	80	1.4	1.6	2.0
90	0.7	0.8	0.9	90	1.1	1.3	1.6
100	0.5	0.6	0.7	100	0.8	1.0	1.3
110	0.4	0.4	0.6	110	0.6	0.8	1.0
120	0.3	0.4	0.4	120	0.5	0.6	0.8
130	0.3	0.3	0.4	130	0.4	0.5	0.6
140	0.2	0.3	0.4	140	0.3	0.4	0.5
150	0.2	0.2	0.3	150	0.3	0.3	0.4
160	0.1	0.2	0.2	160	0.2	0.3	0.4
	Birch				*Aspen*		
10	13.0	13.0	13.0	10	11.4	11.4	11.4
20	6.2	7.4	8.6	20	5.8	5.9	6.0
30	3.7	4.5	5.2	30	3.7	3.8	4.0
40	2.4	3.1	3.5	40	2.5	2.7	2.8
50	1.7	2.1	2.5	50	1.7	1.9	2.1
60	1.2	1.5	1.8	60	1.2	1.4	1.6
70	0.9	1.1	1.3	70	0.9	1.1	1.1
80	0.7	0.9	1.0	80	0.7	0.8	0.9
90	0.5	0.6	0.8	90	0.4	0.5	0.7
100	0.4	0.5	0.6	100	0.3	0.4	0.5
110	0.3	0.4	0.5	110	0.2	0.3	0.3
120	0.2	0.3	0.4	120	0.1	0.3	0.3

Table 4.2. **Amendments to the current change of growing stock for stands of different density, percent**

Age, years	Relative density of tree stand							
	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3
Scots pine and other tree species, non-tolerant to shade								
30	1.0	1.06	1.09	1.08	1.03	0.95	0.83	0.68
40	1.0	0.99	0.95	0.90	0.83	0.73	0.62	0.50
50	1.0	0.95	0.89	0.82	0.74	0.64	0.54	0.42
60	1.0	0.93	0.85	0.77	0.68	0.58	0.48	0.37
70	1.0	0.92	0.83	0.74	0.65	0.55	0.45	0.34
80	1.0	0.91	0.82	0.73	0.63	0.53	0.43	0.33
90	1.0	0.91	0.81	0.72	0.62	0.52	0.42	0.32
Spruce and other shade tolerant tree species								
40	1.0	0.945	0.880	0.805	0.720	0.625	0.520	0.405
50	1.0	0.941	0.873	0.795	0.709	0.614	0.509	0.395
60	1.0	0.937	0.866	0.786	0.698	0.602	0.502	0.386
70	1.0	0.935	0.862	0.781	0.692	0.597	0.493	0.381
80	1.0	0.933	0.860	0.778	0.689	0.593	0.490	0.378

Table 4.3. **Dynamics of stand areas in age groups of Orel Oblast during period 1961-1998**

Age group	Year of the account															
	1961		1966		1973		1978		1983		1988		1993		1998	
	Area, thousand ha	%	Area, thousand ha	%	Area, thousand ha	%	Area, thousand ha	%	Area, thousand ha	%	Area, thousand ha	%	Area, thousand ha	%	Area, thousand ha	%
Coniferous																
Young	7.9	***58.1***	10.6	***65.8***	10.7	***45.7***	14.7	***66.8***	15.4	***67.2***	10.7	***46.1***	12.4	***51.5***	10.4	***37.1***
Middle-aged	3.3	***24.3***	1.7	***10.6***	5.3	***22.6***	5.9	***26.8***	6.3	***27.5***	8.3	***35.8***	10.9	***45.2***	17.3	***61.8***
Maturing	1.9	***14.0***	2.7	***16.8***	4.7	***20.1***	0.9	***4.1***	0.9	***3.9***	2.8	***12.1***	0.8	***3.3***	0.3	***1.1***
Mature & overmature	0.5	***3.7***	1.1	***6.8***	2.7	***11.5***	0.5	***2.3***	0.3	***1.3***	1.4	***6.0***	0	***0.0***		***0.0***
Total	13.6	***100.0***	16.1	***100.0***	23.4	***100.0***	22	***100.0***	22.9	***100.0***	23.2	***100.0***	24.1	***100.0***	28	***100.0***
Deciduous hardwood																
Young	25.4	***58.8***	26.7	***57.5***	19.3	***37.8***	15.2	***31.9***	16.5	***33.5***	12.9	***27.4***	14.2	***29.5***	10.4	***24.2***
Middle-aged	14.3	***33.1***	12.7	***27.4***	22.6	***44.2***	26.4	***55.3***	27.4	***55.7***	26.6	***56.5***	27.9	***58.0***	31.9	***74.4***
Maturing	1.7	***3.9***	3	***6.5***	3.2	***6.3***	3.5	***7.3***	3.4	***6.9***	3.5	***7.4***	3.1	***6.4***	0.3	***0.7***
Mature & overmature	1.8	***4.2***	4	***8.6***	6	***11.7***	2.6	***5.5***	1.9	***3.9***	4.1	***8.7***	2.9	***6.0***	0.3	***0.7***
Total	43.2	***100.0***	46.4	***100.0***	51.1	***100.0***	47.7	***100.0***	49.2	***100.0***	47.1	***100.0***	48.1	***100.0***	42.9	***100.0***
Deciduous softwood																
Young	24.7	***61.9***	16.3	***46.0***	3.8	***11.2***	5.8	***14.8***	5.2	***14.0***	2.9	***7.6***	2.2	***5.9***	4.5	***8.4***
Middle-aged	7.5	***18.8***	7.4	***20.9***	14.8	***43.5***	19.8	***50.5***	20.2	***54.3***	21.1	***55.2***	19.7	***53.1***	30.8	***57.5***
Maturing	5	***12.5***	5.3	***15.0***	6.7	***19.7***	7.7	***19.6***	7.9	***21.2***	7.1	***18.6***	4.5	***12.1***	11.2	***20.9***
Mature & overmature	2.7	***6.8***	6.4	***18.1***	8.7	***25.6***	5.9	***15.1***	3.9	***10.5***	7.1	***18.6***	10.7	***28.8***	7.1	***13.2***
Total	39.9	***100.0***	35.4	***100.0***	34	***100.0***	39.2	***100.0***	37.2	***100.0***	38.2	***100.0***	37.1	***100.0***	53.6	***100.0***
All tree stan groups																
Young	58	***60***	53.6	***54.7***	33.8	***31.2***	35.7	***32.8***	37.1	***33.9***	26.5	***24.4***	28.8	***26.3***	25.3	***20.3***
Middle-aged	25.1	***26***	21.8	***22.3***	42.7	***39.4***	52.1	***47.8***	53.9	***49.3***	56	***51.6***	58.5	***53.5***	80	***64.3***
Maturing	8.6	***8.9***	11	***11.2***	14.6	***13.5***	12.1	***11.1***	12.2	***11.2***	13.4	***12.4***	8.4	***7.7***	11.8	***9.5***
Mature & overmature	5	***5.2***	11.5	***11.7***	17.4	***16***	9	***8.3***	6.1	***5.6***	12.6	***11.6***	13.6	***12.4***	7.4	***5.9***
Total	96.7	***100***	97.9	***100***	108.5	***100***	108.9	***100***	109.3	***100***	108.5	***100***	109.3	***100***	124.5	***100***

Table 4.4. **Dynamic of area and growing stock in tree stands of Krasnoyarsk Kray in two SFFA periods***

Age group	01.01. 1988				01.01. 1993			
	Area, thousand ha	%	Growing stock, million m^3	AGS, m^3	Area, thousand ha	%	Growing stock, million m^3	AGS, m^3
Coniferous								
Young stands	4122.3	4.4	141.03	34.2	7739.1	9.6	183.99	23.8
Middle-aged	10234.0	10.9	1005.74	98.3	11102.5	13.7	1360.36	122.5
Maturing	7042.7	7.5	1083.50	153.8	7321.9	9.0	1213.58	165.7
Mature & overmature	72552.7	77.2	10051.58	138.5	54766.1	67.7	7417.26	135.4
Total	93951.7	100.0	12281.85	130.7	80929.6	100.0	10175.19	125.7
Deciduous softwood								
Young stands	2436.9	14.1	44.01	18.1	2392.5	15.2	46.77	19.5
Middle-aged	4239.7	24.5	258.52	61.0	3999.5	25.3	275.04	68.8
Maturing	2757.2	15.9	250.34	90.8	1581.1	10.0	183.84	116.3
Mature & overmature	7876.8	45.5	971.32	123.3	7804.9	49.5	1036.47	132.8
Total	17310.6	100.0	1524.19	88.0	15778.0	100.0	1542.12	97.7

*Data for 1988 do not include 117.9 thousand ha of stocked area and 13.5 million m^3 of growing stock of the forests under a long-term lease. Taking these into account, the changes for 1988-1993 would be even greater.

Table 4.5. **Dynamic of tree stand areas of Magadan Oblast in 1961-1998, percent**

Age group	Year of the account							
	1961	1966	1973	1978	1983	1988	1993	1998
Coniferous								
Young stands I class of age	0.1	0.5	1.5	0.9	1.0	10.3	No p. d*	no p. d..
Young stands II class of age	6.8	5.8	4.8	6.8	6.8	12.5	No p. d..	no p. d..
Young stands I+II cl. of age	6.9	6.3	6.3	7.7	7.8	22.8	22.6	22.9
Middle-aged	5.9	9.1	10.5	32.1	32.7	26.0	26.0	25.8
Maturing	7.1	9.3	4.5	5.4	5.5	3.7	3.7	3.7
Mature & overmature	80.1	75.3	78.7	54.7	53.9	47.5	47.7	47.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Deciduous softwood								
Young stands I class of age	0.0	0.0	1.3	0.7	0.7	1.1	no p. d..	no p. d..
Young stands II class of age	0.0	3.0	3.0	5.3	5.2	3.9	no p. d..	no p. d..
Young stands I+II cl. of age	0.0	3.0	4.3	6.0	5.9	5.0	5.1	5.2
Middle-aged	3.5	12.8	18.7	49.5	50.2	41.8	41.9	39.8
Maturing	16.5	15.1	11.7	13.9	14.0	11.6	11.7	11.0
Mature & overmature	80.1	69.0	65.2	30.6	29.9	41.6	41.4	43.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*no p. d. - no published data

Table 4.6. **Dynamics of area and stock of coniferous stands in Magadan Oblast**

Age group	Year of the account								
	1983			1988			1993		
	Area, thousand ha	Stock, million m^3	AGS, m^3	Area, thousand ha	Stock, million m^3	AGS, m^3	Area, thousand ha	Stock, million m^3	AGS, m^3
Young stands I class of age	71.3	0.43	***6.0***	969.6	3.44	***3.5***	no p. d*	no p. d..	no p. d..
Young stands II class of age	491.3	7.39	***15.0***	1175.5	7.19	***6.1***	no p. d..	no p. d..	no p. d..
Young stands I+II cl. of age	562.6	7.82	***13.9***	2145.1	10.63	***5.0***	2113.3	10.66	***5.0***
Middle-aged	2363.5	101.7	***43.0***	2451.7	73.62	***30.0***	2435.7	73.71	***30.3***
Maturing	400.2	23.83	***59.5***	347.5	15.03	***43.3***	346.2	14.97	***43.2***
Mature & overmature	3894	219.38	***56.3***	4477.2	240.38	***53.7***	4460.8	239.12	***53.6***
Total	7220.3	352.73	***48.9***	9421.5	339.66	***36.1***	9356	338.46	***36.2***

*no p. d. - no published data

Table 4.7. **Dynamics of areas and stocks in stands of stone birch in Kamchatka Oblast**

Age group	Area, thousand ha	%	Stock, million m^3	AGS, m^3	Area, thousand ha	%	Stock, million m^3	AGS, m^3
	1961, together with forests under long-term lease				1966, forests under control only of Forest Service			
Young stands I+II cl. of age	1.5	*0.0*	0.01	6.7	1.5	*0.0*	0.2	133.3
Middle-aged	1.2	*0.0*	0.11	91.7	84.2	*2.3*	9.31	110.6
Maturing	1.2	*0.0*	0.14	116.7	142.2	*3.9*	14.62	102.8
Mature & overmature	5598.3	*99.9*	514.36	91.9	3429.8	*93.8*	311.21	90.7
Total	5602.2	*100.0*	514.62	91.9	3657.7	*100.0*	335.34	91.7
Age group	1988, together with forests under long-term lease				1998, together with forests under long-term lease			
Young stands I+II cl. of age	12.8	*0.2*	0.18	14.1	29.8	*0.5*	0.42	14.1
Middle-aged	192.7	*3.4*	11.08	57.5	103	*1.7*	5.38	52.2
Maturing	517.4	*9.1*	37.08	71.7	423.1	*7.2*	27.78	65.7
Mature & overmature	4989.1	*87.3*	435.57	87.3	5348.3	*90.6*	468.3	87.6
Total	5712	*100.0*	483.91	84.7	5904.2	*100.0*	501.88	85.0

Table 4.8. **Errors of determination of the AGS in Orel Oblast due to rounding of the statistical data in reference books**

Tree stand group	Age group	Year of the account							
		1961	1966	1973	1978	1983	1988	1993*	1998*
Coniferous	Young stands I class of age	1**	1	1	1	1	1	-	-
	Young stands II class of age	1	1	1	+	+	+	+	+
	Middle-aged	1	1	1	+	+	+	-	-
	Maturing	1	1	1	1	1	1	1	2***
	Mature & overmature	1	1	1	2	2	1	3	+
Deciduous hardwood	Young stands I class of age	1	1	2	1	1	1	-	-
	Young stands II class of age	1	+	1	1	1	1	+	+
	Middle-aged	+	+	+	+	+	+	+	+
	Maturing	1	1	1	1	1	1	1	2
	Mature & overmature	1	1	1	1	1	1	1	2
Deciduous Softwood	Young stands I class of age	1	2	2	2	2	2	+	+
	Young stands II class of age	1	1	1	1	1	1	2	1
	Middle-aged	1	1	+	+	+	+	+	+
	Maturing	1	1	+	+	+	1	1	+
	Mature & overmature	1	1	+	1	1	+	+	+

*Data on the I and II age classes of young stand in 1993, 1998 are combined and shown in the line of 2nd age class.
Indices used in Table mean:
+ - no errors
1** - error due to rounded initial statistical data can amount to 1 to 9 %.
2*** - error due to rounded initial statistical data can exceed 100 %.

Table 4.9. **Errors of AGS determination, caused by rounded statistical data**

Tree stand group	Category of data	Age group			
		Young stands of I+II classes of age	Middle-aged	Maturing	Mature & overmature
Coniferous	Number of all data	357	357	343	301
	Number of errors	112	98	91	35
	% of errors	31.4	27.5	26.5	11.6
Deciduous hardwood	Number of all data	238	245	245	245
	Number of errors	84	49	91	84
	% of errors	35.3	20.0	37.1	34.3
Deciduous softwood	Number of all data	364	364	364	364
	Number of errors	119	91	98	70
	% of errors	32.7	25.0	26.9	19.2

Table 4.10. **Relative (%) average annual changing of AGS in coniferous and deciduous softwood of Chelyabinsk Oblast between account periods of 1961-1998**

Age group	Years between account periods						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
	Coniferous						
Middle-aged	-0.27	-0.35	**6.84**	-0.22	**4.18**	-0.24	1.36
Maturing	-2.00	-0.47	**5.17**	-0.22	**4.81**	-0.48	0.43
Mature & overmature	-2.52	-1.21	**4.22**	-0.24	**4.80**	0.08	0.83
	Deciduous softwood						
Middle-aged	-0.60	-0.28	**8.63**	-0.07	**7.37**	-0.27	1.88
Maturing	-2.30	-0.12	**6.61**	-0.21	**5.13**	-0.36	0.82
Mature & overmature	-1.29	-1.21	**4.59**	-0.44	**4.11**	0.24	-0.15

Table 4.11. **Relative (%) changes in areas and growing stock in coniferous and deciduous softwood stands of Chelyabinsk Oblast in years between account periods of 1961-1998**

Age group	Parameters	Years between account periods						
		1966-61	1973-66	1978-73	1983-78	1988-83	1993-88	1998-93
		Coniferous						
Middle-aged	Area, %	93.4	2.8	13.5	3.2	11.9	5.6	19.8
	Stock, %	90.8	-0.1	**52.8**	2.1	**35.2**	4.3	27.9
Maturing	Area, %	-5.3	-2.7	3.1	-2.4	8.3	-3.1	-8.8
	Stock, %	-14.8	-5.0	**28.5**	-3.4	**34.3**	-5.4	-6.8
Mature & overmature	Area, %	-15.9	11.1	-18.1	-10.9	3.8	-18.7	-20.8
	Stock, %	-26.5	3.4	**-2.5**	-11.9	**28.7**	-18.3	-17.6
		Deciduous softwood						
Middle-aged	Area, %	41.7	-11.7	23.9	-0.5	19.7	4.1	45.4
	Stock, %	37.5	-12.0	**74.4**	-0.9	**63.8**	2.7	59.1
Maturing	Area, %	-11.9	24.1	12.6	-1.1	-4.3	-1.2	7.1
	Stock, %	-22.0	22.9	**49.9**	-2.1	**20.3**	-3.0	11.5
Mature & overmature	Area, %	-10.8	37.9	-18.2	-11.8	6.5	-13.8	-8.8
	Stock, %	-16.5	20.7	**5.3**	-13.8	**28.4**	-12.7	-9.5

Chapter 5

DYNAMICS OF THE PRODUCTIVITY OF TREE STANDS ACCORDING TO PUBLISHED DATA

5.1. European-Urals part of Russia

For the 37 years under investigation, the characteristics of areas and growing stock volumes in the European-Urals territory of Russia have changed considerably (Table 5.1).

The mature and overmature coniferous stands have been subjected to the largest transformation. The total area was reduced by 14 million ha (25,4%). With removal of 4.1 billion m^3 of timber (*Dynamics..., 1989*), the growing stock of mature forests has decreased by 1.9 billion m^3. During this period, the Russian Forest Service conducted silvicultural operations on not less than 50 million ha of coniferous stands (*Yatskevich et al., 2001, p. 163*). The area of young stands has increased on 13.3 million ha. On the whole, the area of coniferous stands has increased by 6.2 million ha and the growing stock has increased by 0.4 billion m^3.

The age group structure changes are more vivid in relative units (Table 5.2). It follows from the table that, for example, in coniferous stands the area occupied by mature and overmature forests has decreased from 66.4% to 46.1% and the presence of young stands has doubled, from 13.9% to 27.8%.

The dynamics of average growing stock volumes are shown in Fig. 72. The absolute values of the AGS estimated for the whole European territory have no rounding mistakes but contain all remaining errors for each of 8 accounts during the period from 1961 to 1998.

The AGS of coniferous tree stands is rather specific. The largest AGS (210 m^3/ha) is found in maturing stands, and the second-largest in middle-aged stands (165 m^3). Mature and overmature stands have even less than these younger stands (143 m^3). These estimates show that the main part of the most productive forests was eliminated by the former harvests. This situation was created earlier, but in 1961 the difference between the AGS of maturing and mature tree stands was small, and now it has increased more than twice due to the growth of average stock of maturing stands (Fig. 72A).

Statistical data show that in the European-Urals part of Russia, the AGS of mature and overmature coniferous stands for 1998 has remained the same as 37 years ago. This is extremely unlikely since cutting of the best forests will inevitably lead to a decrease of the AGS of remaining mature forests. The transfer of younger stands into a group of mature tree stands, which has taken place for 37 years, could not compensate for the decrease of the areas of old-aged forests and, consequently, could not also offset the loss of the best tree stands. The only possible positive explanation is that the effect has occasionally occurred as a result of the compensating role of global climate change acting in the opposite direction at the same intensity. This assumption requires verification. Another explanation could be connected with suspicion of cover-up activity in time of the SFFA updating. This assumption also requires verification.

The AGS of maturing coniferous forests increased very fast and permanently (Fig. 72A). Only for the accounting period of 1993-98 has their insignificant decrease taken place in association with the spread of the so-called Scandinavian technology of intermediate felling in the northwest of Russia. It is unclear why growth of the maturing AGS has happened much faster than increment of middle-aged stands. Perhaps it is a consequence of updating errors.

The characteristics of areas and stock of deciduous softwood tree stands over the last 37 years have also changed considerably. The area of this group of stands has increased by 7.5 million ha (19.6%) as a result of substitution by coniferous stands after clear-cut harvest. The area of the mature and overmature stands has remained the same but the stock has increased by 37%. The area of the middle-aged forests has risen by 105%, and growth of the stock has achieved 190% (Table 5.1). All age groups of deciduous softwood forests show rapid increases in productivity (Fig. 72B).

The areas of deciduous hardwood have decreased by 0.7 million ha (11.9%), mainly due to a sharp reduction of young stands. The growing stock has

remained approximately at the former level. Mature and overmature deciduous hardwood stands showed a decrease of the AGS before 1973 and then an increase, with significantly large differences in individual years of accounts (Fig. 72C). In the remaining cases, productivity growth was observed in all accounts.

The dynamics of the AGS in the European-Urals part of Russia, expressed in relative units (percent), are shown in Table 5.3. They are calculated for the FFS areas but can be considered representative of the whole stocked territory of the Forest Fund. If the data of Table 5.3 is true, then there is occurring a big increase of forest productivity at the current time. Practically all deciduous softwood stands during 37 years have increased their productivity by 50%; middle-aged deciduous hardwood - by 45%; and even the growth of maturing coniferous stands has increased by 40%. Note that the data of Table 5.3 do not include volumes of wood removed from tree stands as a result of thinning and other intermediate harvest. Accounting for these volumes could increase the estimate of the productivity change for coniferous and deciduous hardwood stands.

The AGS trends reflect the joint impact of forest management, natural and anthropogenic stresses, global change, and updating errors during the preparation of the SFFA. The most important disturbing factor for forests in European-Urals Russia is harvest of forests, that is - the activity of forest management (Table 8A, *Shvidenko et al., 2000, et al.*). The contribution of fires and air pollution, to the extent that it is possible to understand from the direct and indirect official data and literature, is large in absolute figures but rather small in relative units (Table 9A, *Alexeyev, Chmyr, 1997; Isaev, et al., 1995; Federal.., 1999, et al.*). The impact of different stresses, clear-cuts, and intermediate harvest plays a negative role in changing of total and average growing stock. In the opposite direction is large-scale global transformation of climate. Only this factor can produce the appreciable positive influence of extra growth in huge areas of forests. The impact of updating will be estimated later, in chapter 6.

The diversity of the annual regional change in the AGS productivity is shown in Table 5.4. It is obvious that the main part of the middle-aged and the maturing stands has a positive change of the increment. However, the abundance of suspicious statistical data does not give us confidence in accuracy of this information.

Conclusions for section 5.1:

- The dynamics of growing stock in forests of the European-Urals part of Russia from 1961-1998 is caused by the forestry and forest industry activities (mainly by impact of harvesting), by errors in the SFFA data, and by the influence of global climate change.
- The impact of activity of the forest enterprises and global climate change can be assessed only as a result of elimination of errors in statistical data of the SFFA.

5.2. Asian part of Russia

For the period 1961-1998, big changes have taken place in the forest fund of the Asian part of Russia (Tables 2A-5A and Table 5.5). The use of more accurate methods of forest inventory has allowed more thorough delineation of forest and non-forest areas. As a result, the forest areas of the FFS have increased by 24.5 million hectares (Table 3A). The age group structure of the stocked stands appears to be at the present time more natural than before (Table 5.6). The areas of coniferous stands have been subjected to a considerable change. The amount of mature and maturing tree stands has decreased by 79.5 million ha (27.4%), and the areas of young and middle-aged tree stands have risen by 86.6 million ha.

Nevertheless, in this part of the country, there are actually more coniferous young tree stands than their registered number. And vice versa, the number of old-aged coniferous stands is less than indicated in the statistical reference books. The reason is the availability of absolutely uneven aged climax forests. In the SFFA data they are recorded as mature and overmature, whereas in reality they include all age classes.

The areas of deciduous softwood have an inventoried age group distribution that is close to the natural norm.

Deciduous hardwoods have small area of young stands and an excess of mature and overmature stands. Both peculiarities are connected with the availability of climax forests and traditional rules of their inventory and account.

The data of special interest is the data about change of growing stock volumes (Table 5.5).

By 1st January 1998, when the last published SFFA took place, the total and average values of the growing stock of all stands not subjected to clear-cut have risen. The growing stock increased more intensively than the areas. The increment of the growing stock of deciduous softwood, for example, has not only compensated for the area decrease but essentially exceeds the stock in 1961.

A different situation was observed in the harvested mature and overmature coniferous stands. Their stock has declined over 37 years by 13.4 billion m^3, a decrease that has occurred more intensively that the area reduction. Why has the stock reduction happened?

During 37 years, approximately 3.6 billion m^3 of timber was harvested in the Asian part of the country (Table 8A with additional data of *Shvidenko, Nilsson, 1998; Yatskevich et al., 2001*). The loss of the other 9.8 billion m^3 of coniferous timber should be attributed to fires, loss of forests from other reasons, and updating the inventory characteristics of near-tundra and low-productive north-taiga forests which had formerly been studied by means of visual aerial survey.

The area of dead tree stands as a result of industrial pollution, insect outbreaks, windfalls and climatic stresses equals 1.6 million ha in the Asian part of the country (*Russian Forest Fund, 1999*). Here, the loss of stock could reach 0.4-0.5 billion m^3.

The area of fires for 37 years, according to burned area and time of reforestation (*Isaev et al., 1995*), amounted to about 30-35 million ha. This has caused a loss of 6-7 billion m^3 from the stock of live damaged tree stands. The replacement of the visual aerial survey data with more accurate data of remote sensing methods has entailed, according to A.Z. Shvidenko, the reduction of growing stock by 20-25% (*Shvidenko, Nilsson, 1997*). If this is the case, then the change of forest inventory data of 300 million ha should have caused the reduction of growing stock in coniferous stands of approximately 6 billion m^3. The sum of all these losses exceeds the officially declared figure of 2-4 billion m^3.

The data on the dynamics of the AGS show (Fig. 73A) that the reduction of growing stock in mature and overmature coniferous stands occurred gradually and stopped in the early 1990s. The growth of productivity of mature tree stands that occurred during these years has been concealed by the influence of felling, fires, and elaboration of forest inventory characteristics.

The productivity of middle-aged and maturing coniferous stands has increased over 37 years by 13.7% and 4.4%, respectively (Table 5.7). It is difficult to discuss these changes and the causes of them due to the influence of many factors complicated by various errors of accounts.

The data on the dynamics of average growing stock volumes of climax deciduous hardwood tree stands show (Fig. 73C) that the initial data that caused their "jumps" were obviously unreliable, especially from 1966 to 1978. The data on this group of tree stands are not included in Table 5.7.

The data on the change of mature and overmature deciduous softwood stands in 1966-1973 cannot be considered reliable. The old-aged forests could not increase their growing stock volume over 7 years by 16.5%. At the same time, if the errors in the SFFA could be eliminated, this group of tree stands couldhelp to clarify the influence of global climate change. The deciduous softwood forests are studied better (they are concentrated in the industrial territories), and to a lesser extent than coniferous forests, have been subjected to the influence of fire during their growth. In addition, these forests were left to their own fate due to their low economic value and, consequently, suffered less operational activity.

The regional data of the Asian part of Russia shows a rather high increase of the AGS in during 37 years (Table 5.8). Some estimates of changing AGS (for Kamchatka, Magadan Oblasts and others) are of doubtful reliability.

Conclusions of section 5.2:

- The dynamics of forests of the Asian part of Russia in 1961-1998 are caused by the influence of improving of knowledge of forests, harvest of stands, intensive fires, influence of global climate change and updating errors. The impact of global climate change is concealed or considerably changed by the influence of these factors.
- Some statistical data appear to be of doubtful reliability.

Conclusions of Chapter 5:

- The widespread occurrence of explicit errors makes the determination of tree stand productivity change in the European-Urals and Asian parts of Russia

unreliable and does not allow approximation of the tendencies of changes during the 37-year period.

- In order to improve the quality of data, it is necessary to eliminate or considerably reduce the errors in the published statistical data, and to admit that their appearance is not only occasional but have systematic character.

Table 5.1. **Change in area and growing stock of stands in European-Urals part of Russia, 1961-1998**

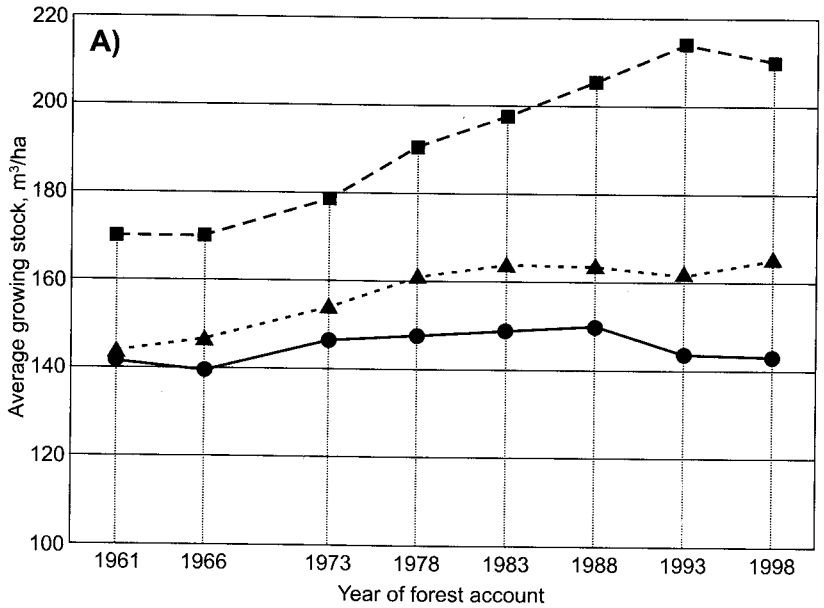
Age group	1961 год		1998 год		Changing for 1961-1998.	
	Area, million ha	Stock, Billion m^3	Area, Million ha	Stock, billion m^3	Area, million ha	Stock, billion m^3
			Coniferous			
Young	11.5	0.44	24.8	1.14	13.3	0.70
Middle-aged	9.3	1.34	16.6	2.74	7.2	1.40
Maturing	7.1	1.20	6.8	1.43	-0.3	0.23
Mature & overmature	55.2	7.81	41.2	5.88	-14.0	-1.93
Total	83.1	10.80	89.4	11.20	6.2	0.40
			Deciduous hardwood			
Young	1.9	0.07	0.8	0.04	-1.1	-0.03
Middle-aged	1.9	0.20	2.6	0.38	0.6	0.18
Maturing	0.7	0.11	0.7	0.12	0.0	0.01
Mature & overmature	1.3	0.24	1.2	0.24	-0.1	0.00
Total	5.9	0.62	5.2	0.77	-0.7	0.15
			Deciduous softwood			
Young	13.8	0.31	9.8	0.26	-4.0	-0.05
Middle-aged	8.5	0.73	17.4	2.12	8.9	1.39
Maturing	3.5	0.44	6.1	1.10	2.6	0.67
Mature & overmature	12.4	1.73	12.4	2.37	0.0	0.64
Total	38.2	3.20	45.7	5.85	7.5	2.65

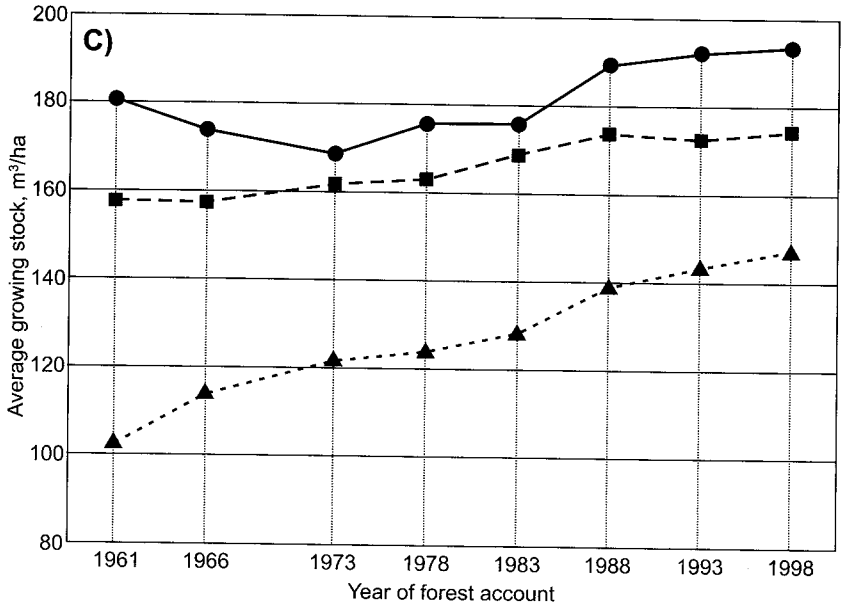
Table 5.2. **Dynamics of the areas of various tree stand groups by groups of age classes, from 1961 to 1998, % of total**

Age group	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
	Coniferous							
Young	13.9	16.9	23.8	26.6	28.8	29.8	27.8	27.8
Middle-aged	11.2	12.2	14.1	15.3	15.6	16.2	17.2	18.5
Maturing	8.5	7.9	6.9	6.7	6.9	7.3	7.5	7.6
Mature & overmature	66.4	63.1	55.2	51.5	48.7	46.8	47.5	46.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Deciduous hardwood							
Young	32.3	28.9	27.8	21.2	20.1	16.7	16.4	14.7
Middle-aged	33.0	36.1	39.4	42.1	44.2	46.9	47.1	48.9
Maturing	12.3	12.7	12.0	12.5	12.6	12.9	13.4	13.1
Mature & overmature	22.4	22.4	20.8	24.3	23.1	23.6	23.2	23.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Deciduous softwood							
Young	36.3	31.8	31.1	29.2	29.0	25.4	23.3	21.4
Middle-aged	22.2	27.7	33.3	35.3	37.1	39.1	39.3	38.0
Maturing	9.2	9.8	9.6	10.4	10.7	11.4	12.6	13.4
Mature & overmature	32.4	30.7	26.0	25.1	23.2	24.1	24.8	27.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 5.3. **Annual dynamics of tree stand productivity in the European-Urals part of Russia for 1961-1998, calculated by published statistical reports, percent**

Age group	Years of the periods between accounts							Average annual for 37 years	Total for 37 years
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993		
	Coniferous								
Middle-aged	0.57	1.10	1.39	0.57	-0.05	-0.35	0.70	0.56	20.7
Maturing	0.00	1.25	2.36	1.42	1.56	1.75	-0.82	1.07	39.6
Mature & overmature	-0.43	1.00	0.21	0.22	0.21	-1.20	-0.15	-0.02	-0.7
	Deciduous hardwood								
Middle-aged	2.33	1.10	0.43	0.83	2.16	0.88	0.75	1.21	44.8
Maturing	-0.04	0.62	0.23	1.20	0.97	-0.23	0.36	0.45	16.7
Mature & overmature	-1.35	-0.76	1.39	0.05	2.70	0.59	0.25	0.41	15.2
	Deciduous softwood								
Middle-aged	0.96	1.01	2.76	1.00	0.91	0.02	0.15	0.97	35.9
Maturing	1.62	1.18	2.59	0.83	2.83	0.81	0.65	1.50	55.5
Mature & overmature	1.67	1.94	1.44	0.80	1.32	0.84	1.51	1.36	50.3





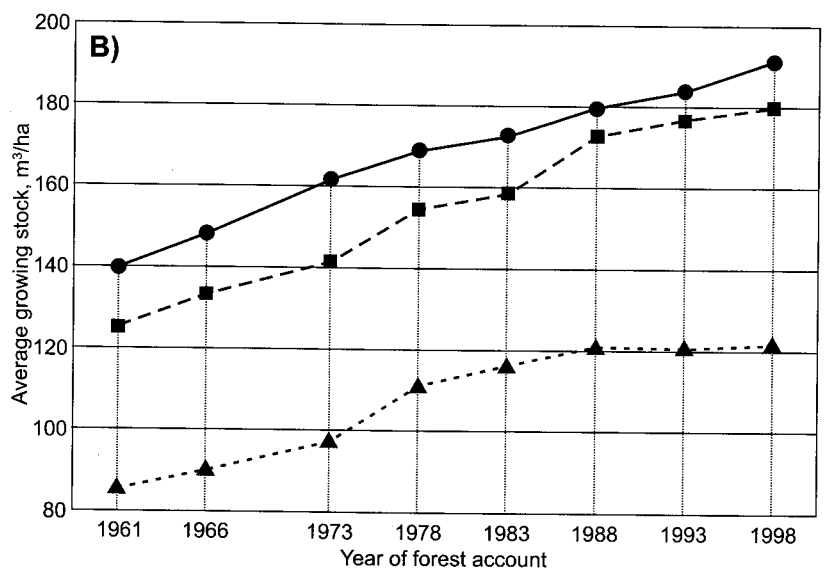


Fig. 72 . Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of European Russia by age groups.

middle-aged — maturing — mature and overmature

Table 5.4. **Average annual dynamics of tree stand productivity in regions of European-Urals Russia for 1961-1998 calculated by published statistical accounts, percent**

Administrative territory	Groups of species and age								
	Coniferous			Deciduous softwood			Deciduous hardwood		
	middle-aged	maturing	mature & overmature	middle-aged	maturing	mature & overmature	middle-aged	maturing	mature & overmature
1. Kaliningrad Oblast	0.42	0.20	-0.12	2.35	2.41	0.90	0.64	0.36	-0.09
2. Arkhangel Oblast	0.18	0.84	0.07	0.88	1.71	0.65	-	-	-
3. Vologda Oblast	0.79	0.59	0.21	1.32	1.47	0.70	-	-	-
4. Murmansk Oblast	0.27	1.03	-0.01	0.47	1.45	1.48	-	-	-
5. Rep. of Karelia	-0.16	0.10	0.09	1.10	1.51	1.56	-	-	-
6. Komi Republic	-0.31	-0.39	-0.42	0.81	0.54	-0.50	-	-	-
7. Leningrad Oblast	0.68	0.60	0.93	1.20	2.14	1.29	-	-	-
8. Novgorod Oblast	0.66	0.75	1.23	1.77	1.44	1.44	-	-	-
9. Pskov Oblast	1.03	1.17	1.02	2.22	2.05	1.48	-	-	-
10. Bryansk Oblast	0.60	0.39	0.20	0.95	0.66	0.42	0.22	0.19	-0.08
11. Vladimir Oblast	0.48	0.40	0.34	0.78	0.54	0.41	1.16	1.67	0.10
12. Ivanovo Oblast	0.56	0.31	0.30	1.17	1.07	0.70	0.68	1.35	0.15
13. Tver Oblast	1.80	0.94	0.56	2.48	2.00	1.11	-	-	-
14. Kaluga Oblast	0.94	0.88	0.76	1.75	1.29	0.77	1.15	1.14	0.67
15. Kostroma Oblast	0.87	0.65	0.58	1.19	1.17	0.34	-	-	-
16. Moscow Oblast	0.55	0.65	0.94	1.32	0.75	0.54	1.22	0.18	0.36
17. Orel Oblast	2.23	0.15	0.00	2.33	1.91	1.39	3.67	1.13	0.65
18. Ryazan Oblast	0.81	0.75	1.03	1.80	1.18	0.81	1.91	1.38	1.31
19. Smolensk Oblast	1.63	1.22	0.41	1.42	0.66	0.93	4.95	0.90	1.00
20. Tula Oblast	0.68	0.60	0.93	2.35	1.80	1.11	0.96	0.22	0.12
21. Yaroslavl Oblast	1.13	1.10	0.91	1.36	1.01	0.63	-	-	-
22. Nizhni Novgorod Oblast	0.81	0.55	0.10	1.58	1.26	0.48	0.84	0.63	0.09
23. Kirov Oblast	0.23	0.21	0.24	1.07	0.93	0.23	0.22	0.84	0.63
24. Rep. of Marii El	0.55	0.74	-0.09	1.27	1.11	0.47	0.27	0.19	0.77
25. Rep. of Mordovia	0.11	0.05	0.07	0.71	1.03	0.83	1.11	0.88	0.29
26. Chuvash Republic	0.42	0.27	0.05	0.78	0.29	0.01	-0.38	-0.71	-1.10
27. Belgorod Oblast	1.00	-2.70	0.00	1.37	1.45	0.54	1.54	0.07	-0.51
28. Voronezh Oblast	0.51	0.43	0.72	1.22	0.79	0.06	0.40	-0.17	-0.61
29. Kursk Oblast	0.62	-0.68	0.00	1.08	0.59	0.72	1.28	0.23	-0.38
30. Lipetsk Oblast	0.46	0.20	0.57	1.81	1.29	1.00	1.74	0.73	0.52
31. Tambov Oblast	1.52	0.61	0.36	1.12	1.25	1.07	1.48	0.20	-0.21
32. Astrakhan Oblast	-	-	0.00	0.26	-0.01	-0.23	0.21	-0.06	-0.81
33. Volgograd Oblast	-0.50	-2.70	0.00	0.23	0.69	0.26	-0.22	-0.54	-0.55
34. Samara Oblast	0.83	0.58	-0.05	1.70	1.59	0.61	2.19	1.52	0.82
35. Penza Oblast	0.64	0.31	0.05	1.01	0.72	0.38	0.67	0.17	0.05
36. Saratov Oblast	1.33	0.33	0.45	1.91	1.20	0.82	1.17	0.69	0.63
37. Ulyanovsk Oblast	1.46	0.90	0.36	1.92	1.14	0.58	1.67	0.63	0.34
39. Rep. of Tatarstan	0.24	0.24	-0.10	1.32	0.58	-0.07	0.65	-0.37	-0.53
40. Krasnodar Kray	-0.69	0.03	-0.06	0.45	0.99	-0.15	0.85	0.33	0.35
41. Stavropol Kray	0.04	0.92	0.42	1.00	1.14	1.62	1.79	0.82	0.46
42. Rostov Oblast	1.54	-2.70	0.00	2.46	1.29	0.35	0.14	-0.45	-0.05
43. Rep. of Daghestan	1.46	0.98	0.63	2.67	1.72	1.07	1.99	1.10	0.63
44. Kabardino-Balkarian Rep.	-0.02	0.90	-0.09	0.34	0.96	2.13	0.14	-0.83	-0.37
45. Rep. of Northern Ossetia	0.05	1.35	0.00	0.71	1.60	0.28	0.43	-0.36	0.04

Table 5.4. Continued

Administrative territory	Groups of species and age								
	Coniferous			deciduous softwood			Deciduous hardwood		
	middle-aged	maturing	mature & overmature	middle-aged	maturing	mature & overmature	middle-aged	maturing	mature & overmature
46. Chechen-Ingush Republic	0.01	0.00	1.04	1.15	1.63	0.81	0.72	0.84	-0.27
47. Kurgan Oblast	0.96	0.77	0.22	2.02	1.50	1.00	-	-	-
48. Orenburg Oblast	0.33	0.12	0.25	1.76	0.73	0.72	1.40	0.78	1.60
49. Perm Oblast	0.26	0.37	0.03	1.57	1.51	0.62	-	-	-
50. Sverdlovsk Oblast	0.98	0.78	-0.13	1.33	0.90	0.32	-	-	-
51. Chelyabinsk Oblast	1.70	0.92	0.65	2.71	1.31	0.67	0.37	-0.01	0.19
52. Rep. of Bashkortostan	0.76	0.63	0.49	1.53	0.84	0.69	0.97	0.94	0.42
53. Udmurtian Republic	1.29	1.19	1.01	1.64	1.12	0.87	1.15	-1.35	0.18

Table 5.5. **Change in areas and growing stock of stands in Asian part of Russia for 37 years (1961-1998)**

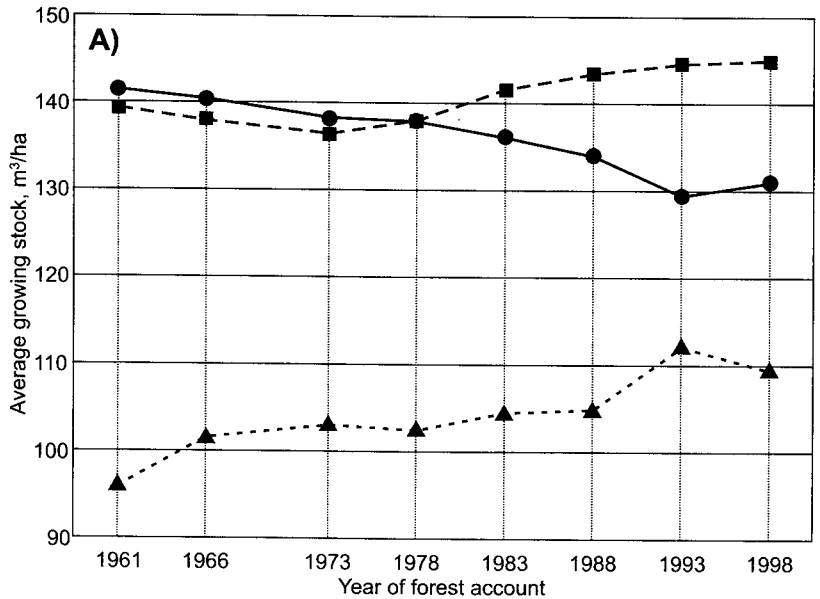
Age group	1961 год		1998 год		Changing for 1961-1998.	
	Area, million ha	Stock, billion m^3	Area, million ha	Stock, billion m^3	Area, million ha	Stock, billion m^3
	Coniferous					
Young	24.2	0.54	65.9	1.78	41.7	1.25
Middle-aged	53.7	5.17	98.7	10.83	44.9	5.66
Maturing	38.4	5.36	44.4	6.43	5.9	1.07
Mature & overmature	289.7	40.99	210.3	27.55	-79.5	-13.44
Total	406.2	52.06	419.3	46.59	13.1	-5.47
	Deciduous hardwood					
Young	0.7	0.02	1.1	0.04	0.4	0.02
Middle-aged	0.9	0.07	1.8	0.16	0.9	0.09
Maturing	0.7	0.06	1.2	0.11	0.5	0.05
Mature & overmature	8.3	0.9	8.1	0.83	-0.2	-0.02
Total	10.6	1.01	12.3	1.14	1.7	0.13
	Deciduous softwood					
Young	9.0	0.15	15.6	0.27	6.6	0.12
Middle-aged	14.6	0.90	21.6	1.57	7.1	0.67
Maturing	8.4	0.76	6.9	0.81	-1.4	0.05
Mature & overmature	32.4	3.65	29.9	4.59	-2.5	0.94
Total	64.3	5.46	74.0	7.24	9.7	1.78

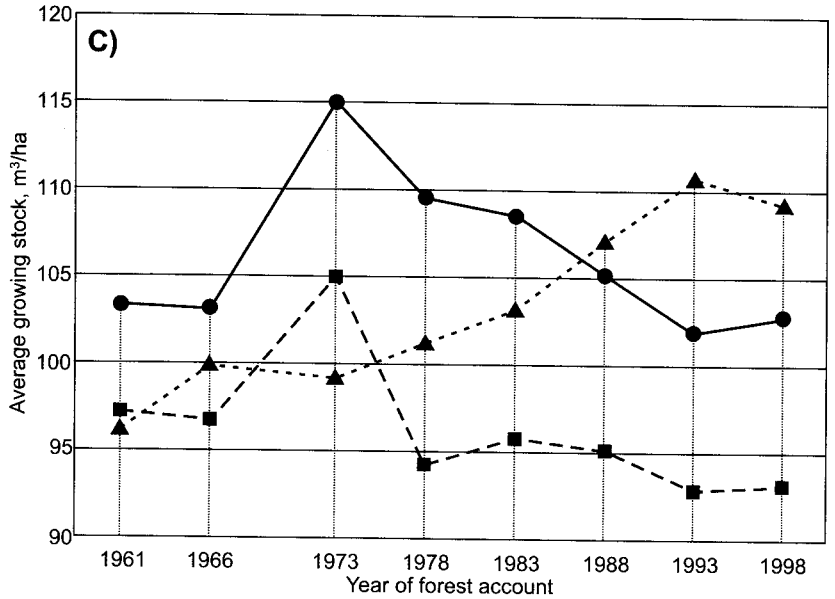
Table 5.6. **Dynamics of the ratio of areas of various tree stand groups by groups of age classes in Asian Russia, percent**

Age group	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
	Coniferous							
Young	6.0	7.0	10.1	12.0	12.7	14.0	15.2	15.7
Middle-aged	13.2	14.2	15.2	15.9	17.5	19.7	23.0	23.5
Maturing	9.5	10.0	9.4	9.0	9.8	10.0	9.9	10.6
Mature & overmature	71.3	68.9	65.3	63.1	60.0	56.3	51.8	50.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Deciduous hardwood							
Young	6.7	9.1	14.0	14.5	14.1	12.8	9.6	9.4
Middle-aged	8.8	11.7	15.7	17.8	18.6	17.2	14.9	14.9
Maturing	6.3	9.0	9.9	11.4	10.7	10.5	9.5	9.8
Mature & overmature	78.2	70.2	60.4	56.3	56.7	59.5	66.0	65.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Deciduous softwood							
Young	14.0	14.5	18.5	20.3	20.0	19.5	20.6	21.0
Middle-aged	22.7	23.7	22.9	24.3	27.1	29.0	29.2	29.2
Maturing	13.0	13.3	12.1	11.7	11.7	11.5	9.5	9.4
Mature & overmature	50.3	48.5	46.4	43.7	41.2	40.0	40.7	40.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 5.7. **Annual dynamics of tree stand productivity in the Asian part of Russia for 1961-1998 calculated by published data of statistical reports, percent**

Age group	Years of the periods between accounts							Average annual for 37 years	Total for 37 years
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993		
	Coniferous								
Middle-aged	1.15	0.23	-0.13	0.37	0.06	1.41	-0.46	0.37	13.7
Maturing	-0.18	-0.18	0.24	0.52	0.27	0.16	0.03	0.12	4.4
Mature & overmature	-0.17	-0.21	-0.04	-0.24	-0.31	-0.69	0.23	-0.20	-7.4
	Deciduous softwood								
Middle-aged	0.14	1.18	0.15	0.94	-0.42	0.69	0.11	0.40	14.8
Maturing	0.20	0.65	0.77	0.98	0.52	1.68	0.13	0.70	25.9
Mature & overmature	1.38	2.39	0.74	0.17	0.56	0.25	0.08	0.80	29.6





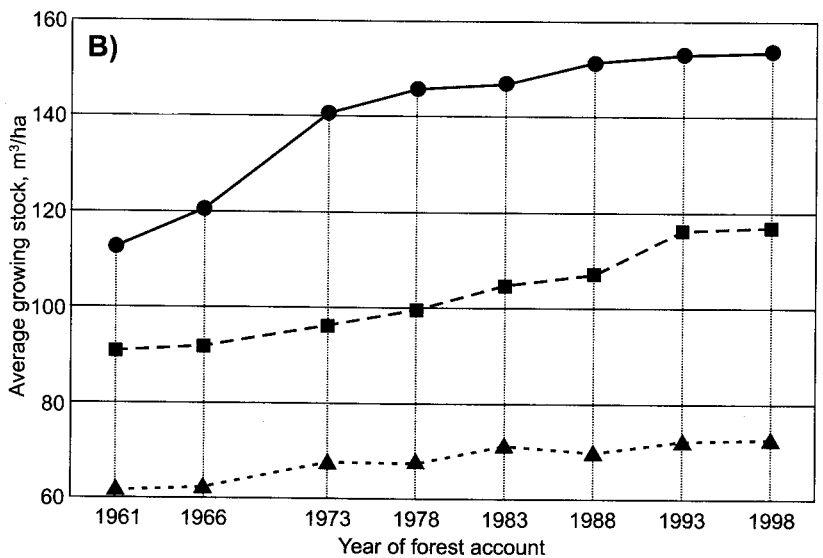


Fig. 73 . Dynamic of average growing stock volume in coniferous (A), deciduous softwood (B) and deciduous hardwood (C) of Asian Russia by age groups.

middle-aged — maturing — mature and overmature

Table 5.8. **Average annual dynamics of tree stand productivity in regions of Asian Russia for 1961-1998 calculated by published statistical accounts, percent**

Administrative territory	Groups of species and age								
	Coniferous			Deciduous softwood			Deciduous hardwood		
	middle-aged	maturing	mature & overmature	middle-aged	maturing	mature & overmature	middle-aged	maturing	mature & overmature
54. Altai Kray	1.25	1.28	-0.02	1.40	0.78	0.56	-	-	-
55. Kemerovo Oblast	0.23	0.56	-0.06	1.11	1.36	0.62	-	-	-
56. Novosibirsk Oblast	1.09	-0.05	-0.10	2.18	1.00	0.40	-	-	-
57. Omsk Oblast	1.43	0.65	-0.51	1.55	1.44	0.60	-	-	-
58. Tomsk Oblast	0.81	0.42	-0.26	0.38	0.70	0.70	-	-	-
59. Tyumen Oblast	0.12	-0.25	-0.35	0.86	1.04	1.75	-	-	-
60. Krasnoyarsk Kray	0.63	0.14	-0.31	0.45	0.61	0.62	-	-	-
61. Irkutsk Oblast	1.16	0.91	0.42	0.36	1.04	1.39	-	-	-
62. Chita Oblast	0.66	0.36	0.16	1.04	1.46	0.66	-	-	-
63. Rep. of Buryatia	0.76	0.17	-0.47	0.59	0.87	0.77	-	-	-
64. Rep. of Tuva	1.19	0.11	0.61	0.68	1.57	1.55	-	-	-
65. Primorie Kray	1.03	0.14	-0.29	1.07	0.39	0.12	0.97	0.13	-0.09
66. Khabarovsk Kray	0.05	-0.53	-0.30	-0.12	0.42	0.29	-0.38	0.05	0.40
67. Amur Oblast	-0.07	-0.33	-0.16	0.66	0.80	0.61	1.31	0.68	-0.56
68. Kamchatka Oblast	-0.78	-2.02	-0.21	-0.58	0.13	1.42	-1.16	-1.18	-0.13
69. Magadan Oblast	-0.82	-1.09	-0.62	2.53	1.39	3.42	-	-	-
70. Sakhalin Oblast	1.42	0.43	-0.40	0.53	1.00	-0.14	0.37	0.11	-0.18
71. Rep. of Yakutia (Sakha)	-0.41	-0.44	-0.37	0.24	1.02	2.55	-	-	-

Chapter 6

DYNAMICS OF THE PRODUCTIVITY OF TREE STANDS IN THE SECOND HALF OF THE XX CENTURY

6.1. Correction of errors

6.1.1. Calculation of relative changes of average growing stock volumes by the "percentage difference" method

As shown in the previous sections, the initial data contain a number of errors and inaccuracies. To understand the reality of changes in productivity, it would be useful to know the size of the simultaneous change in both growing stock and area for each period between accounts. To this end, we have used the fact that the relative changes (in percent) of AGS can be expressed as follows

$$\Delta M_{av}^{\%} = (\Delta M^{\%} - \Delta S^{\%}) \frac{S_{t-1}}{S_t}, \qquad (1)$$

where $\Delta M_{av}^{\%}$ is the mean percentage of change of the AGS of stands for the period between accounts, $\Delta M\%$ is the percentage of change of the growing stock of stands for the period between accounts, $\Delta S\%$ is the percentage of change of the stand area for the period between accounts, S_t is the stand area in the year of SFFA, and S_{t-1} is the stand area in the year of previous SFFA.
The existence of this dependence allows analysis of the conformity between changes of areas and growing stock in every account, and estimation of the size of inter-account area change.

Taking $\frac{S_{t-1}}{S_t} = K$,

we derive $\Delta M_{av}^{\%} = K\ (\Delta M^{\%} - \Delta S^{\%}),$ (2)

which is more convenient for calculations.
The data published on the forest fund account contain inter-account periods of various duration (5 and 7 years), which does not allow concurrent processing and comparison of data. Therefore, statistical processing has been carried out to determine average annual values. For annual estimation the difference between the change of growing stock volume percentage and the change of area percentage can be denoted as $\Delta M_1\% - \Delta S_1\%$. Then

$$\Delta M_{av}^{\%} = K\ (\Delta M^{\%} - \Delta S^{\%}) \qquad (3)$$

The details of the calculation procedure for the stand productivity change by the "percentage difference" method are given in Table 6.1 with an example of the coniferous stands in the Chelyabinsk Oblast. The results fully coincide with the values of changes of AGS given in Table 4.10.

The regional percentage change of areas and growing stock for the inter-account periods of 1961-1998 are given in the Table 11A. They are similar to the data given in Table 4.11 from the search of gross updating errors for Chelyabinsk Oblast in 1961-1998.

Since statistical data given in Table 11A are of interest not only for the solution of problems under this project but also in other cases, they are calculated for all published statistical data by Russian regions, with their breakdown into groups of tree stands and groups of age classes. The data given in Table 11A contain all the SFFA mistakes. Many big mistakes can easily be detected by a review of the table (it is necessary to take into account the concept of standards of the current growth of tree stands).

The data of Table 11A are needed for the calculation of relative changes of AGS according to the "percentage difference" method. The results of calculations for each of the RF regions are given in Table 12A. They enable the reader to perform statistical processing and conduct any numerical experiments with the same data, which used by authors in this study.

Below, a part of the data of Table 12A are shown for the European-Urals and Asian parts of the Russian Federation, processed according to the Statistic software package with the 95% confidence level. In order to discard the occasional errors* with the significance level less than 0,05, the C1' и B1' criteria have been used (*Dixon, 1970; David, 1979; Thompson, 1935; Thompson, 1955*).

The statistics of the annual average changes of tree stand productivity have been determined for three versions:

- For all regions, including regions with rounded data (with occasional errors, without data correction);

* The terms "occasional errors" refers to the intentional (systematic) and unintentional errors made in the statistical data.

- For regions having no rounded data (with and without occasional errors);
- For "basic" regions (with errors and with removal of occasional errors).

6.1.2. European-Urals part of Russia

First version. The main results of statistical treatment according to the first version are given in Table 6.2 (column 1). The processing includes the data by administrative territories without any data rejection. The statistics show that in all cases the distribution of values has a considerable right-sided asymmetry and large excess. The annual AGS value change for 37 years is sometimes noticeably different from the values given in Table 5.3, which were calculated with accounting for representation of the area of each group of stands and age classes, and averaged over 7 inter-account periods.

The differences is explained by the fact that during statistical data processing, all regions are weighted equally irrespective of the area of tree stands, and so a large number of errors made in small regions cause a far stronger effect than the weighted determination of growing stock. The largest differences have been detected in the group of mature coniferous tree stands, which is evidence of the explicit distortion of the data by those responsible for the reporting..

Second version. The second version contains no rounded data causing the incorrect determination of AGS (Table 6.2, column 2). Note that the rounded data have practically no systematic errors; therefore, removal of a large quantity of data (up to 20-30%) has only a weak effect on the change of average annual productivity values. This is evident by comparison of figures given in Table 6.2, columns 1 *A* and 2 *B*.

The deletion of occasional errors* (which amount to 5-14% of all observations) after removing the rounded data reduces the values of average annual productivity growth factors (Table 6.2, column 2 *C*). The statistics of variability have improved but in most cases the asymmetry and non-conformance with the expected normal distribution have remained. Only mature deciduous hardwood tree stands have met the statistical requirements, with average annual productivity growth for 37 years equal to 0.05%. In the second version as in the first version, forest size accounting in the regions is not included.

Third version. In order to avoid distortions caused by statistical identity of RF territories, the "basic" regions have been formed (Table 6.2, column 3). The basic regions include administrative territories having not less than 1.5-2% of the growing stock of the studied group of stands. Under such an approach, the same administrative region can be "basic" for one group of stands (for instance, for coniferous group) and not "basic" for another group of stands (for example, for deciduous hardwood group).The total growing stock of the basic regions amounts to 80-90% of the reported growing stock in the European-Urals territory for each group of species (coniferous, deciduous softwood and deciduous hardwood).

Then, in the basic regions, the differences in growing stock were taken into account. To accomplish this, the growing stock of the tree-stand group in the smallest basic region has been defined as a unit. The number of observations in bigger regions has been increased by the equivalent number of observations that there would be if the region were broken into smaller regions.

After it the statistical data processing was done. The values of average annual productivity changes for 1961-1998 that were obtained after removal of occasional errors are given in Table 6.2, column 3 *C*. The results characterize 80-100% of territory in the basic regions. These results are more "correct" than the values of changes of forest productivity without taking account of the scale factor of forests of each region. However this increased "correctness" does not mean any greater reliability, as the specific weight of an error in a forest-rich region is far more significant than an error of a forest-poor region. Unfortunately, this version has not justified hopes for detection of data having no systematic errors.

6.1.3. Asian part of Russia

The results of statistical processing of data for the Asian part of Russia are given in Table 6.3.

Regions in the vast Siberian and Far East territories have few rounded values of AGS; therefore the values of columns 1 A and 2 B in Table 6.3 are significantly different from the reported values in only two cases.

In the Asian part of Russia the elimination of occasional errors affected 6.5% of the total number of observations and 2.5% of the number of observations in the variant with "basic" regions. The coniferous stand group of this last category includes 5 Oblasts (Tomsk, Tyumen, Irkutsk, Chita and Amur),

3 Krays (Krasnoyarsk, Primorie and Khabarovsk) and 3 Republics (Buryatia, Tuva and Yakutia). The group of deciduous softwood "basic" stands includes Kemerovo, Novosybirsk, Omsk, Tomsk, Tyumen, Irkutsk, and Amur Oblasts, Altai, Krasnoyarsk, Primorie and Khabarovsk Krays. Estimation for deciduous hardwood stands was not done because there was no data on the climax forests.

Unlike the European territory, the data for the Asian part of the country contain far less systematic errors. The deletion of occasional errors only has led to quite suitable results regarding mature and maturing groups of age classes for coniferous and deciduous softwood stands. Their statistics are quite satisfactory and the data need no further corrections. A graphical example of the conformity and nonconformity data with the expected normal distribution is given in Fig. 74 and Fig. 75.

Administrative territories with growing stock stands where the visual aerial survey has been carried out have the least number of systematic errors. In addition, almost all their data do not contain even occasional errors.

6.1.4. Attempts to determine sizes and to eliminate part of systematic errors

The elimination of occasional errors has noticeably reduced the parameters of forest productivity growth as compared with initial values but has not solved the whole problem of systematic errors. The right-sided concentration of data and the availability of corresponding asymmetry in most distributions is evidence of the fact that they have remained.

Statistical methods do not provide for the detection and elimination of systematic errors. Nevertheless, we would like to take some measures to at least understand the size of systematic errors and improve the reliability of figures with determination of the role of global change and forest management as factors causing productivity changes.

Therefore, besides normal statistical data processing, which was mentioned above, a series of numerical experiments has been carried out with the deletion of extreme observations within the range from 1% to 5% with a step of 0.5%. Their goal is to determine the behavior of statistics and the possibility of improvement of their conformity with the expected normal distribution.

The experiments have been carried out basing on the following conditions:

- Only those distributions were corrected which, after deletion of occasional errors, have the right-sided asymmetry exceeding 0.20;
- The distributions with left-sided asymmetry have not been corrected after deletion of occasional errors, as no special reduction of growing stock would have been performed at the generation of SFFA reports;
- The deletion of extreme values was not carried out if the amplitude of minimal and maximal observations has been less than the double standard of the tabular annual change of the current growing stock of stands determined according to V.V. Zagreyev's tables (*Zagreyev et al., 1992*).
- No reduction of the number of observations by more than by 25% has been permitted during the corrections.

Using these criteria, conducted more than 200 experiments and analyzed the results.

As should be expected, in the overwhelming number of cases it has become impossible to delete systematic errors or reduce their size. The situation can be illustrated by Fig. 75. The maximal possible truncation of extreme values has not affected the data conformity with the expected normal distribution.

The deletion of extreme observations has improved the conformance of the distribution in only three cases. In each of these cases the initial distribution of observations with deviations was irregular and allowed us to truncate deviations of the right (positive) side practically without deletion of observations on the negative side.

6.2. Change of the productivity of tree stands in the second half of the 20th century

In previous sections we developed different approaches to estimate the change of productivity of Russian forest stands during the last half of the 20th century. Analyses of available data have revealed numerous errors, which impede the understanding of the real state of affairs.

In this section we use the results of research from chapter 5 (Tables 5.3 and 5.7) and the present chapter (Tables 6.2 and 6.3) for clarifying the situation. With this goal we combined the data of previous tables and compared them.

Table 6.4 contains data without any correction, but the first variant (data of Tables 5.3 and 5.7) has been calculated without statistical processing, and the

second variant (data of Tables 6.2 and 6.3) with statistical processing.

Table 6.5 has been made on the basis of data Tables 6.2 and 6.3, with statistical processing and the deletion of occasional and a part of systematic errors.

Quantitative results of calculations by different variants can be described in the form of two indexes: the index of the global change impact (I_{gci}) and the index of joint impact of all active factors (I_{jf}).

6.2.1. Variants without correction of published data

Due to differences in calculation methods, the I_{jf} for various variants differs in revealing errors (Table 6.4). For example, numerous instances of false reporting for the mature coniferous stands in pure-forests regions of the European Russia have been detected by the statistical processing. At the same time the results of calculations without statistical processing have revealed a very high growth for the same group of age classes of deciduous softwood tree stands.

Both variants show the need for analysis of errors presented in published reference data on the forest fund. They show that it is impossible to achieve the goals of this study without deletion of these errors.

6.2.2. A variant with correction of published data

The deletion of occasional and a part of systematic errors in published data has sharply reduced the estimated values in comparing for the uncorrected variants, thus making the estimates of productivity change far more realistic (Table 6.5, column "estimation"). However a part of these data yet contains systematic errors, enlarging the calculated indices.

Deciduous softwood forests. The increase of productivity has become fully apparent in forests consisting of deciduous softwood stands (with birch, aspen, and alder as dominant species). This group of stands has not been the subject of strong industrial and forest attention until currently, especially in taiga forests. No improvement thinning has been carried out in these forests, nor does fire have a large effect. No big insect outbreaks have been noted during the last 50 years. Significant industrial atmospheric pollution that reduced the productivity of birch stands has mainly been noted in the Murmansk Oblast and does not play any noticeable role in the scope of the European Russia (without industrial part of the Ural regions). Because these factors are collectively insignificant, we can assume that the indexes I_{gci} and I_{jf} coincide with each other in middle-aged and maturing deciduous softwoods forests.

If no updating errors in the growing stock of these forests were present, then global climate change could be considered the only important factor causing the increase of the increment of trees and stand productivity.

We could not eliminate all systematic errors from the data. Large occasional errors have been deleted. Smaller mistakes are present in middle-aged and maturing forests of the European-Urals territory (Table 6.4, the data with errors are shown in parenthesis). Maturing deciduous softwood stands of a main part of the Asian Russia, on the contrary, have no systematic error and are characterized by a good coincidence of the distribution of observations with the curve of expected normal distribution. The I_{gci} of productivity equals 0.58.

After correcting for a possible I_{gci} determination error and taking into account the value in basic regions of Asian deciduous softwood forests, we have estimated I_{gci} to be 0.5% per annum. Without more accurate regional data this coefficient can be considered as representative for all age groups in deciduous softwood forests of Russia.

For the Asian part of Russia the size of I_{jf} for mature and overmature stands is rather close to I_{gci}, whereas in forests of the European-Urals part of the country, as a result of more intensive selective harvest, the value of the I_{jf} equals 0.22% (Table 6.5).

Deciduous hardwood forests. The I_{jf} determination for deciduous hardwood tree stands has been carried out only for forests of the European-Urals part of the Russian Federation. These forests (especially oak stands) have been the objects of intensive harvest during the last 200-300 years. Positive changes in the productivity of maturing and mature groups of age classes are almost indistinguishable due to extraction of a part of the growing stock by selective harvest of valuable trees (Table 6.5). Unfortunately, the published reference data on thinning (Table 8A) contain no information to identify tree species and age classes.

The I_{gci} of the middle-aged forests shown in Table 6.2 is overestimated by systematic errors. Its uncorrected value was equal to 1.21-1.01% per annum (Table 6.2, 6.4). After deletion of occasional errors, it was reduced to 0.76 (Table 6.2, 6.5), but the asymmetry of the distribution still remained (Ta-

ble 6.2). We suppose that the value of this coefficient can be reduced by 1/3. In this case I_{gci} will be equal to value for deciduous softwood stands (0.5%). This solution is an arbitrary approach that may underestimate the impact of global climate change.

Coniferous forests. Almost no large areas with high-productivity coniferous forest stands remain in Russia. As with deciduous hardwood tree stands, coniferous forests were subjected to various kinds of harvest over many years, which has affected the succession processes and the productivity of subsequent generations.

The values of indexes for coniferous stands that have not reached the mature age are lower than values for deciduous stands (Tables 5.3, 5.7, 6.2 and 6.5). The approximate calculations allow estimation of the I_{gci} values for coniferous stands as 0.5% per annum, but error of this estimation may be as much as 30% of the accepted index.

Errors for the middle-aged and maturing age groups of stands were not eliminated completely. We can only note that the real size of the I_{jf} for these stands in the European-Urals territory may be even less than the I_{jf} determined after the deletion of occasional errors (Table 6.2, 6.5).

For maturing forests of Asian part of the country, the deletion of occasional errors has shown a satisfactory quality of statistics (Fig. 74). However, the calculated I_{jf} (0.17% per annum) reflects a rather complex situation, the result of corrected inventory data, fires and influence of intermediate harvesting.

In section 5.1 we criticized data on the dynamics of AGS of mature and overmature forests of the European territory, while noting that absence of a reduction of the AGS is possible only in the presence of a powerful hidden factor that acted opposite to the reduction. With the I_{gci} equaled to 0.5%, the compensating influence of global climate change over 37 years have achieved 18.5% of the total growing stock. Based on indirect data about other groups of age classes and tree stands, one can believe that in reality the growing stock decrease due to factors besides global change is close to this value. However, we have no direct proofs of this.

The situation with mature and overmature coniferous forests in the Asian part of the country is complicated and entangled. At the present time, we have no data to separate the causes of the negative balance of Asian forests (improving knowledge, fires, various kinds of felling and other anthropogenic and natural stresses). It is only clear that the positive influence of climate change cannot fully compensate for the loss of growing stock of mature tree stands, which has occurred for 37 years.

Since the process of the index estimations is connected with many uncertainties and restrictions, we added in Table 6.5 a column titled "accepted", to show corrected values of the global change impact index (I_{gci}). It is easy to see that our corrections generally produced decreasing values of the additional increment.

6.2.3. The size of errors in published reference data for 1961-1998 and their impact on parameters of stand productivity

In order to determine the size of errors, we calculated the difference between the average annual productivity changes obtained according to Table 6.4 and the data obtained after the elimination of main part of errors (Table 6.5, column "accepted"). The errors detected vary within very broad limits, reaching 40% in some cases (Table 6.6).

The SFFA instructions did not envision the detection of errors in the change of AGS values; therefore, no one has analyzed the available data from this point of view. Data massaging happened over decades. By 2000, the accumulated updating errors on the European-Urals territory amounted to tens of percents, overtaking by far those systematic errors underestimating the growing stock, which are inherent to the forest inventory specialists.

In the Asian part of Russia, the share of the intentional errors seems to be smaller than in the European part of the country. However detailed analysis is impossible due to the lack of information.

Conclusion of chapter 6:

- For 37 years the SFFA have accumulated a rather large number of occasional and systematic errors. Though insignificant for each separate account, in total the errors have amounted in the European-Urals part of Russia to 20-40% of the total growing stock at present;
- There are large mistakes in practically every Oblast, Kray and Republic of the Russian Federation. This makes calculation of the dynamics of productivity for regions too indefinite without additional information, and compels the authors to restrict estimation of this characteristic to the whole of the European-Urals and Asian territories;

- The deletion of errors by statistical processing of data has decreased coefficients of productivity change by a factor of nearly two;
- The biggest growth of productivity is observed in middle-aged and maturing stands of deciduous softwood, which are less affected by activity of forestry and forest industry and by different natural and anthropogenic factors. This group of stands has the largest estimated index of global change with the average annual rate equal to 0.5%;
- The I_{gci} value for deciduous hardwood is the same as deciduous softwood, equaling 0.5% per annum. However the global change impact is evident only in the middle-aged forests. The older tree stands are subjected to intensive intermediate felling and without account of removed timber the rate of their productivity change is close to zero;
- We could not eliminate systematic errors from coniferous stands and for this reason have very approximately determined the influence of global change. The annual I_{gci} was estimated to be 0.5% per year partly because we do not see physiological reasons for diminishing the rate of growth.
- The real behavior of coniferous stand productivity is much less than the potential. The worst situations are observed in the mature and overmature stands. These forests are growing faster, as with another tree species, but this rate of growth cannot compensate for the loss of productivity as a in result of decreasing area of the most productive stands from harvest.
- It is important to note that the negative change in productivity of mature and overmature forests in the Asian part of the country is connected with 3 factors (fires, harvest and re-estimating of growing stock by improved inventory), and that the productivity decrease in the European Russia is connected mainly with poor forest management.

Table 6.1. **Average annual change of productivity of tree stands in the Chelyabinsk Oblast determined by the difference of percentages of growing stock and areas in the inter-account periods from 1961 to 1998**

Age group	Parameters*	Changing in periods between the accounts, %						
		1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
Coniferous								
Middle-aged	$\Delta S^{\%}$	93.4	3.5	12.8	3.2	11.9	5.6	19.8
	$\Delta M^{\%}$	90.8	0.9	51.3	2.1	35.2	4.3	27.9
	$\Delta M^{\%} - \Delta S^{\%}$	-2.6	-2.6	38.6	-1.1	23.4	-1.3	8.1
	$\Delta M_1^{\%} - \Delta S_1^{\%}$	-0.52	-0.37	7.71	-0.22	4.68	-0.26	1.63
	K	0.52	0.97	0.89	0.97	0.89	0.95	0.83
	$\Delta M^{\%}_{av} = K^*(\Delta M_1^{\%} - \Delta S_1^{\%})$	**-0.27**	**-0.35**	**6.84**	**-0.22**	**4.18**	**-0.24**	**1.36**
Maturing	$\Delta S^{\%}$	-5.3	1.4	-1.1	-2.4	8.3	-3.1	-8.8
	$\Delta M^{\%}$	-14.8	-1.9	24.4	-3.4	34.3	-5.4	-6.8
	$\Delta M^{\%} - \Delta S^{\%}$	-9.5	-3.3	25.5	-1.1	26.0	-2.3	2.0
	$\Delta M_1^{\%} - \Delta S_1^{\%}$	-1.90	-0.47	5.11	-0.21	5.21	-0.46	0.40
	K	1.06	0.99	1.01	1.02	0.92	1.03	1.10
	$\Delta M^{\%}_{av} = K^*(\Delta M_1^{\%} - \Delta S_1^{\%})$	**-2.00**	**-0.47**	**5.17**	**-0.22**	**4.81**	**-0.48**	**0.43**
Mature & overmature	$\Delta S^{\%}$	-15.9	-5.5	-3.7	-10.9	3.8	-18.7	-20.8
	$\Delta M^{\%}$	-26.5	-13.5	16.6	-11.9	28.7	-18.3	-17.6
	$\Delta M^{\%} - \Delta S^{\%}$	-10.6	-8.0	20.3	-1.1	24.9	0.3	3.3
	$\Delta M_1^{\%} - \Delta S_1^{\%}$	-2.11	-1.14	4.06	-0.22	4.99	0.07	0.65
	K	1.19	1.06	1.04	1.12	0.96	1.23	1.26
	$\Delta M^{\%}_{av} = K^*(\Delta M_1^{\%} - \Delta S_1^{\%})$	**-2.52**	**-1.21**	**4.22**	**-0.24**	**4.80**	**0.08**	**0.83**

* See text for description of the parameters in the table

Table 6.2. **Statistics of change of average annual productivity values for tree stands of the European-Urals part of Russia for 1961-1998 at various calculation methods**
(see explanations in footnotes and in the text)

Age group	Statistics*	1	2		3 («basic regions»)***	
		*A***	*Б***	*B***	*A*	*B*
		Coniferous				
Middle-aged	$\overline{X}$	**0.69**	**0.67**	**0.53**	**0.41**	**0.31**
	m	±0.11	±0.10	±0.07	±0.12	±0.06
	σ	2.08	1.65	1.14	1.71	0.79
	E	10.45	7.90	1.34	19.09	-0.42
	A_s	1.37	0.84	0.27	1.71	0.10
	n	357	259	247	217	206
Maturing	$\overline{X}$	**0.67**	**0.61**	**0.46**	**0.60**	**0.58**
	m	±0.14	±0.10	±0.07	±0.18	±0.08
	σ	2.56	1.64	1.00	1.99	0.83
	E	21.81	10.35	0.43	15.52	0.39
	A_s	2.91	1.30	0.39	1.44	0.91
	n	341	252	235	119	111
Mature and overmature	$\overline{X}$	**0.40**	**0.39**	**0.12**	**0.07**	**0.07**
	m	±0.10	±0.10	±0.06	±0.04	±0.04
	σ	1.71	1.65	1.00	0.70	0.70
	A_s	1.16	1.28	0.52	0.66	0.66
	n	301	266	244	266	266
		Deciduous hardwood				
Middle-aged	$\overline{X}$	**1.01**	**0.95**	**0.76**	**0.85**	**0.85**
	m	±0.14	±0.14	±0.12	±0.10	±0.10
	σ	2.23	1.91	1.64	1.71	1.71
	E	5.98	1.71	1.35	0.83	0.83
	A_s	1.20	0.74	0.23	0.48	0.48
	n	245	196	189	301	301
Maturing	$\overline{X}$	**0.53**	**0.47**	**0.16**	**0.35**	**0.29**
	m	±0.18	±0.24	±0.10	±0.09	±0.06
	σ	2.84	2.96	1.13	1.56	0.96
	E	43.57	58.74	0.57	11.01	1.13
	A_s	4.56	6.15	0.19	1.15	0.67
	n	245	154	136	294	276
Mature and overmature	$\overline{X}$	**0.21**	**0.19**	**0.05**	**0.18**	**0.14**
	m	±0.13	±0.12	±0.09	±0.07	±0.06
	σ	2.09	1.55	1.16	1.27	1.09
	E	8.02	1.37	-0.07	1.75	0.59
	A_s	0.92	0.56	-0.05	0.42	0.18
	n	245	161	150	301	292

Table 6.2. Continued

Age group	Statistics*	1	2		3 («basic regions»)***	
		*A***	*Б***	*B***	*A*	*B*
Deciduous softwood						
Middle-aged	$\overline{X}$	**1.33**	**1.36**	**0.96**	**1.23**	**0.88**
	m	±0.12	±0.12	±0.09	±0.12	±0.08
	σ	2.35	2.04	1.41	1.69	1.16
	E	6.08	2.93	0.69	2.30	-0.43
	A_s	1.49	1.54	0.69	1.45	0.64
	n	364	273	254	203	188
Maturing	$\overline{X}$	**1.05**	**1.14**	**0.63**	**1.17**	**0.75**
	m	±0.13	±0.12	±0.07	±0.12	±0.07
	σ	2.40	1.94	1.01	1.98	1.15
	E	15.56	5.66	0.05	7.60	0.62
	A_s	-0.98	1.52	0.26	2.29	0.41
	n	364	266	229	294	273
Mature and overmature	$\overline{X}$	**0.89**	**0.81**	**0.35**	**0.66**	**0.50**
	m	±0.12	±0.11	±0.06	±0.05	±0.04
	σ	2.22	1.85	0.98	1.26	0.89
	E	11.64	8.32	0.33	13.34	0.84
	A_s	2.74	2.43	0.58	2.70	1.08
	n	364	294	265	539	520

*Statistics: "$\overline{X}$" are the average sample values (average annual values of productivity changes for 37 years), "m" is the standard error, "σ" is the mean square deviation, "E" is the excess, "A_s" is the asymmetry, "n" is the number of observations.

**A - the calculation includes all published data. No rejection of errors has been carried out.

**B - rounded data have been deleted from the calculation.

**C - occasional errors have been deleted from the calculation.

***The group of coniferous stands of the basic regions includes: Archangel, Vologda, Leningrad, Kostroma, Kirov, Perm, Sverdlovsk Oblasts, the Republic of Karelia and the Komi Republic.

The group of deciduous hardwood stands of the basic regions includes : Belgorod, Voronezh, Volgograd, Penza, Saratov, Ulyanovsk Oblasts, Krasnodar and Stavropol Krays, Tatarstan, Northern Ossetia, Bashkortostan, Chechen-Ingush and Chuvash Republics.

The group of deciduous softwood stands of the basic regions includes: Archangel, Vologda, Leningrad, Novgorod, Tver, Kostroma, Moscow, Nizhni Novgorod, Kirov, Perm, Sverdlovsk, Chelyabinsk Oblasts, Republic of Bashkortostan and Komi Republic.

Table 6.3. **Statistics of change of average annual productivity values for tree stands of the Asian part of Russia for 1961-1998 by various calculation methods**
(see explanations in footnotes and in the text)

Age group	Statistics*	1	2		3 («basic regions»)***	
		*A***	*Б***	*B***	*A*	*B*
		Coniferous				
Middle-aged	$\overline{X}$	**0.49**	**0.49**	**0.25**	**0.41**	**0.17**
	m	±0.15	±0.15	±0.10	±0.08	±0.07
	σ	1.70	1.70	1.08	1.52	1.16
	E	2.80	2.80	0.05	1.61	-0.02
	A_s	0.12	0.12	0.29	0.89	-0.11
	n	126	126	113	336	318
Maturing	$\overline{X}$	**-0.01**	**-0.01**	**0.17**	**0.01**	**0.01**
	m	±0.16	±0.16	±0.09	±0.05	±0.05
	σ	1.77	1.77	0.96	0.90	0.90
	E	29.75	29.75	0.22	-0.66	-0.66
	A_s	-3.94	-3.94	-0.14	-0.32	-0.32
	n	126	126	121	336	336
Mature and overmature	$\overline{X}$	**-0.15**	**-0.15**	**-0.06**	**-0.19**	**-0.19**
	m	±0.11	±0.11	±0.07	±0.04	±0.04
	σ	1.20	1.20	0.76	0.70	0.70
	E	10.94	10.94	0.37	0.91	0.91
	A_s	-0.25	-0.25	0.06	-0.78	-0.78
	n	126	126	120	336	336
		Deciduous softwood				
Middle-aged	$\overline{X}$	**0.70**	**0.61**	**0.61**	**0.53**	**0.53**
	m	±0.16	±0.14	±0.14	±0.08	±0.08
	σ	1.80	1.50	1.50	1.53	1.53
	E	11.36	1.34	1.34	-0.38	-0.38
	A_s	1.84	0.03	0.03	0.41	0.41
	n	126	124	124	406	406
Maturing	$\overline{X}$	**0.86**	**0.84**	**0.58**	**0.75**	**0.75**
	m	±0.16	±0.16	±0.11	±0.08	±0.08
	σ	1.82	1.81	1.23	1.69	1.69
	E	11.05	11.46	1.50	1.75	1.75
	A_s	2.20	2.26	-0.18	0.95	0.95
	n	126	125	120	406	406
Mature and overmature	$\overline{X}$	**0.81**	**0.81**	**0.37**	**0.71**	**0.43**
	m	±0.15	±0.15	±0.06	±0.06	±0.03
	σ	1.73	1.73	0.67	1.25	0.65
	E	9.97	9.97	-0.35	7.17	-0.52
	A_s	2.87	2.87	0.37	2.33	0.29
	n	126	126	113	406	374

Table 6.4. **Average annual and total change of productivity of Russian tree stands for 1961-1998, percent**
(The published reference data are used without correction)

Age group	Change productivity of tree stand and age groups, %					
	Deciduous softwood		Deciduous hardwood		Coniferous	
	Annual	For 37 years	Annual	For 37 years	Annual	For 37 years
	European-Urals territory, without statistical processing					
Middle-aged	0.97	35.9	1.21	44.8	0.56	20.7
Maturing	1.50	55.5	0.45	16.7	1.07	39.6
Mature & overmature	1.36	50.3	0.41	15.2	-0.02	-0.7
	European-Urals territory, with statistical processing					
Middle-aged	1.33	49.2	1.01	37.4	0.69	25.5
Maturing	1.05	38.8	0.53	19.6	0.67	24.8
Mature & overmature	0.89	32.9	0.21	7.8	0.40	14.8
	Asian territory, without statistical processing					
Middle-aged	0.40	14.8	No data		0.37	13.7
Maturing	0.70	25.9	No data		0.12	4.4
Mature & overmature	0.80	29.6	No data		-0.20	-7.4
	Asian territory, with statistical processing					
Middle-aged	0.61	22.6	No data		0.49	18.3
Maturing	0.84	31.1	No data		-0.01	-0.4
Mature & overmature	0.81	30.0	No data		-0.15	-5.6

Table 6.5. **Change of annual productivity of Russian tree stands for 1961-1998, percent**
(occasional and systematic errors have been deleted)

Age group	Change of annual productivity by tree stands and age classes group, %					
	Coniferous		Deciduous hardwood		Deciduous softwood	
	Estimation*	Accepted	Estimation	Accepted	Estimation	Accepted
	European-Urals territory					
Middle-aged	(0.53)	0.50	(0.76)	0.50	(0.88)	0.50
Maturing	(0.46)	(0.46)	0.08	0.08	(0.63)	0.50
Mature & overmature	-0.01	-0.01	0.05	0.05	0.22	0.22
	Asian territory					
Middle-aged	0.17	0.17	No data		(0.46)	(0.46)
Maturing	0.17	0.17	No data		0.58	0.50
Mature & overmature	-0.06	-0.06	No data		0.43	0.43

*The values in parenthesis are given in those cases when systematic errors have not been fully eliminated.

Table 6.6. **The size and joint influence of occasional and systematic errors on dynamics of the productivity of Russian tree stands in 1961-1998**

Age group	Combined occasional and systematic errors, %					
	Deciduous softwood		Deciduous hardwood		Coniferous	
	Annual	For 37 years	Annual	For 37 years	Annual	For 37 years
	European-Urals territory, without statistical processing					
Middle-aged	0.47	17.4	0.71	26.3	0.06	2.2
Maturing	1.0	37.0	0.37	13.7	0.57	21.1
Mature & overmature	1.14	42.2	0.36	13.3	-0.01	-0.4
	European-Urals territory, with statistical processing					
Middle-aged	0.83	30.7	0.51	18.9	0.19	7.0
Maturing	0.55	20.4	0.45	16.7	0.21	7.8
Mature & overmature	0.67	24.8	0.16	5.9	0.41	15.2
	Asian territory, without statistical processing					
Middle-aged	-0.06	-2.2	No data		0.20	7.4
Maturing	0.20	7.4	No data		-0.05	-1.9
Mature & overmature	0.37	13.7	No data		-0.14	-5.2
	Asian territory, with statistical processing					
Middle-aged	0.15	5.6	No data		0.32	1.6
Maturing	0.26	9.6	No data		-0.18	-0.9
Mature & overmature	0.38	14.1	No data		-0.09	-0.5

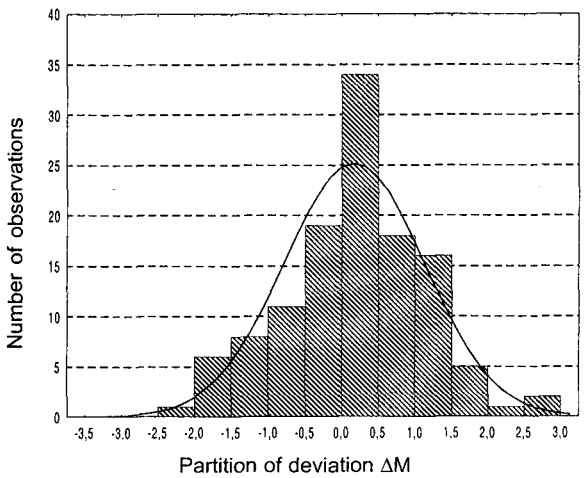
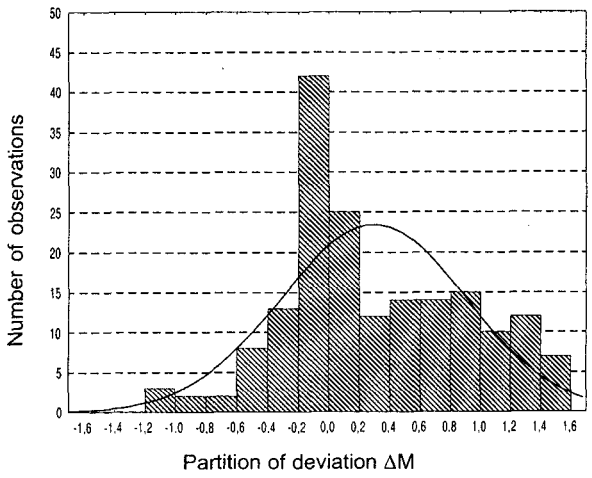


Fig. 74. Diagram of distribution values of the change in average annual productivity of maturing coniferous stands of the Asian part of Russia, 1961-1998



—— expected normal curve

Fig. 75. Diagram of distribution values of the change in average annual productivity of maturing deciduous softwood stands of the European-Urals part of Russia, in 1961-1998

SUMMARY AND CONCLUSIONS

The information presented about dynamics of the productivity of stands was developed on the basis of published statistical data, and was dependent upon its detail and reliability. During the course of the work, we found that the statistical data contain a number of errors. Therefore, prior to drawing conclusions about the issues that are interesting to us, it would be expedient to summarize our concerns about the quality of the statistical data of the forest fund of Russia.

I. Forest Fund of Russia

1. Statistical data for the years of 1961-1998 were published by the forest authorities of the two states: the USSR and the Russian Federation.

The information on the forest resources of the USSR demonstrated the richness of biodiversity of the national renewable resource in the largest forest land area on earth.

After independence, Russia remained the largest forest country of the world. However, the attitude of federal bodies towards the forests has worsened, and the modern statistical information on forest resources of the country reflects this fact.

The forests of Russia belong to the state. Nevertheless, in the published statistical reference books on the forest resources of Russia there is no complete information about the composition, the areas and the growing stock of forests in the country and its Oblasts, Krays and Republics. Only reduced data is available, primarily about the tree stands that are under the Forest Service management, which is not the same as having comprehensive and detailed data about all Russian forests.

Conclusions:

- For the purpose of general use, it would be expedient to publish the information on the areas and stocks of forest resources for the state as a whole, and the subjects of federation, for the basic forest-forming species, including the absolute age of stands, rounded to 10-20 years. With modern computers and database of the Forest Fund, it no longer requires large expenditures of labor to compile and store large and detailed data sets;
- The information about forests acquired during FIP (or forest inventory), at a level of leskhozes and other forest enterprises, should be stored at the SFFA in initial condition, without updating and reductions. Updated information must be formed separately.

2. The administrative territories (the Subjects of Russian Federation) differ significantly in terms of forest area and stock. Many of them are forest-poor. The published reference books on the forest fund of Russia and its regions offer rounded data on the areas in thousands of hectares (with one digit after the decimal point) and about the stocks of stands in millions of cubic meters (with two digits after the decimal point).

The rounding-off, undoubtedly, is required. At the same time, it is necessary to round in such a way that the average growing stocks of stands by age groups (in m3/hectare) could be authentically determined for the forest-pure Oblasts, Krays and Republics of Russia.

This problem concerns 48 Oblasts of the Russian Federation. Among them there are 10 republics (Chechen, Chuvash, Daghestan, Ingush, Kabardino-Balkarian, Kalmykia, Marii El, North Ossetia, Tatarstan, Udmurtia), 35 Oblasts (Astrakhan, Belgorod, Bryansk, Chelyabinsk, Ivanovo, Kaliningrad, Kaluga, Kemerovo, Kirov, Kostroma, Kursk, Leningrad, Lipetsk, Moscow, Nizhni Novgorod, Novgorod, Novosibirsk, Omsk, Orenburg, Orel, Perm, Pskov, Rostov, Samara, Saratov, Sverdlovsk, Smolensk, Tambov, Tver, Tula, Vladimir, Vologda, Volgograd, Voronezh, Yaroslavl) and 3 Krays (Altai, Krasnodar, Stavropol).

We conclude that a simple, and at the same time, radical way of improvement of the data about the amount of areas and stocks of stands in the forest-poor regions of Russia would be to change the rules of rounding-off in the published directories. The number of digits after decimal point needs to be increased by 1 digit.

3. The updating of data for the accounts of the forest fund is necessary and inevitable. However, as it has been shown in this research, the opportunity to correct the forest inventory data by each of 1880 forestry enterprises and 71 (nowadays 89) administrative

territories results in occurrence of errors. Since these errors accumulate over decades, they may reach several tens of percents, considerably exceeding the threshold of allowable error.

Conclusions:

- It is necessary to change the existing tendency to reduce emphasis on field forest inventory, as this is the only way to acquire and restore reliable data;
- It would be expedient to strengthen field and office control of the information quality of collecting and updating of data for "the permanent forest inventory". Some methods for office checks of the reliability of the SFFA data are stated in the text of this book. Spot field checks, according to the revealed errors, would be expediently assigned to the forest inventory enterprises.

4. The authors of the book did not have task of revealing statistical problems and reporting errors in the reference books. These errors were determined during data analysis as a byproduct of the study . It is likely that not all of the errors were found. However, the existence of significant errors highlights serious shortcomings in the statistical information, and casts doubt on reliability of the data about the forest resources of Russia.

Conclusions:

- Changing of the active regulations related to forest inventory and compilation of reference books on the forest fund of the country shall be required;
- It is expedient to prepare and carry out a comprehensive and simultaneous (during a short time span of several years) inventory for the total area of Russian forests using up-to-date methods.

II. Changing of stand productivity

1. The temporal dynamic of stand productivity depends upon many biotic and abiotic factors. The contributing factors and intensity of influence of each of them, as well as their aggregate influence, are different in the various administrative and natural regions of the country. Therefore, conclusions about the significance of influence of one or another factor (or a group of factors) depend upon the area covered by the research. In this study, conclusions were made only for European and Asian macroregions of the country.

In European Russia the dynamics of stand productivity during the years of 1961-1998 was caused by the influence of forest management (mainly by clear-cuts and selective harvests) and of global changes in climate. Additionally, a strong impact was from data manipulation due to cover-up activity. Other reasons, including fires, have less significance for the stands of this part of the country. The influence of upward statistical distortions is comparable to global changes in climate.

The main impact of forest management on productivity is negative. The most negative impact was on the productivity of coniferous and deciduous hardwood stands.

In the Asian part of Russia as a whole, dynamics of stand productivity from 1961-1998 was caused by several factors, among which the main ones were man-caused fires, harvest, global changes of climate, and improving of inventory of data on the areas and stock of Northern forests, extended for decades. Other reasons, including systematic errors in statistical data, were of secondary importance.

2. For revealing the influence of global changes in climate upon the productivity of stands, it was noted that owing to a weak interest of forest industry in deciduous softwood species, this group of species was hardly affected by a pressure of harvest. This has allowed the analysis to ignore the impact of the management factor.

With the help of various approaches, the influence of errors was reduced to minimum. For maturing softwood deciduous species within the Asian macroregion, this factor was excluded by simple eliminating of occasional errors.

The average annual increase of the productivity of deciduous softwood stands due to global change of climate in 1961-1998 was estimated to be 0.50% for the whole of Russia. The possible error of this estimate amounts to ±20%, with a higher probability that the estimate should be higher than 0.50%.

The changing productivity of hardwood deciduous forests in response to global changes is similar to that of softwood stands (0.5%), but in contrast to the latter, they have an opportunity to display an increase of productivity within the European-Urals territory only during the initial period of life when the timber is not yet large enough for economical harvesting. As the stand age, felling of a part of the stock begins, and the improvement of growth from changing atmospheric conditions is difficult to calculate. The revealed increase of productivity of ma-

ture hardwood stands by 2 % during the 40 years does not account for the extracted volume of timber of thinning.

The average annual coefficient of enhancement of the productivity of coniferous stands' has been determined approximately, as it was not possible to completely remove systematic errors. It is assumed to be the same as for deciduous species.

Coniferous forests of the European-Urals part of Russia have been harvested to such an extent that at present the AGS of maturing and even sometimes middle-aged stands surpasses the AGS of mature forests. Compared with younger forests, the productivity of mature forests is not increased, but is reduced. It was not possible to determine the extent that harvests have caused the reduction of average productivity of remaining mature coniferous forests within the European part of Russia because of systematic errors. It is only clear that this reduction is not less than 20%.

The coniferous forests of Siberia and the Far East are subject to strong human-caused and natural stresses, apparent in all the examined age groups. The total negative impact of these factors, and also the elaboration of forest characteristics, exceeds the potential increase in growth from global climate change.

Conclusions:

- The positive influence of global change on stand productivity of Russian forests in the second part of the XX century is an incontrovertible fact;
- The main factors that have reduced the full attainment of potential forest productivity are harvest of stands and anthropogenic fires;
- Published statistic reference information is insufficient for understanding of the regional changes in forest productivity. For future research it is necessary to use the computer database of the SFFA and other additional information.

3. According to the figures of the published reference books, the forests of the European-Urals part of Russia were growing during the year of 1998 by 30-60 % more intensively than during the year of 1961. Elimination of errors has allowed us to reduce the parameters of published rates of growth increase by almost one half. According to the revised data, by the end of the XX century the growth of forests has increased by 20-25 % relative to 40 years ago.

We conclude that the tables showing the rate of growth, and a number of other normative documents, compiled several decades ago and used for today's account of stock, are corresponding less and less to the present-day reality, and require checking and updating.

4. The storage of carbon in stands of the region, or the country as a whole, is estimated based on the growing stock of stands, using some constant coefficients for calculation. It is natural that the trends discovered with respect to dynamics of the growing stock volume, are also true for the dynamics of carbon storage.

For carbon, as well as for timber, it is necessary to distinguish the influence of global changes in climate from other factors that simultaneously affect forests of the region, the country, or the planet as a whole. In many publications these distinctions are not taken into account (*Myneni et al., 1997, 2001; Nemani et al., 2003*). The data shown in this book indicate that this difference is very essential. In Russia, despite an overall increase of growth during the last half-century, the productivity of many categories of stands had a significantly lower increase, and in some categories decreased. About the same magnitude of changes took place with the carbon storage of stands.

The issue of the absolute stocks of carbon available in the forests of Russia requires elaboration. The estimates offered up to the present time were based on the data available from the SFFA of 1988 and partly of 1993. Previous works have not accounted for the presence of systematic errors in the handbooks and SFFA for those years, as well as overestimated data about growing stock, unavoidably having an effect on the results of calculations of the amount of carbon.

Conclusion:

The published information about the stock of carbon in the forests of Russia overestimates its values in about the same proportion as in the published statistical information about the growing stock of forests.

5. This research can only be considered the first stage of a large-scale work directed towards determination of the response of forest ecosystems to the changes of the leading natural and man-caused factors, including global climate change.

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GLOSSARY

Administrative territory: The Russian Federation (Russia) consists of administrative regions or territories (Republics, Krays, and Oblasts) that are "Subjects of Russian Federation" with more or less equal rights.

Age group: There are five age groups defined for forest stands in stocked areas: young, middle-aged, maturing, mature, and overmature. Young stands include tree communities of two age classes: early regeneration and advanced regeneration. Duration of the age class of trees is dependent on tree species: deciduous softwoods is 10 years; deciduous hardwoods and conifers is 20 years (except Siberian pine is 40 years). Middle-aged stands include usially two age classes. Maturing stands have only one age class. The mature and the overmature groups can include several age classes depending on the developmental stability and total age of tree species. For example, *Abies sibirica* lives for 100-200 years while *Pinus sibirica* lives for about 500 years.

Asian Russia: The part of Russia located east of the Ural mountains. The Asian part of Russia includes several geographic regions: Western Siberia, Middle Siberia, East Siberia and Yakutia, and the Far East.

European-Urals Russia. The part of Russia that includes the Ural Mountains and all territory to the West.

Forest Fund: A designation for all lands included in the government register as forest resources. The Forest Fund includes both forest and nonforest lands, encircled by forests.

Forest land: Area with tree stands, shrubs and temporarily unstocked areas (woodlands, burnt areas, cutover areas, glades and wastelands).

Growing stock: Volume of all living tree stems (including bark) in tree stands

Kray: Administrative region (territory); a constituent part (subject) of Russian Federation

Leskhoz: A rayonal governmental enterprise for forestry (for forest management on the territory of the Forest Fund). The American analogue is a National forest.

Nonforest land: Include peatlands, water, roads, cropland, and other areas that are not suitable for forest or are used for other purposes.

Oblast: Administrative region (territory); a constituent part (subject) of Russian Federation.

Rayon: Administrative district; a subdivision (part) of Oblast, Kray or Republic.

Republic: Administrative region (territory); a constituent part (subject) of Russian Federation with relatively more autonomy than others.

Site quality class: Stocked lands are placed into site-quality classes ranging from I (high productivity) to V (low productivity). There are also three gradations within class I: Ia, Ib, and Ic (best quality); and two gradations within class V: Va and Vb (poorest quality).

Species group: Tree species are aggregated into three groups: coniferous (*Abies spp., Picea spp., Pinus sylvestris, P. sibirica., Juniperus spp.*), decidious hardwood (*Quercus spp., Fagus spp., Betula ermanii* et al.), and decidious softwood (*Betula spp., Populus spp., Alnus spp.*).

Stocked land: A category of the Forest Fund that represents areas with tree stands.

Tree stand (or simply stand): Community of trees with a relative basal area not less than 0.3 of the standard density and height of trees in mature age not less than 5 m.

Unstocked land: Areas that temporarily are not covered by forests; includes woodlands, burned and cutover areas, glades, and waste grounds.

APPENDIX

(regional data on forest lands under the Federal Forest Service management)

Table 1A. **Administrative territories (=regions), changed by the Constitution of Russian Federation in 1993**

Administrative territory of the Russian Federation	
Before 1993	1993 and later
Archangel Oblast	Archangel Oblast, Nenets Autonomous Okrug
Krasnodar Kray	Krasnodar Kray, Republik of Adygeya
Stavropol Kray	Stavropol Kray, Karachayevo-Circassian Republic
Chechen-Ingush Republic	Chechen Republic, Republic of Ingushetia
Perm Oblast	Perm Oblast, Komi-Permyak Autonomous Okrug
Altai Kray	Altai Kray, Republic of Altai
Tyumen Oblast	Tyumen Oblast, Khanty-Mansi Autonomous Okrug, Yamalo-Nenets Autonomous Okrug
Krasnoyarsk Kray	Krasnoyarsk Kray, Taimyr (Dolgano-Nenets) Autonomous Okrug, Republic of Khakassia, Evenki Autonomous Okrug
Irkutsk Oblast	Irkutsk Oblast, Ust-Ordyn Buryat Autonomous Okrug
Chita Oblast	Chita Oblast, Aginsk Buryat Autonomous Okrug
Khabarovsk Kray	Khabarovsk Kray, Jewish Autonomous Oblast
Kamchatka Oblast	Kamchatka Oblast, Koryak Autonomous Okrug
Magadan Oblast	Magadan Oblast, Chukotka Autonomous Okrug

Table 2A. **Area of forest lands by land category and year, 1961-1998, thousand ha**

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
1. Kaliningrad Oblast										
Coniferous	82.5	76.7	82.4	88.4	83.8	86.3	81.8	84.2	1.7	2.1
Deciduous hardwood	26.7	37.7	41.5	42.6	44.1	43.7	43.9	44.1	17.4	65.2
Deciduous softwood	68.2	77.7	85.1	84.0	91.7	88.8	99.2	99.7	31.5	46.2
Subtotal	177.4	192.1	209.0	215.0	219.6	218.8	224.9	228.1	50.7	28.6
Bushes	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	-
Stocked land	177.4	192.1	209.0	215.0	219.7	218.9	225.0	228.3	50.9	28.7
Nonstocked land	31.8	33.1	16.9	11.6	8.5	8.9	107.3	6.4	-25.4	-79.9
Total of forest land	209.2	225.2	225.9	226.6	228.2	227.8	332.3	234.7	25.5	12.2
2. Archangel Oblast*										
Coniferous	16619.2	17078.4	17053.1	16384.9	16429.8	16299.2	16748.9	16830.7	211.5	1.3
Deciduous softwood	1912.7	2246.6	2405.9	2570.4	2658.4	2706.5	3102.6	3544.4	1631.7	85.3
Subtotal	18531.9	19325.0	19459.0	18955.3	19088.2	19005.7	19851.5	20375.1	1843.2	9.9
Bushes	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-100.0
Stocked land	18532.1	19325.0	19459.0	18955.3	19088.2	19005.7	19851.5	20375.1	1843.0	9.9
Nonstocked land	1473.0	1434.1	931.1	1007.9	947.2	1007.7	848.8	458.9	-1014.1	-68.8
Total of forest land	20005.1	20759.1	20390.1	19963.2	20035.4	20013.4	20700.3	20834.0	828.9	4.1
3. Vologda Oblast										
Coniferous	4040.5	4139.1	3997.4	3852.2	3891.8	4006.9	3737.9	3939.2	-101.3	-2.5
Deciduous hardwood	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	-
Deciduous softwood	2526.7	2740.4	2683.6	2865.5	2888.1	2912.4	3138.5	3238.8	712.1	28.2
Subtotal	6567.2	6879.5	6681.1	6717.8	6780.0	6919.4	6876.5	7178.1	610.9	9.3
Bushes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Stocked land	6567.2	6879.5	6681.1	6717.8	6780.0	6919.4	6876.5	7178.1	610.9	9.3
Nonstocked land	301.5	179.1	249.8	275.5	238.8	233.7	284.6	184.9	-116.6	-38.7
Total of forest land	6868.7	7058.6	6930.9	6993.3	7018.8	7153.1	7161.1	7363	494.3	7.2
4. Murmansk Oblast										
Coniferous	3259.1	3190.0	3421.7	3463.5	3577.3	3682.3	3670.8	3726.8	467.7	14.4
Deciduous softwood	1087.7	1164.7	1196.9	1230.4	1281.6	1287.4	1303.1	1299.7	212.0	19.5
Subtotal	4346.8	4354.7	4618.6	4693.9	4858.9	4969.7	4973.9	5026.5	679.7	15.6
Bushes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Stocked land	4346.8	4354.7	4618.6	4693.9	4858.9	4969.7	4973.9	5026.5	679.7	15.6
Nonstocked land	879.9	857.5	581.3	521.9	357.2	209.7	218.7	161.8	-718.1	-81.6
Total of forest land	5226.7	5212.2	5199.9	5215.8	5216.1	5179.4	5192.6	5188.3	-38.4	-0.7
5. Republic of Karelia										
Coniferous	7267.2	6933.6	7110.6	7228.9	7719.0	7965.4	8029.7	8247.8	980.6	13.5
Deciduous softwood	848.7	924.2	1080.8	1094.1	1097.3	999.9	953.6	1019.6	170.9	20.1
Subtotal	8115.9	7857.8	8191.4	8323	8816.3	8965.3	8983.3	9267.4	1151.5	14.2
Bushes	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.0	-0.1	-100.0
Stocked land	8116	7857.8	8191.4	8323	8816.3	8965.6	8983.3	9267.4	1151.4	14.2

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Nonstocked land	1373.7	1695.5	1467.1	1264.4	796.2	660.7	673.2	427.3	-946.4	-68.9
Total of forest land	9489.7	9553.3	9658.5	9587.4	9612.5	9626.3	9656.5	9694.7	205.0	2.2
6. Komi Republic										
Coniferous	21791.5	22476.1	19884.2	20404	20511.1	20333.6	23426.4	23699.1	1907.6	8.8
Deciduous softwood	5119.8	5154.9	4160.0	4178.7	4220.0	4241.8	5060.8	5277.7	157.9	3.1
Subtotal	26911.3	27631	24044.2	24582.7	24731.1	24575.4	28487.2	28976.8	2065.5	7.7
Bushes	0.1	20.4	4.6	0.8	0.8	0.5	263.9	252.5	252.4	252400.0
Stocked land	26911.4	27651.4	24048.8	24583.5	24731.9	24575.9	28751.1	29229.3	2317.9	8.6
Nonstocked land	2147.8	1739.2	969.4	798.6	594.8	742.6	897.6	562.7	-1585.1	-73.8
Total of forest land	29059.2	29390.6	25018.2	25382.1	25326.7	25318.5	29648.7	29792	732.8	2.5
7. Leningrad Oblast										
Coniferous	1953.1	2040.5	2136.2	2228.0	2243.9	2329.7	2336.8	2305.3	352.2	18.0
Deciduous hardwood	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.1	50.0
Deciduous softwood	1215.8	1263.7	1282.8	1213.1	1148.2	1088.0	1071.9	1189.8	-26.0	-2.1
Subtotal	3169.1	3304.5	3419.2	3441.4	3392.5	3418	3409	3495.4	326.3	10.3
Bushes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Stocked land	3169.1	3304.5	3419.2	3441.4	3392.5	3418.0	3409.0	3495.4	326.3	10.3
Nonstocked land	193.1	176.0	155.9	147.6	138.0	136.5	145.0	117.3	-75.8	-39.3
Total of forest land	3362.2	3480.5	3575.1	3589.0	3530.5	3554.5	3554.0	3612.7	250.5	7.5
8. Novgorod Oblast										
Coniferous	557.5	618.2	622.0	663.9	689.3	837.3	901.9	939.3	381.8	68.5
Deciduous hardwood	0.7	1.3	1.1	1.1	1.1	1.6	1.8	2.1	1.4	200.0
Deciduous softwood	745.5	866.3	818.0	817.8	793.0	861.2	913.0	1254.8	509.3	68.3
Subtotal	1303.7	1485.8	1441.1	1482.8	1483.4	1700.1	1816.7	2196.2	892.5	68.5
Bushes	0.0	1.6	1.6	2.6	2.7	2.3	2.4	3.2	3.2	-
Stocked land	1303.7	1487.4	1442.7	1485.4	1486.1	1702.4	1819.1	2199.4	895.7	68.7
Nonstocked land	73.8	73.9	77.2	67.9	65.2	72.1	75.8	54.3	-19.5	-26.4
Total of forest land	1377.5	1561.3	1519.9	1553.3	1551.3	1774.5	1894.9	2253.7	876.2	63.6
9. Pskov Oblast										
Coniferous	519.8	535.8	553.5	566.2	582.1	615.3	622.8	607.5	87.7	16.9
Deciduous hardwood	1.2	2.5	2.2	1.7	1.7	1.3	1.3	1.1	-0.1	-8.3
Deciduous softwood	342.1	384.0	389.4	394.3	390.8	387.4	403.6	481.6	139.5	40.8
Subtotal	863.1	922.3	945.1	962.2	974.6	1004.0	1027.7	1090.2	227.1	26.3
Bushes	0.8	0.1	0.2	0.0	0.0	0.0	0.0	0.0	-0.8	-100.0
Stocked land	863.9	922.4	945.3	962.2	974.6	1004.0	1027.7	1090.2	226.3	26.2
Nonstocked land	32.6	41.4	30.2	32.1	34.8	42.4	49.5	27.9	-4.7	-14.4
Total of forest land	896.5	963.8	975.5	994.3	1009.4	1046.4	1077.2	1118.1	221.6	24.7
10. Bryansk Oblast										
Coniferous	312.3	336.0	375.3	365.4	379.0	361.6	364.2	377.5	65.2	20.9
Deciduous hardwood	72.5	72.1	74.1	62.5	61.9	49.0	46.4	46.8	-25.7	-35.4
Deciduous softwood	306.8	310.9	305.3	316.7	307.2	306.2	304.7	304.6	-2.2	-0.7

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Subtotal	691.6	719.0	754.7	744.6	748.1	716.8	715.3	728.9	37.3	5.4
Bushes	0.1	0.0	0.0	0.0	0.0	0.0	0.0	4.5	4.4	4400.0
Stocked land	691.7	719.0	754.7	744.6	748.1	716.8	715.3	733.4	41.7	6.0
Nonstocked land	49.7	51.4	29.9	40.6	35.2	31.2	33.9	26.3	-23.4	-47.1
Total of forest land	741.4	770.4	784.6	785.2	783.3	748.0	749.2	759.7	18.3	2.5
11. Vladimir Oblast										
Coniferous	531.0	574.1	570.0	614.8	600.7	599.3	594.7	594.1	63.1	11.9
Deciduous hardwood	7.1	8.8	8.6	8.6	7.9	7.1	7.2	6.0	-1.1	-15.5
Deciduous softwood	404.6	375.6	341.1	333.9	356.2	335.3	336	368.9	-35.7	-8.8
Subtotal	942.7	958.5	919.7	957.3	964.8	941.7	937.9	969.0	26.3	2.8
Bushes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Stocked land	942.7	958.5	919.7	957.3	964.8	941.7	937.9	969	26.3	2.8
Nonstocked land	57.5	60.2	98.9	63.6	58.8	58.9	65.9	47.4	-10.1	-17.6
Total of forest land	1000.2	1018.7	1018.6	1020.9	1023.6	1000.6	1003.8	1016.4	16.2	1.6
12. Ivanovo Oblast										
Coniferous	333.2	353.7	407.9	419.9	438.1	421.8	434.4	367	33.8	10.1
Deciduous hardwood	2.4	2.7	2.6	2.4	2.5	2.4	2.4	2.4	0.0	0.0
Deciduous softwood	399.3	368.2	357.7	345.4	332.8	339.3	331.1	353.1	-46.2	-11.6
Subtotal	734.9	724.6	768.2	767.7	773.4	763.5	767.9	722.5	-12.4	-1.7
Bushes	0.0	0.0	0.1	0.0	0.1	0.0	0.4	0.0	0.0	-
Stocked land	734.9	724.6	768.3	767.7	773.5	763.5	768.3	722.5	-12.4	-1.7
Nonstocked land	49.0	75.8	49.9	56.4	47.5	58.4	55.0	32.2	-16.8	-34.3
Total of forest land	783.9	800.4	818.2	824.1	821.0	821.9	823.3	754.7	-29.2	-3.7
13. Tver Oblast										
Coniferous	998.0	1033.8	1049.8	1063.5	1098.4	1144.9	1151.9	1111.5	113.5	11.4
Deciduous hardwood	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.0	0.0
Deciduous softwood	968.0	987.8	953.0	959.0	932.0	947.8	930.3	1005.0	37	3.8
Subtotal	1966.3	2021.8	2003.0	2022.8	2030.7	2093.0	2082.5	2116.8	150.5	7.7
Bushes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Stocked land	1966.3	2021.8	2003.0	2022.8	2030.7	2093.0	2082.5	2116.8	150.5	7.7
Nonstocked land	99.4	118.1	102.0	98.8	88.6	98.8	106.3	80.0	-19.4	-19.5
Total of forest land	2065.7	2139.9	2105.0	2121.6	2119.3	2191.8	2188.8	2196.8	131.1	6.3
14. Kaluga Oblast										
Coniferous	138.4	169.4	202.7	223.8	240.0	253.0	263.4	261.3	122.9	88.8
Deciduous hardwood	30.8	36.8	37.5	34.0	33.6	32.0	31.3	24.7	-6.1	-19.8
Deciduous softwood	438.8	480.3	434.3	425.4	410.2	401.8	391.6	391.3	-47.5	-10.8
Subtotal	608.0	686.5	674.5	683.2	683.8	686.8	686.3	677.3	69.3	11.4
Bushes	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	-
Stocked land	608.0	686.5	674.5	683.2	683.8	686.8	686.5	677.4	69.4	11.4
Nonstocked land	63.8	52.2	34.5	34.2	32.5	30.6	30.4	20.8	-43.0	-67.4
Total of forest land	671.8	738.7	709.0	717.4	716.3	717.4	716.9	698.2	26.4	3.9

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
15. Kostroma Oblast										
Coniferous	1508.3	1527.8	1531.8	1530.4	1655.1	1647.1	1700.4	1582.4	74.1	4.9
Deciduous hardwood	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.2	-0.2	-50.0
Deciduous softwood	1539.2	1712.9	1678.2	1674.4	1606.4	1634.1	1579.7	1780.4	241.2	15.7
Subtotal	3047.9	3241.1	3210.4	3205.1	3261.9	3281.5	3280.4	3363.0	315.1	10.3
Bushes	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	-
Stocked land	3047.9	3241.1	3210.4	3205.1	3261.9	3281.6	3280.5	3363.0	315.1	10.3
Nonstocked land	337.1	237.8	273.4	232.2	170.5	149.5	156.6	90.7	-246.4	-73.1
Total of forest land	3385.0	3478.9	3483.8	3437.3	3432.4	3431.1	3437.1	3453.7	68.7	2.0
16. Moscow Oblast										
Coniferous	530.7	546.0	637.4	663.0	753.0	757.8	732.3	746.4	215.7	40.6
Deciduous hardwood	37.6	38.1	41.6	41.2	36.8	36.2	30.9	31.4	-6.2	-16.5
Deciduous softwood	810.8	776.6	724.8	705.1	754.0	721.7	778.4	769.8	-41	-5.1
Subtotal	1379.1	1360.7	1403.8	1409.3	1543.8	1515.7	1541.6	1547.6	168.5	12.2
Bushes	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-100.0
Stocked land	1379.2	1360.8	1403.9	1409.3	1543.8	1515.7	1541.6	1547.6	168.4	12.2
Nonstocked land	76.8	72.7	83.3	75.8	55.7	46.1	28.9	41.7	-35.1	-45.7
Total of forest land	1456.0	1433.5	1487.2	1485.1	1599.5	1561.8	1570.5	1589.3	133.3	9.2
17. Orel Oblast										
Coniferous	13.6	16.1	23.4	22.0	22.9	23.2	24.1	28.0	14.4	105.9
Deciduous hardwood	43.2	46.4	51.1	47.7	49.2	47.1	48.1	42.9	-0.3	-0.7
Deciduous softwood	39.9	35.4	34.0	39.2	37.2	38.2	37.1	53.6	13.7	34.3
Subtotal	96.7	97.9	108.5	108.9	109.3	108.5	109.3	124.5	27.8	28.7
Bushes	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.4	0.4	-
Stocked land	96.7	98.0	108.6	108.9	109.3	108.5	109.3	124.9	28.2	29.2
Nonstocked land	8.9	10.3	5.3	5.7	6.0	6.2	4.9	3.1	-5.8	-65.2
Total of forest land	105.6	108.3	113.9	114.6	115.3	114.7	114.2	128.0	22.4	21.2
18. Ryazan Oblast										
Coniferous	295.8	306.9	316.9	333.3	333.4	341.6	313.8	322.0	26.2	8.9
Deciduous hardwood	88.0	97.8	90.1	90.1	82.1	83.3	75.9	77.1	-10.9	-12.4
Deciduous softwood	340.6	322.6	293.7	307.0	319.3	314.2	328.1	331.0	-9.6	-2.8
Subtotal	724.4	727.3	700.7	730.4	734.8	739.1	717.8	730.1	5.7	0.8
Bushes	1.5	1.5	1.4	1.4	1.3	1.2	1.3	1.2	-0.3	-20.0
Stocked land	725.9	728.8	702.1	731.8	736.1	740.3	719.1	731.3	5.4	0.7
Nonstocked land	47.0	46.0	72.9	39.6	37.5	33.1	30.2	21.1	-25.9	-55.1
Total of forest land	772.9	774.8	775.0	771.4	773.6	773.4	749.3	752.4	-20.5	-2.7
19. Smolensk Oblast										
Coniferous	247.4	284.8	317.7	331.3	354.7	391.0	416.3	348.0	100.6	40.7
Deciduous hardwood	4.2	3.1	2.8	3.5	3.1	3.3	3.3	3.1	-1.1	-26.2
Deciduous softwood	397.4	542.5	541.3	528.1	509.7	476.7	499.8	583.0	185.6	46.7
Subtotal	649.0	830.4	861.8	862.9	867.5	871.0	919.4	934.1	285.1	43.9

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Bushes	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.5	0.5	-
Stocked land	649.0	830.5	861.8	862.9	867.6	871.2	919.7	934.6	285.6	44.0
Nonstocked land	49.4	57.5	45.7	39.4	34.8	34.9	28.6	21.5	-27.9	-56.5
Total of forest land	698.4	888.0	907.5	902.3	902.4	906.1	948.3	956.1	257.7	36.9
20. Tula Oblast										
Coniferous	16.2	16.4	21.7	24.9	24.1	28.3	27.9	31.6	15.4	95.1
Deciduous hardwood	89.7	97.1	109.8	115.1	101.3	104.8	98.5	104.8	15.1	16.8
Deciduous softwood	120.5	114.5	104.5	99.2	116.3	109.2	117.1	124.4	3.9	3.2
Subtotal	226.4	228.0	236.0	239.2	241.7	242.3	243.5	260.8	34.4	15.2
Bushes	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	-
Stocked land	226.4	228.2	236.0	239.5	241.7	242.3	243.5	260.8	34.4	15.2
Nonstocked land	19.0	21.0	17.0	14.3	15.0	14.4	13.0	6.6	-12.4	-65.3
Total of forest land	245.4	249.2	253.0	253.8	256.7	256.7	256.5	267.4	22	9.0
21. Yaroslavl Oblast										
Coniferous	245.7	260.9	281.5	318.0	329.6	350.4	332.1	346.8	101.1	41.1
Deciduous hardwood	3.0	3.2	2.9	2.8	2.3	2.3	1.7	1.7	-1.3	-43.3
Deciduous softwood	527.0	553.7	519.0	502.2	494.8	474.0	518.1	512.0	-15.0	-2.8
Subtotal	775.7	817.8	803.4	823.0	826.7	826.7	851.9	860.5	84.8	10.9
Bushes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Stocked land	775.7	817.8	803.4	823.0	826.7	826.7	851.9	860.5	84.8	10.9
Nonstocked land	56.1	52.6	64.7	46.6	46.3	45.8	30.9	36.8	-19.3	-34.4
Total of forest land	831.8	870.4	868.1	869.6	873.0	872.5	882.8	897.3	65.5	7.9
22. Nizhni Novgorod Oblast										
Coniferous	1302.6	1308.6	1184.0	1236.6	1329.9	1367.8	1397.2	1410.6	108.0	8.3
Deciduous hardwood	83.4	93.9	96.8	92.1	91.0	73.2	73.5	56.7	-26.7	-32.0
Deciduous softwood	1281.0	1273.0	1164.1	1319.4	1333.3	1306.5	1298.7	1371.5	90.5	7.1
Subtotal	2667.0	2675.5	2444.9	2648.1	2754.2	2747.5	2769.4	2838.8	171.8	6.4
Bushes	2.3	2.1	1.7	2	1.6	1.7	1.9	1.8	-0.5	-21.7
Stocked land	2669.3	2677.6	2446.6	2650.1	2755.8	2749.2	2771.3	2840.6	171.3	6.4
Nonstocked land	260.0	250.8	472.7	286.4	152.8	144.0	117.0	95.2	-164.8	-63.4
Total of forest land	2929.3	2928.4	2919.3	2936.5	2908.6	2893.2	2888.3	2935.8	6.5	0.2
23. Kirov Oblast										
Coniferous	3105.1	3123.8	3134.9	3107.7	3074.7	3059.6	2968.7	3172.0	66.9	2.2
Deciduous hardwood	4.0	4.8	5.8	5.6	4.3	4.1	3.8	3.6	-0.4	-10.0
Deciduous softwood	2115.8	2436.3	2403.4	2494.3	2506.8	2466.2	2587.0	2557.0	441.2	20.9
Subtotal	5224.9	5564.9	5544.1	5607.6	5585.8	5529.9	5559.5	5732.6	507.7	9.7
Bushes	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.8	-100.0
Stocked land	5225.7	5565.1	5544.1	5607.6	5585.8	5529.9	5559.5	5732.6	506.9	9.7
Nonstocked land	538.8	212.1	273.2	224.5	249.0	318.7	300.6	224.7	-314.1	-58.3
Total of forest land	5764.5	5777.2	5817.3	5832.1	5834.8	5848.6	5860.1	5957.3	192.8	3.3

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
24. Republic of Marii El										
Coniferous	588.1	592.9	485.4	530.1	567.2	580.5	581.8	554.2	-33.9	-5.8
Deciduous hardwood	16.0	18.5	16.4	15.7	13.6	11.5	11.6	9.6	-6.4	-40.0
Deciduous softwood	434.8	454.9	414.3	474.4	469.6	493.3	475.2	536.9	102.1	23.5
Subtotal	1038.9	1066.3	916.1	1020.2	1050.4	1085.3	1068.6	1100.7	61.8	5.9
Bushes	0.0	0.2	0.2	0.1	0.4	0.1	0.1	0.1	0.1	-
Stocked land	1038.9	1066.5	916.3	1020.3	1050.8	1085.4	1068.7	1100.8	61.9	6.0
Nonstocked land	141.5	134.1	247.7	154.0	100.6	54.1	52.6	31.0	-110.5	-78.1
Total of forest land	1180.4	1200.6	1164.0	1174.3	1151.4	1139.5	1121.3	1131.8	-48.6	-4.1
25. Republic of Mordovia										
Coniferous	123.7	144.1	153.7	151.1	172.7	163.1	171.9	168.4	44.7	36.1
Deciduous hardwood	126.6	120.5	117.1	107.4	107.3	90.7	91.4	75.4	-51.2	-40.4
Deciduous softwood	266.8	246.5	226.4	258.3	252.6	270.4	263.9	296.7	29.9	11.2
Subtotal	517.1	511.1	497.2	516.8	532.6	524.2	527.2	540.5	23.4	4.5
Bushes	0.2	0.6	0.9	0.5	0.4	0.3	0.3	0.0	-0.2	-100.0
Stocked land	517.3	511.7	498.1	517.3	533.0	524.5	527.5	540.5	23.2	4.5
Nonstocked land	38.0	52.5	67.4	47.4	30.8	35.3	31.3	17.5	-20.5	-53.9
Total of forest land	555.3	564.2	565.5	564.7	563.8	559.8	558.8	558.0	2.7	0.5
26. Chuvash Republic										
Coniferous	134.3	135.2	138.9	140.7	150.7	158.2	167.2	170.7	36.4	27.1
Deciduous hardwood	136.4	142.5	149.1	133.9	132.3	122.8	124.9	106.0	-30.4	-22.3
Deciduous softwood	241.9	243.9	214.7	246.9	238.6	242.7	235.0	255.2	13.3	5.5
Subtotal	512.6	521.6	502.7	521.5	521.6	523.7	527.1	531.9	19.3	3.8
Bushes	3.4	3.2	3.0	2.4	1.8	2.0	2.0	2.1	-1.3	-38.2
Stocked land	516.0	524.8	505.7	523.9	523.4	525.7	529.1	534.0	18.0	3.5
Nonstocked land	58.2	53.0	67.2	45.8	43.7	37.7	32.4	21.5	-36.7	-63.1
Total of forest land	574.2	577.8	572.9	569.7	567.1	563.4	561.5	555.5	-18.7	-3.3
27. Belgorod Oblast										
Coniferous	12.1	14.7	18.6	21.8	22.0	22.4	22.6	19.2	7.1	58.7
Deciduous hardwood	166.7	166.9	172.6	172.0	171.6	171.7	171.6	172.1	5.4	3.2
Deciduous softwood	8.1	8.7	8.2	9.2	9.3	11.1	11.1	11.2	3.1	38.3
Subtotal	186.9	190.3	199.4	203.0	202.9	205.2	205.3	202.5	15.6	8.3
Bushes	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.2	0.1	100.0
Stocked land	187.0	190.4	199.6	203.0	202.9	205.3	205.5	202.7	15.7	8.4
Nonstocked land	16.0	18.4	9.2	7.6	8.8	7.3	6.8	4.4	-11.6	-72.5
Total of forest land	203.0	208.8	208.8	210.6	211.7	212.6	212.3	207.1	4.1	2.0
28. Voronezh Oblast										
Coniferous	72.9	86.6	97.9	104.1	102.7	104.3	102.2	103.6	30.7	42.1
Deciduous hardwood	182.3	180.1	178.3	179.2	178.5	178.5	181.0	185.0	2.7	1.5
Deciduous softwood	40.5	38.0	41.0	40.9	43.6	43.8	50.9	52.8	12.3	30.4
Subtotal	295.7	304.7	317.2	324.2	324.8	326.6	334.1	341.4	45.7	15.5

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Bushes	5.8	6.2	6.0	5.9	5.9	5.9	4.4	4.4	-1.4	-24.1
Stocked land	301.5	310.9	323.2	330.1	330.7	332.5	338.5	345.8	44.3	14.7
Nonstocked land	48.1	39.4	33.5	29.4	30.8	29.4	20.3	16.0	-32.1	-66.7
Total of forest land	349.6	350.3	356.7	359.5	361.5	361.9	358.8	361.8	12.2	3.5
29. Kursk Oblast										
Coniferous	8.6	9.4	14.3	19.3	19.8	22.4	22.9	24.2	15.6	181.4
Deciduous hardwood	117.4	118.0	129.6	134.9	136.2	136.8	137.5	138.2	20.8	17.7
Deciduous softwood	27.5	29.0	28.7	30.6	31.8	31.2	34.5	33.8	6.3	22.9
Subtotal	153.5	156.4	172.6	184.8	187.8	190.4	194.9	196.2	42.7	27.8
Bushes	0.8	1.2	0.7	0.8	0.7	0.7	0.8	0.6	-0.2	-25.0
Stocked land	154.3	157.6	173.3	185.6	188.5	191.1	195.7	196.8	42.5	27.5
Nonstocked land	36.5	32.0	13.3	9.0	11.2	10.7	7.6	5.3	-31.2	-85.5
Total of forest land	190.8	189.6	186.6	194.6	199.7	201.8	203.3	202.1	11.3	5.9
30. Lipetsk Oblast										
Coniferous	40.9	47.5	50.4	52.2	56.5	53.7	53.9	54.2	13.3	32.5
Deciduous hardwood	56.4	58.7	61.6	59.9	59.3	58.4	58.6	58.6	2.2	3.9
Deciduous softwood	27.7	25.9	26.0	29.5	28.1	30.0	29.6	30.7	3.0	10.8
Subtotal	125.0	132.1	138.0	141.6	143.9	142.1	142.1	143.5	18.5	14.8
Bushes	0.5	0.2	0.6	0.7	0.8	0.7	0.7	0.7	0.2	40.0
Stocked land	125.5	132.3	138.6	142.3	144.7	142.8	142.8	144.2	18.7	14.9
Nonstocked land	10.6	15.1	8.6	8.8	7.8	9.2	8.7	6.5	-4.1	-38.7
Total of forest land	136.1	147.4	147.2	151.1	152.5	152.0	151.5	150.7	14.6	10.7
31. Tambov Oblast										
Coniferous	110.9	120.1	124.1	128.4	132.8	137.3	136.0	141.9	31.0	28.0
Deciduous hardwood	57.8	58.9	57.1	56.3	54.2	53.9	54.1	53.7	-4.1	-7.1
Deciduous softwood	100.7	99.1	96.1	104.1	102.8	102.5	106.3	102.6	1.9	1.9
Subtotal	269.4	278.1	277.3	288.8	289.8	293.7	296.4	298.2	28.8	10.7
Bushes	1.7	2.0	0.7	0.7	1.5	1.4	1.5	1.5	-0.2	-11.8
Stocked land	271.1	280.1	278.0	289.5	291.3	295.1	297.9	299.7	28.6	10.5
Nonstocked land	32.9	29.6	34.0	25.1	23.7	18.7	16.2	9.2	-23.7	-72.0
Total of forest land	304.0	309.7	312.0	314.6	315.0	313.8	314.1	308.9	4.9	1.6
32. Astrakhan Oblast										
Deciduous hardwood	5.8	8.8	9.9	9.7	10.8	12.1	13.3	14.4	8.6	148.3
Deciduous softwood	54.0	54.8	55.0	51.3	54.3	46.9	48.5	50.1	-3.9	-7.2
Subtotal	59.8	63.6	64.9	61.0	65.1	59.0	61.8	64.5	4.7	7.9
Bushes	16.7	16.1	17.0	15.3	15.9	13.7	14.3	15.0	-1.7	-10.2
Stocked land	76.5	79.7	81.9	76.3	81.0	72.7	76.1	79.5	3.0	3.9
Nonstocked land	41.6	28.7	21.7	30.6	28.7	23.6	21.5	10.5	-31.1	-74.8
Total of forest land	118.1	108.4	103.6	106.9	109.7	96.3	97.6	90.0	-28.1	-23.8
33. Volgograd Oblast										
Coniferous	9.9	12.0	24.5	27.9	33.8	39.7	46.6	56.5	46.6	470.7

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Deciduous hardwood	188.8	196.4	210.0	204.8	205.4	207.0	211.0	234.5	45.7	24.2
Deciduous softwood	47.8	46.3	48.9	55.4	56.1	59.5	60.9	65.5	17.7	37.0
Subtotal	246.5	254.7	283.4	288.1	295.3	306.2	318.5	356.5	110.0	44.6
Bushes	14.5	15.7	13.1	16.2	16.2	21.3	21.6	21.6	7.1	49.0
Stocked land	261.0	270.4	296.5	304.3	311.5	327.5	340.1	378.1	117.1	44.9
Nonstocked land	171.7	107.3	83.2	111.0	105.7	68.9	60.6	50.3	-121.4	-70.7
Total of forest land	432.7	377.7	379.7	415.3	417.2	396.4	400.7	428.4	-4.3	-1.0
34. Samara Oblast										
Coniferous	52.5	65.4	82.2	85.2	87.1	82.3	84.7	78.3	25.8	49.1
Deciduous hardwood	228.9	232.5	227.1	229.2	211.4	193.8	193.1	170.7	-58.2	-25.4
Deciduous softwood	226.2	254.7	238.5	241.4	223.2	247.4	248.3	274.0	47.8	21.1
Subtotal	507.6	552.6	547.8	555.8	521.7	523.5	526.1	523.0	15.4	3.0
Bushes	16.8	9.7	6.7	9.3	7.9	8.0	8.4	3.6	-13.2	-78.6
Stocked land	524.4	562.3	554.5	565.1	529.6	531.5	534.5	526.6	2.2	0.4
Nonstocked land	107.9	73.4	63.5	52.8	37.3	34.6	30.6	22.3	-85.6	-79.3
Total of forest land	632.3	635.7	618.0	617.9	566.9	566.1	565.1	548.9	-83.4	-13.2
35. Penza Oblast										
Coniferous	179.0	198.3	239.5	263.6	246.4	256.7	239.4	248.1	69.1	38.6
Deciduous hardwood	254.2	245.2	221.0	214.8	192.6	186.0	172.0	170.8	-83.4	-32.8
Deciduous softwood	293.9	305.7	320.5	326.0	365.0	346.8	371.5	370.4	76.5	26.0
Subtotal	727.1	749.2	781.0	804.4	804.0	789.5	782.9	789.3	62.2	8.6
Bushes	5.0	2.4	1.9	1.8	1.6	1.6	1.4	1.4	-3.6	-72.0
Stocked land	732.1	751.6	782.9	806.2	805.6	791.1	784.3	790.7	58.6	8.0
Nonstocked land	64.2	58.3	76.9	52.1	49.3	42.5	39.3	27.9	-36.3	-56.5
Total of forest land	796.3	809.9	859.8	858.3	854.9	833.6	823.6	818.6	22.3	2.8
36. Saratov Oblast										
Coniferous	16.5	19.2	25.7	27.8	31.3	39.5	45.2	48.3	31.8	192.7
Deciduous hardwood	285.8	268.7	277.2	278.9	274.4	270.8	271.3	265.1	-20.7	-7.2
Deciduous softwood	79.3	75.9	81.8	84.5	91.6	97.3	97.8	114.1	34.8	43.9
Subtotal	381.6	363.8	384.7	391.2	397.3	407.6	414.3	427.5	45.9	12.0
Bushes	8.7	6.9	6.6	7.5	7.9	9.1	9.2	6.7	-2.0	-23.0
Stocked land	390.3	370.7	391.3	398.7	405.2	416.7	423.5	434.2	43.9	11.2
Nonstocked land	102.8	73.5	57.8	52.0	47.1	38.7	31.3	24.0	-78.8	-76.7
Total of forest land	493.1	444.2	449.1	450.7	452.3	455.4	454.8	458.2	-34.9	-7.1
37. Ulyanovsk Oblast										
Coniferous	238.2	258.8	297.3	317.9	320.2	338.2	343.0	357.6	119.4	50.1
Deciduous hardwood	235.6	216.1	186.3	182.2	145.7	139.0	117.5	104.7	-130.9	-55.6
Deciduous softwood	358.7	359.9	346.8	349.8	377.9	371.7	393.9	411.2	52.5	14.6
Subtotal	832.5	834.8	830.4	849.9	843.8	848.9	854.4	873.5	41.0	4.9
Bushes	4.0	2.5	1.7	1.7	1.5	1.5	1.2	1.2	-2.8	-70.0
Stocked land	836.5	837.3	832.1	851.6	845.3	850.4	855.6	874.7	38.2	4.6
Nonstocked land	78.9	75.0	79.8	58.4	63.7	58.9	52.5	34.4	-44.5	-56.4

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Total of forest land	915.4	912.3	911.9	910.0	909.0	909.3	908.1	909.1	-6.3	-0.7
38. Republic of Kalmykia										
Deciduous hardwood	2.3	6.1	6.6	6.7	8.1	6.4	6.6	6.8	4.5	195.7
Deciduous softwood	0.4	0.9	0.7	0.7	0.7	0.4	0.4	0.8	0.4	100.0
Subtotal	2.7	7.0	7.3	7.4	8.8	6.8	7.0	7.6	4.9	181.5
Bushes	2.1	2.6	3.0	4.1	4.6	5.5	4.8	6.9	4.8	228.6
Stocked land	4.8	9.6	10.3	11.5	13.4	12.3	11.8	14.5	9.7	202.1
Nonstocked land	18.2	16.3	16.9	16.7	15.7	14.9	14.6	18.2	0.0	0.0
Total of forest land	23.0	25.9	27.2	28.2	29.1	27.2	26.4	32.7	9.7	42.2
39. Republic of Tatarstan										
Coniferous	122.4	133.0	188.9	194.1	211.3	214.8	214.6	228.2	105.8	86.4
Deciduous hardwood	277.5	287.6	300	283.2	278.9	216.2	198.7	182.0	-95.5	-34.4
Deciduous softwood	575.9	533.7	505.4	502.5	493.5	552.8	571.0	609.8	33.9	5.9
Subtotal	975.8	954.3	994.3	979.8	983.7	983.8	984.3	1020.0	44.2	4.5
Bushes	8.6	3.5	8.8	7.8	2.0	1.8	2.0	5.5	-3.1	-36.0
Stocked land	984.4	957.8	1003.1	987.6	985.7	985.6	986.3	1025.5	41.1	4.2
Nonstocked land	99.9	108.2	72.3	83.9	79.4	79.9	79.1	52.7	-47.2	-47.2
Total of forest land	1084.3	1066.0	1075.4	1071.5	1065.1	1065.5	1065.4	1078.2	-6.1	-0.6
40. Krasnodar Kray*										
Coniferous	85.2	51.9	63.0	62.0	66.4	87.2	93.1	93.5	8.3	9.7
Deciduous hardwood	1118.9	1115.1	1099.8	1104.5	1097.5	1155.6	1157.9	1170.3	51.4	4.6
Deciduous softwood	70.5	70.3	68.7	70.0	68.7	71.0	72.2	78.5	8.0	11.3
Subtotal	1274.6	1237.3	1129.3	1236.5	1232.6	1313.8	1323.2	1342.3	67.7	5.3
Bushes	49.3	60.3	183.1	80.1	81.7	80.8	82.9	82.6	33.3	67.5
Stocked land	1323.9	1297.6	1312.4	1316.6	1314.3	1394.6	1406.1	1424.9	101.0	7.6
Nonstocked land	50.5	65.7	51.4	49.0	48.3	41.4	30.2	20.2	-30.3	-60.0
Total of forest land	1374.4	1363.3	1363.8	1365.6	1362.6	1436	1436.3	1445.1	70.7	5.1
41. Stavropol Kray*										
Coniferous	82.3	86.9	97.5	100.6	101.9	107.8	108.4	108.7	26.4	32.1
Deciduous hardwood	173.6	186.5	192.1	192.3	193.4	195.7	201.1	200.5	26.9	15.5
Deciduous softwood	124.7	133.3	135.3	133.3	132.3	136.9	136.8	138.9	14.2	11.4
Subtotal	380.6	406.7	424.9	426.2	427.6	440.4	446.3	448.1	67.5	17.7
Bushes	2.0	3.0	3.6	4.9	4.7	6.7	7.1	8.8	6.8	340.0
Stocked land	382.6	409.7	428.5	431.1	432.3	447.1	453.4	456.9	74.3	19.4
Nonstocked land	46.1	46.9	29.8	19.6	20.7	15.9	13.6	8.6	-37.5	-81.3
Total of forest land	428.7	456.6	458.3	450.7	453.0	463.0	467.0	465.5	36.8	8.6
42. Rostov Oblast										
Coniferous	10.4	17.7	43.5	51.9	60.0	64.6	69.5	68.8	58.4	561.5
Deciduous hardwood	66.4	83.8	101.2	102.3	98.8	99.9	114.2	111.8	45.4	68.4
Deciduous softwood	17.3	16.9	22.5	23.0	21.9	21.9	20.6	20.0	2.7	15.6
Subtotal	94.1	118.4	167.2	177.2	180.7	186.4	204.3	200.6	106.5	113.2

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Bushes	11.6	14.1	14.5	13.8	20.0	20.0	11.1	10.9	-0.7	-6.0
Stocked land	105.7	132.5	181.7	191.0	200.7	206.4	215.4	211.5	105.8	100.1
Nonstocked land	140.6	137.0	54.3	43.7	38.7	34.6	25.9	23.4	-117.2	-83.4
Total of forest land	246.3	269.5	236.0	234.7	239.4	241.0	241.3	234.9	-11.4	-4.6
43. Republic of Daghestan										
Coniferous	53.2	54.5	55.8	57.6	57.9	64.2	64.1	65.5	12.3	23.1
Deciduous hardwood	195.8	188.5	187.3	194.8	195.7	203.0	196.3	211.0	15.2	7.8
Deciduous softwood	75.8	78.0	77.3	78.4	78.0	71.2	71.5	71.1	-4.7	-6.2
Subtotal	324.8	321.0	320.4	330.8	331.6	338.4	331.9	347.6	22.8	7.0
Bushes	4.2	6.7	7.5	8.1	7.9	9.7	10.7	12.8	8.6	204.8
Stocked land	329.0	327.7	327.9	338.9	339.5	348.1	342.6	360.4	31.4	9.5
Nonstocked land	46.4	29.5	30.2	27.1	27.2	17.9	15.5	15.7	-30.7	-66.2
Total of forest land	375.4	357.2	358.1	366.0	366.7	366.0	358.1	376.1	0.7	0.2
44. Kabardino-Balkarian Republic										
Coniferous	6.6	7.0	7.1	7.3	6.5	6.5	6.4	6.7	0.1	1.5
Deciduous hardwood	65.6	70.6	70.6	68.2	69.5	72.1	72.5	73.6	8.0	12.2
Deciduous softwood	39.7	40.8	41.3	45.5	43.8	45.5	45.6	45.9	6.2	15.6
Subtotal	111.9	118.4	119.0	121.0	119.8	124.1	124.5	126.2	14.3	12.8
Bushes	4.3	4.5	3.4	2.3	2.2	3.6	3.9	10.7	6.4	148.8
Stocked land	116.2	122.9	122.4	123.3	122.0	127.7	128.4	136.9	20.7	17.8
Nonstocked land	17.7	10.2	10.9	12.0	10.9	7.9	7.3	6.6	-11.1	-62.7
Total of forest land	133.9	133.1	133.3	135.3	132.9	135.6	135.7	143.5	9.6	7.2
45. Republic of North Ossetia										
Coniferous	7.8	8.2	7.0	7.1	7.1	7.5	7.4	7.4	-0.4	-5.1
Deciduous hardwood	125.1	125.3	124.1	126.7	124.5	127.2	127.5	128.1	3.0	2.4
Deciduous softwood	30.0	28.0	25.8	29.9	29.8	28.5	28.9	29.3	-0.7	-2.3
Subtotal	162.9	161.5	156.9	163.7	161.4	163.2	163.8	164.8	1.9	1.2
Bushes	4.2	4.5	4.6	3.1	2.9	1.9	2.1	2.6	-1.6	-38.1
Stocked land	167.1	166.0	161.5	166.8	164.3	165.1	165.9	167.4	0.3	0.2
Nonstocked land	8.6	12.1	11.2	7.5	7.2	5.7	5.0	5.6	-3.0	-34.9
Total of forest land	175.7	178.1	172.7	174.3	171.5	170.8	170.9	173.0	-2.7	-1.5
46. Chechen Republic and Republic of Ingushetia*										
Coniferous	7.2	7.8	7.7	7.8	8.0	7.8	7.8	7.8	0.6	8.3
Deciduous hardwood	230.0	227.8	237.3	237.6	240.7	208.1	216.5	216.5	-13.5	-5.9
Deciduous softwood	59.1	60.6	64.5	65.0	64.6	60.5	60.8	60.8	1.7	2.9
Subtotal	296.3	296.2	309.5	310.4	313.3	276.4	285.1	285.1	-11.2	-3.8
Bushes	10.7	9.7	9.4	8.2	8.4	8.7	9.0	51.9	41.2	385.0
Stocked land	307.0	305.9	318.9	318.6	321.7	285.1	294.1	337.0	30.0	9.8
Nonstocked land	30.2	32.7	17.9	17.9	15.1	11.0	1.9	13.0	-17.2	-57.0
Total of forest land	337.2	338.6	336.8	336.5	336.8	296.1	296.0	350.0	12.8	3.8
47. Kurgan Oblast										
Coniferous	263.3	279.6	332.7	339.2	357.0	362.3	364.7	379.3	116.0	44.1

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Deciduous softwood	517.9	530.6	522.1	521.7	513.3	543.2	535.8	722.3	204.4	39.5
Subtotal	781.2	810.2	854.8	860.9	870.3	905.5	900.5	1101.6	320.4	41.0
Bushes	0.2	6.2	8.8	6.3	6.0	3.7	3.7	3.4	3.2	1600.0
Stocked land	781.4	816.4	863.6	867.2	876.3	909.2	904.2	1105.0	323.6	41.4
Nonstocked land	175.4	150.5	101.5	109.3	100.5	73.7	77.3	54.8	-120.6	-68.8
Total of forest land	956.8	966.9	965.1	976.5	976.8	982.9	981.5	1159.8	203.0	21.2
48. Orenburg Oblast										
Coniferous	28.7	35.2	42.0	45.8	50.4	50.3	57.5	59.0	30.3	105.6
Deciduous hardwood	162.6	170.6	175.1	159.9	163.3	152.9	168.5	151.4	-11.2	-6.9
Deciduous softwood	133.2	146.1	151.9	172.3	177.3	175.9	189.5	215.7	82.5	61.9
Subtotal	324.5	351.9	369.0	378.0	391.0	379.1	415.5	426.1	101.6	31.3
Bushes	8.0	5.3	5.2	21.8	21.3	24.0	24.9	24.3	16.3	203.8
Stocked land	332.5	357.2	374.2	399.8	412.3	403.1	440.4	450.4	117.9	35.5
Nonstocked land	132.0	130.5	114.4	78.9	69.3	45.4	40.9	22.0	-110.0	-83.3
Total of forest land	464.5	487.7	488.6	478.7	481.6	448.5	481.3	472.4	7.9	1.7
49. Perm Oblast*										
Coniferous	6414.7	6199.8	6511.0	6388.9	6215.1	6319.4	5783.8	5776.5	-638.2	-9.9
Deciduous hardwood	1.2	1.2	1.6	1.8	1.8	1.8	1.2	1.0	-0.2	-16.7
Deciduous softwood	2150	2331.4	2627.4	2661.8	2802.7	2792.4	3173.5	3425.3	1275.3	59.3
Subtotal	8565.9	8532.4	9140.0	9052.5	9019.6	9113.6	8958.5	9202.8	636.9	7.4
Bushes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Stocked land	8565.9	8532.4	9140.0	9052.5	9019.6	9113.6	8958.5	9202.8	636.9	7.4
Nonstocked land	1250.0	1261.3	640.9	726.5	701.6	585.2	528.7	291.8	-958.2	-76.7
Total of forest land	9815.9	9793.7	9780.9	9779.0	9721.2	9698.8	9487.2	9494.6	-321.3	-3.3
50. Sverdlovsk Oblast*										
Coniferous	6486.8	6296.9	6712.9	6855.8	6793.6	6972.2	6665.8	6757.8	271.0	4.2
Deciduous hardwood	0.5	0.7	0.8	0.5	0.3	0.1	0.1	0.1	-0.4	-80.0
Deciduous softwood	3886.6	3869	3732.5	3649.9	3728.0	3713.1	4074.5	4205.9	319.3	8.2
Subtotal	10373.9	10166.6	10446.2	10506.2	10521.9	10685.4	10740.4	10963.8	589.9	5.7
Bushes	0.2	0.6	1.7	1.5	0.5	0.1	0.0	0.0	-0.2	-100.0
Stocked land	10374.1	10167.2	10447.9	10507.7	10522.4	10685.5	10740.4	10963.8	589.7	5.7
Nonstocked land	750.6	918.6	772.8	723.7	593.2	504.9	505.3	329.8	-420.8	-56.1
Total of forest land	11124.7	11085.8	11220.7	11231.4	11115.6	11190.4	11245.7	11293.6	168.9	1.5
51. Chelyabinsk Oblast										
Coniferous	575.6	628.4	714.5	728.0	759.0	751.8	765.4	775.8	200.2	34.8
Deciduous hardwood	22.9	25.8	31.2	38.7	38.8	35.8	36.3	36.3	13.4	58.5
Deciduous softwood	1202.4	1247.6	1286.2	1250.6	1238.6	1307.6	1302.6	1528.3	325.9	27.1
Subtotal	1800.9	1901.8	2031.9	2017.3	2036.4	2095.2	2104.3	2340.4	539.5	30.0
Bushes	4.2	3.8	3.8	3.9	4.0	4.8	5.3	5.6	1.4	33.3
Stocked land	1805.1	1905.6	2035.7	2021.2	2040.4	2100.0	2109.6	2346.0	540.9	30.0
Nonstocked land	384.2	319.1	212.1	235.8	200.5	163.6	146.3	101.7	-282.5	-73.5
Total of forest land	2189.3	2224.7	2247.8	2257.0	2240.9	2263.6	2255.9	2447.7	258.4	11.8

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
52. Republic of Bashkortostan										
Coniferous	906.5	891.9	1001.4	1052.4	1086.4	1129.7	1083.5	1158.8	252.3	27.8
Deciduous hardwood	875.4	897.4	846.5	812.7	759.4	645.7	531.5	485.9	-389.5	-44.5
Deciduous softwood	2974.6	3075.3	3101.8	3112.3	3120.0	3177.4	3270.4	3341.1	366.5	12.3
Subtotal	4756.5	4864.6	4949.7	4977.4	4965.8	4952.8	4885.4	4985.8	229.3	4.8
Bushes	22.2	26.8	22.9	18.7	18.3	16.0	15.1	15.0	-7.2	-32.4
Stocked land	4778.7	4891.4	4972.6	4996.1	4984.1	4968.8	4900.5	5000.8	222.1	4.6
Nonstocked land	393.4	265.9	227.7	199.0	206.8	198.6	246.1	170.2	-223.2	-56.7
Total of forest land	5172.1	5157.3	5200.3	5195.1	5190.9	5167.4	5146.6	5171.0	-1.1	0.0
53. Udmurtian Republic										
Coniferous	818.4	763.3	827.7	768.9	795.1	801.8	832.5	774.2	-44.2	-5.4
Deciduous hardwood	7.7	6.3	5.7	4.7	4.4	2.0	1.8	1.6	-6.1	-79.2
Deciduous softwood	570.9	629.4	611.5	663.0	634.6	654.5	624.5	705.8	134.9	23.6
Subtotal	1397.0	1399.0	1444.9	1436.6	1434.1	1458.3	1458.8	1481.6	84.6	6.1
Bushes	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.0	-100.0
Stocked land	1398.0	1399.0	1444.9	1436.6	1434.1	1458.3	1458.8	1481.6	83.6	6.0
Nonstocked land	151.5	166.2	110.1	117.4	124.1	97.3	92.3	67.1	-84.4	-55.7
Total of forest land	1549.5	1565.2	1555.0	1554.0	1558.2	1555.6	1551.1	1548.7	-0.8	-0.1
54. Altai Kray*										
Coniferous	3165.6	3480.5	3324.5	3369.5	3402.3	3417.3	3351.4	4214.2	1048.6	33.1
Deciduous hardwood	0.0	0.2	0.9	1.3	1.6	1.7	1.7	1.7	1.7	-
Deciduous softwood	1036.9	1253.6	1440.4	1449.5	1492.9	1507.7	1585.1	1857.2	820.3	79.1
Subtotal	4202.5	4734.3	4765.8	4820.3	4896.8	4926.7	4938.2	6073.1	1870.6	44.5
Bushes	3.3	30.9	93.6	93.0	130.4	119.0	135.1	154.3	151.0	4575.8
Stocked land	4205.8	4765.2	4859.4	4913.3	5027.2	5045.7	5073.3	6227.4	2021.6	48.1
Nonstocked land	1051.6	1024.4	638.1	595.7	483.3	449.2	431.7	652.7	-398.9	-37.9
Total of forest land	5257.4	5789.6	5497.5	5509.0	5510.5	5494.9	5505.0	6880.1	1622.7	30.9
55. Kemerovo Oblast										
Coniferous	2459.9	2399.3	2575.6	2593.5	2783.4	2865.9	2455.1	2521.5	61.6	2.5
Deciduous hardwood	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	-
Deciduous softwood	1364.3	1443.2	1539.0	1617.1	1772.5	1718.2	1802.4	1793.4	429.1	31.5
Subtotal	3824.2	3842.5	4114.6	4210.6	4555.9	4584.1	4257.8	4315.2	491.0	12.8
Bushes	1.0	1.8	4.9	3.6	6.5	7.5	7.9	8.3	7.3	730.0
Stocked land	3825.2	3844.3	4119.5	4214.2	4562.4	4591.6	4265.7	4323.5	498.3	13.0
Nonstocked land	1025.9	1062.4	757.4	640.3	272.0	199.0	352.8	264.5	-761.4	-74.2
Total of forest land	4851.1	4906.7	4876.9	4854.5	4834.4	4790.6	4618.5	4588.0	-263.1	-5.4
56. Novosibirsk Oblast										
Coniferous	883.4	880.8	851.1	833.1	877.0	879.0	971.8	977.1	93.7	10.6
Deciduous hardwood	0.8	0.8	1.2	1.2	1.2	1.4	1.0	1.0	0.2	25.0
Deciduous softwood	1110.9	1149.3	1341.8	1346.4	1485.3	1498.6	1614.0	1657.4	546.5	49.2
Subtotal	1995.1	2030.9	2194.1	2180.7	2363.5	2379.0	2586.8	2635.5	640.4	32.1

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Bushes	3.2	6.5	13.4	10.9	23.8	17.7	18.2	18.4	15.2	475.0
Stocked land	1998.3	2037.4	2207.5	2191.6	2387.3	2396.7	2605.0	2653.9	655.6	32.8
Nonstocked land	391.3	311.8	254.8	245.1	157.5	154.2	111.5	87.1	-304.2	-77.7
Total of forest land	2389.6	2349.2	2462.3	2436.7	2544.8	2550.9	2716.5	2741.0	351.4	14.7
57. Omsk Oblast										
Coniferous	741.8	767.7	867.6	942.7	972.7	998.3	963.4	928.2	186.4	25.1
Deciduous hardwood	0.4	0.3	0.4	0.3	0.2	0.2	0.2	0.2	-0.2	-50.0
Deciduous softwood	1506.8	1528.4	1546.5	1543.5	1543.2	1532.1	1608.1	1654.2	147.4	9.8
Subtotal	2249.0	2296.4	2414.5	2486.5	2516.1	2530.6	2571.7	2582.6	333.6	14.8
Bushes	7.3	5.7	4.0	3.8	3.3	3.4	2.6	2.0	-5.3	-72.6
Stocked land	2256.3	2302.1	2418.5	2490.3	2519.4	2534.0	2574.3	2584.6	328.3	14.6
Nonstocked land	329.2	206.1	184.5	119.8	98.9	87.9	79.2	79.0	-250.2	-76.0
Total of forest land	2585.5	2508.2	2603.0	2610.1	2618.3	2621.9	2653.5	2663.6	78.1	3.0
58. Tomsk Oblast										
Coniferous	8719.6	8327.1	9276.1	9664.6	9945.8	10108.0	9853.7	10060.4	1340.8	15.4
Deciduous softwood	8081.3	7990.2	7436.5	7276.1	7033.2	6921.5	6910.3	7212.2	-869.1	-10.8
Subtotal	16800.9	16317.3	16712.6	16940.7	16979	17029.5	16764.0	17272.6	471.7	2.8
Bushes	3.6	5.0	6.2	5.9	4.3	5.0	5.7	6.4	2.8	77.8
Stocked land	16804.5	16322.3	16718.8	16946.6	16983.3	17034.5	16769.7	17279	474.5	2.8
Nonstocked land	1336.7	1433.6	1032.8	819.2	771.9	669.0	1000.2	369.2	-967.5	-72.4
Total of forest land	18141.2	17755.9	17751.6	17765.8	17755.2	17703.5	17769.9	17648.2	-493	-2.7
59. Tyumen Oblast*										
Coniferous	31033.2	31583.6	35096.0	33654.8	33703.2	33578.9	38065.1	38205.0	7171.8	23.1
Deciduous softwood	11453.5	11895.8	10294.7	9366.2	9390.6	8189.8	8526.2	8887.6	-2565.9	-22.4
Subtotal	42486.7	43479.4	45390.7	43021.0	43093.8	41768.7	46591.3	47092.6	4605.9	10.8
Bushes	23.8	13.7	1.9	3.5	8.3	346.7	881.0	890.9	867.1	3643.3
Stocked land	42510.5	43493.1	45392.6	43024.5	43102.1	42115.4	47472.3	47983.5	5473.0	12.9
Nonstocked land	7818.9	7421.7	6574.7	4977.3	4706.5	3335.6	2512.5	1900.0	-5918.9	-75.7
Total of forest land	50329.4	50914.8	51967.3	48001.8	47808.6	45451.0	49984.8	49883.5	-445.9	-0.9
60. Krasnoyarsk Kray*										
Coniferous	87609.1	87304.5	89615.9	93996.7	94279.5	93951.7	80929.6	81334.7	-6274.4	-7.2
Deciduous softwood	18506.7	18498.3	17648.1	17643.5	17682.7	17310.6	15778.0	16324.2	-2182.5	-11.8
Subtotal	106115.8	105802.8	107264	111640.2	111962.2	111262.3	96707.6	97658.9	-8456.9	-8.0
Bushes	1039.0	1041.9	1007.2	1052.4	1087.3	1093.1	6916.6	6981.0	5942.0	571.9
Stocked land	107154.8	106844.7	108271.2	112692.6	113049.5	112355.4	103624.2	104639.9	-2514.9	-2.3
Nonstocked land	10482.4	10968.5	10144.4	9556.0	9343.0	9207.6	13580.6	15329.2	4846.8	46.2
Total of forest land	117637.2	117813.2	118415.6	122248.6	122392.5	121563.0	117204.8	119969.1	2331.9	2.0
61. Irkutsk Oblast*										
Coniferous	44265.5	43976.4	45204.1	45565.2	46229.5	44031.1	44254.0	44727.4	461.9	1.0
Deciduous softwood	8616.9	8008.2	8300.7	8530.4	8303.0	7807.6	9704.6	10424.1	1807.2	21.0
Subtotal	52882.4	51984.6	53504.8	54095.6	54532.5	51838.7	53958.6	55151.5	2269.1	4.3

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Bushes	3118.5	3140.1	3135.9	3587.7	4202.1	3532.9	3650.0	3673.4	554.9	17.8
Stocked land	56000.9	55124.7	56640.7	57683.3	58734.6	55371.6	57608.6	58824.9	2824	5.0
Nonstocked land	7239.3	7738.6	6834.7	5124.4	4357.1	7259.1	3997.2	3878.6	-3360.7	-46.4
Total of forest land	63240.2	62863.3	63475.4	62807.7	63091.7	62630.7	61605.8	62703.5	-536.7	-0.8
62. Chita Oblast*										
Coniferous	19640.5	18989.6	19133.4	18962.6	19358.5	19142.6	18953.6	18945.6	-694.9	-3.5
Deciduous hardwood	0.0	0.0	0.0	0.3	0.0	0.6	0.0	0.0	0.0	-
Deciduous softwood	1411.2	2863.0	3784.0	3987.7	4346.4	4537.4	4944.3	5081.0	3669.8	260.0
Subtotal	21051.7	21852.6	22917.4	22950.6	23704.9	23680.6	23897.9	24026.6	2974.9	14.1
Bushes	1026.5	1399.1	1744.6	2137.0	3241.0	3265.1	3324.1	3336.3	2309.8	225.0
Stocked land	22078.2	23251.7	24662.0	25087.6	26945.9	26945.7	27222.0	27362.9	5284.7	23.9
Nonstocked land	4901.6	4303.8	3077.6	2850.1	1663.2	1705.8	1473.8	1337.0	-3564.6	-72.7
Total of forest land	26979.8	27555.5	27739.6	27937.7	28609.1	28651.5	28695.8	28699.9	1720.1	6.4
63. Republic of Buryatia										
Coniferous	14576.2	14726.7	15094.7	15544.4	15504.7	15566.5	15174.2	15323.0	746.8	5.1
Deciduous hardwood	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.0	0.0	-
Deciduous softwood	972.8	1146.0	1178.1	1406.9	1453.6	1411.3	1588.5	1652.0	679.2	69.8
Subtotal	15549.0	15872.7	16272.8	16951.3	16958.6	16978.1	16763.0	16975.0	1426.0	9.2
Bushes	1223.5	1876.5	2244.5	3214.2	3219.9	3307.1	3276.2	3294.1	2070.6	169.2
Stocked land	16772.5	17749.2	18517.3	20165.5	20178.5	20285.2	20039.2	20269.1	3496.6	20.8
Nonstocked land	2634.8	1911.2	1662.9	1246.0	1260.1	1190.6	1200.9	1022.9	-1611.9	-61.2
Total of forest land	19407.3	19660.4	20180.2	21411.5	21438.6	21475.8	21240.1	21292.0	1884.7	9.7
64. Republic of Tuva										
Coniferous	7597.1	7471.1	7517.2	7526.9	7530.0	7400.1	7381.6	7358.6	-238.5	-3.1
Deciduous softwood	173.2	254.6	273.1	290.1	289.7	271.0	275.9	274.9	101.7	58.7
Subtotal	7770.3	7725.7	7790.3	7817.0	7819.7	7671.1	7657.5	7633.5	-136.8	-1.8
Bushes	126.7	138.9	144.7	157.5	157.8	218.1	207.5	207.4	80.7	63.7
Stocked land	7897.0	7864.6	7935.0	7974.5	7977.5	7889.2	7865.0	7840.9	-56.1	-0.7
Nonstocked land	598.4	626.0	592.9	593.3	590.3	544.6	559.7	560.1	-38.3	-6.4
Total of forest land	8495.4	8490.6	8527.9	8567.8	8567.8	8433.8	8424.7	8401.0	-94.4	-1.1
65. Primorie Kray										
Coniferous	6340.6	6328.1	6257.2	6177.0	6237.8	6497.0	6457.9	6328.1	-12.5	-0.2
Deciduous hardwood	2595.5	2301.4	3073.9	3114.4	3124.3	2931.1	2978.2	3125.5	530.0	20.4
Deciduous softwood	1239.5	1538.8	1764.6	1857.7	1733.6	1681.5	1751.7	1829.3	589.8	47.6
Subtotal	10175.6	10168.3	11095.7	11149.1	11095.7	11109.6	11187.8	11282.9	1107.3	10.9
Bushes	24.0	607.4	36.6	38.8	47.9	47.3	52.0	52.4	28.4	118.3
Stocked land	10199.6	10775.7	11132.3	11187.9	11143.6	11156.9	11239.8	11335.3	1135.7	11.1
Nonstocked land	921.1	864.1	482.8	385.1	442.9	435.5	305.1	185.9	-735.2	-79.8
Total of forest land	11120.7	11639.8	11615.1	11573.0	11586.5	11592.4	11544.9	11521.2	400.5	3.6
66. Khabarovsk Kray*										
Coniferous	35254.2	30591.0	27385.4	26893.5	27987.0	29544.7	35997.7	39816.2	4562.0	12.9

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
Deciduous hardwood	1135.8	1194.8	1689.7	1515.0	1521.7	1581.6	1663.8	1721.0	585.2	51.5
Deciduous softwood	2236.3	2981.4	3552.7	3552.5	4159.0	4705.5	5595.4	6170.9	3934.6	175.9
Subtotal	38626.3	34767.2	32627.8	31961	33667.7	35831.8	43256.9	47708.1	9081.8	23.5
Bushes	4133.6	3493.4	2160.9	2213.9	2795.0	3444.7	5614.7	6324.9	2191.3	53.0
Stocked land	42759.9	38260.6	34788.7	34174.9	36462.7	39276.5	48871.6	54033.0	11273.1	26.4
Nonstocked land	14018.8	8543.6	9731.0	10493.6	8994.3	7406.8	1694.2	5465.5	-8553.3	-61.0
Total of forest land	56778.7	46804.2	44519.7	44668.5	45457.0	46683.3	50565.8	59498.5	2719.8	4.8
67. Amur Oblast										
Coniferous	16026.0	14777.5	14479.2	14308.0	14353.8	14588.9	14399.3	14617.6	-1408.4	-8.8
Deciduous hardwood	340.1	312.6	511.7	500.0	492.4	497.6	492.0	486.8	146.7	43.1
Deciduous softwood	3395.5	3824.8	4162.2	4423.4	4410.1	4738.7	4841.4	5163.4	1767.9	52.1
Subtotal	19761.6	18914.9	19153.1	19231.4	19256.3	19825.2	19732.7	20267.8	506.2	2.6
Bushes	694.0	437.0	794.9	1436.6	1802.6	1952.1	2120.2	2192.3	1498.3	215.9
Stocked land	20455.6	19351.9	19948.0	20668	21058.9	21777.3	21852.9	22460.1	2004.5	9.8
Nonstocked land	3558.7	5373.8	4196.1	3790.1	3641.2	3213.1	2836.2	3134.2	-424.5	-11.9
Total of forest land	24014.3	24725.7	24144.1	24458.1	24700.1	24990.4	24689.1	25594.3	1580.0	6.6
68. Kamchatka Oblast*										
Coniferous	1176.9	702.4	549.1	568.4	584.3	712.6	1149.7	1134.0	-42.9	-3.6
Deciduous hardwood	5602.2	3657.7	2804.3	2971.1	3078.0	3806.9	5872.9	5904.2	302.0	5.4
Deciduous softwood	1094.6	595.9	581.6	714.5	734.1	810.0	1360.3	1382.2	287.6	26.3
Subtotal	7873.7	4956.0	3935.0	4254.0	4396.4	5329.5	8382.9	8420.4	546.7	6.9
Bushes	10650.5	2001.1	2156.7	2473.3	2599.2	3457.0	10767.4	10758.7	108.2	1.0
Stocked land	18524.2	6957.1	6091.7	6727.3	6995.6	8786.5	19150.3	19179.1	654.9	3.5
Nonstocked land	2273.2	894.9	815.5	924.0	827.9	940.9	632.0	1584.5	-688.7	-30.3
Total of forest land	20797.4	7852.0	6907.2	7651.3	7823.5	9727.4	19782.3	20763.6	-33.8	-0.2
69. Magadan Oblast*										
Coniferous	9046.7	9031.5	7604.6	7409.6	7220.3	9421.5	9356.0	9401.1	354.4	3.9
Deciduous softwood	407.6	414.4	347.7	266.5	253.8	310.3	312.7	317.7	-89.9	-22.1
Subtotal	9454.3	9445.9	7952.3	7676.1	7474.1	9731.8	9668.7	9718.8	264.5	2.8
Bushes	11348.5	11284.7	11085.8	10149.1	10009.8	12319.7	12320.5	12414.9	1066.4	9.4
Stocked land	20802.8	20730.6	19038.1	17825.2	17483.9	22051.5	21989.2	22133.7	1330.9	6.4
Nonstocked land	17401.4	16946.1	17907.4	16854.5	16666.4	14812.5	6343.4	14784.7	-2616.7	-15.0
Total of forest land	38204.2	37676.7	36945.5	34679.7	34150.3	36864.0	28332.6	36918.4	-1285.8	-3.4
70. Sakhalin Oblast										
Coniferous	3095.5	3104.2	2982.2	3309.4	3818.8	3812.9	3781.3	3824.5	729.0	23.6
Deciduous hardwood	920.1	936.2	928.6	910.6	854.3	893.2	964.7	1035.5	115.4	12.5
Deciduous softwood	219.2	204.6	221.8	242.7	298.6	300.9	303.3	299.9	80.7	36.8
Subtotal	4234.8	4245	4132.6	4462.7	4971.7	5007.0	5049.3	5159.9	925.1	21.8
Bushes	240.5	254.3	214.3	236.3	334.1	318.7	308.3	306.7	66.2	27.5
Stocked land	4475.3	4499.3	4346.9	4699.0	5305.8	5325.7	5357.6	5466.6	991.3	22.2
Nonstocked land	2015.1	2025.5	1673.6	1831.0	1086.1	986.8	166.8	745.0	-1270.1	-63.0
Total of forest land	6490.4	6524.8	6020.5	6530.0	6391.9	6312.5	5524.4	6211.6	-278.8	-4.3

Table 2A. Continued

Tree stand and category of forest lands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	thousand ha	% to 1961
71. Republic of Sakha (Yakutia)										
Coniferous	114553.7	110682.4	121890.8	125288.5	126550.5	123658.9	125792.5	119604.6	5050.9	4.4
Deciduous softwood	1482.6	1573.4	1856.0	2134.3	1627.3	1968.3	2018.9	2007.5	524.9	35.4
Subtotal	116036.3	112255.8	123746.8	127422.8	128177.8	125627.2	127811.4	121612.1	5575.8	4.8
Bushes	9776.9	6779.8	7274.2	7986.3	11182.8	13857.5	17456.9	21614.4	11837.5	121.1
Stocked land	125813.2	119035.6	131021.0	135409.1	139360.6	139484.7	145268.3	143226.5	17413.3	13.8
Nonstocked land	56314.1	39383.6	37420.1	35511.2	33099.0	38813.1	397.2	49287.5	-7026.6	-12.5
Total of forest land	182127.3	158419.2	168441.1	170920.3	172459.6	178297.8	145665.5	192514.0	10386.7	5.7
Total, million ha										
Coniferous	489.3	479.2	493.0	500.3	506.2	506.0	507.7	508.7	19.4	4.0
Deciduous hardwood	16.5	14.4	15.0	14.9	14.8	15.2	17.3	17.5	1.0	6.1
Deciduous softwood	102.5	107.3	106.3	107.4	108.1	107.4	113.2	119.7	17.2	16.8
Subtotal	608.3	600.9	614.3	622.6	629.1	628.6	638.2	645.9	37.6	6.2
Bushes	43.7	32.8	32.5	35.1	41.1	47.6	67.6	72.8	29.1	66.6
Stocked land	652.0	633.7	646.7	657.6	670.2	676.2	705.8	718.7	66.7	10.2
Nonstocked land	147.2	123.0	113.4	105.1	95.5	98.0	44.2	104.9	-42.3	-28.7
Total of forest land	799.1	756.7	760.1	762.7	765.7	774.1	750.0	823.6	24.5	3.1

* For analytical purposes, the administrative borders of republics, krays and oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

Table 3A. **Area of stocked forest lands by groups of tree stands and age, 1961-1998, thousand ha**

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993**	1998**
1. Kaliningrad Oblast								
Coniferous								
young I class of age	24.2	17.4	27.6	35.9	24.1	29.5	-	-
young II class of age	18.7	16.3	11.3	11.6	18.1	18.6	43.7	48.4
middle-aged	15.2	23.4	26.9	26.7	24.3	23.4	26.1	25.3
maturing	15.1	10.3	8.8	8.5	8.8	8.2	7.2	6.3
mature and overmature	9.3	9.3	7.8	5.7	8.5	6.6	4.8	4.2
Deciduous hardwood								
young I class of age	5.5	8.1	8.0	9.7	4.9	5.3	-	-
young II class of age	6.1	4.8	5.7	5.9	7.7	7.7	9.4	9.9
middle-aged	10.8	18.9	21.6	21.9	22.7	22.5	26.3	26.4
maturing	3.3	3.3	3.5	3.4	5.6	5.6	5.7	5.6
mature and overmature	1.0	2.6	2.7	1.7	3.2	2.6	2.5	2.2
Deciduous softwood								
young I class of age	14.2	11.4	5.7	7.2	3.8	4.2	-	-
young II class of age	12.4	16.0	15.7	15.9	7.8	7.1	7.5	8.6
middle-aged	12.6	21.6	36.1	38.3	56.9	56.3	61.2	61.2
maturing	11.5	10.6	10.0	9.6	10.2	10.2	13.4	13.4
mature and overmature	17.5	18.1	17.6	13.0	13.0	11.0	17.1	16.5
2. Archangel Oblast*								
Coniferous								
young I class of age	517.2	748.4	1337.5	1531.6	1590.9	1640.6	-	-
young II class of age	536.5	705.5	947.7	924.8	1209.4	1375.0	3123.2	3113.5
middle-aged	906.6	1139.2	1311.9	1476.0	1568.0	1772.8	1815.2	2041.2
maturing	777.5	714.1	589.8	535.9	507.1	550.2	533.5	600.8
mature and overmature	13881.4	13771.2	12866.2	11916.6	11554.4	10960.6	11277	11075.2
Deciduous softwood								
young I class of age	392.3	530.7	816.0	806.0	795.5	743.8	-	-
young II class of age	447.4	432.6	347.6	458.4	514.2	566.7	1313.7	1523.1
middle-aged	396.7	563.2	542.9	621.6	743.9	836.6	1120.7	1301.2
maturing	72.2	88.3	127.7	145.5	151.3	141.1	188.8	196.3
mature and overmature	604.1	631.8	571.7	538.9	453.5	418.3	479.4	523.8
3. Vologda Oblast								
Coniferous								
young I class of age	459.8	457.0	635.5	586.1	812.2	847.3	-	-
young II class of age	289.9	377.5	430.0	390.7	390.7	461.9	1029.6	1219.7
middle-aged	731.9	769.3	794.5	936.8	965.2	930.7	937.0	992.5
Maturing	503.5	436.0	325.1	294.4	288.6	330.3	363.1	364.4
mature and overmature	2055.4	2099.3	1812.3	1644.2	1435.1	1436.7	1408.2	1362.6
Deciduous softwood								

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	416.3	486.6	518.8	476.2	548.0	496.9	-	-
young II class of age	857.7	473.3	216.9	293.5	300.9	286.9	820.8	824.3
middle-aged	640.2	1037.1	1301	1213.2	1212.3	1059.6	836.9	845.3
maturing	104.9	194.1	182.9	316.5	310.8	362.7	544.1	462.5
mature and overmature	507.6	549.3	464.0	566.1	516.1	706.3	936.7	1106.7
4. Murmansk Oblast								
Coniferous								
young I class of age	237.8	327.5	504.1	604.0	681.5	582.5	-	-
young II class of age	94.4	143.0	254.0	275.0	369.9	533.4	1126.9	1207.7
middle-aged	160.1	309.7	682.4	709.6	735.0	703.9	714.3	711.0
maturing	209.5	236.9	259.4	274.3	260.7	183.6	166.8	166.1
mature and overmature	2557.3	2172.9	1721.8	1600.6	1530.2	1678.9	1662.8	1642.0
Deciduous softwood								
young I class of age	111.1	110.0	108.6	136.0	139.0	88.6	-	-
young II class of age	135.9	152.9	167.9	175.9	189.6	143.1	204.6	204.6
middle-aged	134.0	295.1	378.9	411.6	445.7	502.6	562.4	559.9
maturing	43.7	123.1	153.2	157.8	159.1	119.1	115.0	114.6
mature and overmature	663.0	483.6	388.3	349.1	348.2	434.0	421.1	420.6
5. Republic of Karelia								
Coniferous								
young I class of age	420.6	433.1	837.1	1281.5	1863.5	1946.8	-	-
young II class of age	248.1	391.2	668.1	796.2	987.8	1224.8	3214.9	3348.8
middle-aged	1150.6	1329.6	1447.6	1514.2	1434.7	1431.0	1529.4	1602.9
maturing	625.6	521.9	424.5	393.6	483.5	584.7	578.3	607.4
mature and overmature	4822.3	4257.8	3733.3	3243.4	2949.5	2778.1	2707.1	2688.7
Deciduous softwood								
young I class of age	157.1	150.5	257.7	280.7	249.0	149.9	-	-
young II class of age	149.2	136.4	151.5	151.2	187.2	170.1	247.1	175.8
middle-aged	258.2	392.6	360.4	360.1	332.6	350.6	379.2	438.1
maturing	95.1	69.1	92.2	88.9	105.8	99.5	104.7	114.2
mature and overmature	189.1	175.6	219.0	213.2	222.7	229.8	222.6	291.5
6. Komi Republic								
Coniferous								
young I class of age	764.3	1132.1	1579.9	1865.0	1790.5	1651.2	-	-
young II class of age	417.2	652.5	1096.6	1421.1	1700.7	1951.1	3370.7	3323.2
middle-aged	1027.9	1152.4	1290.1	1435.6	1634.2	1823.7	2493.8	2962.7
maturing	856.7	784.4	573.9	531.4	580.0	615.9	963.9	1043.8
mature and overmature	18725.4	18754.7	15343.7	15150.9	14805.7	14291.7	16598.0	16369.4
Deciduous softwood								
young I class of age	597.4	631.1	624.6	661.9	661.3	675.7	-	-
young II class of age	667.1	694.9	380.6	411.7	462.0	456.4	1207.6	1241.3
middle-aged	601.2	663.2	900.3	1027.1	1127.1	1313.5	1623.0	1647.7

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
Maturing	197.7	223.1	179.5	168.4	162.1	159.1	270.8	394.8
mature and overmature	3056.4	2942.6	2075.0	1909.6	1807.5	1637.1	1959.4	1993.9
7. Leningrad Oblast								
Coniferous								
young I class of age	236.8	238.5	283.0	336.9	356.4	370.0	-	-
young II class of age	200.0	245.0	252.4	252.7	226.9	241.5	629.6	598.7
middle-aged	965.7	959.5	965.1	981.0	748.2	653.8	605.6	557.1
maturing	276.6	272.8	291.4	291.7	458.9	515.8	530.3	514.5
mature and overmature	274.0	324.7	344.3	365.7	453.5	548.6	571.3	635.0
Deciduous hardwood								
young I class of age	0.0	0.0	0.0	0.2	0	0.1	-	-
young II class of age	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
middle-aged	0.1	0.1	0.2	0.1	0.4	0.2	0.3	0.2
maturing	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
mature and overmature	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Deciduous softwood								
young I class of age	187.1	169.9	156.0	122.4	100.9	60.9	-	-
young II class of age	217.4	144.9	136.8	114.0	94.8	79.1	139.9	94.0
middle-aged	441.2	507.6	523.2	524.2	467.6	409.3	409.3	359.8
maturing	157.7	144.8	154.2	150.0	159.7	188.9	188.2	220.6
mature and overmature	212.4	296.5	312.6	302.5	325.2	349.8	334.5	515.4
8. Novgorod Oblast								
Coniferous								
young I class of age	91.2	63.7	113.3	111.6	152.6	161.2	-	-
young II class of age	69.3	97.6	93.8	83.0	83.2	91.9	296.9	281.4
middle-aged	190.3	198.2	191.4	198.8	197.4	219.9	268.0	276.9
maturing	104.4	133.2	124.5	112.2	111.3	161.8	159.4	180.2
mature and overmature	102.3	125.5	99.2	158.3	144.8	202.5	177.6	200.8
Deciduous hardwood								
young I class of age	0.1	0.0	0.0	0.0	0.0	0.0	-	-
young II class of age	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
middle-aged	0.2	1.0	0.8	0.8	0.8	0.9	1.1	1.1
maturing	0.2	0.1	0.2	0.2	0.2	0.5	0.5	0.5
mature and overmature	0.2	0.1	0.0	0.1	0.1	0.2	0.2	0.4
Deciduous softwood								
young I class of age	189.1	130.4	145.5	56.0	64.0	33.7	-	-
young II class of age	155.5	120.5	100.8	79.7	76.2	48.2	94.4	93.2
middle-aged	256.4	348.4	350.0	358.8	357.1	330.7	392.6	394.4
maturing	61.0	107.1	98.3	130.9	128.1	167.8	172.1	265.4
mature and overmature	83.5	159.9	123.4	192.4	167.6	280.8	253.9	501.8
9. Pskov Oblast								
Coniferous								

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	145.6	103.0	126.2	85.1	113.7	86.8	-	-
young II class of age	104.3	123.9	125.5	124.8	124.4	111.9	215.5	163.0
middle-aged	144.0	140.3	148.0	174.5	174.7	228.5	231.2	231.4
maturing	77.2	97.7	91.2	108.5	107.4	116.9	115.7	136.9
mature and overmature	48.7	70.9	62.6	73.3	61.9	71.2	60.4	76.2
Deciduous hardwood								
young I class of age	0.7	0.6	0.2	0.1	0.0	0.0	-	-
young II class of age	0.1	1.4	1.2	0.9	0.9	0.3	0.3	0.1
middle-aged	0.1	0.3	0.5	0.4	0.5	0.7	0.7	0.7
maturing	0.2	0	0.1	0.1	0.1	0.2	0.2	0.2
mature and overmature	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Deciduous softwood								
young I class of age	74.8	51.7	56.2	25.8	29.7	9.5	-	-
young II class of age	71.6	51.5	54.6	37.2	39.8	19.9	36.2	45.0
middle-aged	79.3	135.4	139.9	190.0	188.9	166.2	177.2	141.8
maturing	42.0	56.8	56.6	56.7	56.1	80.4	83.1	107.8
mature and overmature	74.4	88.6	82.1	84.6	76.3	111.4	107.1	187.0
10. Bryansk Oblast								
Coniferous								
young I class of age	117.5	119.9	165.8	94.1	116.1	70.8	-	-
young II class of age	73.2	91.3	94.7	124.1	123.9	105.2	155.1	143.3
middle-aged	68.2	67.1	68.2	88.3	88.4	119.1	139.7	158.1
maturing	23.2	29.7	28.3	36.0	36.6	45.6	49.7	54.9
mature and overmature	30.2	28.0	18.3	22.9	14.0	20.9	19.7	21.2
Deciduous hardwood								
young I class of age	10.5	13.0	17.0	5.4	6.3	2.9	-	-
young II class of age	11.8	16.0	16.5	9.0	9.0	5.2	6.7	6.2
middle-aged	20.8	24.2	24.4	27.5	27.5	24.8	23.8	23.5
maturing	8.8	9.4	9.1	7.8	7.9	6.4	6.2	6.6
mature and overmature	7.3	9.5	7.1	12.8	11.2	9.7	9.7	10.5
Deciduous softwood								
young I class of age	78.7	59.6	69.0	23.1	29.0	18.6	-	-
young II class of age	56.8	63.1	65.4	52.0	51.2	28.2	42.7	32.7
middle-aged	93.5	98.8	102.6	138.4	137.6	172.2	165.3	153.4
maturing	44.3	47.9	44.9	51.6	51.8	45.0	49.2	58.1
mature and overmature	33.8	41.5	23.4	51.6	37.6	42.2	47.5	60.4
11. Vladimir Oblast								
Coniferous								
young I class of age	172.5	138.5	135.4	175.4	156.3	150.6	-	-
young II class of age	114.0	141.1	141.9	150.4	143.5	134.5	273.7	244.2
middle-aged	148.7	159.4	157.2	154.0	166.7	174.8	190.2	211.6
maturing	71.8	105.0	106.2	107.0	108.4	108.2	104.9	101.8
mature and overmature	24.0	30.1	29.3	28.0	25.8	31.2	25.9	36.5

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
Deciduous hardwood								
young I class of age	0.9	0.6	0.4	0.4	0.2	0.1	-	-
young II class of age	1.1	1.0	0.5	0.4	0.4	0.4	0.4	
middle-aged	2.9	2.8	3.8	3.5	3.6	2.4	2.5	2.2
maturing	1.2	1.8	1.4	1.4	1.2	1.1	1.2	0.7
mature and overmature	1.0	2.6	2.5	2.9	2.5	3.1	3.1	3.1
Deciduous softwood								
young I class of age	122.7	62.8	42.5	35.9	54.4	48.0	-	-
young II class of age	74.3	62.5	49.3	41.1	31.2	23.5	74.9	76.3
middle-aged	142.8	146.8	165.9	180.6	179.5	165.5	168.5	158.6
maturing	47.2	64.9	54.5	47.9	52.9	58.8	58.5	64.2
mature and overmature	17.6	38.6	28.9	28.4	38.2	39.5	34.1	69.8
12. Ivanovo Oblast								
Coniferous								
young I class of age	124.1	100.6	169.2	123.4	108.7	85.0	-	-
young II class of age	52.1	74.0	75.0	110.3	109.6	119.9	225.1	163.2
middle-aged	106.5	97.4	98.1	100.9	113.4	120.2	121.8	107.1
maturing	40.0	61.2	57.5	69.6	71.1	74.5	71.5	67.6
mature and overmature	10.5	20.5	8.1	15.7	35.3	22.2	16.0	29.1
Deciduous hardwood								
young I class of age	0.2	0.1	0.1	0.0	0.0	0.0	-	-
young II class of age	0.0	0.2	0.2	0.0	0.0	0.1	0.1	
middle-aged	1.5	0.7	0.6	0.6	0.4	0.5	0.5	0.2
maturing	0.3	0.9	0.9	0.6	0.3	0.3	0.3	0.2
mature and overmature	0.4	0.8	0.9	1.2	1.8	1.5	1.5	2.0
Deciduous softwood								
young I class of age	109.8	46.7	64.1	29.3	12.0	25.7	-	-
young II class of age	80.4	53.1	56.7	42.2	31.3	30.4	58.7	42.5
middle-aged	114.4	138.5	145.0	166.6	122.9	173.0	172.5	146.7
maturing	66.2	70.7	65.0	63.4	89.4	58.7	56.7	76.9
mature and overmature	28.5	59.2	26.9	43.9	77.2	51.5	43.2	87.0
13. Tver Oblast								
Coniferous								
young I class of age	227.7	150.0	239.0	205.4	268.8	208.3	-	-
young II class of age	141.2	207.7	204.5	180.5	182.3	169.1	422.1	385.6
middle-aged	212.1	236.3	293.7	325.1	325.7	321.0	320.6	344.3
maturing	218.3	217.4	171.4	168.8	164.4	209.4	202.1	192.5
mature and overmature	198.7	222.4	141.2	183.7	157.2	237.1	207.1	189.1
Deciduous softwood								
young I class of age	253.9	155.0	192.6	66.1	74.0	43.8	-	-
young II class of age	203.1	147.3	145.9	123.7	122.5	68.3	129.9	103.7
middle-aged	200.3	344.2	359.7	383.5	385.3	488.3	486.6	423.1
maturing	121.8	128.7	115.1	177.8	173.9	150.1	144.8	199.3

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
mature and overmature	188.9	212.6	139.7	207.9	176.3	197.3	169.0	278.9
14. Kaluga Oblast								
Coniferous								
young I class of age	48.3	59.3	102.0	80.8	98.0	67.2	-	-
young II class of age	23.6	34.9	34.5	50.4	51.9	69.3	149.6	131.6
middle-aged	37.3	38.9	36.9	51.7	51.5	57.6	59.5	65.0
maturing	23.4	25.8	22.4	27.4	30.3	38.9	38.1	40.3
mature and overmature	5.8	10.5	6.9	13.5	8.3	20.0	16.2	24.4
Deciduous hardwood								
young I class of age	4.4	6.2	7.4	2.8	2.9	1.8	-	-
young II class of age	3.1	4.2	4.2	3.7	3.6	3.2	4.6	2.4
middle-aged	12.6	10.1	10.4	12.5	12.2	12.2	12.2	8.0
maturing	4.2	6.6	6.7	5.5	5.9	6.7	6.5	5.5
mature and overmature	6.5	9.7	8.8	9.5	9.0	8.1	8.0	8.8
Deciduous softwood								
young I class of age	78.0	49.8	53.2	11.8	15.4	5.7	-	-
young II class of age	70.1	83.3	78.1	40.5	40.7	17.0	29.0	17.5
middle-aged	76.6	115.8	111.6	183.1	181.9	186.6	184.6	147.6
maturing	92.7	96.7	90.9	80.8	80.3	71.2	69.6	72.1
mature and overmature	121.4	134.7	100.5	109.2	91.9	121.3	108.4	154.1
15. Kostroma Oblast								
Coniferous								
young I class of age	305.8	267.2	448.9	422.5	617.0	428.3	-	-
young II class of age	144.8	307.2	302.5	305.9	310.1	322.9	858.2	721.3
middle-aged	177.2	179.7	181.6	227.1	225.6	366.2	365.4	349.4
maturing	229.8	191.9	187.0	178.2	174.5	173.4	170.9	203.4
mature and overmature	650.7	581.8	411.8	396.7	327.9	356.3	305.9	308.3
Deciduous softwood								
young I class of age	269.5	308.1	357.5	213.9	212.8	134.1	-	-
young II class of age	476.5	223.3	175.7	237.9	236.1	199.6	348.5	288.2
middle-aged	395.9	758.9	798.3	831.1	828.5	783.7	784.9	628.7
maturing	92.1	120.0	122.0	156.5	152.4	251.4	241.1	414.8
mature and overmature	305.2	302.6	224.7	235.0	176.6	265.3	205.2	448.7
16. Moscow Oblast								
Coniferous								
young I class of age	105.8	128.3	123.0	154.7	108.7	131.4	-	-
young II class of age	100.5	103.4	128.2	127.9	142.7	144.4	203.6	229.2
middle-aged	268.0	254.9	346.1	343.3	436.5	335.9	314.5	313.3
maturing	50.1	54.5	35.4	33.5	57.9	113.8	153.6	151.2
mature and overmature	6.3	4.9	4.7	3.6	7.2	32.3	60.6	52.7
Deciduous hardwood								
young I class of age	5.0	6.6	5.0	5.3	1.5	1.7	-	-

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	3.2	3.8	2.9	2.9	4.2	4.1	3.0	3.1
middle-aged	24.6	22.7	22.8	22.6	21.3	20.8	17.6	18.1
maturing	2.0	2.4	5.6	5.5	4.6	4.6	3.8	3.5
mature and overmature	2.8	2.6	5.3	4.9	5.2	5.0	6.5	6.7
Deciduous softwood								
young I class of age	55.9	61.4	17.6	21.4	24.7	24.1	-	-
young II class of age	145.3	150.3	61.4	53.5	24.7	24.5	45.7	47.6
middle-aged	396.9	376.1	454.0	454.6	464.5	453.0	403.4	403.3
maturing	118.4	115.6	105.1	102.8	116.2	111.6	142.5	140.7
mature and overmature	94.3	73.2	86.7	72.8	123.9	108.5	186.8	178.2
17. Orel Oblast								
Coniferous								
young I class of age	6.0	5.6	9.3	6.1	6.8	3.9	-	-
young II class of age	1.9	5.0	6.2	8.6	8.6	6.8	12.4	10.4
middle-aged	3.3	1.7	4.6	5.9	6.3	8.3	10.9	17.3
maturing	1.9	2.7	2.6	0.9	0.9	2.8	0.8	0.3
mature and overmature	0.5	1.1	0.7	0.5	0.3	1.4	0.0	
Deciduous hardwood								
young I class of age	20.3	10.5	16.2	7.6	8.9	4.7	-	-
young II class of age	5.1	16.2	16.4	7.6	7.6	8.2	14.2	10.4
middle-aged	14.3	12.7	12.7	26.4	27.4	26.6	27.9	31.9
maturing	1.7	3.0	3.2	3.5	3.4	3.5	3.1	0.3
mature and overmature	1.8	4.0	2.6	2.6	1.9	4.1	2.9	0.3
Deciduous softwood								
young I class of age	16.4	3.3	3.8	1.7	1.4	1.1	-	-
young II class of age	8.3	13.0	13.9	4.1	3.8	1.8	2.2	4.5
middle-aged	7.5	7.4	7.4	19.8	20.2	21.1	19.7	30.8
maturing	5.0	5.3	5.3	7.7	7.9	7.1	4.5	11.2
mature and overmature	2.7	6.4	3.6	5.9	3.9	7.1	10.7	7.1
18. Ryazan Oblast								
Coniferous								
young I class of age	95.8	93.8	70.2	96.0	68.9	86.5	-	-
young II class of age	70.5	84.0	104.6	103.4	84.6	87.3	120.8	135.9
middle-aged	83.1	78.5	87.9	87.3	103.2	102.6	110.1	111.3
maturing	36.0	38.6	37.4	36.2	53.1	51.3	58.2	57.2
mature and overmature	10.4	12.0	16.8	10.4	23.6	13.9	24.7	17.6
Deciduous hardwood								
young I class of age	22.0	20.8	8.5	11.5	4.6	6.7	-	-
young II class of age	14.1	19.7	13.3	13.1	10.3	10.4	9.8	11.1
middle-aged	37.7	41.2	51.0	50.2	41.9	42.3	36.2	36.5
maturing	9.8	9.6	9.7	9.3	11.3	11.3	14.0	14.0
mature and overmature	4.4	6.5	7.6	6.0	14.0	12.6	15.9	15.5
Deciduous softwood								

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	68.5	50.9	23.2	54.8	46.1	55.3	-	-
young II class of age	79.4	61.5	32.7	32.1	27.4	27.4	76.4	82.3
middle-aged	111.7	129.2	136.4	133.9	165.7	164.6	128.0	128.2
maturing	52.5	54.6	62.7	60.2	45.2	41.9	62.7	62.4
mature and overmature	28.5	26.4	38.7	26.0	34.9	25.0	61.0	58.1
19. Smolensk Oblast								
Coniferous								
young I class of age	55.7	60.4	86.7	105.4	135.9	128.2	-	-
young II class of age	57.8	65.2	69.5	62.3	61.6	62.9	213.1	143.6
middle-aged	54.7	75.6	89.2	97.2	97.2	103.6	115.0	86.8
maturing	44.6	48.1	46.3	44.3	43.0	67.8	65.3	78.2
mature and overmature	34.6	35.5	26.0	22.1	17.0	28.5	22.9	39.4
Deciduous hardwood								
young I class of age	2.0	0.7	0.7	0.9	0.8	0.2	-	-
young II class of age	1.1	1.1	0.6	1.4	1.1	1.2	1.4	0.3
middle-aged	0.5	0.7	0.9	0.7	0.8	1.5	1.5	2.0
maturing	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.3
mature and overmature	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.5
Deciduous softwood								
young I class of age	93.2	73.0	65.2	32.0	35.8	10.9	-	-
young II class of age	77.3	133.2	109.4	67.7	65.0	21.9	41.4	40.6
middle-aged	88.0	159.6	215.5	296.3	296.0	278.2	311.0	264.5
maturing	57.3	68.3	62.8	55.1	53.7	73.5	71.5	117.4
mature and overmature	81.6	108.4	88.4	77.0	59.2	92.2	75.9	160.5
20. Tula Oblast								
Coniferous								
young I class of age	8.6	8.8	11.7	15.4	9.3	12.7	-	-
young II class of age	1.0	1.7	4.8	4.7	7.3	8.0	16.6	20.1
middle-aged	2.2	2.5	4.1	3.9	5.2	5.0	7.9	8.0
maturing	2.7	2.3	1.0	0.9	1.9	2.1	2.2	2.2
mature and overmature	1.7	1.1	0.1	0.0	0.4	0.5	1.2	1.3
Deciduous hardwood								
young I class of age	24.8	28.3	26.8	32.5	20.3	24.4	-	-
young II class of age	15.4	17.6	21.1	21.0	16.7	16.7	30.8	36.0
middle-aged	34.1	35.8	52.8	53.1	51.4	51.6	51.5	52.6
maturing	9.3	9.1	5.2	5.4	7.1	7.0	8.6	8.4
mature and overmature	6.1	6.3	3.9	3.1	5.8	5.1	7.6	7.8
Deciduous softwood								
young I class of age	7.0	8.0	2.8	4.3	3.5	3.5	-	-
young II class of age	16.6	18.2	9.0	9.0	6.0	6.5	8.4	9.4
middle-aged	28.8	30.5	39.6	39.8	50.3	49.2	52.7	61.0
maturing	32.3	31.5	27.6	27.5	18.3	18.3	14.1	13.6
mature and overmature	35.8	26.3	25.5	18.6	38.2	31.7	41.9	40.4

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
21. Yaroslavl Oblast								
Coniferous								
young I class of age	61.4	62.8	66.1	108.1	94.7	121.3	-	-
young II class of age	36.0	53.5	60.0	60.8	57.5	57.8	152.2	170.7
middle-aged	85.2	79.0	87.3	86.7	95.2	94.8	86.2	85.9
maturing	38.1	43.4	44.9	44.5	55.6	54.2	55.6	55.5
mature and overmature	25.0	22.2	23.2	17.9	26.6	22.3	38.1	34.7
Deciduous hardwood								
young I class of age	0.1	0.3	0.1	0.1	0.0	0.0	-	-
young II class of age	0.5	0.5	0.3	0.3	0.2	0.2		
middle-aged	2.3	2.3	1.7	1.6	2.0	2.0	0.3	0.3
maturing	0.1	0.1	0.7	0.7	0.1	0.1	0.2	0.2
mature and overmature	0.0	0.0	0.1	0.1	0.0	0.0	1.2	1.2
Deciduous softwood								
young I class of age	92.8	66.9	22.6	30.7	14.7	15.9	-	-
young II class of age	136.6	97.3	55.8	54.6	27.9	26.4	28.2	28.7
middle-aged	134.1	265.1	266.3	264.5	275.7	275.3	209.8	210.0
maturing	63.7	72.9	78.7	76.7	88.7	86.5	125.6	125.6
mature and overmature	99.8	51.5	95.6	75.7	87.8	69.9	154.5	147.7
22. Nizhni Novgorod Oblast								
Coniferous								
young I class of age	398.9	371.4	440.5	379.5	520.5	409.5	-	-
young II class of age	173.3	266.0	258.6	313.5	312.4	338.2	808.6	700.7
middle-aged	239.4	251.5	217.3	267.8	264.4	322.3	323.2	470.6
maturing	205.7	188.4	138.9	145.0	134.4	157.8	149.7	146.2
mature and overmature	285.3	231.3	128.7	130.8	98.2	140.0	115.7	93.1
Deciduous hardwood								
young I class of age	26.1	18.7	23.5	9.2	10.4	3.0	-	-
young II class of age	14.8	20.4	20.2	13.5	13.1	6.0	9.8	4.3
middle-aged	29.4	43.2	43.2	51.2	50.4	39.6	40.0	29.8
maturing	4.6	3.6	3.5	8.3	7.9	11.6	11.5	8.5
mature and overmature	8.5	8.0	6.4	9.9	9.2	13.0	12.2	14.1
Deciduous softwood								
young I class of age	400.5	313.8	325.2	307.6	385.8	252.6	-	-
young II class of age	246.2	246.1	218.4	226.3	223.3	163.4	452.3	330.1
middle-aged	257.5	343.3	365.5	488.5	484.2	536.7	550.9	631.0
maturing	131.8	131.2	113.3	139.2	127.7	178.2	163.5	205.5
mature and overmature	245.0	238.6	141.7	157.8	112.3	175.6	132.0	204.9
23. Kirov Oblast								
Coniferous								
young I class of age	352.9	525.0	705.0	788.5	764.6	770.5	-	-
young II class of age	258.3	356.0	436.1	427.9	440.5	414.8	1080.0	1308.7

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
middle-aged	524.6	477.2	480.7	559.2	587.8	635.2	645.1	666.8
Maturing	569.4	454.7	326.5	309.5	287.7	270.8	273.8	282.9
mature and overmature	1399.9	1310.9	1186.6	1022.6	994.1	968.3	969.8	913.6
Deciduous hardwood								
young I class of age	0.3	1.0	0.9	1.0	0.0	0.0	-	-
young II class of age	0.2	0.3	0.2	0.2	0.0	0.0	0.0	0.0
middle-aged	1.7	1.7	2.5	2.4	1.4	1.3	1.1	1.1
maturing	0.3	0.4	0.6	0.2	0.4	0.3	0.4	0.4
mature and overmature	1.5	1.4	1.6	1.8	2.5	2.5	2.3	2.1
Deciduous softwood								
young I class of age	338.3	630.4	580.1	614.5	480.5	373.0	-	-
young II class of age	499.3	357.4	244.2	361.9	434.1	462.8	767.9	772.8
middle-aged	453.7	591.8	746.9	749.4	804.7	875.2	978.0	985.3
maturing	84.3	105.0	142.6	154.8	205.2	206.5	250.6	250.0
mature and overmature	740.2	751.7	689.6	613.7	582.3	548.7	590.5	548.9
24. Republic of Marii El								
Coniferous								
young I class of age	149.0	163.9	111.1	132.4	182.0	153.3	-	-
young II class of age	112.7	131.3	120.4	125.8	126.4	118.8	291.5	236.4
middle-aged	95.0	78.5	114.8	136.7	136.4	167.1	161.4	191.0
maturing	78.0	73.6	58.4	60.1	58.9	60.9	58.3	71.7
mature and overmature	153.4	145.6	80.7	75.1	63.5	80.4	70.6	55.1
Deciduous hardwood								
young I class of age	1.5	1.7	2.2	1.8	0.7	0.5	-	-
young II class of age	1.7	2.6	1.6	1.0	0.8	0.4	1.1	0.8
middle-aged	6.7	5.3	6.2	7.2	6.9	3.6	3.7	4.2
maturing	1.3	1.8	2.2	2.1	1.9	1.7	1.7	1.6
mature and overmature	4.8	7.1	4.2	3.6	3.3	5.3	5.1	3.0
Deciduous softwood								
young I class of age	105.9	106.4	48.1	96.0	115.2	108.6	-	-
young II class of age	60.3	62.7	71.2	68.9	62.7	39.8	150.3	137.2
middle-aged	133.8	126.4	174.2	192.6	191.1	206.1	204.0	220.1
maturing	33.2	44.2	36.9	38.1	35.3	55.7	51.6	71.3
mature and overmature	101.6	115.2	83.9	78.8	65.3	83.1	69.3	108.3
25. Republic of Mordovia								
Coniferous								
young I class of age	56.6	52.6	76.5	55.7	78.3	50.5	-	-
young II class of age	20.4	36.6	31.9	44.6	48.0	50.9	114.0	87.0
middle-aged	22.7	24.9	23.7	21.9	21.9	37.3	37.4	59.9
maturing	17.7	17.7	15.6	18.7	17.9	17.2	15.8	15.7
mature and overmature	6.3	12.3	6.0	10.2	6.6	7.2	4.7	5.8
Deciduous hardwood								
young I class of age	41.0	21.2	28.1	13.6	18.4	12.2	-	-

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	25.2	29.0	29.1	16.9	17.0	9.8	24.8	17.5
middle-aged	38.7	37.2	36.9	47.6	47.5	49.1	-20.1	37.2
maturing	11.8	16.4	14.2	11.5	10.9	8.3	77.0	9.2
mature and overmature	9.9	16.7	8.8	17.8	13.5	11.3	9.7	11.5
Deciduous softwood								
young I class of age	83.2	32.3	43.0	56.1	65.1	53.7	-	-
young II class of age	73.4	41.6	40.2	30.6	30.6	28.6	89.9	80.9
middle-aged	65.5	94.4	91.3	109.0	108.4	120.3	120.8	118.4
maturing	33.7	41.5	35.8	33.1	30.2	34.0	30.3	54.0
mature and overmature	11.0	36.7	16.1	29.5	18.3	33.8	22.9	43.4
26. Chuvash Republic								
Coniferous								
young I class of age	49.3	38.2	59.1	52.6	70.3	59.3	-	-
young II class of age	20.2	32.9	28.9	29.1	28.6	38.0	108.0	106.7
middle-aged	28.7	21.3	20.5	29.1	28.2	39.7	39.5	42.3
maturing	12.6	9.7	9.0	10.0	9.7	11.5	12.0	14.9
mature and overmature	23.5	33.1	21.4	19.9	13.9	9.7	7.7	6.8
Deciduous hardwood								
young I class of age	38.4	40.5	53.2	23.7	27.6	15.2	-	-
young II class of age	32.2	34.0	33.0	38.8	38.1	28.2	45.8	32.6
middle-aged	43.7	43.5	43.0	53.9	52.1	65.5	65.2	62.2
maturing	3.3	5.3	4.8	5.2	4.7	5.3	4.8	5.2
mature and overmature	18.8	19.2	15.1	12.3	9.8	8.6	9.1	6.0
Deciduous softwood								
young I class of age	64.8	57.6	62.1	51.4	62.2	50.8	-	-
young II class of age	32.9	32.1	30.6	45.4	44.8	24.9	83.1	73.9
middle-aged	60.9	60.9	59.4	68.5	67.0	91.0	91.1	94.0
maturing	35.8	34.2	30.5	34.1	32.7	31.5	27.2	33.5
mature and overmature	47.5	59.1	32.1	47.5	31.9	44.5	33.6	53.8
27. Belgorod Oblast								
Coniferous								
young I class of age	8.0	9.6	13.5	11.0	11.2	5.1	-	-
young II class of age	2.9	3.8	3.8	7.5	7.5	11.3	16.7	11.8
middle-aged	1.1	1.2	1.2	3.0	2.9	5.3	5.2	7.4
maturing	0.1	0.1	0.1	0.3	0.3	0.6	0.6	0.0
mature and overmature	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Deciduous hardwood								
young I class of age	42.9	29.2	37.8	18.4	19.9	10.4	-	-
young II class of age	46.1	53.5	53.4	34.5	34.7	24.6	36.9	24.4
middle-aged	64.4	68.8	68.6	95.3	95.5	114.3	114.5	135.8
maturing	7.7	11.0	9.5	17.6	17.2	14.4	14.3	8.1
mature and overmature	5.6	4.4	3.3	6.2	4.3	8.0	5.9	3.8
Deciduous softwood								

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	2.7	2.0	2.4	2.3	2.1	1.1	-	-
young II class of age	1.1	2.1	2.0	1.6	1.8	1.3	2.6	2.2
middle-aged	1.5	1.1	1.0	2.3	2.5	6.6	6.4	5.8
maturing	1.9	2.5	2.1	0.9	1.1	0.8	0.8	1.7
mature and overmature	0.9	1.0	0.7	2.1	1.8	1.3	1.3	1.5
28. Voronezh Oblast								
Coniferous								
young I class of age	42.1	55.7	51.5	57.5	23.7	26.6	-	-
young II class of age	16.7	17.0	27.9	27.9	48.4	47.4	58.4	61.1
middle-aged	10.3	12.7	16.2	16.4	24.1	24.2	36.3	38.8
maturing	2.8	0.9	1.5	1.5	4.8	4.7	5.1	3.1
mature and overmature	1.0	0.3	0.8	0.8	1.7	1.4	2.4	0.6
Deciduous hardwood								
young I class of age	24.0	30.6	23.7	32.2	18.1	23.3	-	-
young II class of age	40.6	39.8	27.0	26.5	26.3	26.1	35.5	42.2
middle-aged	75.4	76.2	88.0	87.5	102.5	102.1	104.8	124.7
maturing	27.6	24.2	22.4	20.9	20.1	18.5	21.1	8.9
mature and overmature	14.7	9.3	17.2	12.1	11.5	8.5	19.6	9.2
Deciduous softwood								
young I class of age	4.4	7.4	9.1	13.7	8.2	12.1	-	-
young II class of age	5.5	5.5	4.2	4.4	8.3	8.3	16.9	20.8
middle-aged	8.8	8.6	12.2	11.8	11.5	11.1	16.9	20.9
maturing	11.8	10.8	7.2	6.1	7.6	6.9	5.8	4.7
mature and overmature	10.0	5.7	8.3	4.9	8.0	5.4	11.3	6.4
29. Kursk Oblast								
Coniferous								
young I class of age	4.5	4.1	7.5	10.3	8.5	9.9	-	-
young II class of age	2.1	3.1	4.5	6.1	6.7	7.9	15.6	16.9
middle-aged	1.6	2.0	2.2	2.7	4.6	4.6	6.9	6.8
maturing	0.3	0.1	0.1	0.2	0.0	0.0	0.4	0.5
mature and overmature	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Deciduous hardwood								
young I class of age	50.4	38.6	30.6	36.2	13.9	15.6	-	-
young II class of age	23.3	35.5	35.1	36.0	27.1	27.0	33.5	34.9
middle-aged	34.9	36.4	56.8	57.2	84.6	84.0	87.0	88.2
maturing	6.2	5.5	5.0	4.0	8.2	8.4	12.9	11.3
mature and overmature	2.6	2.0	2.1	1.5	2.4	1.8	4.1	3.8
Deciduous softwood								
young I class of age	10.8	8.4	5.4	8.4	2.3	3.3	-	-
young II class of age	4.6	7.0	6.7	7.3	6.4	6.2	3.9	4.5
middle-aged	6.4	4.8	8.5	8.4	13.8	13.6	17.0	17.2
maturing	4.3	5.6	4.1	3.8	5.5	5.3	6.5	6.4
mature and overmature	1.4	3.2	4.0	2.7	3.8	2.8	7.1	5.7

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
30. Lipetsk Oblast								
Coniferous								
young I class of age	15.8	19.4	21.4	13.0	17.3	6.8	-	-
young II class of age	12.3	14.4	15.1	17.6	17.9	19.9	22.3	24.0
middle-aged	5.0	7.0	8.6	15.6	16.1	22.9	26.6	28.9
maturing	4.8	4.3	3.8	4.0	4.0	3.0	3.8	1.2
mature and overmature	3.0	2.4	1.5	2.0	1.2	1.1	1.2	0.1
Deciduous hardwood								
young I class of age	19.7	10.5	14.1	5.5	5.6	1.9	-	-
young II class of age	8.6	15.8	14.7	12.8	12.7	10.1	9.4	10.4
middle-aged	23.1	26.7	27.6	33.3	33.8	36.3	39.7	43.3
maturing	3.5	4.4	4.1	5.5	5.3	6.2	5.1	3.8
mature and overmature	1.5	1.3	1.1	2.8	1.9	3.9	4.4	1.1
Deciduous softwood								
young I class of age	5.7	3.3	5.3	4.8	4.6	2.5	-	-
young II class of age	3.9	4.0	4.2	3.7	3.6	4.1	6.2	8.1
middle-aged	6.0	6.5	6.3	8.4	9.0	13.4	12.6	16.5
maturing	6.8	8.3	6.5	5.9	5.8	4.2	4.5	3.2
mature and overmature	5.3	3.8	3.7	6.7	5.1	5.8	6.3	2.9
31. Tambov Oblast								
Coniferous								
young I class of age	33.1	44.0	41.1	49.3	35.9	44.3	-	-
young II class of age	22.8	23.8	32.4	32.5	29.8	29.6	63.6	71.0
middle-aged	18.4	26.3	28.4	27.9	37.2	36.9	48.0	47.9
maturing	18.7	14.6	13.8	13.6	17.0	16.9	15.7	15.4
mature and overmature	17.9	11.4	8.4	5.1	12.9	9.6	8.7	7.6
Deciduous hardwood								
young I class of age	9.8	10.8	5.0	6.6	4.6	6.3	-	-
young II class of age	11.4	12.6	7.3	7.0	5.7	6.1	13.2	15.3
middle-aged	26.3	25.8	34.0	34.0	29.3	29.2	34.0	32.1
maturing	5.7	5.1	6.8	6.3	7.6	7.2	3.4	3.5
mature and overmature	4.6	4.6	4.0	2.4	7.0	5.1	3.5	2.8
Deciduous softwood								
young I class of age	13.9	20.6	13.5	28.9	16.6	23.9	-	-
young II class of age	17.5	18.1	10.9	10.8	13.4	13.1	30.6	31.9
middle-aged	18.7	21.0	29.7	29.9	33.9	33.8	39.5	38.2
maturing	26.5	24.4	20.7	19.7	18.0	17.3	16.5	16.2
mature and overmature	24.1	15.0	21.3	14.8	20.9	14.4	19.7	16.3
32. Astrakhan Oblast								
Deciduous hardwood								
young I class of age	3.3	4.4	5.1	0.8	2.3	0.3	-	-
young II class of age	0.6	2.3	2.2	1.1	1.2	1.1	2.9	3.8

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
средневозрастные	1.2	1.4	1.8	3.0	3.2	4.5	4.2	4.3
Maturing	0.3	0.2	0.5	2.2	2.0	2.2	2.3	2.3
mature and overmature	0.4	0.5	0.3	2.6	2.1	4.0	3.9	4.0
Deciduous softwood								
young I class of age	5.7	7.0	15.1	5.6	8.5	1.0	-	-
young II class of age	3.8	4.4	6.6	8.4	8.8	2.7	6.7	9.5
middle-aged	11.4	7.6	6.9	9.6	9.9	9.0	9.0	8.9
maturing	14.0	10.7	8.9	5.2	5.3	7.4	7.3	7.4
mature and overmature	19.1	25.1	17.5	22.5	21.8	26.8	25.5	24.3
33. Volgograd Oblast								
Coniferous								
young I class of age	4.0	4.5	17.0	19.8	24.0	21.9	-	-
young II class of age	3.0	1.8	2.0	3.6	5.4	12.7	41.8	48.7
middle-aged	2.7	3.2	3.2	2.7	2.7	5.0	4.7	7.8
maturing	0.2	2.4	2.2	1.8	1.7	0.1	0.1	
mature and overmature	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Deciduous hardwood								
young I class of age	52.7	36.1	55.8	26.3	40.1	32.9	-	-
young II class of age	26.9	35.7	39.6	28.4	27.6	39.8	83.7	51.3
middle-aged	71.0	58.4	67.5	62.1	60.3	88.1	85.6	121.0
maturing	27.2	37.5	33.2	35.7	32.7	25.2	23.9	35.6
mature and overmature	11.0	28.7	13.9	52.3	44.7	21.0	17.8	26.6
Deciduous softwood								
young I class of age	10.9	10.2	18.9	8.2	10.6	4.5	-	-
young II class of age	5.6	3.7	4.6	7.5	7.5	5.4	13.7	6.4
middle-aged	9.6	7.6	7.6	11.5	12.1	14.9	15.0	14.8
maturing	10.2	6.7	6.3	5.0	4.7	9.3	9.7	9.6
mature and overmature	11.5	18.1	11.5	23.2	21.2	25.4	22.5	34.7
34. Samara Oblast								
Coniferous								
young I class of age	19.2	25.4	39.7	43.1	44.5	26.6	-	-
young II class of age	4.7	7.7	10.8	11.6	13.8	22.0	50.8	41.9
middle-aged	6.6	9.6	12.6	12.4	11.7	17.1	17.8	22.8
maturing	7.2	7.7	5.6	5.4	5.7	5.8	5.6	5.0
mature and overmature	14.8	15.0	13.5	12.7	11.4	10.8	10.5	8.6
Deciduous hardwood								
young I class of age	45.6	27.6	23.5	22.3	24.3	11.2	-	-
young II class of age	34.0	54.5	38.5	18.1	17.1	15.7	28.3	18.9
middle-aged	103.9	95.5	110.2	133.8	130.0	101.9	94.0	86.3
maturing	27.2	34.2	33.5	35.0	28.7	33.1	37.9	30.4
mature and overmature	18.2	20.7	21.4	20.0	11.3	31.9	32.9	35.1
Deciduous softwood								
young I class of age	50.6	47.9	43.1	46.2	53.0	40.6	-	-

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	40.5	37.6	35.6	37.5	34.3	36.8	82.8	56.5
middle-aged	57.3	68.0	82.0	90.2	87.6	105.8	99.8	135.9
maturing	41.8	48.3	39.0	34.3	28.2	35.1	35.1	39.7
mature and overmature	36.0	52.9	38.8	33.2	20.1	29.1	30.6	41.9
35. Penza Oblast								
Coniferous								
young I class of age	62.9	62.0	92.8	118.1	70.4	92.0	-	-
young II class of age	32.1	43.1	50.4	52.4	60.9	59.7	125.3	140.6
middle-aged	33.2	42.5	43.9	45.2	61.0	59.0	61.9	60.3
maturing	29.7	29.6	30.0	29.9	32.2	30.6	30.0	29.4
mature and overmature	21.1	21.1	22.4	18.0	21.9	15.4	22.2	17.8
Deciduous hardwood								
young I class of age	41.4	31.9	16.3	15.8	5.4	7.4	-	-
young II class of age	53.6	48.3	27.2	22.6	12.6	12.6	12.4	15.2
middle-aged	113.2	126.3	132.1	130.6	114.4	113.8	96.7	84.6
maturing	30.5	22.9	26.2	26.3	28.1	27.7	20.4	30.0
mature and overmature	15.5	15.8	19.2	19.5	32.1	24.5	42.5	41.0
Deciduous softwood								
young I class of age	63.6	54.7	44.9	55.7	49.6	64.3	-	-
young II class of age	45.6	49.9	51.5	48.0	45.9	44.7	92.2	100.7
middle-aged	85.9	100.7	118.7	124.6	152.6	145.1	153.3	151.8
maturing	56.0	51.2	50.4	49.9	48.9	46.3	56.3	56.1
mature and overmature	42.8	49.2	55.0	47.8	68.0	46.4	69.7	61.8
36. Saratov Oblast								
Coniferous								
young I class of age	8.0	9.1	14.2	14.9	15.6	20.3	-	-
young II class of age	3.4	3.7	4.7	6.1	8.2	9.7	35.9	34.7
middle-aged	2.1	2.3	2.4	2.7	4.7	6.5	6.3	11.7
maturing	1.7	2.3	2.3	1.7	2.3	2.2	2.2	1.3
mature and overmature	1.3	1.8	2.1	2.4	0.5	0.8	0.8	0.6
Deciduous hardwood								
young I class of age	28.0	25.3	34.4	32.3	26.7	16.7	-	-
young II class of age	45.9	39.9	32.0	21.0	26.5	30.9	53.4	31.5
middle-aged	118.7	113.2	101.4	83.4	135.9	116.8	117.1	134.2
maturing	68.7	61.8	66.7	77.1	59.0	66.5	65.5	54.0
mature and overmature	24.5	28.5	42.7	65.1	26.3	39.9	35.3	45.4
Deciduous softwood								
young I class of age	7.6	5.3	11.3	11.8	12.7	9.9	-	-
young II class of age	14.1	11.2	9.3	6.2	9.5	11.4	24.7	17.8
middle-aged	25.4	23.2	22.3	18.7	37.1	39.7	39.6	51.3
maturing	20.6	21.0	21.2	20.8	13.7	16.2	15.6	12.8
mature and overmature	11.6	15.2	17.7	27.0	18.6	20.1	17.9	32.2

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
37. Ulyanovsk Oblast								
Coniferous								
young I class of age	80.6	75.2	88.1	120.9	80.6	108.3	-	-
young II class of age	39.7	55.7	61.8	61.7	71.6	72.0	179.7	184.8
middle-aged	39.1	36.2	62.0	61.7	86.8	86.3	106.7	125.7
maturing	41.5	43.1	37.5	36.9	37.6	36.7	33.2	30.7
mature and overmature	37.3	48.6	47.9	36.7	43.6	34.9	23.4	16.4
Deciduous hardwood								
young I class of age	44.2	23.4	7.1	12.5	6.4	8.1	-	-
young II class of age	43.8	34.3	15.5	15.5	5.6	5.9	11.3	9.3
middle-aged	94.1	94.9	91.9	91.6	66.6	67.1	54.0	46.8
maturing	32.4	36.8	40.0	39.5	30.4	29.4	27.7	26.5
mature and overmature	21.1	26.7	31.8	23.1	36.7	28.5	24.5	22.1
Deciduous softwood								
young I class of age	88.8	76.1	40.5	64.5	43.1	58.5	-	-
young II class of age	54.3	44.3	51.4	51.2	46.3	45.6	104.9	97.7
middle-aged	78.4	97.6	139.3	139.0	175.7	174.8	185.0	157.4
maturing	68.4	64.8	45.7	45.0	52.9	50.9	57.8	76.6
mature and overmature	68.8	77.1	69.9	50.1	59.9	41.9	46.2	79.5
38. Republic of Kalmykia								
Coniferous								
young I class of age	0.0	0.0	6.2	0.0	0.0	0.0	-	-
young II class of age	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
middle-aged	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
maturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
mature and overmature	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deciduous hardwood								
young I class of age	2.3	4.4	0.0	0.5	2.0	0.2	-	-
young II class of age	0.0	1.7	0.0	1.8	2.1	1.1	2.1	1.0
middle-aged	0.0	0.0	0.0	2.0	1.8	3.1	2.8	2.0
maturing	0.0	0.0	0.0	2.1	2.0	0.4	0.4	0.7
mature and overmature	0.0	0.0	0.0	0.3	0.2	1.6	1.3	3.1
Deciduous softwood								
young I class of age	0.0	0.1	0.3	0.2	0.3	0.0	-	-
young II class of age	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.3
middle-aged	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0
maturing	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.2
mature and overmature	0.1	0.5	0.2	0.2	0.1	0.2	0.2	0.3
39. Republic of Tatarstan								
Coniferous								
young I class of age	50.6	58.0	110.0	109.0	111.6	91.0	-	-
young II class of age	20.9	26.2	34.0	37.2	42.5	58.3	138.3	148.7

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
средневозрастные	26.2	24.1	22.6	28.8	39.5	45.8	53.6	56.9
Maturing	10.1	9.6	10.9	10.8	11.4	13.1	15.0	14.7
mature and overmature	14.6	15.1	11.4	8.3	6.3	6.6	7.7	7.9
Deciduous hardwood								
young I class of age	65.4	57.2	67.9	42.9	47.5	39.6	-	-
young II class of age	62.1	61.5	59.0	46.1	41.7	27.9	59.3	58.2
middle-aged	102.1	120.4	130.9	147.7	145.8	111.1	102.9	87.5
maturing	18.3	17.6	15.9	20.7	21.9	21.4	21.8	19.9
mature and overmature	29.6	30.9	26.3	25.8	22.0	16.2	14.7	16.4
Deciduous softwood								
young I class of age	134.9	118.0	145.2	78.5	87.8	64.5	-	-
young II class of age	82.9	56.9	50.8	86.1	81.4	74.9	140.0	130.3
middle-aged	160.8	152.3	164.6	176.5	179.1	224.8	230.3	224.6
maturing	85.7	92.9	82.4	80.3	79.3	84.5	97.2	122.5
mature and overmature	111.6	113.6	62.4	81.1	65.9	104.1	103.5	132.4
40. Krasnodar Kray*								
Coniferous								
young I class of age	1.5	4.3	14.6	18.3	22.8	25.9	-	-
young II class of age	0.4	0.2	0.6	0.8	0.9	6.2	37.9	38.2
middle-aged	8.9	4.8	7.1	4.6	5.4	6.9	6.7	7.5
maturing	7.8	7.3	7.8	4.9	7.5	8.1	7.7	7.5
mature and overmature	66.6	35.3	32.9	33.4	29.8	40.1	40.8	40.3
Deciduous hardwood								
young I class of age	111.8	81.7	112.5	66.9	85.1	53.9	-	-
young II class of age	84.7	83.2	74.1	103.9	104.2	84.6	153.6	154.1
middle-aged	235.1	301.9	354.0	269.2	294.8	402.9	411.0	431.2
maturing	230.1	207.1	184.7	162.9	162.8	164.9	162.7	173.4
mature and overmature	457.2	441.2	374.5	501.6	450.6	449.3	430.6	411.6
Deciduous softwood								
young I class of age	11.8	8.6	11.2	5.8	6.0	4.4	-	-
young II class of age	11.1	11.6	8.5	9.5	9.5	7.0	13.0	13.8
middle-aged	16.2	11.7	11.7	14.6	15.7	19.0	19.8	22.1
maturing	6.2	10.0	9.8	10.1	9.6	9.0	9.5	9.9
mature and overmature	25.2	28.4	27.5	30.0	27.9	31.6	29.9	32.7
41. Stavropol Kray*								
Coniferous								
young I class of age	2.0	4.0	7.7	6.0	7.2	7.1	-	-
young II class of age	2.3	5.3	5.3	5.5	5.5	4.9	12.7	6.7
middle-aged	18.3	17.5	19.6	29.8	29.9	35.8	35.8	35.0
maturing	17.4	17.4	19.1	16.4	16.4	20.4	20.4	18.5
mature and overmature	42.3	42.7	45.8	42.9	42.9	39.6	39.5	48.5
Deciduous hardwood								

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	22.7	18.3	31.1	12.1	13.1	6.5	-	-
young II class of age	27.1	33.4	30.1	28.8	28.4	12.6	20.4	12.5
middle-aged	57.3	53.5	51.3	69.5	71.0	98.7	101.1	93.0
maturing	20.3	31.4	31.1	29.4	30.0	19.3	20.6	29.2
mature and overmature	46.2	49.9	48.5	52.5	50.9	58.6	59.0	65.8
Deciduous softwood								
young I class of age	10.8	5.3	8.1	3.2	3.8	2.1	-	-
young II class of age	15.3	10.3	10.5	5.1	5.1	3.3	6.2	3.0
middle-aged	28.2	27.9	27.7	32.2	33.1	48.5	39.9	31.0
maturing	12.7	23.8	25.1	22.4	22.2	21.1	30.1	24.1
mature and overmature	57.7	66.0	63.9	70.4	68.1	61.9	60.6	80.8
42. Rostov Oblast								
Coniferous								
young I class of age	5.5	12.1	28.8	37.2	39.9	45.4	-	-
young II class of age	2.3	2.3	10.8	10.6	16.8	15.9	63.9	63.6
middle-aged	2.3	3.0	2.8	2.9	3.3	3.3	5.4	5.2
maturing	0.3	0.3	1.0	1.2	0.0	0.0	0.2	0.0
mature and overmature	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Deciduous hardwood								
young I class of age	20.0	32.9	22.0	27.0	15.6	18.6	-	-
young II class of age	13.2	18.3	37.8	36.8	41.0	40.7	36.9	38.8
middle-aged	19.5	18.0	21.7	21.6	32.0	31.7	55.3	56.1
maturing	8.8	10.2	10.4	10.2	5.0	4.9	12.8	10.4
mature and overmature	4.9	4.4	9.3	6.7	5.2	4.0	9.2	6.5
Deciduous softwood								
young I class of age	2.7	4.2	4.2	6.7	1.6	3.0	-	-
young II class of age	0.9	1.2	3.6	3.3	2.5	2.4	3.4	4.1
middle-aged	4.3	3.8	5.1	4.8	10.2	10.0	9.1	9.0
maturing	2.7	2.2	3.0	2.6	3.1	2.8	3.3	3.1
mature and overmature	6.7	5.5	6.6	5.6	4.5	3.7	4.8	3.8
43. Republic of Daghestan								
Coniferous								
young I class of age	2.4	2.2	3.4	1.0	1.6	0.7	-	-
young II class of age	8.8	9.8	9.9	8.3	8.3	4.8	5.7	7.2
middle-aged	20.8	20.4	20.4	36.5	36.2	50.7	50.4	50.3
maturing	10.8	10.4	10.5	6.8	6.8	5.6	5.6	5.6
mature and overmature	10.4	11.7	11.6	5.0	5.0	2.4	2.4	2.4
Deciduous hardwood								
young I class of age	23.4	7.3	10.9	4.0	3.7	2.6	-	-
young II class of age	56.6	39.7	40.5	17.5	17.6	8.8	11.4	15.0
middle-aged	91.9	95.7	93.1	135.3	137.7	163.8	157.9	168.1
maturing	13.4	24.2	23.5	20.6	19.9	16.7	16.1	16.8
mature and overmature	10.5	21.6	19.3	17.4	16.8	11.1	10.9	11.1

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
Deciduous softwood								
young I class of age	2.3	2.1	2.8	1.3	1.2	0.7	-	-
young II class of age	10.2	7.3	7.4	4.4	4.6	1.5	2.3	2.4
middle-aged	31.4	26.7	26.6	30.0	29.7	42.1	42.2	41.5
maturing	13.0	14.5	14.4	13.3	13.3	11.5	11.5	11.4
mature and overmature	18.9	27.4	26.1	29.4	29.2	15.4	15.5	15.8
44. Kabardino-Balkarian Republic								
Coniferous								
young I class of age	0.2	0.3	0.3	0.3	0.3	0.1	-	-
young II class of age	0.2	0.3	0.4	0.7	0.6	0.4	0.6	0.6
middle-aged	3.7	3.8	3.8	3.3	2.6	2.0	2.0	2.6
maturing	1.4	1.7	1.7	1.3	1.2	1.0	1.0	0.9
mature and overmature	1.1	0.9	0.9	1.7	1.8	3.0	2.8	2.6
Deciduous hardwood								
young I class of age	7.6	7.7	9.3	2.5	4.0	1.9	-	-
young II class of age	9.1	12.9	11.2	6.6	7.0	3.8	6.0	6.5
middle-aged	13.4	18.7	18.6	34.5	34.8	39.2	39.3	40.1
maturing	8.3	13.2	13.9	7.6	8.8	7.3	7.3	7.3
mature and overmature	27.2	18.1	17.6	17.0	14.9	19.9	19.9	19.7
Deciduous softwood								
young I class of age	3.2	2.6	2.5	1.5	1.5	1.0	-	-
young II class of age	9.2	5.6	7.6	1.4	1.3	1.3	2.6	2.8
middle-aged	9.5	10.2	9.6	13.6	13.5	22.8	22.9	22.6
maturing	3.6	6.8	6.2	9.9	9.2	8.9	9.0	9.2
mature and overmature	14.2	15.6	15.4	19.1	18.3	11.5	11.1	11.3
45. Republic of North Ossetia								
Coniferous								
young I class of age	0.5	0.4	0.4	0.0	0.1	0.2	-	-
young II class of age	2.4	2.2	2.2	0.7	0.7	0.7	0.8	0.7
middle-aged	3.3	3.9	3.3	6.2	6.2	6.3	6.2	6.3
maturing	0.9	0.6	0.6	0.2	0.1	0.3	0.3	0.3
mature and overmature	0.7	1.1	0.5	0.0	0.0	0.0	0.1	0.1
Deciduous hardwood								
young I class of age	15.8	8.3	8.1	1.6	2.0	1.6	-	-
young II class of age	24.8	22.0	21.8	11.9	11.8	4.8	6.9	7.8
middle-aged	27.1	43.6	43.1	74.0	73.1	72.5	71.9	71.8
maturing	13.7	13.9	13.7	14.8	14.4	16.9	16.9	16.8
mature and overmature	43.7	37.5	37.4	24.4	23.2	31.4	31.8	31.7
Deciduous softwood								
young I class of age	2.6	0.9	1.0	0.4	0.5	0.1	-	-
young II class of age	7.3	3.3	3.2	1.1	1.1	0.8	1.0	1.3
middle-aged	10.2	14.9	14.0	15.5	15.7	13.3	13.5	13.2
maturing	3.7	3.6	3.3	6.5	6.1	7.1	7.2	7.5

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
mature and overmature	6.2	5.3	4.3	6.4	6.4	7.2	7.2	7.3
46. Chechen Republic and Republic of Ingushetia*								
Coniferous								
young I class of age	0.7	0.8	0.1	0.1	0.1	0.1	-	-
young II class of age	0.9	0.7	1.3	1.4	1.5	1.3	1.3	1.4
middle-aged	3.3	4.5	5.9	5.9	6.0	5.6	5.6	5.7
maturing	1.4	1.5	0.4	0.4	0.4	0.7	0.7	0.7
mature and overmature	0.9	0.3	0.0	0.0	0.0	0.1	0.1	0.1
Deciduous hardwood								
young I class of age	35.6	16.6	11.3	10.7	6.0	3.9	-	-
young II class of age	48.9	58.1	45.4	33.8	21.8	14.6	19.6	23.3
middle-aged	34.8	62.7	115.6	133.4	150.9	143.3	149.5	165.8
maturing	27.2	30.1	26.2	24.6	25.6	17.9	18.2	25.1
mature and overmature	83.5	60.3	38.8	35.1	36.4	28.4	29.2	38.6
Deciduous softwood								
young I class of age	4.0	0.6	1.6	1.9	1.2	0.3	-	-
young II class of age	10.4	12.0	4.1	4.4	3.3	3.6	3.9	3.9
middle-aged	11.9	21.0	38.8	38.3	40.2	41.2	41.5	43.2
maturing	7.9	8.7	7.6	8.1	8.9	7.0	7.0	8.7
mature and overmature	24.9	18.3	12.4	12.3	11.0	8.4	8.4	11.4
47. Kurgan Oblast								
Coniferous								
young I class of age	99.2	79.3	149.0	119.4	145.5	94.0	-	-
young II class of age	24.8	56.1	56.0	83.3	86.2	108.7	182.7	194.2
middle-aged	61.7	53.6	53.4	53.4	53.5	81.6	96.8	135.7
maturing	40.8	52.4	49.8	47.8	47.0	38.1	51.0	32.0
mature and overmature	36.8	38.2	24.5	35.3	24.8	39.9	34.2	17.4
Deciduous softwood								
young I class of age	117.7	90.7	117.5	36.7	59.7	40.6	-	-
young II class of age	84.9	97.4	102.2	82.3	81.6	50.9	78.9	97.3
middle-aged	89.8	129.0	156.1	261.0	264.4	344.0	265.5	470.5
maturing	84.9	84.1	80.4	71.0	61.7	72.5	147.5	103.8
mature and overmature	140.6	129.4	65.9	70.7	45.9	35.2	43.9	50.7
48. Orenburg Oblast								
Coniferous								
young I class of age	8.3	14.1	19.8	20.9	18.5	15.5	-	-
young II class of age	2.1	2.6	3.7	6.1	12.1	14.1	34.5	32.9
middle-aged	6.0	6.2	6.3	7.1	8.7	9.2	10.9	14.5
maturing	3.1	3.5	2.4	2.2	2.6	2.9	2.5	2.0
mature and overmature	9.2	8.8	9.8	9.5	8.5	8.6	9.6	9.6
Deciduous hardwood								
young I class of age	29.4	21.8	32.8	12.8	19.3	13.6	-	-

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	28.1	20.0	19.9	21.4	21.3	17.3	38.7	29.2
middle-aged	79.5	100.4	96.7	70.7	72.7	58.6	60.6	66.2
maturing	18.0	17.6	14.6	32.3	31.0	39.1	42.5	33.7
mature and overmature	7.6	10.8	11.1	22.7	19.0	24.3	26.7	22.3
Deciduous softwood								
young I class of age	28.3	19.1	33.7	16.3	23.5	13.0	-	-
young II class of age	26.0	19.0	18.5	19.2	19.7	16.9	37.0	22.1
middle-aged	35.5	40.8	42.6	44.8	49.1	57.7	57.4	85.6
maturing	26.3	35.2	32.2	36.3	35.6	28.4	31.7	35.7
mature and overmature	17.1	32.0	24.9	55.7	49.4	59.9	63.4	72.3
49. Perm Oblast*								
Coniferous								
young I class of age	380.2	671.4	1129.9	1540.7	1245.5	1591.0	-	-
young II class of age	174.4	213.7	439.7	467.1	781.3	865.3	2224.4	2225.3
middle-aged	511.0	507.5	541.4	572.7	630.3	621.0	695.2	838.6
maturing	610.1	567.1	426.1	421.0	423.0	398.1	349.1	327.6
mature and overmature	4739.0	4240.1	3973.9	3387.4	3135.0	2844.0	2515.1	2385.0
Deciduous hardwood								
young I class of age	0.0	0.0	0.4	0.8	0.3	0.1	-	-
young II class of age	0.0	0.0	0.1	0.1	0.2	0.4	0.9	0.7
middle-aged	0.3	0.3	0.3	0.2	0.7	0.6	0.3	0.3
maturing	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0
mature and overmature	0.8	0.8	0.6	0.5	0.4	0.6	0.0	0.0
Deciduous softwood								
young I class of age	382.9	549.5	809.5	781.9	496.5	467.7	-	-
young II class of age	331.6	336.7	366.5	455.2	707.0	633.6	1056.5	1051.7
middle-aged	292.0	332.6	524.6	593.1	859.3	926.0	1249.1	1397.8
maturing	118.7	133.9	129.7	132.0	148.5	178.8	227.0	296.4
mature and overmature	1024.8	978.7	797.1	699.6	591.4	586.3	640.9	679.4
50. Sverdlovsk Oblast*								
Coniferous								
young I class of age	824.1	933.8	1004.6	1344.6	1142.6	1420.2	-	-
young II class of age	334.5	396.4	760.5	803.7	896.3	930.2	1901.5	2035.6
middle-aged	708.1	810.7	1256.5	1272.9	1419.5	1399.6	1665.8	1726.6
maturing	758.2	706.8	723.3	723.9	717.9	675.9	754.6	761.5
mature and overmature	3861.9	3449.2	2968.0	2710.7	2617.3	2546.3	2343.9	2234.1
Deciduous hardwood								
young I class of age	0.0	0.0	0.1	0.2	0.0	0.1	-	-
young II class of age	0.0	0.2	0.3	0.0	0.0	0.0	0.1	0.1
middle-aged	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
maturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
mature and overmature	0.4	0.4	0.3	0.3	0.3	0.0	0.0	0.0
Deciduous softwood								

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	694.6	843.7	768.1	811.0	599.6	604.8	-	-
young II class of age	677.5	635.3	454.5	484.1	602.8	606.8	972.9	1004.6
middle-aged	682.1	740.5	1177.4	1173.9	1409.8	1486.6	1742.0	1824.7
maturing	278.9	271.8	247.6	257.5	304.3	301.1	468.6	497.6
mature and overmature	1553.5	1377.7	1084.9	923.4	811.5	713.8	891.0	879.0
51. Chelyabinsk Oblast								
Coniferous								
young I class of age	88.1	93.7	181.2	158.6	203.4	122.2	-	-
young II class of age	67.1	74.5	76.5	98.0	99.3	135.3	292.0	291.1
middle-aged	87.7	169.6	175.5	197.9	204.2	228.4	241.1	288.8
maturing	102.6	97.2	98.6	97.5	95.2	103.1	99.9	91.1
mature and overmature	230.1	193.4	182.7	176.0	156.9	162.8	132.4	104.8
Deciduous hardwood								
young I class of age	1.3	4.9	4.1	1.5	2.6	2.8	-	-
young II class of age	1.5	1.4	1.7	2.6	2.6	3.0	6.4	6.9
middle-aged	3.8	5.1	9.3	18.2	18.1	12.1	14.8	14.5
maturing	3.4	2.1	3.6	5.0	5.1	3.4	4.0	3.9
mature and overmature	12.9	12.3	12.5	11.4	10.4	14.5	11.1	11.0
Deciduous softwood								
young I class of age	112.8	151.4	206.0	72.5	110.3	95.4	-	-
young II class of age	222.7	177.0	155.2	102.6	101.5	90.0	209.4	197.0
middle-aged	282.3	400.1	432.1	437.4	435.0	520.8	542.3	788.7
maturing	220.3	194.1	182.4	271.2	268.2	256.7	253.6	271.5
mature and overmature	364.3	325.0	310.5	366.9	323.6	344.7	297.3	271.1
52. Republic of Bashkortostan								
Coniferous								
young I class of age	84.4	119.7	248.9	309.3	318.8	342.5	-	-
young II class of age	63.9	61.2	71.9	79.6	94.5	133.3	426.5	503.8
middle-aged	221.4	209.0	167.7	180.1	180.5	172.5	190.5	199.0
maturing	194.0	190.2	241.7	247.7	247.0	240.6	193.2	190.1
mature and overmature	342.8	311.8	271.2	235.7	245.6	240.8	273.3	265.9
Deciduous hardwood								
young I class of age	64.5	48.8	32.4	17.5	15.1	11.8	-	-
young II class of age	93.9	68.1	53.1	32.0	23.9	15.6	23.7	22.2
middle-aged	259.9	304.0	297.8	292.8	252.9	190.1	147.3	114.6
maturing	58.7	69.9	55.3	62.7	75.5	74.0	67.6	59.5
mature and overmature	398.4	406.6	407.9	407.7	392.0	354.2	292.9	289.6
Deciduous softwood								
young I class of age	266.9	289.5	271.7	231.8	228.1	221.1	-	-
young II class of age	345.8	284.6	226.2	233.7	220.8	212.7	414.8	441.9
middle-aged	799.2	853.9	939.3	990.9	970.8	1005.5	992.2	898.6
maturing	447.8	473.6	425.1	415.5	437.7	445.8	479.4	509.7
mature and overmature	1114.9	1173.7	1239.5	1240.4	1262.6	1292.3	1384.0	1490.9

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
53. Udmurtian Republic								
Coniferous								
young I class of age	166.2	130.6	289.0	213.8	275.7	192.2	-	-
young II class of age	77.1	112.4	112.3	120.1	121.2	183.4	434.2	378.9
middle-aged	86.6	97.5	97.3	134.2	134.5	154.4	152.8	144.2
maturing	98.1	105.2	102.6	94.1	93.4	111.7	110.2	118.2
mature and overmature	390.4	317.6	226.5	206.7	170.3	160.1	135.3	132.9
Deciduous hardwood								
young I class of age	4.9	1.4	1.8	0.5	0.3	0.0	-	-
young II class of age	0.9	1.0	0.9	1.3	1.2	0.1	0.1	0.1
middle-aged	1.4	2.4	1.7	1.9	1.8	1.0	0.9	0.9
maturing	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.1
mature and overmature	0.2	1.1	0.9	0.7	0.8	0.6	0.5	0.5
Deciduous softwood								
young I class of age	225.6	129.6	145.1	71.6	72.2	47.1	-	-
young II class of age	118.4	11.2	109.2	122.6	122.1	70.0	114.0	86.4
middle-aged	135.4	220.0	218.1	303.9	303.5	323.3	325.4	342.6
maturing	22.6	54.5	53.5	77.1	71.2	120.1	130.3	131.6
mature and overmature	68.9	114.1	85.6	87.8	65.6	94.0	54.8	145.2
54. Altai Kray*								
Coniferous								
young I class of age	199.8	109.3	147.0	197.0	161.8	174.1	-	-
young II class of age	182.9	199.5	221.8	218.0	202.4	200.5	320.4	356.6
middle-aged	627.4	920.6	954.5	893.2	992.4	978.3	1162.0	1600.9
maturing	487.8	531.7	555.3	560.8	578.5	623.7	647.7	800.7
mature and overmature	1667.7	1719.4	1445.9	1500.5	1467.2	1440.7	1221.3	1456.0
Deciduous hardwood								
young I class of age	0.0	0.2	0.6	0.9	0.7	0.5	-	-
young II class of age	0.0	0.0	0.3	0.4	0.8	0.9	1.4	0.3
middle-aged	0.0	0.0	0.0	0.0	0.1	0.3	0.3	1.0
maturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
mature and overmature	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deciduous softwood								
young I class of age	97.2	46.2	145.0	174.1	153.2	149.1	-	-
young II class of age	110.8	94.4	144.1	144.4	136.6	111.7	226.3	196.7
middle-aged	299.2	297.8	357.7	346.8	407.0	459.2	431.6	534.4
maturing	169.5	254.2	250.6	246.3	266.6	278.1	261.1	336.7
mature and overmature	360.2	561.0	543.0	537.9	529.5	509.6	666.1	789.4
55. Kemerovo Oblast								
Coniferous								
young I class of age	32.5	53.0	196.2	201.9	345.7	500.0	-	-
young II class of age	60.6	91.2	123.2	131.4	170.2	173.3	354.0	460.2

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
middle-aged	307.6	303.4	421.3	484.0	541.7	538.8	579.1	596.1
Maturing	562.2	508.5	442.5	451.9	521.2	529.7	570.6	568.7
mature and overmature	1497.0	1443.2	1392.4	1324.3	1204.6	1124.1	951.4	896.5
Deciduous softwood								
young I class of age	26.9	53.9	154.1	162.6	265.5	261.7	-	-
young II class of age	67.6	70.5	104.3	118.3	166.1	164.5	351.2	368.1
middle-aged	153.5	204.8	223.6	219.7	321.2	317.2	537.6	536.3
maturing	177.2	212.4	191.3	184.7	219.9	218.0	255.5	252.8
mature and overmature	939.1	901.6	865.7	931.8	799.8	756.8	658.1	636.2
56. Novosibirsk Oblast								
Coniferous								
young I class of age	35.9	50.9	87.2	79.5	91.9	69.5	-	-
young II class of age	50.8	51.0	53.4	51.5	64.1	61.1	96.6	108.7
middle-aged	327.6	364.5	292.5	313.1	345.9	367.1	482.2	476.4
maturing	188.8	171.1	150.1	121.6	131.0	136.5	198.2	198.7
mature and overmature	280.3	243.3	267.9	267.4	244.1	244.8	194.8	193.3
Deciduous hardwood								
young I class of age	0.8	0.8	1.1	0.2	0.1	0.1	-	-
young II class of age	0.0	0.0	0.1	0.8	0.8	0.3	0.1	0.1
middle-aged	0.0	0.0	0.0	0.2	0.3	0.8	0.3	0.3
maturing	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
mature and overmature	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Deciduous softwood								
young I class of age	34.2	47.1	114.9	107.1	141.1	134.9	-	-
young II class of age	56.0	54.4	76.5	69.9	130.8	129.4	180.5	209.6
middle-aged	226.0	260.0	307.1	331.3	451.4	439.0	535.8	552.9
maturing	179.8	172.0	223.9	218.5	206.8	210.6	198.1	199.6
mature and overmature	614.9	615.8	619.4	619.6	555.2	584.7	699.6	695.3
57. Omsk Oblast								
Coniferous								
young I class of age	34.5	52.5	70.0	104.6	139.5	158.0	-	-
young II class of age	30.9	37.4	60.3	69.6	75.8	72.3	169.7	130.6
middle-aged	188.3	191.5	324.2	315.8	329.4	343.4	391.3	344.8
maturing	93.2	105.3	143.6	162.2	160.4	164.0	156.8	160.7
mature and overmature	394.9	381.0	269.5	290.5	267.6	260.6	245.6	292.1
Deciduous softwood								
young I class of age	42.4	105.0	98.8	103.5	95.7	97.1	-	-
young II class of age	94.9	83.5	64.8	96.1	101.2	97.9	193.4	205.6
middle-aged	336.6	283.5	262.2	250.3	286.2	280.3	325.4	285.1
maturing	217.9	196.1	233.1	222.2	205.7	203.4	207.1	164.9
mature and overmature	815.0	860.3	887.6	871.4	854.4	853.4	882.2	998.6

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
58. Tomsk Oblast								
Coniferous								
young I class of age	95.6	150.4	409.6	548.2	664.0	712.0	-	-
young II class of age	135.0	165.3	247.5	256.2	302.7	337.9	1000.9	1089.0
middle-aged	1013.5	1047.1	1295.6	1345.4	1596.4	1644.3	1912.7	2385.8
maturing	1323.6	1268.5	1631.5	1702.8	1686.6	1753.0	1887.0	2152.4
mature and overmature	6151.9	5695.8	5691.9	5812.0	5696.1	5660.8	5053.1	4433.2
Deciduous softwood								
young I class of age	91.9	151.7	517.0	529.4	363.7	329.6	-	-
young II class of age	141.7	138.9	208.1	307.3	465.9	428.8	673.4	874.3
middle-aged	1371.8	1201.1	1105.3	1231.9	1096.6	960.1	854.1	1090.3
maturing	1445.6	1331.0	672.2	633.2	630.3	545.4	329.5	253.9
mature and overmature	5030.3	5167.5	4933.9	4574.3	4476.7	4657.6	5053.3	4993.7
59. Tyumen Oblast*								
Coniferous								
young I class of age	177.8	430.1	623.0	998.2	1321.2	1415.4	-	-
young II class of age	376.4	447.1	600.2	639.2	716.5	937.3	2512.3	2970.6
middle-aged	2930.6	2949.6	4112.1	4145.9	4379.5	5847.4	10332.7	9920.8
maturing	3673.6	3549.1	5574.6	5120.9	5053.1	5313.3	6172.3	6257.9
mature and overmature	23874.8	24207.7	24186.1	22750.6	22232.9	20065.5	19047.8	19055.7
Deciduous softwood								
young I class of age	523.8	741.2	556.4	452.8	457.8	328.4	-	-
young II class of age	466.9	456.8	456.4	483.3	518.4	404.1	692.0	892.4
middle-aged	2183.7	2217.9	1961.6	1843.3	1846.3	1605.6	1577.3	1701.9
maturing	1571.9	1554.2	1012.1	882.7	879.0	759.7	768.9	779.6
mature and overmature	6707.2	6925.7	6308.2	5704.1	5689.1	5092.0	5488.0	5513.7
60. Krasnoyarsk Kray*								
Coniferous								
young I class of age	1009.1	1057.0	1603.6	1966.3	1982.1	2218.1	-	-
young II class of age	958.3	1175.8	1523.6	1780.0	1843.8	1904.2	7739.1	9099.0
middle-aged	9117.9	10029.5	9689.7	9856.9	10317.1	10234.0	11102.5	10832.9
maturing	6910.6	7213.1	6377.8	6501.2	7191.8	7042.7	7321.9	7213.6
mature and overmature	69613.2	67829.1	70421.2	73892.3	72944.7	72552.7	54766.1	54179.2
Deciduous softwood								
young I class of age	627.2	635.5	847.2	1017.5	975.2	1014.3	-	-
young II class of age	730.0	696.6	869.0	1287.7	1447.0	1422.6	2392.5	2571.2
middle-aged	4626.4	4723.1	3831.4	3789.5	4195.6	4239.7	3999.5	4186.0
maturing	2541.2	2513.4	2782.3	2773.5	2735.7	2757.2	1581.1	1563.5
mature and overmature	9981.9	9929.7	9318.2	8775.3	8329.2	7876.8	7804.9	8003.5
61. Irkutsk Oblast*								
Coniferous								
young I class of age	1162.0	1182.1	2083.3	2964.8	3175.7	3224.1	-	-

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	1328.6	2129.0	2225.1	2645.1	2831.4	2816.6	7023.2	7728.1
middle-aged	5508.3	6232.3	8014.7	9125.1	9258.7	9776.1	10792.2	10517.7
maturing	4247.2	4514.0	4405.3	4367.8	5037.6	4796.0	4578.3	4954.6
mature and overmature	32019.4	29919.0	28475.7	26462.4	25926.1	23418.3	21860.3	21527.0
Deciduous softwood								
young I class of age	1224.0	722.1	940.5	1147.7	985.7	902.6	-	-
young II class of age	1366.7	1048.8	951.0	1040.0	1051.0	892.9	3063.5	3295.2
middle-aged	2825.0	2723.9	2642.6	2556.3	2776.6	2612.0	2785.7	2851.8
maturing	767.4	1050.9	1122.7	927.8	894.0	829.1	892.6	933.9
mature and overmature	2433.8	2462.5	2643.9	2858.6	2595.7	2571.0	2962.8	3343.2
62. Chita Oblast*								
Coniferous								
young I class of age	659.0	956.3	1603.2	1815.7	1599.3	1410.9	-	-
young II class of age	706.3	858.0	964.3	1082.9	1584.9	2021.4	3130.6	3228.9
middle-aged	3823.9	3822.6	3963.0	4107.6	5389.4	5662.7	5996.6	5597.4
maturing	2998.2	2636.6	2334.5	2325.4	2625.1	2665.0	2395.8	2290.4
mature and overmature	11453.1	10716.1	10268.4	9631.0	8159.8	7382.6	7430.6	7828.9
Deciduous softwood								
young I class of age	259.5	655.3	716.3	632.6	705.0	821.2	-	-
young II class of age	209.4	609.1	1042.8	1167.7	1063.9	805.5	1488.8	1523.5
middle-aged	254.8	657.6	939.4	1059.9	1535.5	2059.7	2548.6	2588.7
maturing	209.6	363.3	378.7	404.6	401.5	366.7	393.4	418.1
mature and overmature	477.9	577.7	706.8	722.9	640.5	484.3	513.5	550.7
63. Republic of Buryatia								
Coniferous								
young I class of age	502.1	901.4	1177.1	1463.2	1351.2	1413.0	-	-
young II class of age	584.5	734.2	810.6	1322.3	1385.4	1431.7	2734.9	2759.1
middle-aged	1718.7	2332.8	3357.4	3780.4	3909.6	4519.4	4675.0	4741.6
maturing	1954.5	1890.1	2070.6	1357.3	1433.2	1682.8	1518.7	1622.8
mature and overmature	9816.4	8868.2	7679.0	7621.2	7425.3	6519.6	6245.6	6199.5
Deciduous softwood								
young I class of age	74.7	137.5	150.6	225.4	236.8	231.1	-	-
young II class of age	96.9	147.9	154.2	185.4	217.3	208.7	471.2	466.9
middle-aged	277.6	327.3	364.4	472.9	534.8	551.9	643.7	684.9
maturing	149.7	142.4	132.7	147.1	138.0	142.6	156.5	168.1
mature and overmature	373.9	390.9	376.2	376.1	326.7	277.0	317.1	332.1
64. Republic of Tuva								
Coniferous								
young I class of age	153.6	112.1	128.9	130.3	234.0	219.1	-	-
young II class of age	190.8	250.5	269.7	286.3	420.2	404.0	616.8	623.8
middle-aged	439.3	792.9	862.4	897.5	1291.3	1667.5	3524.1	2547.3
maturing	265.7	499.4	525.9	518.8	2237.0	2044.8	780.5	1728.9

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
mature and overmature	6547.7	5816.2	5730.3	5694.0	3347.5	3064.7	2460.2	2458.6
Deciduous softwood								
young I class of age	2.9	3.1	5.9	4.5	4.4	4.8	-	-
young II class of age	6.3	12.2	14.6	13.0	13.1	11.9	17.7	17.4
middle-aged	24.8	62.5	69.5	68.2	98.2	92.2	87.8	87.7
maturing	15.5	33.7	36.0	33.6	40.3	34.8	39.4	39.3
mature and overmature	123.7	143.1	147.1	170.8	133.7	127.3	131.0	130.5
65. Primorie Kray								
Coniferous								
young I class of age	73.0	37.0	134.5	137.0	105.6	124.8	-	-
young II class of age	193.0	137.7	150.0	153.7	159.3	165.8	254.3	209.5
middle-aged	421.2	378.1	529.7	637.9	1300.4	1288.0	2420.2	2359.8
maturing	495.8	524.0	551.3	705.4	1068.1	1306.2	1040.5	1066.2
mature and overmature	5157.6	5251.3	4891.7	4543.0	3604.4	3612.2	2742.9	2692.6
Deciduous hardwood								
young I class of age	176.4	187.6	248.9	247.1	205.4	165.2	-	-
young II class of age	231.5	253.5	338.2	339.1	307.0	291.2	293.9	295.6
middle-aged	569.6	535.3	707.3	728.0	806.9	856.0	989.3	966.3
maturing	365.0	329.3	303.5	304.3	333.6	379.0	409.8	457.7
mature and overmature	1253.0	995.7	1476.0	1495.9	1471.4	1239.7	1285.2	1405.9
Deciduous softwood								
young I class of age	51.7	56.3	93.7	100.3	55.4	40.2	-	-
young II class of age	144.8	127.9	160.8	187.2	169.3	138.4	137.5	164.5
middle-aged	368.1	523.0	594.1	647.0	680.3	692.4	673.0	652.1
maturing	200.8	225.6	246.3	233.3	204.9	229.4	272.2	300.4
mature and overmature	474.1	606.0	669.7	689.9	623.7	581.1	669.0	712.3
66. Khabarovsk Kray*								
Coniferous								
young I class of age	1388.0	963.4	1164.7	1549.1	1629.9	2139.4	-	-
young II class of age	1571.3	1360.3	1449.3	1272.1	1981.2	2447.3	5925.8	6781.5
middle-aged	5989.2	5295.1	4699.0	4718.8	4883.7	5603.7	7635.6	8754.6
maturing	3382.5	3467.8	2510.0	2469.8	2966.2	3363.3	4030.2	4201.8
mature and overmature	22923.2	19504.4	17562.4	16883.7	16526.0	15991.0	18406.1	20078.3
Deciduous hardwood								
young I class of age	11.2	14.5	107.1	105.9	126.1	108.8	-	-
young II class of age	15.3	25.2	74.7	114.9	113.0	136.8	269.3	315.0
middle-aged	91.9	139.5	250.5	284.4	290.3	268.8	283.1	289.5
maturing	90.9	108.0	176.9	164.7	171.3	175.1	189.7	192.4
mature and overmature	926.5	907.6	1080.5	845.1	821.0	892.1	921.7	924.1
Deciduous softwood								
young I class of age	116.6	175.1	380.3	322.4	607.4	793.8	-	-
young II class of age	160.0	313.8	482.7	616.1	574.4	627.3	1982.5	2212.6
middle-aged	414.0	808.7	979.6	1154.4	1515.1	1768.5	1955.6	2144.5

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
Maturing	291.4	297.8	303.0	327.8	448.7	440.3	477.4	531.7
mature and overmature	1254.3	1386.0	1407.1	1131.8	1013.4	1075.6	1179.9	1282.1
67. Amur Oblast								
Coniferous								
young I class of age	546.6	523.3	1254.3	1220.6	1169.4	1100.0	-	-
young II class of age	545.3	681.9	1272.3	1106.4	1122.7	1409.7	2450.2	2636.3
middle-aged	1617.1	1984.2	2968.0	3343.1	3617.9	3629.7	3611.7	3399.4
maturing	1230.6	1675.6	1412.2	1577.6	1555.2	1612.4	1716.9	1824.9
mature and overmature	12086.4	9912.5	7572.4	7060.3	6888.6	6837.1	6620.5	6757.0
Deciduous hardwood								
young I class of age	80.8	90.5	217.8	206.8	197.3	190.1	-	-
young II class of age	30.3	22.1	51.9	63.4	71.1	90.1	276.1	276.6
middle-aged	67.4	45.4	110.1	127.4	134.9	119.1	118.6	111.6
maturing	45.2	30.6	43.4	44.7	32.7	40.0	39.6	42.5
mature and overmature	116.4	124.0	88.5	57.7	56.4	58.3	57.7	56.1
Deciduous softwood								
young I class of age	695.5	629.0	1038.6	930.0	907.4	728.3	-	-
young II class of age	622.4	747.2	741.8	742.0	722.0	863.7	1640.8	1596.1
middle-aged	899.5	1141.7	1219.2	1573.3	1705.9	2100.7	2075.0	2124.5
maturing	252.8	365.5	374.3	449.7	460.6	461.0	507.0	613.9
mature and overmature	925.3	941.4	788.3	728.4	614.2	585.0	618.6	828.9
68. Kamchatka Oblast*								
Coniferous								
young I class of age	2.8	3.7	7.6	19.5	28.2	29.9	-	-
young II class of age	10.8	6.0	9.9	14.7	14.6	26.9	62.9	77.9
middle-aged	26.8	28.6	34.8	28.8	26.6	44.4	64.3	59.3
maturing	23.8	68.1	39.4	29.7	25.3	24.3	164.7	165.4
mature and overmature	1112.7	596.0	457.4	475.7	489.6	587.1	857.8	831.4
Deciduous hardwood								
young I class of age	0.4	0.4	1.2	0.6	2.3	5.3	-	-
young II class of age	1.1	1.1	0.8	1.0	2.6	3.3	21.1	29.8
middle-aged	1.2	84.2	154.2	278.9	231.4	156.3	117.4	103.0
maturing	1.2	142.2	235.3	382.9	351.5	348.9	418.9	423.1
mature and overmature	5598.3	3429.8	2412.8	2307.7	2490.2	3293.1	5315.5	5348.3
Deciduous softwood								
young I class of age	1.2	9.9	25.0	18.3	18.4	12.4	-	-
young II class of age	4.3	6.2	14.8	38.4	42.4	50.9	81.3	86.8
middle-aged	3.2	35.7	71.9	160.6	169.7	196.5	406.6	417.4
maturing	8.9	45.0	50.6	69.1	67.3	99.0	210.1	211.8
mature and overmature	1077.0	499.1	419.3	428.1	436.3	451.2	662.3	666.2

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
69. Magadan Oblast*								
Coniferous								
young I class of age	9.3	42.0	116.3	67.6	71.3	969.6	-	-
young II class of age	615.8	521.2	367.6	505.3	491.3	1175.5	2113.3	2157.2
middle-aged	536.3	824.1	798.0	2381.8	2363.5	2451.7	2435.7	2425.9
maturing	643.4	840.9	338.7	400.7	400.2	347.5	346.2	350.2
mature and overmature	7241.9	6803.3	5984.0	4054.2	3894.0	4477.2	4460.8	4467.8
Deciduous softwood								
young I class of age	0.0	0.2	4.5	1.9	1.8	3.5	-	-
young II class of age	0.0	12.5	10.6	14.1	13.2	12.2	15.8	16.6
middle-aged	14.1	53.2	65.0	132.0	127.4	129.7	131.0	126.5
maturing	67.2	62.6	40.8	37.0	35.5	35.9	36.5	35.1
mature and overmature	326.3	285.9	226.8	81.5	75.9	129.0	129.4	139.5
70. Sakhalin Oblast								
Coniferous								
young I class of age	54.2	78.0	108.3	190.0	387.7	440.6	-	-
young II class of age	148.3	146.1	224.6	235.4	389.4	352.8	919.9	987.9
middle-aged	425.5	424.3	426.6	499.3	783.3	852.4	915.7	875.0
maturing	301.2	299.5	243.4	275.0	309.7	310.5	311.9	366.1
mature and overmature	2166.3	2156.3	1979.3	2109.7	1948.7	1856.6	1633.8	1595.5
Deciduous hardwood								
young I class of age	41.0	47.4	58.6	62.8	70.5	61.6	-	-
young II class of age	122.2	123.7	157.7	160.2	181.3	190.8	289.7	231.2
middle-aged	202.8	181.5	191.5	183.8	221.2	270.9	275.9	352.7
maturing	162.2	142.8	137.1	134.5	77.3	76.6	78.9	92.4
mature and overmature	391.9	440.8	383.7	369.3	304.0	293.3	320.2	359.2
Deciduous softwood								
young I class of age	5.6	21.1	25.7	26.5	9.4	9.1	-	-
young II class of age	37.2	34.7	35.0	41.7	44.0	44.5	45.5	40.6
middle-aged	80.1	74.4	95.0	101.7	158.3	158.1	161.5	161.0
maturing	28.0	21.1	16.8	18.0	37.1	38.6	47.6	42.3
mature and overmature	68.3	53.3	49.3	54.8	49.8	50.6	48.7	56.0
71. Republic of Sakha (Yakutia)								
Coniferous								
young I class of age	5358.8	5999.7	13586.7	16953.7	17152.0	14959.0	-	-
young II class of age	5058.2	5992.2	6486.3	7523.0	8152.2	11591.2	26463.8	24521.9
middle-aged	18764.3	18093.8	19327.5	19486.0	22405.0	27401.6	28589.0	31295.5
maturing	9654.0	9606.6	9042.2	8641.2	8248.6	8264.1	7786.5	8460.6
mature and overmature	75718.4	70990.1	73448.1	72684.6	70592.7	61443.0	62953.2	55326.6
Deciduous softwood								
young I class of age	409.4	370.1	513.2	546.5	265.6	246.6	-	-
young II class of age	401.1	546.5	601.4	671.3	491.8	576.5	845.8	824.1

Table 3A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
middle-aged	220.1	294.0	318.4	472.5	528.3	853.3	886.8	903.3
Maturing	73.8	89.0	100.6	123.9	82.7	93.3	94.1	93.4
mature and overmature	378.2	273.8	322.4	320.1	258.9	198.6	192.2	186.7

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

** Tree stands I and II classes of age in the reference books of 1993 and 1998 are combined. In the Table their joint growing stock is shown in the line "young II class of age".

Table 4A. **Volume of growing-stock in tree stands, 1961-1998, million m³**

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m³	% to 1961
1. Kaliningrad Oblast										
Coniferous	11.66	11.77	13.35	12.89	13.90	12.95	14.26	13.46	1.8	15.4
Deciduous hardwood	3.72	5.57	6.85	6.74	7.95	7.77	8.99	8.95	5.2	140.6
Deciduous softwood	6.10	7.79	11.39	10.99	13.90	13.28	17.66	17.45	11.4	186.1
Total	21.48	25.13	31.59	30.62	35.75	34.00	40.91	39.86	18.4	85.6
2. Archangel Oblast*										
Coniferous	2103.45	2135.94	2086.37	1961.12	1921.31	1892.34	1956.14	1949.61	-153.8	-7.3
Deciduous softwood	101.88	119.38	115.76	124.38	125.82	136.43	194.49	212.34	110.5	108.4
Total	2205.33	2255.32	2202.13	2085.50	2047.13	2028.77	2150.63	2161.95	-43.4	-2.0
3. Vologda Oblast										
Coniferous	550.05	585.86	531.03	550.34	508.55	513.77	531.99	536.09	-14.0	-2.5
Deciduous softwood	226.15	233.13	248.86	309.50	299.77	350.10	428.70	453.72	227.6	100.6
Total	776.20	818.99	779.89	859.84	808.32	863.88	960.70	989.81	213.6	27.5
4. Murmansk Oblast										
Coniferous	215.48	181.33	171.01	164.03	162.83	173.92	172.90	170.55	-44.9	-20.9
Deciduous softwood	25.06	21.93	21.34	21.22	22.26	26.80	27.65	27.53	2.5	9.9
Total	240.54	203.26	192.35	185.25	185.09	200.72	200.55	198.08	-42.5	-17.7
5. Republic of Karelia										
Coniferous	928.98	843.59	791.16	735.30	702.25	726.75	764.23	814.13	-114.9	-12.4
Deciduous softwood	51.66	64.70	77.58	75.92	79.02	80.49	84.38	105.10	53.4	103.4
Total	980.64	908.29	868.74	811.22	781.27	807.24	848.61	919.23	-61.4	-6.3
6. Komi Republic										
Coniferous	2328.37	2370.49	2241.48	2241.94	2233.24	2183.13	2408.21	2407.32	79.0	3.4
Deciduous softwood	330.67	370.98	345.82	340.46	337.33	326.81	428.54	448.48	117.8	35.6
Total	2659.04	2741.47	2587.3	2582.40	2570.57	2509.94	2836.75	2855.80	196.8	7.4
7. Leningrad Oblast										
Coniferous	264.22	281.03	331.19	356.26	378.89	399.21	403.47	415.48	151.3	57.2
Deciduous hardwood	0.02	0.03	0.02	0.01	0.04	0.03	0.03	0.06	0.0	200.0
Deciduous softwood	106.84	137.51	161.47	172.75	178.81	183.66	179.68	225.73	118.9	111.3
Total	371.08	418.57	492.68	529.02	557.74	582.90	583.18	641.27	270.2	72.8
8. Novgorod Oblast										
Coniferous	68.34	82.11	74.93	103.27	99.60	133.77	137.23	157.83	89.5	130.9
Deciduous hardwood	0.06	0.19	0.17	0.22	0.24	0.30	0.31	0.36	0.3	500.0
Deciduous softwood	51.15	85.17	76.92	123.56	116.57	148.71	151.71	228.92	177.8	347.5
Total	119.55	167.47	152.02	227.05	216.41	282.78	289.25	387.11	267.6	223.8
9. Pskov Oblast										
Coniferous	45.76	54.78	54.54	77.14	74.29	92.06	88.87	96.95	51.2	111.9

Table 4A. Continued

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m^3	% to 1961
Deciduous hardwood	0.07	0.19	0.19	0.17	0.20	0.19	0.18	0.17	0.1	142.9
Deciduous softwood	25.38	35.35	36.58	54.98	53.01	65.63	66.07	84.34	59.0	232.3
Total	71.21	90.32	91.31	132.29	127.50	157.88	155.12	181.46	110.3	154.8
10. Bryansk Oblast										
Coniferous	41.48	43.84	41.01	57.14	54.63	64.86	72.51	78.69	37.2	89.7
Deciduous hardwood	7.42	7.45	6.93	8.00	7.73	7.39	7.65	8.13	0.7	9.6
Deciduous softwood	30.04	34.01	29.13	42.39	38.92	46.19	48.31	52.98	22.9	76.4
Total	78.94	85.30	77.07	107.53	101.28	118.44	128.47	139.80	60.9	77.1
11. Vladimir Oblast										
Coniferous	76.20	90.03	94.7	98.76	100.13	104.48	105.65	117.12	40.9	53.7
Deciduous hardwood	0.78	1.06	1.06	1.29	1.20	1.15	1.20	1.17	0.4	50.0
Deciduous softwood	34.28	41.57	40.51	42.48	45.11	45.25	45.39	56.33	22.1	64.3
Total	111.26	132.66	136.27	142.53	146.44	150.88	152.24	174.62	63.4	56.9
12. Ivanovo Oblast										
Coniferous	42.14	51.54	48.17	62.22	61.43	70.24	68.13	68.00	25.9	61.4
Deciduous hardwood	0.28	0.42	0.4	0.40	0.42	0.42	0.42	0.43	0.2	53.6
Deciduous softwood	33.10	44.97	37.6	46.87	43.84	51.65	49.19	61.24	28.1	85.0
Total	75.52	96.93	86.17	109.49	105.69	122.31	117.74	129.67	54.2	71.7
13. Tver Oblast										
Coniferous	121.53	151.94	135.91	168.79	160.64	196.06	185.77	195.25	73.7	60.7
Deciduous hardwood	0.03	0.02	0.02	0.02	0.03	0.04	0.03	0.05	0.0	66.7
Deciduous softwood	72.69	105.96	92.49	135.50	126.85	162.63	151.54	175.75	103.1	141.8
Total	194.25	257.92	228.42	304.31	287.52	358.73	337.34	371.05	176.8	91.0
14. Kaluga Oblast										
Coniferous	18.64	23.80	21.53	31.84	31.21	44.01	43.61	50.13	31.5	168.9
Deciduous hardwood	4.10	4.63	4.65	5.25	5.18	5.98	5.95	5.35	1.3	30.5
Deciduous softwood	50.95	62.70	53.42	67.94	63.74	77.81	73.62	81.34	30.4	59.6
Total	73.69	91.13	79.6	105.03	100.13	127.80	123.18	136.82	63.1	85.7
15. Kostroma Oblast										
Coniferous	238.77	237.19	193.87	220.90	203.05	245.47	232.67	267.45	28.7	12.0
Deciduous hardwood	0.04	0.04	0.04	0.05	0.05	0.04	0.04	0.05	0.0	25.0
Deciduous softwood	141.52	184.20	167.99	220.69	205.32	251.49	234.58	295.77	154.3	109.0
Total	380.33	421.43	361.9	441.64	408.42	497.00	467.29	563.27	182.9	48.1
16. Moscow Oblast										
Coniferous	89.03	86.28	112.86	111.65	153.41	147.73	174.39	171.87	82.8	93.0
Deciduous hardwood	4.46	4.29	5.42	5.35	6.08	6.02	5.98	5.96	1.5	33.6
Deciduous softwood	96.01	86.77	103.24	99.46	131.42	125.26	152.53	149.72	53.7	55.9
Total	189.50	177.34	221.52	216.46	290.91	279.01	332.90	327.55	138.1	72.8
17. Orel Oblast										
Coniferous	1.35	1.98	2.39	3.41	3.41	4.45	4.36	6.16	4.8	356.3

Table 4A. Continued

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m^3	% to 1961
Deciduous hardwood	2.28	3.35	3.16	4.70	4.65	6.34	6.29	7.60	5.3	233.3
Deciduous softwood	2.51	3.83	3.22	5.55	5.09	6.84	6.59	9.89	7.4	294.0
Total	6.14	9.16	8.77	13.66	13.15	17.63	17.24	23.65	17.5	285.2
18. Ryazan Oblast										
Coniferous	37.19	38.76	48.08	46.02	55.33	52.65	63.28	61.29	24.1	64.8
Deciduous hardwood	7.93	10.63	13.15	12.70	13.82	13.54	15.16	15.13	7.2	90.8
Deciduous softwood	28.01	30.13	38.97	35.69	44.12	41.19	50.68	50.03	22.0	78.6
Total	73.13	79.52	100.2	94.41	113.27	107.38	129.12	126.45	53.3	72.9
19. Smolensk Oblast										
Coniferous	31.10	38.80	40.75	43.36	42.15	59.59	59.25	67.02	35.9	115.5
Deciduous hardwood	0.20	0.21	0.25	0.33	0.33	0.48	0.47	0.55	0.4	175.0
Deciduous softwood	35.91	57.22	61.6	68.86	64.23	79.27	79.80	115.48	79.6	221.6
Total	67.21	96.23	102.6	112.55	106.71	139.34	139.52	183.05	115.8	172.4
20. Tula Oblast										
Coniferous	1.64	4.04	2.26	2.20	3.56	3.52	4.84	4.99	3.4	204.3
Deciduous hardwood	9.24	9.17	11.81	11.71	13.08	12.86	14.91	15.53	6.3	68.1
Deciduous softwood	21.65	14.78	16.01	14.73	20.53	19.06	23.29	25.35	3.7	17.1
Total	32.53	27.99	30.08	28.64	37.17	35.44	43.04	45.87	13.3	41.0
21. Yaroslavl Oblast										
Coniferous	30.65	34.52	39.88	38.67	47.49	46.03	56.11	55.28	24.6	80.4
Deciduous hardwood	0.36	0.36	0.36	0.34	0.33	0.32	0.34	0.34	0.0	-5.6
Deciduous softwood	48.80	61.39	69.65	64.78	75.25	70.62	92.56	90.81	42.0	86.1
Total	79.81	96.27	109.89	103.79	123.07	116.97	149.01	146.43	66.6	83.5
22. Nizhni Novgorod Oblast										
Coniferous	171.43	177.31	139.47	181.05	169.85	198.11	187.58	219.64	48.2	28.1
Deciduous hardwood	6.56	9.04	8.82	11.75	11.39	10.01	9.74	8.45	1.9	28.8
Deciduous softwood	107.89	128.25	110.88	157.92	143.53	168.80	155.47	206.90	99.0	91.8
Total	285.88	314.60	259.17	350.72	324.77	376.92	352.79	434.99	149.1	52.2
23. Kirov Oblast										
Coniferous	520.29	467.52	439.5	428.67	434.40	429.66	448.57	445.39	-74.9	-14.4
Deciduous hardwood	0.47	0.50	0.66	0.65	0.67	0.66	0.65	0.59	0.1	25.5
Deciduous softwood	232.08	247.50	270.91	272.41	303.80	306.62	337.12	326.71	94.6	40.8
Total	752.84	715.52	711.07	701.73	738.87	736.94	786.34	772.69	19.9	2.6
24. Republic of Marii El										
Coniferous	77.68	73.95	71.09	74.78	72.04	76.13	72.34	83.07	5.4	6.9
Deciduous hardwood	2.17	2.67	2.51	2.57	2.38	2.02	1.98	1.68	-0.5	-22.6
Deciduous softwood	43.95	47.35	57.38	59.94	55.51	66.09	61.50	84.00	40.1	91.1
Total	123.80	123.97	130.98	137.29	129.93	144.24	135.82	168.75	45.0	36.3

Table 4A. Continued

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m^3	% to 1961
25. Republic of Mordovia										
Coniferous	15.74	18.98	17.93	19.91	18.09	22.46	21.47	27.76	12.0	76.4
Deciduous hardwood	10.07	11.38	9.6	11.33	10.44	11.05	10.62	11.04	1.0	9.6
Deciduous softwood	20.44	28.89	23.14	30.71	27.45	35.27	32.13	44.93	24.5	119.8
Total	46.25	59.25	50.67	61.95	55.98	68.78	64.22	83.73	37.5	81.0
26. Chuvash Republic										
Coniferous	19.99	22.13	18.01	22.14	20.19	23.57	22.83	27.21	7.2	36.1
Deciduous hardwood	16.57	17.18	15.64	18.42	18.77	16.14	16.12	12.71	-3.9	-23.3
Deciduous softwood	27.66	31.19	23.31	34.02	29.45	34.62	30.77	37.66	10.0	36.2
Total	64.22	70.50	56.96	74.58	68.41	74.33	69.72	77.58	13.4	20.8
27. Belgorod Oblast										
Coniferous	0.76	0.89	0.91	2.07	2.05	3.10	3.10	4.28	3.5	463.2
Deciduous hardwood	14.76	18.89	18.31	20.78	20.37	25.51	25.07	28.33	13.6	91.9
Мягколиственные	0.66	0.82	0.70	1.01	0.93	1.39	1.34	1.71	1.1	159.1
Total	16.18	20.60	19.92	23.86	23.35	30.00	29.51	34.32	18.1	112.1
28. Voronezh Oblast										
Coniferous	6.03	6.03	10.24	10.39	13.69	13.43	18.76	18.48	12.5	206.5
Deciduous hardwood	20.86	19.49	21.82	20.74	21.94	21.13	24.38	24.01	3.2	15.1
Deciduous softwood	4.70	3.80	4.51	3.81	4.78	4.03	5.80	5.57	0.9	18.5
Total	31.59	29.32	36.57	34.94	40.41	38.59	48.94	48.06	16.5	52.1
29. Kursk Oblast										
Coniferous	0.79	0.99	1.65	1.99	2.51	2.63	3.82	3.75	3.0	374.7
Deciduous hardwood	6.75	7.27	9.49	9.50	12.40	12.27	16.94	16.92	10.2	150.7
Deciduous softwood	1.86	2.24	2.76	2.59	3.52	3.31	5.13	4.89	3.0	162.9
Total	9.40	10.50	13.9	14.08	18.43	18.21	25.89	25.56	16.2	171.9
30. Lipetsk Oblast										
Coniferous	5.53	6.50	6.67	8.80	8.61	10.59	10.96	10.57	5.0	91.1
Deciduous hardwood	3.71	5.07	5.45	7.24	7.08	8.26	8.55	8.48	4.8	128.6
Deciduous softwood	2.73	2.89	2.85	3.92	3.56	4.35	4.22	4.08	1.4	49.5
Total	11.97	14.46	14.97	19.96	19.25	23.20	23.73	23.13	11.2	93.2
31. Tambov Oblast										
Coniferous	16.91	16.75	20.21	19.30	23.54	22.57	29.04	28.74	11.8	70.0
Deciduous hardwood	5.30	5.20	6.91	6.58	7.15	6.76	8.02	7.57	2.3	42.8
Deciduous softwood	10.84	9.65	12.62	11.24	13.86	12.36	15.22	14.04	3.2	29.5
Total	33.05	31.6	39.74	37.12	44.55	41.69	52.28	50.35	17.3	52.3
32. Astrakhan Oblast										
Deciduous hardwood	0.19	0.26	0.33	0.48	0.52	0.75	0.73	0.74	0.6	289.5
Deciduous softwood	4.42	4.40	3.28	3.55	3.52	4.13	4.08	4.01	-0.4	-9.3

Table 4A. Continued

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m^3	% to 1961
Total	4.61	4.66	3.61	4.03	4.04	4.88	4.81	4.75	0.1	3.0
33. Volgograd Oblast										
Coniferous	0.85	0.91	1.07	1.44	1.47	2.33	2.34	3.94	3.1	363.5
Deciduous hardwood	12.48	14.36	12.8	13.97	13.07	11.51	12.42	16.72	4.2	34.0
Deciduous softwood	3.77	4.22	3.13	4.69	4.42	5.88	5.60	7.75	4.0	105.6
Total	17.10	19.49	17	20.10	18.96	19.72	20.36	28.41	11.3	66.1
34. Samara Oblast										
Coniferous	8.88	10.02	11.69	11.44	11.73	13.37	13.28	14.30	5.4	61.0
Deciduous hardwood	13.52	17.70	20.74	23.66	21.19	22.64	22.40	21.77	8.3	61.0
Deciduous softwood	19.58	26.92	26.17	26.58	23.10	31.02	29.56	40.65	21.1	107.6
Total	41.98	54.64	58.6	61.68	56.02	67.03	65.24	76.72	34.7	82.8
35. Penza Oblast										
Coniferous	26.58	30.14	38.23	39.52	46.06	43.55	45.33	43.92	17.3	65.2
Deciduous hardwood	21.38	22.23	22.45	21.91	23.08	21.64	22.42	21.89	0.5	2.4
Deciduous softwood	29.61	33.90	39.76	40.68	51.01	44.94	53.70	52.38	22.8	76.9
Total	77.57	86.27	100.44	102.11	120.15	110.13	121.45	118.19	40.6	52.4
36. Saratov Oblast										
Coniferous	1.44	1.71	2.08	2.53	2.86	3.55	3.52	4.89	3.5	239.6
Deciduous hardwood	20.37	21.39	22.20	23.68	24.98	27.33	26.66	28.69	8.3	40.8
Deciduous softwood	7.06	8.10	8.42	9.35	10.25	11.95	11.53	16.22	9.2	129.7
Total	28.87	31.20	32.7	35.56	38.09	42.83	41.71	49.80	20.9	72.5
37. Ulyanovsk Oblast										
Coniferous	35.07	41.99	55.73	52.21	64.94	62.21	67.29	74.30	39.2	111.9
Deciduous hardwood	15.50	16.31	20.24	18.79	16.49	15.33	14.14	13.22	-2.3	-14.7
Deciduous softwood	34.36	40.01	51.00	46.23	57.64	53.19	59.17	65.12	30.8	89.5
Total	84.93	98.31	126.97	117.23	139.07	130.73	140.60	152.64	67.7	79.7
38. Republic of Kalmykia										
Deciduous hardwood	0.05	0.10	0.09	0.14	0.17	0.17	0.16	0.21	0.2	320.0
Deciduous softwood	0.05	0.08	0.04	0.04	0.03	0.03	0.03	0.06	0.0	20.0
Total	0.10	0.18	0.13	0.18	0.20	0.20	0.19	0.27	0.2	170.0
39. Republic of Tatarstan										
Coniferous	18.75	18.88	20.45	23.61	27.35	31.36	36.75	39.46	20.7	110.5
Deciduous hardwood	23.62	27.21	28.85	34.00	32.32	22.92	21.02	18.95	-4.7	-19.8
Deciduous softwood	62.52	63.54	55.19	68.80	67.49	82.32	86.84	96.30	33.8	54.0
Total	104.89	109.63	104.49	126.41	127.16	136.60	144.61	154.71	49.8	47.5
40. Krasnodar Kray*										
Coniferous	47.11	23.99	22.85	21.28	20.97	30.80	30.58	31.07	-16.0	-34.0
Deciduous hardwood	191.60	191.35	180.45	198.85	192.90	234.46	231.49	234.70	43.1	22.5
Deciduous softwood	9.03	9.33	8.46	9.76	9.26	10.80	10.64	11.96	2.9	32.4

Table 4A. Continued

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m^3	% to 1961
Total	247.74	224.67	211.76	229.89	223.13	276.06	272.71	277.73	30.0	12.1
41. Stavropol Kray*										
Coniferous	23.92	17.90	19.86	22.88	22.78	32.40	32.42	34.88	11.0	45.8
Deciduous hardwood	20.41	25.28	24.22	28.31	28.22	34.54	35.02	37.57	17.2	84.1
Deciduous softwood	9.23	11.25	10.98	13.86	13.47	16.40	16.14	18.33	9.1	98.6
Total	53.56	54.43	55.06	65.05	64.47	83.34	83.58	90.78	37.2	69.5
42. Rostov Oblast										
Coniferous	0.39	0.44	1.37	1.45	3.07	3.05	4.83	4.33	3.9	1010.3
Deciduous hardwood	3.16	3.25	4.38	4.02	5.22	5.10	7.28	6.87	3.7	117.4
Deciduous softwood	1.46	1.16	1.68	1.43	2.35	2.19	2.46	2.28	0.8	56.2
Total	5.01	4.85	7.43	6.90	10.64	10.34	14.57	13.48	8.5	169.1
43. Republic of Daghestan										
Coniferous	5.99	5.27	5.29	6.69	6.73	9.71	9.74	9.76	3.8	62.9
Deciduous hardwood	11.66	15.76	15.35	18.01	18.12	23.29	22.14	23.39	11.7	100.6
Deciduous softwood	3.85	4.47	4.31	5.23	5.13	6.12	6.13	6.08	2.2	57.9
Total	21.50	25.50	24.95	29.93	29.98	39.12	38.01	39.23	17.7	82.5
44. Kabardino-Balkarian Republic										
Coniferous	0.87	0.81	0.79	0.79	0.76	0.82	0.82	0.97	0.1	11.5
Deciduous hardwood	11.25	9.76	9.39	9.91	9.77	11.81	11.77	11.72	0.5	4.2
Deciduous softwood	1.82	2.07	2.04	2.77	2.69	3.26	3.28	3.35	1.5	84.1
Total	13.94	12.64	12.22	13.47	13.22	15.89	15.87	16.04	2.1	15.1
45. Republic of North Ossetia										
Coniferous	0.67	0.54	0.43	0.55	0.57	0.80	0.80	0.80	0.1	19.4
Deciduous hardwood	20.29	23.99	23.21	24.07	23.31	25.47	25.27	25.18	4.9	24.1
Deciduous softwood	1.60	1.77	1.62	2.18	2.17	2.44	2.42	2.40	0.8	50.0
Total	22.56	26.30	25.26	26.80	26.05	28.71	28.49	28.38	5.8	25.8
46. Chechen Republic and Republic of Ingushetia*										
Coniferous	0.75	0.75	0.61	0.63	0.66	0.85	0.85	0.85	0.1	13.3
Deciduous hardwood	38.00	35.36	34.61	35.15	39.94	35.33	36.76	36.76	-1.2	-3.3
Deciduous softwood	4.24	3.73	4.2	4.29	4.66	5.05	5.09	5.09	0.9	20.0
Total	42.99	39.84	39.42	40.07	45.26	41.23	42.70	42.70	-0.3	-0.7
47. Kurgan Oblast										
Coniferous	35.98	43.01	38.36	50.22	46.98	60.77	63.37	64.19	28.2	78.4
Deciduous softwood	33.81	37.31	33.05	48.08	43.64	60.15	60.67	77.05	43.2	127.9
Total	69.79	80.32	71.41	98.30	90.62	120.92	124.04	141.24	71.5	102.4
48. Orenburg Oblast										
Coniferous	6.16	6.31	6.82	7.35	9.14	9.42	10.48	11.27	5.1	83.0
Deciduous hardwood	10.36	13.50	12.88	15.50	15.13	16.28	17.80	16.73	6.4	61.5
Deciduous softwood	10.90	15.01	13.77	20.54	20.34	23.69	24.77	33.99	23.1	211.8

Table 4A. Continued

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m^3	% to 1961
Total	27.42	34.82	33.47	43.39	44.61	49.39	53.05	61.99	34.6	126.1
49. Perm Oblast*										
Coniferous	1097.47	992.04	996.90	896.49	931.17	850.50	775.50	757.75	-339.7	-31.0
Deciduous hardwood	0.11	0.10	0.12	0.10	0.18	0.19	0.05	0.04	-0.1	-63.6
Deciduous softwood	227.85	229.66	246.71	250.07	315.44	315.99	381.58	422.05	194.2	85.2
Total	1325.43	1221.80	1243.73	1146.66	1246.79	1166.68	1157.13	1179.84	-145.6	-11.0
50. Sverdlovsk Oblast*										
Coniferous	1034.54	932.93	964.75	966.08	1076.70	1046.87	1076.93	1066.83	32.3	3.1
Deciduous hardwood	0.06	0.07	0.07	0.04	0.04	0.00	0.00	0.00	-0.1	-100.0
Deciduous softwood	380.03	343.04	369.04	347.13	379.27	371.28	472.58	493.20	113.2	29.8
Total	1414.63	1276.04	1333.86	1313.25	1456.01	1418.15	1549.51	1560.03	145.4	10.3
51. Chelyabinsk Oblast										
Coniferous	86.72	85.04	81.52	109.70	105.82	141.97	135.85	145.88	59.2	68.2
Deciduous hardwood	2.42	2.32	3.02	4.99	4.84	3.93	3.87	3.81	1.4	57.4
Deciduous softwood	95.37	88.76	83.93	124.84	117.05	160.66	154.71	192.21	96.8	101.5
Total	184.51	176.12	168.47	239.53	227.71	306.56	294.43	341.90	157.4	85.3
52. Republic of Bashkortostan										
Coniferous	141.62	132.22	135.03	143.18	161.61	161.66	172.42	172.02	30.4	21.5
Deciduous hardwood	75.52	85.37	89.17	94.18	91.43	76.38	63.75	58.34	-17.2	-22.7
Deciduous softwood	299.19	322.40	353.93	388.50	423.44	434.42	472.00	483.39	184.2	61.6
Total	516.33	539.99	578.13	625.86	676.48	672.46	708.17	713.75	197.4	38.2
53. Udmurtian Republic										
Coniferous	127.64	123.98	103.6	117.56	109.51	125.86	119.05	142.06	14.4	11.3
Deciduous hardwood	0.30	0.50	0.40	0.50	0.47	0.22	0.21	0.20	-0.1	-33.3
Deciduous softwood	35.32	65.99	59.4	84.76	78.55	98.85	91.94	118.95	83.6	236.8
Total	163.26	190.47	163.4	202.82	188.53	224.93	211.20	261.21	98.0	60.0
54. Altai Kray*										
Coniferous	526.70	601.90	575.1	585.76	597.63	604.62	679.95	855.68	329.0	62.5
Deciduous hardwood	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.07	0.1	-
Deciduous softwood	89.82	142.93	134.5	135.64	152.89	158.57	185.59	229.53	139.7	155.5
Total	616.52	744.83	709.7	721.42	750.54	763.21	865.56	1085.28	468.8	76.0
55. Kemerovo Oblast										
Coniferous	362.10	342.39	321.82	346.12	351.85	342.29	338.08	336.71	-25.4	-7.0
Deciduous hardwood	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0	-
Deciduous softwood	150.12	160.53	156.18	173.63	179.49	173.25	199.77	198.07	48.0	31.9
Total	512.22	502.92	478	519.75	531.34	515.54	537.86	534.78	22.6	4.4
56. Novosibirsk Oblast										
Coniferous	90.75	84.39	82.22	88.71	98.35	107.20	115.57	113.68	22.9	25.3
Deciduous hardwood	0.00	0.00	0.01	0.01	0.03	0.03	0.02	0.02	0.0	-

Table 4A. Continued

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m^3	% to 1961
Deciduous softwood	96.32	99.33	109.81	117.11	125.61	132.39	162.35	166.00	69.7	72.3
Total	187.07	183.72	192.04	205.83	223.99	239.62	277.94	279.70	92.6	49.5
57. Omsk Oblast										
Coniferous	92.20	90.99	91.14	95.73	99.07	104.04	111.54	114.04	21.8	23.7
Deciduous hardwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.0	
Deciduous softwood	177.79	180.20	220.87	219.57	221.32	233.45	245.41	255.41	77.6	43.7
Total	269.99	271.19	312.01	315.30	320.39	337.49	356.95	369.46	99.5	36.8
58. Tomsk Oblast										
Coniferous	1465.34	1307.61	1382.24	1417.16	1474.50	1527.03	1514.92	1555.27	89.9	6.1
Deciduous softwood	973.82	963.74	1096.8	1083.85	1060.27	1048.97	1046.96	1049.76	75.9	7.8
Total	2439.16	2271.35	2479.04	2501.01	2534.77	2576.00	2561.88	2605.03	165.9	6.8
59. Tyumen Oblast*										
Coniferous	3770.25	3816.19	4327.24	4042.57	4013.93	3763.16	3903.31	3872.30	102.1	2.7
Deciduous softwood	861.51	944.62	1156.3	1118.57	1081.76	985.88	1006.36	1032.38	170.9	19.8
Total	4631.76	4760.81	5483.54	5161.14	5095.69	4749.04	4909.67	4904.68	272.9	5.9
60. Krasnoyarsk Kray*										
Coniferous	12705.70	12529.86	11903.36	12275.04	12382.76	12281.85	10175.19	10114.29	-2591.4	-20.4
Deciduous softwood	1627.61	1667.64	1590.69	1531.70	1554.05	1524.19	1542.12	1596.34	-31.3	-1.9
Total	14333.31	14197.50	13494.05	13806.74	13936.81	13806.04	11717.31	11710.63	-2622.7	-18.3
61. Irkutsk Oblast*										
Coniferous	7393.77	7282.11	7530.21	7437.14	7822.63	7750.37	7836.31	7910.76	517.0	7.0
Deciduous softwood	626.60	688.36	762.66	810.06	817.88	817.88	938.96	1032.89	406.3	64.8
Total	8020.37	7970.47	8292.87	8247.20	8640.51	8568.25	8775.27	8943.65	923.3	11.5
62. Chita Oblast*										
Coniferous	2134.63	2091.79	2074.51	2039.17	2069.22	2089.68	2141.13	2130.02	-4.6	-0.2
Deciduous softwood	74.10	129.73	186.34	199.69	220.95	240.65	281.74	296.27	222.2	299.8
Total	2208.73	2221.52	2260.85	2238.86	2290.17	2330.33	2422.87	2426.29	217.6	9.9
63. Republic of Buryatia										
Coniferous	1957.14	1785.56	1849.7	1671.34	1721.10	1744.77	1726.65	1758.62	-198.5	-10.1
Deciduous softwood	79.76	83.90	92.78	100.66	107.10	106.13	123.30	130.64	50.9	63.8
Total	2036.90	1869.46	1942.48	1772.00	1828.20	1850.90	1849.95	1889.26	-147.6	-7.2
64. Republic of Tuva										
Coniferous	1001.05	1005.90	1022.57	1024.37	1019.83	1057.74	1060.34	1047.84	46.8	4.7
Deciduous softwood	13.05	24.78	26.75	29.72	29.78	27.94	28.89	28.85	15.8	121.1
Total	1014.10	1030.68	1049.32	1054.09	1049.61	1085.68	1089.23	1076.69	62.6	6.2
65. Primorie Kray										
Coniferous	1312.05	1333.79	1286.57	1294.88	1242.62	1240	1220.35	1181.88	-130.2	-9.9
Deciduous hardwood	286.18	237.18	345.75	352.65	350.44	320.80	341.97	371.17	85.0	29.7

Table 4A. Continued

Tree stands	Year of account								Change between 1961-1998	
	1961	1966	1973	1978	1983	1988	1993	1998	million m^3	% to 1961
Deciduous softwood	122.59	161.38	184.52	199.62	193.66	186.08	203.88	213.89	91.3	74.5
Total	1720.82	1732.35	1816.84	1847.15	1786.72	1746.88	1766.20	1766.94	46.1	2.7
66. Khabarovsk Kray*										
Coniferous	4916.67	4314.70	4081.22	4143.19	4063.74	3964.00	4355.29	4545.36	-371.3	-7.6
Deciduous hardwood	130.37	137.81	202.78	158.60	165.50	174.28	181.63	181.60	51.2	39.3
Deciduous softwood	230.36	297.07	341.91	318.94	340.61	363.01	398.52	428.34	198.0	85.9
Total	5277.40	4749.58	4625.91	4620.73	4569.85	4501.29	4935.44	5155.30	-122.1	-2.3
67. Amur Kray										
Coniferous	2080.72	1851.17	1557.09	1587.24	1608.00	1616.65	1574.88	1572.69	-508.0	-24.4
Deciduous hardwood	16.45	12.91	17.74	15.26	17.42	19.75	19.69	20.65	4.2	25.5
Deciduous softwood	181.24	219.14	215.92	261.15	269.84	300.91	307.79	341.50	160.3	88.4
Total	2278.41	2083.22	1790.75	1863.65	1895.26	1937.31	1902.36	1934.84	-343.6	-15.1
68. Kamchatka Oblast*										
Coniferous	168.19	132.33	105.52	106.61	110.04	126.23	131.72	126.97	-41.2	-24.5
Deciduous hardwood	514.62	335.34	253.25	238.15	237.48	313.23	497.71	501.88	-12.7	-2.5
Deciduous softwood	70.06	51.43	48.2	57.28	58.72	65.22	105.14	106.48	36.4	52.0
Total	752.87	519.10	406.97	402.04	406.24	504.68	734.57	735.33	-17.5	-2.3
69. Magadan Oblast*										
Coniferous	585.31	548.11	402.02	367.66	352.73	339.66	338.46	339.24	-246.1	-42.0
Deciduous softwood	26.28	28.06	27.9	25.82	24.15	33.26	33.42	33.84	7.6	28.8
Total	611.59	576.17	429.92	393.48	376.88	372.92	371.88	373.08	-238.5	-39.0
70. Sakhalin Oblast										
Coniferous	561.38	562.44	545.04	569.74	582.96	582.22	533.10	516.94	-44.4	-7.9
Deciduous hardwood	59.51	59.03	55.01	53.07	48.15	50.11	53.97	63.45	3.9	6.6
Deciduous softwood	13.67	10.98	11.54	12.98	17.12	17.64	18.68	18.65	5.0	36.4
Total	634.56	632.45	611.59	635.79	648.23	649.97	605.75	599.04	-35.5	-5.6
71. Republic of Sakha (Yakutia)										
Coniferous	10934.44	10420.37	10529.42	10310.19	9704.40	8765.73	8952.20	8498.25	-2436.2	-22.3
Deciduous softwood	44.42	47.79	54.89	59.97	56.72	82.75	84.24	83.91	39.5	88.9
Total	10978.86	10468.16	10529.42	10370.16	9761.12	8848.48	9036.44	8582.16	-2396.7	-21.8
Total, billion $м^3$										
Coniferous	62.84	60.71	59.98	59.73	59.74	58.61	57.68	57.79	-5.05	-8.0
Deciduous hardwood	1.63	1.45	1.55	1.55	1.55	1.64	1.86	1.91	0.28	17.1
Deciduous softwood	8.72	9.52	10.12	10.62	10.82	11.19	12.10	13.09	4.38	50.2
Total	73.18	71.69	71.65	71.90	72.12	71.44	71.64	72.79	-0.40	-0.5

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

Table 5A. **Volume of growing stock by groups of tree stands and age, 1961-1998, million m³**

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993**	1998**
1. Kaliningrad Oblast								
Coniferous								
young I class of age	0.44	0.35	1.01	1.18	1.15	1.20	-	-
young II class of age	2.26	2.22	1.79	1.80	2.47	2.45	4.83	4.94
middle-aged	3.08	4.81	6.34	6.36	5.75	5.55	6.40	5.92
maturing	3.59	2.28	2.25	2.12	2.31	2.08	1.86	1.61
mature and overmature	2.29	2.11	1.96	1.43	2.22	1.67	1.17	0.99
Deciduous hardwood								
young I class of age	0.09	0.21	0.25	0.28	0.18	0.18	-	-
young II class of age	0.69	0.51	0.57	0.55	0.79	0.79	0.96	0.99
middle-aged	2.05	3.67	4.65	4.73	4.97	4.93	6.01	6.20
maturing	0.65	0.67	0.82	0.76	1.31	1.30	1.44	1.25
mature and overmature	0.24	0.51	0.56	0.42	0.70	0.57	0.58	0.51
Deciduous softwood								
young I class of age	0.12	0.24	0.07	0.10	0.05	0.05	-	-
young II class of age	0.6	0.76	0.92	0.97	0.46	0.44	0.26	0.28
middle-aged	1.17	2.43	4.90	5.39	8.33	8.32	10.66	10.62
maturing	1.33	1.54	1.96	1.89	2.10	2.05	2.92	2.93
mature and overmature	2.88	2.82	3.54	2.64	2.96	2.42	3.82	3.62
2. Archangel Oblast*								
Coniferous								
young I class of age	6.03	7.51	8.11	8.44	9.93	12.74	-	-
young II class of age	29.53	39.56	43.89	38.99	40.48	48.31	72.49	76.72
middle-aged	100.52	132.68	151.85	172.48	190.68	221.26	223.81	241.48
maturing	96.58	88.29	77.91	73.20	71.33	79.41	88.82	97.78
mature and overmature	1870.89	1867.9	1804.61	1668.01	1608.89	1530.62	1571.02	1533.63
Deciduous softwood								
young I class of age	1.69	2.33	2.76	2.23	2.07	2.77	-	-
young II class of age	7.59	7.38	6.11	7.30	8.36	10.45	19.52	22.39
middle-aged	21.24	30.38	30.64	39.70	45.24	55.23	84.39	92.39
maturing	6.18	7.68	11.96	15.40	16.70	17.55	26.99	27.41
mature and overmature	65.18	71.61	64.29	59.75	53.45	50.43	63.59	70.15
3. Vologda Oblast								
Coniferous								
young I class of age	6.11	6.14	4.60	6.48	7.84	8.88	-	-
young II class of age	19.19	26.32	32.76	27.61	25.82	27.85	34.13	38.00
middle-aged	96.44	106.81	115.94	146.56	152.72	146.88	157.79	168.83
maturing	88.91	75.25	56.26	57.40	56.58	63.61	78.60	78.30
mature and overmature	351.76	371.34	321.47	312.29	265.59	266.55	261.47	250.96
Deciduous softwood								
young I class of age	2.05	2.75	2.43	3.01	3.45	3.41	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	28.98	15.77	7.68	9.75	9.64	9.22	14.31	14.78
middle-aged	49.21	86.01	119.70	136.19	139.20	123.15	96.35	96.64
maturing	12.97	24.94	26.62	49.74	48.92	67.21	107.14	88.36
mature and overmature	92.42	103.66	92.43	110.81	98.56	147.11	210.90	253.94
4. Murmansk Oblast								
Coniferous								
young I class of age	0.42	0.58	0.96	0.92	1.04	1.39	-	-
young II class of age	2.26	3.18	6.28	6.66	8.90	13.31	15.97	15.79
middle-aged	11.03	18.62	42.67	43.69	45.04	43.11	43.48	43.32
maturing	15.06	13.64	15.00	15.87	14.78	11.38	10.28	10.2
mature and overmature	186.71	145.31	106.10	96.89	93.07	104.73	103.17	101.24
Deciduous softwood								
young I class of age	0.03	0.05	0.07	0.05	0.07	0.06	-	-
young II class of age	0.77	0.67	0.77	0.78	0.93	0.84	0.89	0.89
middle-aged	2.27	4.79	6.54	7.16	8.02	11.02	12.35	12.31
maturing	1.13	2.54	3.98	4.07	4.12	3.62	3.57	3.55
mature and overmature	20.86	13.88	9.98	9.16	9.12	11.26	10.84	10.78
5. Republic of Karelia								
Coniferous								
young I class of age	4.61	5.09	6.98	7.72	11.47	18.75	-	-
young II class of age	14.56	19.28	27.88	33.41	40.69	52.89	86.52	110.26
middle-aged	134.64	169.27	197.17	203.78	190.33	183.09	196.21	206.13
maturing	84.58	72.68	64.12	60.38	75.33	96.86	103.93	113.49
mature and overmature	690.59	577.27	495.01	430.01	384.43	375.16	377.57	384.25
Deciduous softwood								
young I class of age	0.82	0.87	1.49	1.2	0.80	0.38	-	-
young II class of age	2.87	2.64	2.56	2.88	3.39	3.61	3.69	2.30
middle-aged	17.48	28.76	29.05	28.99	25.67	27.05	29.76	34.84
maturing	8.80	8.31	12.13	11.42	13.45	12.80	13.91	16.22
mature and overmature	21.69	24.12	32.35	31.43	35.71	36.65	37.02	51.74
6. Komi Republic								
Coniferous								
young I class of age	6.52	12.55	15.29	12.95	12.00	13.56	-	-
young II class of age	24.93	36.92	51.67	59.16	66.67	70.90	83.92	83.30
middle-aged	116.96	140.26	163.27	183.17	200.16	218.38	284.51	316.97
maturing	107.99	100.76	87.95	83.58	90.87	98.98	126.25	136.62
mature and overmature	2071.97	2080.00	1923.30	1903.08	1863.54	1781.31	1913.53	1870.43
Deciduous softwood								
young I class of age	2.37	3.32	2.53	2.58	3.34	2.85	-	-
young II class of age	12.65	12.89	6.60	6.27	7.11	7.60	15.85	16.44
middle-aged	27.6	35.34	47.78	58.3	68.56	77.96	101.73	106.39
maturing	14.17	18.33	17.29	16.57	15.99	16.84	33.94	44.13

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
mature and overmature	273.88	301.10	271.62	256.44	242.33	221.56	277.02	281.52
7. Leningrad Oblast								
Coniferous								
young I class of age	4.38	4.01	3.83	4.18	5.94	8.26	-	-
young II class of age	15.52	19.86	21.95	23.72	21.35	22.39	29.33	36.10
middle-aged	141.27	146.34	178.23	189.98	143.36	116.72	109.94	102.00
maturing	51.78	48.57	57.00	61.57	101.62	114.06	120.78	117.71
mature and overmature	51.27	62.25	70.18	76.81	106.62	137.78	143.42	159.67
Deciduous hardwood								
young I class of age	0.00	0.00	0.00	0.00	0.00	0.01	-	-
young II class of age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
middle-aged	0.01	0.02	0.02	0.01	0.04	0.02	0.03	0.04
maturing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
mature and overmature	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.02
Deciduous softwood								
young I class of age	1.33	1.01	1.04	1.09	1.11	0.75	-	-
young II class of age	8.95	6.08	6.69	5.78	5.13	4.49	5.12	3.46
middle-aged	43.68	53.73	64.88	74.02	66.73	57.43	58.18	51.46
maturing	17.48	21.23	25.41	26.43	29.95	36.99	36.65	43.83
mature and overmature	35.40	55.46	63.45	65.43	75.89	84.00	79.73	126.98
8. Novgorod Oblast								
Coniferous								
young I class of age	1.52	1.23	1.44	2.16	2.52	5.68	-	-
young II class of age	4.83	7.41	7.55	7.83	7.85	8.62	15.34	21.01
middle-aged	27.63	28.36	27.90	35.69	35.59	35.16	45.52	50.02
maturing	17.36	23.04	21.53	22.99	22.77	34.54	33.82	38.29
mature and overmature	17.00	22.07	16.51	34.60	30.87	49.77	42.55	48.51
Deciduous hardwood								
young I class of age	0.00	0.00	0.00	0.00	0.00	0.00	-	-
young II class of age	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01
middle-aged	0.02	0.13	0.12	0.13	0.16	0.17	0.19	0.16
maturing	0.02	0.04	0.04	0.06	0.05	0.08	0.07	0.12
mature and overmature	0.02	0.01	0.00	0.03	0.03	0.05	0.05	0.07
Deciduous softwood								
young I class of age	1.61	1.10	1.18	0.84	0.93	0.47	-	-
young II class of age	6.56	5.23	4.64	5.15	5.05	2.91	3.67	3.52
middle-aged	22.72	34.68	36.15	49.78	49.57	47.98	56.61	57.88
maturing	7.51	14.90	13.23	24.19	23.63	32.11	32.76	50.03
mature and overmature	12.75	29.26	21.72	43.60	37.39	65.24	58.67	117.49
9. Pskov Oblast								
Coniferous								
young I class of age	2.15	1.96	1.96	1.84	2.14	2.65	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	6.56	9.41	9.76	12.32	12.36	10.53	13.35	11.55
middle-aged	16.91	16.73	17.99	26.92	26.94	36.16	36.31	37.50
maturing	11.69	14.60	14.01	20.55	20.25	25.34	24.86	29.70
mature and overmature	8.45	12.08	10.82	15.51	12.60	17.38	14.35	18.20
Deciduous hardwood								
young I class of age	0.01	0.02	0.02	0.00	0.00	0.00	-	-
young II class of age	0.01	0.12	0.09	0.06	0.07	0.03	0.03	0.01
middle-aged	0.01	0.03	0.05	0.04	0.06	0.10	0.09	0.11
maturing	0.03	0.00	0.01	0.03	0.02	0.04	0.04	0.03
mature and overmature	0.01	0.02	0.02	0.04	0.05	0.02	0.02	0.02
Deciduous softwood								
young I class of age	0.59	0.40	0.46	0.39	0.42	0.16	-	-
young II class of age	3.14	2.15	2.26	2.19	2.27	1.35	1.60	1.27
middle-aged	6.23	12.28	13.31	24.99	25.00	23.01	24.25	20.30
maturing	4.43	6.66	6.90	9.73	9.69	14.96	15.38	20.01
mature and overmature	10.99	13.86	13.65	17.68	15.63	26.15	24.84	42.76
10. Bryansk Oblast								
Coniferous								
young I class of age	2.93	2.97	3.20	2.90	3.02	1.99	-	-
young II class of age	8.49	10.95	11.15	17.30	17.26	16.00	15.73	13.24
middle-aged	14.78	14.44	14.43	20.11	20.12	28.29	35.81	41.83
maturing	6.18	7.61	7.29	10.20	10.26	12.57	14.74	16.76
mature and overmature	9.10	7.87	4.94	6.63	3.97	6.01	6.23	6.86
Deciduous hardwood								
young I class of age	0.24	0.19	0.20	0.11	0.12	0.06	-	-
young II class of age	0.57	0.67	0.69	0.55	0.60	0.46	0.50	0.46
middle-aged	3.30	3.02	2.98	3.45	3.50	3.70	3.92	4.04
maturing	1.70	1.76	1.71	1.48	1.44	1.28	1.28	1.37
mature and overmature	1.61	1.81	1.35	2.41	2.07	1.89	1.95	2.26
Deciduous softwood								
young I class of age	1.02	0.93	0.89	0.45	0.47	0.33	-	-
young II class of age	3.25	3.43	3.43	3.68	3.64	1.84	1.76	1.3
middle-aged	11.25	11.94	12.18	17.40	17.41	25.39	25.42	24.95
maturing	7.47	8.68	8.07	9.59	9.47	8.91	9.89	12.19
mature and overmature	7.05	9.03	4.56	11.27	7.93	9.72	11.24	14.54
11. Vladimir Oblast								
Coniferous								
young I class of age	3.75	3.50	3.99	4.29	4.19	4.05	-	-
young II class of age	13.46	15.78	18.29	20.48	20.05	18.80	21.00	18.90
middle-aged	33.13	34.41	35.42	35.51	38.72	41.86	46.76	55.54
maturing	19.07	27.71	28.62	30.11	29.70	30.62	30.20	31.06
mature and overmature	6.79	8.63	8.38	8.37	7.47	9.15	7.69	11.62
Deciduous hardwood								

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age							-	-
young II class of age	0.05	0.04	0.02	0.01	0.01	0.03	0.04	0.00
middle-aged	0.36	0.35	0.49	0.49	0.51	0.36	0.38	0.39
maturing	0.18	0.26	0.21	0.24	0.20	0.19	0.20	0.17
mature and overmature	0.19	0.41	0.34	0.55	0.48	0.57	0.58	0.61
Deciduous softwood								
young I class of age	1.33	0.62	0.52	0.48	0.59	0.64	-	-
young II class of age	4.09	3.35	2.77	2.33	1.75	1.24	1.95	2.24
middle-aged	17.24	18.17	21.44	24.47	24.43	23.21	24.30	24.69
maturing	8.06	11.43	9.72	9.06	10.01	11.46	11.40	13.16
mature and overmature	3.56	8.00	6.06	6.14	8.33	8.70	7.74	16.24
12. Ivanovo Oblast								
Coniferous								
young I class of age	1.72	2.97	3.58	3.64	2.81	2.44	-	-
young II class of age	5.80	8.64	8.75	14.97	11.27	15.77	18.16	14.26
middle-aged	21.97	20.37	20.43	22.31	22.02	27.18	27.55	26.69
maturing	9.95	14.57	13.57	17.10	16.76	19.14	18.39	18.75
mature and overmature	2.70	4.99	1.84	4.20	8.57	5.71	4.03	8.30
Deciduous hardwood								
young I class of age	0.00	0.00	0.00	0.00	0.00	0.00	-	-
young II class of age	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
middle-aged	0.18	0.11	0.09	0.07	0.05	0.06	0.06	0.03
maturing	0.03	0.14	0.15	0.09	0.03	0.05	0.05	0.03
mature and overmature	0.07	0.16	0.15	0.24	0.34	0.31	0.31	0.37
Deciduous softwood								
young I class of age	0.88	0.60	0.71	0.41	0.12	0.33	-	-
young II class of age	4.29	3.14	3.31	2.52	0.90	1.75	2.12	1.46
middle-aged	12.68	16.94	17.72	23.59	14.01	26.69	26.53	23.31
maturing	9.97	12.07	10.93	11.46	14.39	11.63	11.13	16.17
mature and overmature	5.28	12.22	4.93	8.89	14.42	11.25	9.41	20.30
13. Tver Oblast								
Coniferous								
young I class of age	3.16	3.11	3.55	5.53	6.00	6.77	-	-
young II class of age	10.35	19.36	19.04	20.06	20.07	17.67	24.83	24.88
middle-aged	28.68	38.62	52.43	64.69	64.71	63.86	63.58	77.60
maturing	40.07	42.93	33.53	37.06	35.76	49.38	47.52	47.63
mature and overmature	39.27	47.92	27.36	41.45	34.10	58.38	49.84	45.14
Deciduous hardwood								
young I class of age	0.00	0.00	0.00	0.00	0.00	0.00	-	-
young II class of age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
middle-aged	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01
maturing	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0
mature and overmature	0.02	0.01	0.02	0.02	0.03	0.03	0.03	0.04

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
Deciduous softwood								
young I class of age	1.85	1.56	1.96	1.02	1.05	0.87	-	-
young II class of age	9.01	7.18	7.11	7.79	7.79	4.87	5.78	3.60
middle-aged	16.58	36.80	39.61	50.13	50.19	79.72	77.12	67.12
maturing	14.14	19.04	17.16	31.48	30.44	30.58	29.08	40.29
mature and overmature	31.11	41.38	26.65	45.08	37.38	46.59	39.56	64.74
14. Kaluga Oblast								
Coniferous								
young I class of age	0.90	1.44	1.69	2.52	2.68	2.94	-	-
young II class of age	2.94	4.35	4.24	6.73	6.80	9.64	12.71	11.23
middle-aged	7.64	8.92	8.41	11.62	11.57	14.39	15.18	17.95
maturing	5.67	6.36	5.39	7.23	7.93	11.14	10.92	12.93
mature and overmature	1.49	2.73	1.80	3.74	2.23	5.90	4.80	8.02
Deciduous hardwood								
young I class of age	0.05	0.12	0.17	0.07	0.12	0.05	-	-
young II class of age	0.20	0.25	0.27	0.37	0.35	0.39	0.48	0.21
middle-aged	1.90	1.48	1.52	2.07	2.04	2.44	2.41	1.72
maturing	0.72	1.07	1.16	1.04	1.08	1.48	1.47	1.34
mature and overmature	1.23	1.71	1.53	1.70	1.59	1.62	1.59	2.08
Deciduous softwood								
young I class of age	0.91	0.87	0.88	0.27	0.31	0.15	-	-
young II class of age	4.39	4.75	4.47	2.87	2.91	1.34	1.66	0.81
middle-aged	8.26	13.65	13.10	25.21	25.08	31.61	30.83	26.24
maturing	13.77	16.07	15.00	15.64	15.51	15.56	15.07	15.82
mature and overmature	23.62	27.36	19.97	23.95	19.93	29.15	26.06	38.47
15. Kostroma Oblast								
Coniferous								
young I class of age	6.05	5.19	5.3	10.33	11.53	12.06	-	-
young II class of age	12.21	30.20	29.66	36.15	36.25	33.13	47.08	56.19
middle-aged	29.00	31.28	31.79	42.48	42.27	72.36	72.31	75.62
maturing	48.63	38.94	38.36	39.94	38.56	41.19	40.15	53.36
mature and overmature	142.88	131.58	88.76	92.00	74.44	86.73	73.13	82.28
Deciduous hardwood								
young I class of age	0.00	0.00	0.00	0.00	0.00	0.00	-	-
young II class of age	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
middle-aged	0.02	0.01	0.01	0.00	0.00	0.01	0.01	0.00
maturing	0.00	0.02	0.02	0.02	0.02	0.01	0.01	0.00
mature and overmature	0.01	0.01	0.01	0.03	0.03	0.02	0.02	0.05
Deciduous softwood								
young I class of age	2.16	3.29	3.64	3.02	3.19	2.55	-	-
young II class of age	21.80	11.13	8.67	13.19	13.17	12.12	14.94	11.26
middle-aged	39.33	83.35	87.44	118.00	117.54	121.53	121.49	89.90
maturing	13.54	20.69	21.07	30.64	29.84	52.75	50.19	87.41

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
mature and overmature	64.69	65.74	47.17	55.84	41.58	62.54	47.96	107.20
16. Moscow Oblast								
Coniferous								
young I class of age	3.05	3.27	4.07	4.27	4.26	4.28	-	-
young II class of age	11.99	12.06	17.05	16.84	21.72	21.26	21.33	22.01
middle-aged	59.51	56.33	81.28	80.77	109.70	82.49	83.76	83.77
maturing	12.91	13.51	9.45	9.03	15.92	30.94	48.93	48.39
mature and overmature	1.57	1.11	1.01	0.74	1.81	8.76	20.37	17.70
Deciduous hardwood								
young I class of age	0.07	0.10	0.11	0.10	0.07	0.07	-	-
young II class of age	0.14	0.21	0.14	0.13	0.39	0.39	0.34	0.34
middle-aged	3.40	3.10	3.28	3.31	3.80	3.77	3.65	3.63
maturing	0.37	0.39	0.98	0.96	0.83	0.84	0.68	0.69
mature and overmature	0.48	0.49	0.91	0.85	0.99	0.95	1.31	1.30
Deciduous softwood								
young I class of age	0.84	0.90	0.26	0.28	0.42	0.39	-	-
young II class of age	6.95	6.94	3.73	3.22	1.64	1.63	1.98	1.98
middle-aged	50.17	47.20	64.32	64.45	79.98	78.46	75.61	75.97
maturing	19.31	18.15	17.93	17.63	22.23	21.21	30.52	29.29
mature and overmature	18.74	13.58	17.00	13.88	27.15	23.57	44.42	42.48
17. Orel Oblast								
Coniferous								
young I class of age	0.18	0.20	0.19	0.23	0.26	0.19	-	-
young II class of age	0.17	0.64	0.68	1.41	1.39	1.18	1.42	1.12
middle-aged	0.52	0.32	0.77	1.35	1.43	2.02	2.72	4.98
maturing	0.36	0.57	0.61	0.27	0.23	0.70	0.22	0.06
mature and overmature	0.12	0.25	0.14	0.15	0.10	0.36		
Deciduous hardwood								
young I class of age	0.30	0.13	0.14	0.19	0.21	0.16	-	-
young II class of age	0.20	0.76	0.76	0.46	0.45	0.79	0.97	0.91
middle-aged	1.25	1.38	1.35	3.01	3.09	3.91	4.16	6.57
maturing	0.24	0.46	0.48	0.59	0.59	0.68	0.58	0.06
mature and overmature	0.29	0.62	0.43	0.45	0.31	0.80	0.58	0.06
Deciduous softwood								
young I class of age	0.30	0.06	0.05	0.02	0.02	0.02	-	-
young II class of age	0.39	0.79	0.81	0.26	0.27	0.12	0.08	0.26
middle-aged	0.68	0.80	0.83	2.51	2.49	3.42	3.26	5.20
maturing	0.68	0.88	0.85	1.41	1.47	1.50	0.81	2.60
mature and overmature	0.46	1.30	0.68	1.35	0.84	1.78	2.44	1.83
18. Ryazan Oblast								
Coniferous								
young I class of age	3.09	3.04	2.23	2.46	2.46	2.64	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	7.52	9.56	14.17	14.00	11.80	11.91	11.03	11.18
middle-aged	15.98	15.06	18.72	18.48	21.94	21.89	27.66	27.85
maturing	8.18	8.37	9.03	8.63	13.21	12.77	16.87	16.61
mature and overmature	2.42	2.73	3.93	2.45	5.92	3.44	7.72	5.65
Deciduous hardwood								
young I class of age	0.29	0.46	0.22	0.25	0.13	0.16	-	-
young II class of age	0.97	1.50	1.07	1.08	0.91	0.92	0.85	0.86
middle-aged	4.45	5.68	8.30	8.22	7.27	7.28	7.33	7.36
maturing	1.53	1.74	1.99	1.95	2.51	2.47	3.31	3.30
mature and overmature	0.69	1.25	1.57	1.20	3.00	2.71	3.67	3.61
Deciduous softwood								
young I class of age	0.82	0.40	0.37	0.59	0.72	0.76	-	-
young II class of age	3.91	3.22	1.89	1.83	1.69	1.70	2.99	3.05
middle-aged	10.48	13.17	17.39	17.09	24.69	24.63	20.08	20.03
maturing	7.40	8.48	11.21	10.67	8.97	8.26	12.69	12.63
mature and overmature	5.40	4.86	8.11	5.51	8.05	5.84	14.92	14.32
19. Smolensk Oblast								
Coniferous								
young I class of age	1.04	1.48	2.11	2.94	3.28	6.40	-	-
young II class of age	4.81	6.90	8.53	8.15	8.15	7.73	14.6	13.49
middle-aged	7.97	12.22	14.85	17.96	17.97	22.06	23.57	20.28
maturing	8.62	9.82	9.70	9.59	9.29	16.37	15.61	21.91
mature and overmature	8.66	8.38	5.56	4.72	3.46	7.03	5.47	11.34
Deciduous hardwood								
young I class of age	0.02	0.01	0.01	0.02	0.04	0.01	-	-
young II class of age	0.05	0.04	0.04	0.15	0.14	0.13	0.15	0.03
middle-aged	0.03	0.07	0.09	0.07	0.09	0.26	0.24	0.34
maturing	0.03	0.04	0.07	0.07	0.05	0.05	0.05	0.06
mature and overmature	0.07	0.05	0.04	0.02	0.01	0.03	0.03	0.12
Deciduous softwood								
young I class of age	1.18	1.04	1.17	0.57	0.59	0.23	-	-
young II class of age	4.19	7.09	6.28	4.43	4.37	1.56	2.06	2
middle-aged	8.36	16.63	25.19	38.05	37.69	42.85	47.26	46.97
maturing	7.70	10.52	10.57	9.73	9.35	14.10	13.79	26.31
mature and overmature	14.48	21.94	18.39	16.08	12.23	20.53	16.69	40.2
20. Tula Oblast								
Coniferous								
young I class of age	0.22	0.24	0.31	0.30	0.29	0.28	-	-
young II class of age	0.12	0.25	0.73	0.73	1.19	1.19	1.44	1.51
middle-aged	0.35	0.41	0.97	0.94	1.38	1.25	2.25	2.36
maturing	0.56	0.47	0.24	0.22	0.56	0.66	0.71	0.69
mature and overmature	0.39	0.25	0.01	0.01	0.14	0.14	0.44	0.43
Deciduous hardwood								

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	0.52	0.52	0.44	0.48	0.51	0.52	-	-
young II class of age	0.97	1.05	1.43	1.43	1.48	1.48	2.07	2.25
middle-aged	4.74	4.80	8.13	8.14	8.79	8.75	9.53	9.91
maturing	1.82	1.66	1.11	1.07	1.28	1.30	1.79	1.78
mature and overmature	1.19	1.14	0.70	0.59	1.02	0.81	1.52	1.59
Deciduous softwood								
young I class of age	0.13	0.12	0.03	0.04	0.09	0.08	-	-
young II class of age	0.95	0.93	0.58	0.56	0.40	0.39	0.52	0.67
middle-aged	3.65	3.71	5.33	5.33	7.72	7.69	9.44	11.79
maturing	5.28	5.10	4.88	4.86	3.46	3.43	2.95	2.77
mature and overmature	6.67	4.92	5.19	3.94	8.86	7.47	10.38	10.12
21. Yaroslavl Oblast								
Coniferous								
young I class of age	1.23	1.59	1.46	1.72	2.54	2.71	-	-
young II class of age	3.31	5.01	6.69	6.68	6.40	6.40	11.13	11.31
middle-aged	13.88	14.07	17.02	16.93	19.47	19.37	19.91	19.87
maturing	7.21	9.09	9.85	9.74	13.33	12.98	14.85	14.78
mature and overmature	5.02	4.76	4.86	3.60	5.75	4.57	10.22	9.32
Deciduous hardwood								
young I class of age	0.01	0.00	0.00	0.00	0.00	0.00	-	-
young II class of age	0.04	0.05	0.03	0.03	0.02	0.02	0.00	0.00
middle-aged	0.29	0.30	0.22	0.21	0.30	0.29	0.08	0.08
maturing	0.02	0.01	0.10	0.09	0.01	0.01	0.03	0.03
mature and overmature	0.00	0.00	0.01	0.01	0.00	0.00	0.23	0.23
Deciduous softwood								
young I class of age	1.09	1.06	0.42	0.49	0.24	0.27	-	-
young II class of age	6.83	5.52	3.30	3.23	1.75	1.71	1.11	1.14
middle-aged	13.63	31.48	33.85	33.81	39.12	38.98	32.18	32.05
maturing	8.89	12.83	13.17	12.79	16.20	15.72	24.27	24.11
mature and overmature	18.36	10.50	18.91	14.46	17.94	13.94	35.00	33.51
22. Nizhni Novgorod Oblast								
Coniferous								
young I class of age	6.49	7.51	7.07	11.66	12.93	10.98	-	-
young II class of age	15.07	24.95	25.52	39.5	39.19	41.42	52.55	55.81
middle-aged	41.06	48.98	44.67	59.93	59.19	70.79	69.75	105.04
maturing	42.50	42.70	33.33	37.81	34.78	40.66	37.70	36.33
mature and overmature	66.31	53.17	28.88	32.15	23.76	34.26	27.58	22.46
Deciduous hardwood								
young I class of age	0.35	0.32	0.35	0.26	0.28	0.06	-	-
young II class of age	0.89	1.18	1.18	1.03	1.02	0.46	0.55	0.21
middle-aged	3.22	5.51	5.56	7.17	7.07	5.29	5.22	4.28
maturing	0.64	0.59	0.58	1.46	1.36	1.93	1.87	1.46
mature and overmature	1.46	1.44	1.15	1.83	1.66	2.27	2.10	2.50

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
Deciduous softwood								
young I class of age	2.64	3.61	4.00	3.17	3.65	3.90	-	-
young II class of age	11.64	12.98	11.97	15.42	15.21	9.40	13.39	14.93
middle-aged	25.83	39.79	45.02	72.37	71.71	79.13	80.42	100.20
maturing	19.22	22.29	20.19	28.99	26.3	36.20	32.63	43.96
mature and overmature	48.56	49.58	29.70	37.97	26.66	40.17	29.03	47.81
23. Kirov Oblast								
Coniferous								
young I class of age	6.37	6.65	7.22	10.03	14.11	15.01	-	-
young II class of age	23.49	30.09	38.07	40.49	43.02	36.88	56.17	59.16
middle-aged	87.28	77.30	81.45	98.18	104.31	112.82	116.29	120.33
maturing	115.82	89.69	66.71	64.73	61.32	58.07	60.04	61.97
mature and overmature	287.33	263.79	246.05	215.24	211.64	206.88	216.07	203.93
Deciduous hardwood								
young I class of age	0.00	0.00	0.01	0.00	0.00	0.00	-	-
young II class of age	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00
middle-aged	0.20	0.21	0.32	0.32	0.16	0.14	0.17	0.14
maturing	0.04	0.05	0.07	0.06	0.05	0.04	0.07	0.07
mature and overmature	0.22	0.22	0.25	0.27	0.46	0.48	0.41	0.38
Deciduous softwood								
young I class of age	2.19	4.13	4.25	5.75	5.18	3.96	-	-
young II class of age	17.64	13.09	10.23	15.82	20.92	22.81	23.64	23.67
middle-aged	41.24	54.51	74.45	81.85	100.41	110.60	124.56	124.90
maturing	12.67	15.39	23.21	26.51	37.38	39.93	50.84	50.54
mature and overmature	158.34	160.38	158.77	142.48	139.91	129.32	138.08	127.60
24. Republic of Marii El								
Coniferous								
young I class of age	2.86	3.37	3.03	3.37	3.84	3.31	-	-
young II class of age	9.88	12.19	13.84	14.18	14.18	10.84	14.27	15.53
middle-aged	15.97	12.66	22.37	26.56	26.47	30.85	30.07	38.63
maturing	14.49	13.74	13.11	13.30	13.03	13.59	12.89	16.95
mature and overmature	34.48	31.99	18.74	17.37	14.52	17.54	15.11	11.96
Deciduous hardwood								
young I class of age	0.03	0.01	0.05	0.04	0.02	0.01	-	-
young II class of age	0.10	0.25	0.15	0.10	0.08	0.04	0.05	0.05
middle-aged	1.06	0.80	1.08	1.28	1.23	0.59	0.57	0.73
maturing	0.22	0.33	0.42	0.45	0.39	0.30	0.30	0.29
mature and overmature	0.76	1.28	0.81	0.70	0.66	1.08	1.06	0.61
Deciduous softwood								
young I class of age	0.72	0.88	0.87	1.27	1.45	1.91	-	-
young II class of age	2.74	3.10	4.11	4.13	3.71	2.41	4.33	6.93
middle-aged	14.84	13.83	25.78	28.92	28.56	31.47	31.05	35.90
maturing	5.13	6.94	7.25	7.50	6.90	11.83	10.97	15.53

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
mature and overmature	20.52	22.60	19.37	18.12	14.89	18.47	15.15	25.64
25. Republic of Mordovia								
Coniferous								
young I class of age	1.14	1.45	1.86	1.61	1.68	1.51	-	-
young II class of age	2.70	4.51	4.56	6.03	5.97	6.77	8.32	7.36
middle-aged	5.19	5.41	6.08	4.76	4.60	7.94	7.91	14.26
maturing	4.92	4.34	3.88	4.88	4.30	4.47	4.08	4.45
mature and overmature	1.79	3.27	1.55	2.63	1.54	1.77	1.16	1.69
Deciduous hardwood								
young I class of age	0.56	0.28	0.34	0.28	0.32	0.25	-	-
young II class of age	1.51	1.48	1.42	0.97	0.96	0.73	0.96	0.89
middle-aged	4.34	4.09	4.04	5.25	5.18	6.35	6.33	5.89
maturing	1.76	2.44	2.13	1.71	1.62	1.47	1.41	1.82
mature and overmature	1.90	3.09	1.67	3.12	2.36	2.25	1.92	2.44
Deciduous softwood								
young I class of age	0.83	0.47	0.51	0.68	0.70	1.12	-	-
young II class of age	4.12	2.45	2.35	2.13	2.12	1.85	2.99	3.92
middle-aged	8.25	11.02	10.44	15.26	15.09	18.39	18.38	18.82
maturing	5.15	7.40	6.22	6.18	5.54	6.50	5.70	11.41
mature and overmature	2.09	7.55	3.62	6.46	4.00	7.41	5.06	10.78
26. Chuvash Republic								
Coniferous								
young I class of age	1.02	0.67	0.83	1.59	1.74	1.84	-	-
young II class of age	2.07	3.88	3.59	4.22	4.12	5.11	6.91	9.62
middle-aged	6.60	4.81	4.61	7.24	6.94	10.19	10.09	11.23
maturing	3.31	2.51	2.34	2.95	2.79	3.43	3.52	4.30
mature and overmature	6.99	10.26	6.64	6.14	4.60	3.00	2.31	2.06
Deciduous hardwood								
young I class of age	0.88	0.88	0.91	0.61	0.66	0.33	-	-
young II class of age	2.57	2.81	2.68	3.79	3.73	2.32	2.59	1.78
middle-aged	7.47	7.62	7.31	10.10	11.17	10.84	10.89	9.15
maturing	0.73	1.14	1.05	1.16	1.03	0.95	0.88	0.85
mature and overmature	4.92	4.73	3.69	2.76	2.18	1.70	1.76	0.93
Deciduous softwood								
young I class of age	0.69	0.75	0.71	0.40	0.53	0.90	-	-
young II class of age	1.79	1.91	1.81	2.96	2.93	1.63	2.75	3.36
middle-aged	7.42	7.97	7.68	10.51	10.39	14.06	13.61	14.76
maturing	6.66	6.68	5.92	7.72	7.34	6.87	5.88	6.91
mature and overmature	11.10	13.88	7.19	12.43	8.26	11.16	8.53	12.63
27. Belgorod Oblast								
Coniferous								
young I class of age	0.22	0.23	0.25	0.49	0.48	0.31	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	0.29	0.39	0.39	0.91	0.90	1.62	1.94	2.07
middle-aged	0.24	0.25	0.25	0.56	0.56	1.02	1.01	2.21
maturing	0.01	0.02	0.02	0.10	0.10	0.14	0.14	0.00
mature and overmature	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00
Deciduous hardwood								
young I class of age	0.81	0.65	0.67	0.32	0.36	0.28	-	-
young II class of age	3.95	5.22	5.21	2.52	2.57	2.35	2.69	1.67
middle-aged	7.42	9.66	9.65	12.96	13.02	18.71	18.67	24.56
maturing	1.29	2.31	2.00	3.60	3.54	2.70	2.64	1.39
mature and overmature	1.29	1.05	0.78	1.38	0.88	1.47	1.07	0.71
Deciduous softwood								
young I class of age	0.02	0.02	0.04	0.03	0.03	0.01	-	-
young II class of age	0.08	0.14	0.12	0.11	0.13	0.07	0.09	0.09
middle-aged	0.17	0.13	0.12	0.28	0.30	0.87	0.85	0.99
maturing	0.24	0.37	0.30	0.16	0.14	0.13	0.14	0.33
mature and overmature	0.15	0.16	0.12	0.43	0.33	0.31	0.26	0.30
28. Voronezh Oblast								
Coniferous								
young I class of age	1.04	1.06	1.93	2.01	1.01	1.01	-	-
young II class of age	1.84	1.87	3.48	3.45	5.78	5.67	7.63	7.58
middle-aged	2.19	2.80	4.20	4.27	5.16	5.16	9.00	9.80
maturing	0.71	0.22	0.41	0.43	1.30	1.28	1.47	0.91
mature and overmature	0.25	0.08	0.22	0.23	0.44	0.31	0.66	0.19
Deciduous hardwood								
young I class of age	0.43	0.44	0.44	0.43	0.42	0.46	-	-
young II class of age	2.85	2.80	2.13	2.16	1.74	1.73	1.95	2.00
middle-aged	10.07	10.36	12.66	12.54	14.38	14.31	15.95	19.14
maturing	4.23	3.55	3.26	3.11	3.27	3.03	3.28	1.28
mature and overmature	3.28	2.34	3.33	2.50	2.13	1.60	3.20	1.59
Deciduous softwood								
young I class of age	0.02	0.05	0.14	0.16	0.06	0.08	-	-
young II class of age	0.38	0.36	0.23	0.22	0.46	0.47	0.58	0.56
middle-aged	0.87	0.85	1.49	1.51	1.51	1.42	2.06	3.00
maturing	1.67	1.55	1.19	1.03	1.23	1.12	1.02	0.86
mature and overmature	1.76	0.99	1.46	0.89	1.52	0.94	2.14	1.15
29. Kursk Oblast								
Coniferous								
young I class of age	0.12	0.12	0.36	0.4	0.52	0.52	-	-
young II class of age	0.25	0.41	0.73	0.94	0.94	1.06	2.00	1.98
middle-aged	0.32	0.42	0.54	0.62	1.05	1.05	1.72	1.67
maturing	0.08	0.03	0.02	0.03	0.00	0.00	0.10	0.10
mature and overmature	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Deciduous hardwood								

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	0.72	0.50	0.50	0.58	0.39	0.40	-	-
young II class of age	1.53	1.88	1.84	1.86	1.52	1.49	2.75	2.75
middle-aged	3.20	3.80	6.06	6.11	8.75	8.76	11.64	11.91
maturing	0.87	0.76	0.73	0.66	1.31	1.30	1.95	1.72
mature and overmature	0.43	0.33	0.36	0.29	0.43	0.32	0.60	0.54
Deciduous softwood								
young I class of age	0.14	0.09	0.10	0.13	0.02	0.06	-	-
young II class of age	0.25	0.36	0.36	0.37	0.34	0.34	0.18	0.16
middle-aged	0.63	0.49	0.93	0.95	1.60	1.56	2.37	2.37
maturing	0.59	0.77	0.67	0.63	0.86	0.83	1.11	1.07
mature and overmature	0.25	0.53	0.70	0.51	0.70	0.52	1.47	1.29
30. Lipetsk Oblast								
Coniferous								
young I class of age	0.53	0.87	0.75	0.62	0.64	0.27	-	-
young II class of age	1.57	2.00	2.32	2.66	2.65	3.12	2.74	2.73
middle-aged	1.10	1.72	2.11	3.86	3.87	6.02	6.80	7.44
maturing	1.34	1.18	1.02	1.09	1.07	0.84	1.05	0.36
mature and overmature	0.99	0.73	0.47	0.57	0.38	0.34	0.37	0.04
Deciduous hardwood								
young I class of age	0.29	0.17	0.19	0.14	0.15	0.06	-	-
young II class of age	0.46	0.83	0.78	1.14	1.16	0.90	0.65	0.66
middle-aged	2.27	3.19	3.59	4.44	4.45	5.67	6.30	6.99
maturing	0.45	0.66	0.68	0.96	0.93	0.97	0.83	0.62
mature and overmature	0.24	0.22	0.21	0.56	0.39	0.66	0.77	0.21
Deciduous softwood								
young I class of age	0.09	0.05	0.06	0.05	0.05	0.02	-	-
young II class of age	0.21	0.26	0.26	0.23	0.23	0.21	0.11	0.16
middle-aged	0.56	0.69	0.75	1.10	1.15	1.95	1.42	2.57
maturing	0.95	1.25	1.06	1.06	1.02	0.81	0.86	0.66
mature and overmature	0.92	0.64	0.72	1.48	1.11	1.36	1.83	0.69
31. Tambov Oblast								
Coniferous								
young I class of age	1.12	1.30	1.44	1.53	1.68	1.78	-	-
young II class of age	2.61	2.64	5.47	5.43	4.59	4.55	7.31	7.43
middle-aged	3.49	5.96	7.30	7.28	8.98	8.92	14.17	14.19
maturing	4.64	3.63	3.59	3.49	4.60	4.56	4.79	4.69
mature and overmature	5.05	3.22	2.41	1.57	3.69	2.76	2.77	2.43
Deciduous hardwood								
young I class of age	0.12	0.11	0.03	0.06	0.10	0.12	-	-
young II class of age	0.46	0.48	0.29	0.29	0.37	0.38	0.87	0.86
middle-aged	2.99	2.98	4.47	4.45	3.84	3.86	5.96	5.65
maturing	0.91	0.84	1.31	1.25	1.41	1.35	0.61	0.60
mature and overmature	0.82	0.79	0.81	0.53	1.43	1.05	0.58	0.46

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
Deciduous softwood								
young I class of age	0.17	0.18	0.18	0.25	0.25	0.36	-	-
young II class of age	0.98	0.97	0.64	0.63	0.83	0.82	1.27	1.26
middle-aged	1.96	2.27	3.45	3.48	4.60	4.60	5.94	5.67
maturing	3.78	3.71	3.63	3.51	3.47	3.31	3.41	3.38
mature and overmature	3.95	2.52	4.72	3.37	4.71	3.27	4.60	3.73
32. Astrakhan Oblast								
Deciduous hardwood								
young I class of age	0.03	0.04	0.05	0.00	0.02		-	-
young II class of age	0.03	0.07	0.07	0.06	0.06	0.03	0.00	0.04
middle-aged	0.07	0.09	0.13	0.13	0.16	0.28	0.27	0.27
maturing	0.02	0.02	0.06	0.14	0.13	0.12	0.12	0.15
mature and overmature	0.04	0.04	0.02	0.15	0.15	0.32	0.34	0.28
Deciduous softwood								
young I class of age	0.05	0.09	0.15	0.05	0.11	0.00	-	-
young II class of age	0.14	0.20	0.22	0.31	0.33	0.08	0.13	0.14
middle-aged	0.70	0.53	0.45	0.63	0.63	0.62	0.60	0.60
maturing	1.31	0.95	0.74	0.48	0.50	0.71	0.72	0.69
mature and overmature	2.22	2.63	1.72	2.08	1.95	2.72	2.63	2.58
33. Volgograd Oblast								
Coniferous								
young I class of age	0.07	0.03	0.20	0.41	0.46	0.58	-	-
young II class of age	0.24	0.10	0.11	0.28	0.30	0.98	1.57	2.69
middle-aged	0.53	0.35	0.35	0.41	0.41	0.76	0.76	1.25
maturing	0.01	0.41	0.40	0.33	0.30	0.01	0.01	0.00
mature and overmature	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Deciduous hardwood								
young I class of age	0.71	0.32	0.40	0.22	0.36	0.37	-	-
young II class of age	1.23	1.38	1.42	0.68	0.69	1.40	1.89	1.34
middle-aged	5.74	5.17	6.03	4.20	4.12	6.48	6.28	8.98
maturing	3.24	3.80	3.35	3.34	3.12	2.50	2.32	3.40
mature and overmature	1.56	3.69	1.60	5.53	4.78	2.32	1.93	3.00
Deciduous softwood								
young I class of age	0.16	0.07	0.13	0.08	0.09	0.04	-	-
young II class of age	0.27	0.16	0.15	0.34	0.34	0.21	0.35	0.15
middle-aged	0.76	0.64	0.65	0.76	0.78	1.14	1.18	1.27
maturing	1.04	0.83	0.72	0.48	0.47	0.99	1.00	1.23
mature and overmature	1.54	2.52	1.48	3.03	2.74	3.50	3.07	5.10
34. Samara Oblast								
Coniferous								
young I class of age	0.32	0.46	1.16	1.15	1.04	0.82	-	-
young II class of age	0.58	0.83	1.40	1.52	2.03	2.72	3.52	4.05

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
middle-aged	1.32	2.20	3.22	3.26	3.12	4.45	4.55	5.96
Maturing	1.80	2.01	1.61	1.55	1.55	1.73	1.66	1.52
mature and overmature	4.86	4.52	4.30	3.96	3.99	3.65	3.55	2.77
Deciduous hardwood								
young I class of age	0.27	0.54	0.47	0.23	0.26	0.13	-	-
young II class of age	1.15	3.08	2.38	0.75	0.70	0.73	0.86	0.88
middle-aged	7.46	7.94	10.79	15.07	15.00	12.48	11.53	11.21
maturing	2.59	3.65	4.11	4.84	3.79	4.92	5.49	4.52
mature and overmature	2.05	2.49	2.99	2.77	1.44	4.38	4.52	5.16
Deciduous softwood								
young I class of age	0.45	0.63	0.57	0.60	0.59	0.65	-	-
young II class of age	2.01	2.07	1.92	2.03	1.83	2.14	2.72	2.49
middle-aged	5.45	7.33	10.10	11.90	12.13	15.62	14.59	21.07
maturing	5.39	7.25	6.20	5.72	4.85	6.62	6.24	8.14
mature and overmature	6.28	9.64	7.38	6.33	3.70	5.99	6.01	8.95
35. Penza Oblast								
Coniferous								
young I class of age	1.46	1.73	3.19	4.16	3.78	4.26	-	-
young II class of age	3.89	5.70	8.09	8.56	9.40	9.18	13.54	13.76
middle-aged	7.20	9.84	11.14	11.85	16.04	15.58	16.57	16.19
maturing	7.83	7.24	8.64	9.07	9.92	9.56	8.77	8.65
mature and overmature	6.20	5.63	7.17	5.88	6.92	4.97	6.45	5.32
Deciduous hardwood								
young I class of age	0.52	0.53	0.31	0.23	0.12	0.16	-	-
young II class of age	3.09	2.46	1.35	1.05	0.79	0.79	0.68	0.71
middle-aged	11.27	13.33	13.87	13.42	12.89	12.79	10.79	10.50
maturing	4.15	3.35	3.89	3.86	4.11	4.02	4.40	4.34
mature and overmature	2.35	2.56	3.03	3.35	5.17	3.88	6.55	6.34
Deciduous softwood								
young I class of age	0.49	0.55	0.62	0.71	0.99	1.15	-	-
young II class of age	2.46	2.80	2.99	2.95	2.94	2.87	3.99	4.29
middle-aged	9.54	12.30	15.74	17.43	22.33	21.45	23.35	23.16
maturing	8.67	8.57	8.81	9.19	9.49	8.92	11.01	11.00
mature and overmature	8.45	9.68	11.60	10.40	15.26	10.55	15.35	13.93
36. Saratov Oblast								
Coniferous								
young I class of age	0.16	0.18	0.27	0.31	0.31	0.35	-	-
young II class of age	0.35	0.38	0.48	0.72	0.94	1.05	1.45	1.79
middle-aged	0.32	0.37	0.38	0.51	0.97	1.41	1.34	2.66
maturing	0.35	0.43	0.50	0.45	0.54	0.55	0.55	0.30
mature and overmature	0.26	0.35	0.45	0.54	0.10	0.19	0.18	0.14
Deciduous hardwood								
young I class of age	0.28	0.21	0.36	0.52	0.44	0.23	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	1.57	1.50	1.17	0.77	1.12	1.37	1.65	1.05
middle-aged	9.08	9.77	8.55	6.44	12.74	12.18	12.15	14.72
maturing	6.66	6.52	7.10	7.92	7.15	8.26	8.16	6.57
mature and overmature	2.78	3.39	5.02	8.03	3.53	5.29	4.70	6.35
Deciduous softwood								
young I class of age	0.11	0.07	0.13	0.16	0.20	0.17	-	-
young II class of age	0.77	0.61	0.48	0.31	0.47	0.65	0.88	0.61
middle-aged	2.25	2.33	2.37	1.89	4.69	5.39	5.39	7.75
maturing	2.34	2.67	2.80	2.79	1.94	2.40	2.33	2.10
mature and overmature	1.59	2.42	2.64	4.20	2.95	3.34	2.93	5.76
37. Ulyanovsk Oblast								
Coniferous								
young I class of age	1.39	1.49	2.62	2.88	2.83	3.16	-	-
young II class of age	4.50	6.87	10.40	10.35	11.21	11.18	16.13	18.38
middle-aged	8.15	8.39	16.50	16.40	24.91	24.73	32.57	40.31
maturing	10.56	11.21	11.23	10.99	12.17	11.89	11.04	10.40
mature and overmature	10.47	14.03	14.98	11.59	13.82	11.25	7.55	5.21
Deciduous hardwood								
young I class of age	0.29	0.17	0.09	0.11	0.15	0.15	-	-
young II class of age	1.45	1.13	0.64	0.64	0.26	0.26	0.40	0.35
middle-aged	7.24	7.31	9.51	9.48	7.04	7.06	6.35	5.82
maturing	3.72	4.17	5.19	5.07	3.89	3.78	3.87	3.75
mature and overmature	2.80	3.53	4.81	3.49	5.15	4.08	3.52	3.30
Deciduous softwood								
young I class of age	0.55	0.72	0.57	0.69	0.72	0.86	-	-
young II class of age	2.83	2.45	3.22	3.21	2.97	2.94	3.89	3.92
middle-aged	7.79	10.47	21.73	21.66	29.10	29.02	32.00	26.76
maturing	9.96	10.46	8.98	8.79	10.91	10.50	12.20	15.85
mature and overmature	13.23	15.91	16.50	11.88	13.94	9.87	11.08	18.59
38. Republic of Kalmykia								
Coniferous								
young I class of age	0.00	0.00	0.08	0.00	0.00	0.00	-	-
young II class of age	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
middle-aged	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
maturing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
mature and overmature	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deciduous hardwood								
young I class of age	0.05	0.08	0.00	0.00	0.03	0.00	-	-
young II class of age	0.00	0.02	0.00	0.03	0.04	0.00	0.02	0.00
middle-aged	0.00	0.00	0.00	0.05	0.06	0.11	0.09	0.04
maturing	0.00	0.00	0.00	0.05	0.03	0.00	0.00	0.03
mature and overmature	0.00	0.00	0.00	0.01	0.01	0.06	0.05	0.14
Deciduous softwood								

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	0.00	0.00	0.00	0.00	0.01		-	-
young II class of age	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
middle-aged	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
maturing	0.03	0.01	0.01	0.00	0.00	0.01	0.01	0.02
mature and overmature	0.01	0.06	0.02	0.02	0.01	0.02	0.02	0.04
39. Republic of Tatarstan								
Coniferous								
young I class of age	1.31	1.63	2.40	3.44	3.90	3.85	-	-
young II class of age	2.72	3.52	5.21	6.31	7.01	8.93	14.47	16.08
middle-aged	6.80	6.36	6.18	8.10	10.76	12.55	15.03	16.07
maturing	2.99	2.63	3.05	3.22	3.62	4.09	4.71	4.74
mature and overmature	4.93	4.74	3.61	2.54	2.06	1.94	2.54	2.57
Deciduous hardwood								
young I class of age	1.08	1.13	1.17	0.91	0.99	0.97	-	-
young II class of age	3.68	4.03	4.09	3.81	3.50	2.13	2.81	2.56
middle-aged	10.57	13.58	15.78	20.82	20.57	14.29	12.83	11.23
maturing	2.98	2.93	2.78	3.66	3.73	3.09	3.18	2.80
mature and overmature	5.31	5.54	5.03	4.80	3.53	2.44	2.20	2.36
Deciduous softwood								
young I class of age	1.30	1.70	1.96	1.48	1.54	1.18	-	-
young II class of age	4.87	3.34	3.51	6.33	6.12	5.73	6.76	5.76
middle-aged	18.43	18.85	21.87	27.65	29.47	36.75	37.82	38.28
maturing	14.49	16.33	14.96	15.84	15.99	16.92	20.10	25.19
mature and overmature	23.43	23.32	12.89	17.50	14.37	21.74	22.16	27.07
40. Krasnodar Kray*								
Coniferous								
young I class of age	0.02	0.04	0.14	0.56	0.66	1.04	-	-
young II class of age	0.01	0.02	0.03	0.13	0.11	0.79	1.93	1.91
middle-aged	2.71	1.69	2.02	0.90	1.21	1.52	1.50	1.70
maturing	3.10	4.26	3.37	1.65	2.84	3.08	2.92	3.01
mature and overmature	41.27	17.98	17.29	18.04	16.15	24.37	24.23	24.45
Deciduous hardwood								
young I class of age	2.14	1.75	2.08	2.11	2.44	1.82	-	-
young II class of age	5.67	5.18	4.65	10.97	10.87	8.47	10.47	10.60
middle-aged	32.74	45.06	53.25	36.20	43.14	72.60	74.52	78.89
maturing	48.94	44.29	39.39	36.17	36.81	39.08	38.78	41.43
mature and overmature	102.11	95.07	81.08	113.40	99.64	112.49	107.72	103.78
Deciduous softwood								
young I class of age	0.27	0.20	0.19	0.06	0.08	0.06	-	-
young II class of age	0.71	0.73	0.47	0.52	0.57	0.46	0.55	0.54
middle-aged	1.89	1.34	1.28	1.60	1.72	2.53	2.65	3.01
maturing	0.89	1.36	1.35	1.57	1.50	1.69	1.72	1.94

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
mature and overmature	5.27	5.70	5.17	6.01	5.39	6.06	5.72	6.47
41. Stavropol Kray*								
Coniferous								
young I class of age	0.03	0.14	0.18	0.09	0.23	0.30	-	-
young II class of age	0.17	0.47	0.47	0.55	0.54	0.58	0.90	0.55
middle-aged	4.03	2.68	3.08	5.33	5.37	7.92	7.94	7.83
maturing	3.98	3.15	3.64	3.59	3.69	6.53	6.53	5.67
mature and overmature	15.71	11.46	12.49	13.32	12.95	17.07	17.05	20.83
Deciduous hardwood								
young I class of age	0.31	0.68	0.75	0.29	0.30	0.11	-	-
young II class of age	1.73	2.78	2.54	3.50	3.41	0.64	0.77	0.56
middle-aged	5.59	6.42	6.17	8.17	8.30	14.69	14.91	15.07
maturing	3.00	5.51	5.43	5.56	5.56	4.12	4.27	5.62
mature and overmature	9.78	9.89	9.33	10.79	10.65	14.98	15.07	16.32
Deciduous softwood								
young I class of age	0.07	0.06	0.09	0.02	0.03	0.01	-	-
young II class of age	0.61	0.40	0.39	0.25	0.24	0.14	0.15	0.09
middle-aged	1.97	1.88	1.86	2.52	2.61	4.62	4.64	2.97
maturing	1.17	2.00	2.10	2.38	2.39	2.78	2.75	3.16
mature and overmature	5.41	6.91	6.54	8.69	8.20	8.85	8.60	12.11
42. Rostov Oblast								
Coniferous								
young I class of age	0.05	0.06	0.36	0.45	1.34	1.37	-	-
young II class of age	0.10	0.08	0.53	0.53	1.24	1.19	4.01	3.55
middle-aged	0.22	0.27	0.26	0.25	0.49	0.49	0.80	0.78
maturing	0.02	0.03	0.20	0.20	0.00	0.00	0.02	0.00
mature and overmature	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00
Deciduous hardwood								
young I class of age	0.16	0.23	0.24	0.24	0.37	0.40	-	-
young II class of age	0.51	0.45	0.98	0.94	1.76	1.79	1.85	1.71
middle-aged	1.25	1.23	1.23	1.17	2.07	2.05	3.57	3.78
maturing	0.74	0.94	0.87	0.87	0.46	0.44	0.95	0.73
mature and overmature	0.50	0.40	1.06	0.80	0.56	0.42	0.91	0.65
Deciduous softwood								
young I class of age	0.03	0.02	0.05	0.07	0.02	0.05	-	-
young II class of age	0.01	0.02	0.11	0.10	0.15	0.14	0.13	0.12
middle-aged	0.30	0.28	0.36	0.31	1.08	1.04	1.16	1.20
maturing	0.23	0.19	0.32	0.26	0.41	0.38	0.43	0.39
mature and overmature	0.89	0.65	0.84	0.69	0.69	0.58	0.74	0.57
43. Republic of Daghestan								
Coniferous								
young I class of age	0.04	0.05	0.06	0.02	0.03	0.01	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	0.48	0.50	0.49	0.51	0.52	0.36	0.38	0.40
middle-aged	2.08	1.83	1.86	4.25	4.27	7.73	7.75	7.75
maturing	1.53	1.27	1.28	1.07	1.07	1.08	1.08	1.08
mature and overmature	1.86	1.62	1.60	0.84	0.84	0.53	0.53	0.53
Deciduous hardwood								
young I class of age	0.42	0.19	0.23	0.04	0.08	0.06	-	-
young II class of age	2.58	1.84	1.87	1.06	1.11	0.64	0.68	0.82
middle-aged	5.65	7.34	7.22	10.90	11.17	17.92	17.00	17.95
maturing	1.52	3.20	3.15	2.90	2.76	2.70	2.54	2.68
mature and overmature	1.49	3.19	2.88	3.11	3.00	1.97	1.92	1.94
Deciduous softwood								
young I class of age	0.03	0.03	0.04	0.00	0.00	0.01	-	-
young II class of age	0.23	0.13	0.16	0.06	0.06	0.04	0.05	0.05
middle-aged	1.12	0.96	0.95	1.46	1.47	2.99	3.02	2.94
maturing	0.78	0.83	0.82	0.89	0.88	1.13	1.13	1.12
mature and overmature	1.69	2.52	2.34	2.82	2.72	1.95	1.93	1.97
44. Kabardino-Balkarian Republic								
Coniferous								
young I class of age	0.01	0.00	0.00	0.00	0.01	0.00	-	-
young II class of age	0.01	0.02	0.02	0.05	0.04	0.01	0.01	0.01
middle-aged	0.43	0.42	0.40	0.34	0.28	0.24	0.24	0.30
maturing	0.21	0.23	0.24	0.17	0.17	0.15	0.15	0.18
mature and overmature	0.21	0.14	0.13	0.23	0.26	0.42	0.42	0.48
Deciduous hardwood								
young I class of age	0.16	0.11	0.37	0.07	0.15	0.06	-	-
young II class of age	0.69	1.03	0.84	0.55	0.55	0.31	0.36	0.35
middle-aged	1.95	2.48	2.45	4.87	4.87	6.06	6.10	6.13
maturing	2.04	2.50	2.45	1.32	1.30	1.24	1.25	1.24
mature and overmature	6.41	3.64	3.28	3.10	2.90	4.14	4.06	4.00
Deciduous softwood								
young I class of age	0.04	0.01	0.03	0.04	0.05	0.01	-	-
young II class of age	0.25	0.12	0.31	0.03	0.04	0.06	0.08	0.09
middle-aged	0.44	0.47	0.44	0.56	0.62	1.14	1.97	1.18
maturing	0.26	0.51	0.40	0.69	0.66	0.89	0.90	0.90
mature and overmature	0.83	0.96	0.86	1.45	1.32	1.16	1.14	1.18
45. Republic of North Ossetia								
Coniferous								
young I class of age	0.01	0.01	0.01	0.00	0.00	0.00	-	-
young II class of age	0.16	0.10	0.10	0.05	0.06	0.07	0.07	0.07
middle-aged	0.35	0.30	0.24	0.48	0.50	0.70	0.68	0.68
maturing	0.08	0.03	0.03	0.01	0.01	0.03	0.04	0.04
mature and overmature	0.07	0.10	0.05	0.01	0.00	0.00	0.01	0.01
Deciduous hardwood								

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young I class of age	0.55	0.53	0.50	0.06	0.10	0.05	-	-
young II class of age	2.16	2.94	2.91	1.45	1.44	0.57	0.63	0.62
middle-aged	4.51	8.62	8.53	13.73	13.58	13.88	13.89	13.87
maturing	3.27	2.73	2.69	3.06	3.03	3.49	3.50	3.47
mature and overmature	9.80	9.17	8.58	5.77	5.16	7.48	7.25	7.22
Deciduous softwood								
young I class of age	0.04	0.03	0.03	0.00	0.00	0.00	-	-
young II class of age	0.22	0.16	0.15	0.03	0.03	0.05	0.05	0.05
middle-aged	0.55	0.77	0.73	1.01	1.08	0.95	0.94	0.90
maturing	0.22	0.30	0.28	0.54	0.50	0.67	0.67	0.71
mature and overmature	0.57	0.51	0.43	0.60	0.56	0.77	0.76	0.74
46. Chechen Republic and Republic of Ingushetia*								
Coniferous								
young I class of age	0.01	0.01	0.00	0.00	0.00	0.01	-	-
young II class of age	0.03	0.02	0.04	0.05	0.06	0.06	0.06	0.08
middle-aged	0.38	0.45	0.53	0.53	0.55	0.66	0.66	0.66
maturing	0.20	0.20	0.04	0.05	0.05	0.10	0.10	0.10
mature and overmature	0.13	0.07	0.00	0.00	0.00	0.02	0.02	0.02
Deciduous hardwood								
young I class of age	1.28	0.56	0.45	0.37	0.24	0.15	-	-
young II class of age	4.44	5.46	4.10	2.66	1.48	1.06	1.35	1.61
middle-aged	4.47	8.46	16.49	19.97	23.50	23.32	24.36	26.99
maturing	4.23	4.69	4.84	4.44	5.24	3.70	3.78	5.11
mature and overmature	23.58	16.19	8.73	7.71	9.48	7.10	7.27	9.83
Deciduous softwood								
young I class of age	0.06	0.00	0.04	0.03	0.04	0.01	-	-
young II class of age	0.31	0.30	0.11	0.12	0.10	0.14	0.15	0.15
middle-aged	0.58	1.01	2.22	2.21	2.39	2.83	2.87	3.00
maturing	0.55	0.52	0.65	0.71	0.87	0.82	0.82	0.97
mature and overmature	2.74	1.90	1.18	1.22	1.26	1.25	1.25	1.63
47. Kurgan Oblast								
Coniferous								
young I class of age	1.49	1.87	2.15	3.35	3.48	3.51	-	-
young II class of age	2.65	4.98	4.98	9.47	9.48	12.97	15.24	14.48
middle-aged	11.65	12.03	12.05	13.36	13.41	19.88	22.06	34.69
maturing	9.47	13.37	12.70	13.81	13.55	11.59	15.15	9.53
mature and overmature	10.72	10.76	6.48	10.23	7.06	12.82	10.92	5.49
Deciduous softwood								
young I class of age	0.58	0.98	1.19	0.41	0.56	0.63	-	-
young II class of age	2.99	3.54	3.89	3.80	3.76	2.14	2.52	2.73
middle-aged	5.62	9.16	12.06	24.49	24.93	40.38	29.29	51.41
maturing	7.65	8.05	8.12	9.26	8.00	11.24	21.71	14.53
mature and overmature	16.97	15.58	7.79	10.12	6.39	5.76	7.15	8.38

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
48. Orenburg Oblast								
Coniferous								
young I class of age	0.14	0.23	0.51	0.76	0.66	0.56	-	-
young II class of age	0.22	0.29	0.44	0.73	1.62	1.79	2.79	2.93
middle-aged	1.40	1.47	1.56	1.80	2.52	2.61	3.04	3.80
maturing	1.01	1.07	0.71	0.66	0.87	0.95	0.80	0.68
mature and overmature	3.39	3.25	3.60	3.40	3.47	3.51	3.85	3.86
Deciduous hardwood								
young I class of age	0.27	0.21	0.31	0.26	0.34	0.21	-	-
young II class of age	1.36	0.80	0.80	0.84	0.80	0.82	1.23	0.94
middle-aged	6.06	9.30	8.89	7.66	7.88	6.00	6.39	7.66
maturing	1.92	2.00	1.62	3.99	3.85	5.66	6.15	4.63
mature and overmature	0.75	1.19	1.26	2.75	2.26	3.59	4.03	3.50
Deciduous softwood								
young I class of age	0.27	0.32	0.47	0.26	0.34	0.23	-	-
young II class of age	1.33	0.95	0.95	1.04	1.09	0.91	1.32	0.76
middle-aged	3.10	3.81	4.05	5.14	6.08	7.80	7.64	12.35
maturing	3.40	4.48	4.09	4.98	5.03	4.22	4.69	5.87
mature and overmature	2.80	5.45	4.21	9.12	7.80	10.53	11.12	15.01
49. Perm Oblast*								
Coniferous								
young I class of age	5.17	7.46	11.49	15.16	23.02	27.91	-	-
young II class of age	12.07	13.71	28.72	30.81	49.55	54.37	83.17	100.07
middle-aged	74.17	74.19	81.76	91.22	105.22	100.30	72.83	133.61
maturing	112.45	104.59	80.96	83.26	89.39	83.51	113.91	68.68
mature and overmature	893.61	792.09	793.97	676.04	663.99	584.41	505.59	455.39
Deciduous hardwood								
young I class of age	0.00	0.00	0.00	0.00	0.00	0.00	-	-
young II class of age	0.00	0.00	0.01	0.00	0.00	0.02	0.03	0.03
middle-aged	0.02	0.02	0.02	0.02	0.08	0.06	0.02	0.01
maturing	0.01	0.00	0.02	0.02	0.04	0.02	0.00	0.00
mature and overmature	0.08	0.08	0.07	0.06	0.06	0.09	0.00	0.00
Deciduous softwood								
young I class of age	2.43	3.72	7.88	8.55	7.34	6.64	-	-
young II class of age	11.84	12.13	14.67	20.67	38.85	33.04	36.94	34.73
middle-aged	24.57	30.81	49.97	64.43	114.15	119.17	162.85	185.79
maturing	15.44	18.14	20.21	21.75	29.77	34.82	44.94	60.08
mature and overmature	173.57	164.86	153.98	134.67	125.33	122.32	136.85	141.45
50. Sverdlovsk Oblast*								
Coniferous								
young I class of age	9.69	10.62	15.78	19.12	27.29	30.14	-	-
young II class of age	23.76	25.65	60.57	69.92	90.52	91.65	110.39	108.09

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
middle-aged	110.07	126.47	222.35	242.42	295.68	292.57	354.32	365.25
Maturing	138.10	127.36	133.41	142.18	157.26	150.30	177.26	178.62
mature and overmature	752.92	642.83	532.64	492.44	505.95	482.21	434.96	414.87
Deciduous hardwood								
young I class of age	0.00	0.00	0.00	0.00	0.00	0.00	-	-
young II class of age	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
middle-aged	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
maturing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
mature and overmature	0.05	0.06	0.05	0.04	0.04	0.00	0.00	0.00
Deciduous softwood								
young I class of age	3.81	4.23	9.34	9.59	6.71	6.41	-	-
young II class of age	23.55	22.10	16.88	17.94	23.95	24.48	28.38	30.10
middle-aged	52.56	56.06	109.83	113.77	149.68	159.57	195.43	210.02
maturing	36.06	33.28	37.19	39.92	48.12	48.07	80.27	85.81
mature and overmature	264.05	227.37	195.80	165.91	150.81	132.75	168.50	167.27
51. Chelyabinsk Oblast								
Coniferous								
young I class of age	1.65	2.01	2.88	4.35	4.52	4.90	-	-
young II class of age	6.01	6.66	6.92	11.32	11.21	17.38	22.32	23.62
middle-aged	13.64	26.02	26.26	39.74	40.56	54.85	57.20	73.17
maturing	19.38	16.52	16.21	20.17	19.48	26.17	24.75	23.06
mature and overmature	46.04	33.83	29.25	34.12	30.05	38.67	31.58	26.03
Deciduous hardwood								
young I class of age	0.03	0.02	0.08	0.03	0.04	0.05	-	-
young II class of age	0.07	0.07	0.11	0.20	0.18	0.20	0.26	0.26
middle-aged	0.39	0.60	0.97	2.42	2.44	1.49	1.73	1.69
maturing	0.42	0.27	0.37	0.70	0.70	0.47	0.50	0.48
mature and overmature	1.51	1.36	1.49	1.64	1.48	1.72	1.38	1.38
Deciduous softwood								
young I class of age	1.17	1.31	2.05	0.82	1.02	1.16	-	-
young II class of age	6.95	5.79	4.80	3.81	3.68	3.98	5.56	4.93
middle-aged	18.56	25.52	27.02	39.16	38.81	63.59	65.33	103.93
maturing	21.80	17.00	15.84	31.33	30.66	36.87	35.77	39.87
mature and overmature	46.89	39.14	34.22	49.72	42.88	55.06	48.05	43.48
52. Republic of Bashkortostan								
Coniferous								
young I class of age	1.33	1.81	4.08	6.20	7.87	8.10	-	-
young II class of age	6.62	6.51	8.31	9.55	12.05	16.73	28.18	30.55
middle-aged	36.15	34.73	30.61	34.93	36.56	34.69	39.75	41.65
maturing	35.94	34.52	45.15	48.78	54.13	52.36	44.20	43.43
mature and overmature	61.58	54.65	46.88	43.72	51.00	49.78	60.29	56.39
Deciduous hardwood								
young I class of age	0.53	0.41	0.36	0.24	0.24	0.19	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
53. Udmurtian Republic								
Coniferous								
young I class of age	166.2	130.6	289.0	213.8	275.7	192.2	-	-
young II class of age	77.1	112.4	112.3	120.1	121.2	183.4	434.2	378.9
middle-aged	86.6	97.5	97.3	134.2	134.5	154.4	152.8	144.2
maturing	98.1	105.2	102.6	94.1	93.4	111.7	110.2	118.2
mature and overmature	390.4	317.6	226.5	206.7	170.3	160.1	135.3	132.9
Deciduous hardwood								
young I class of age	4.9	1.4	1.8	0.5	0.3	0.0	-	-
young II class of age	0.9	1.0	0.9	1.3	1.2	0.1	0.1	0.1
middle-aged	1.4	2.4	1.7	1.9	1.8	1.0	0.9	0.9
maturing	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.1
mature and overmature	0.2	1.1	0.9	0.7	0.8	0.6	0.5	0.5
Deciduous softwood								
young I class of age	225.6	129.6	145.1	71.6	72.2	47.1	-	-
young II class of age	118.4	11.2	109.2	122.6	122.1	70.0	114.0	86.4
middle-aged	135.4	220.0	218.1	303.9	303.5	323.3	325.4	342.6
maturing	22.6	54.5	53.5	77.1	71.2	120.1	130.3	131.6
mature and overmature	68.9	114.1	85.6	87.8	65.6	94.0	54.8	145.2
54. Altai Kray*								
Coniferous								
young I class of age	199.8	109.3	147.0	197.0	161.8	174.1	-	-
young II class of age	182.9	199.5	221.8	218.0	202.4	200.5	320.4	356.6
middle-aged	627.4	920.6	954.5	893.2	992.4	978.3	1162.0	1600.9
maturing	487.8	531.7	555.3	560.8	578.5	623.7	647.7	800.7
mature and overmature	1667.7	1719.4	1445.9	1500.5	1467.2	1440.7	1221.3	1456.0
Deciduous hardwood								
young I class of age	0.0	0.2	0.6	0.9	0.7	0.5	-	-
young II class of age	0.0	0.0	0.3	0.4	0.8	0.9	1.4	0.3
middle-aged	0.0	0.0	0.0	0.0	0.1	0.3	0.3	1.0
maturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
mature and overmature	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Deciduous softwood								
young I class of age	97.2	46.2	145.0	174.1	153.2	149.1	-	-
young II class of age	110.8	94.4	144.1	144.4	136.6	111.7	226.3	196.7
middle-aged	299.2	297.8	357.7	346.8	407.0	459.2	431.6	534.4
maturing	169.5	254.2	250.6	246.3	266.6	278.1	261.1	336.7
mature and overmature	360.2	561.0	543.0	537.9	529.5	509.6	666.1	789.4
55. Kemerovo Oblast								
Coniferous								
young I class of age	32.5	53.0	196.2	201.9	345.7	500.0	-	-
young II class of age	60.6	91.2	123.2	131.4	170.2	173.3	354.0	460.2

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
middle-aged	307.6	303.4	421.3	484.0	541.7	538.8	579.1	596.1
Maturing	562.2	508.5	442.5	451.9	521.2	529.7	570.6	568.7
mature and overmature	1497.0	1443.2	1392.4	1324.3	1204.6	1124.1	951.4	896.5
Deciduous softwood								
young I class of age	26.9	53.9	154.1	162.6	265.5	261.7	-	-
young II class of age	67.6	70.5	104.3	118.3	166.1	164.5	351.2	368.1
middle-aged	153.5	204.8	223.6	219.7	321.2	317.2	537.6	536.3
maturing	177.2	212.4	191.3	184.7	219.9	218.0	255.5	252.8
mature and overmature	939.1	901.6	865.7	931.8	799.8	756.8	658.1	636.2
56. Novosibirsk Oblast								
Coniferous								
young I class of age	35.9	50.9	87.2	79.5	91.9	69.5	-	-
young II class of age	50.8	51.0	53.4	51.5	64.1	61.1	96.6	108.7
middle-aged	327.6	364.5	292.5	313.1	345.9	367.1	482.2	476.4
maturing	188.8	171.1	150.1	121.6	131.0	136.5	198.2	198.7
mature and overmature	280.3	243.3	267.9	267.4	244.1	244.8	194.8	193.3
Deciduous hardwood								
young I class of age	0.8	0.8	1.1	0.2	0.1	0.1	-	-
young II class of age	0.0	0.0	0.1	0.8	0.8	0.3	0.1	0.1
middle-aged	0.0	0.0	0.0	0.2	0.3	0.8	0.3	0.3
maturing	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2
mature and overmature	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
Deciduous softwood								
young I class of age	34.2	47.1	114.9	107.1	141.1	134.9	-	-
young II class of age	56.0	54.4	76.5	69.9	130.8	129.4	180.5	209.6
middle-aged	226.0	260.0	307.1	331.3	451.4	439.0	535.8	552.9
maturing	179.8	172.0	223.9	218.5	206.8	210.6	198.1	199.6
mature and overmature	614.9	615.8	619.4	619.6	555.2	584.7	699.6	695.3
57. Omsk Oblast								
Coniferous								
young I class of age	34.5	52.5	70.0	104.6	139.5	158.0	-	-
young II class of age	30.9	37.4	60.3	69.6	75.8	72.3	169.7	130.6
middle-aged	188.3	191.5	324.2	315.8	329.4	343.4	391.3	344.8
maturing	93.2	105.3	143.6	162.2	160.4	164.0	156.8	160.7
mature and overmature	394.9	381.0	269.5	290.5	267.6	260.6	245.6	292.1
Deciduous softwood								
young I class of age	42.4	105.0	98.8	103.5	95.7	97.1	-	-
young II class of age	94.9	83.5	64.8	96.1	101.2	97.9	193.4	205.6
middle-aged	336.6	283.5	262.2	250.3	286.2	280.3	325.4	285.1
maturing	217.9	196.1	233.1	222.2	205.7	203.4	207.1	164.9
mature and overmature	815.0	860.3	887.6	871.4	854.4	853.4	882.2	998.6

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
58. Tomsk Oblast								
Coniferous								
young I class of age	95.6	150.4	409.6	548.2	664.0	712.0	-	-
young II class of age	135.0	165.3	247.5	256.2	302.7	337.9	1000.9	1089.0
middle-aged	1013.5	1047.1	1295.6	1345.4	1596.4	1644.3	1912.7	2385.8
maturing	1323.6	1268.5	1631.5	1702.8	1686.6	1753.0	1887.0	2152.4
mature and overmature	6151.9	5695.8	5691.9	5812.0	5696.1	5660.8	5053.1	4433.2
Deciduous softwood								
young I class of age	91.9	151.7	517.0	529.4	363.7	329.6	-	-
young II class of age	141.7	138.9	208.1	307.3	465.9	428.8	673.4	874.3
middle-aged	1371.8	1201.1	1105.3	1231.9	1096.6	960.1	854.1	1090.3
maturing	1445.6	1331.0	672.2	633.2	630.3	545.4	329.5	253.9
mature and overmature	5030.3	5167.5	4933.9	4574.3	4476.7	4657.6	5053.3	4993.7
59. Tyumen Oblast*								
Coniferous								
young I class of age	177.8	430.1	623.0	998.2	1321.2	1415.4	-	-
young II class of age	376.4	447.1	600.2	639.2	716.5	937.3	2512.3	2970.6
middle-aged	2930.6	2949.6	4112.1	4145.9	4379.5	5847.4	10332.7	9920.8
maturing	3673.6	3549.1	5574.6	5120.9	5053.1	5313.3	6172.3	6257.9
mature and overmature	23874.8	24207.7	24186.1	22750.6	22232.9	20065.5	19047.8	19055.7
Deciduous softwood								
young I class of age	523.8	741.2	556.4	452.8	457.8	328.4	-	-
young II class of age	466.9	456.8	456.4	483.3	518.4	404.1	692.0	892.4
middle-aged	2183.7	2217.9	1961.6	1843.3	1846.3	1605.6	1577.3	1701.9
maturing	1571.9	1554.2	1012.1	882.7	879.0	759.7	768.9	779.6
mature and overmature	6707.2	6925.7	6308.2	5704.1	5689.1	5092.0	5488.0	5513.7
60. Krasnoyarsk Kray*								
Coniferous								
young I class of age	1009.1	1057.0	1603.6	1966.3	1982.1	2218.1	-	-
young II class of age	958.3	1175.8	1523.6	1780.0	1843.8	1904.2	7739.1	9099.0
middle-aged	9117.9	10029.5	9689.7	9856.9	10317.1	10234.0	11102.5	10832.9
maturing	6910.6	7213.1	6377.8	6501.2	7191.8	7042.7	7321.9	7213.6
mature and overmature	69613.2	67829.1	70421.2	73892.3	72944.7	72552.7	54766.1	54179.2
Deciduous softwood								
young I class of age	627.2	635.5	847.2	1017.5	975.2	1014.3	-	-
young II class of age	730.0	696.6	869.0	1287.7	1447.0	1422.6	2392.5	2571.2
middle-aged	4626.4	4723.1	3831.4	3789.5	4195.6	4239.7	3999.5	4186.0
maturing	2541.2	2513.4	2782.3	2773.5	2735.7	2757.2	1581.1	1563.5
mature and overmature	9981.9	9929.7	9318.2	8775.3	8329.2	7876.8	7804.9	8003.5
61. Irkutsk Oblast*								
Coniferous								
young I class of age	1162.0	1182.1	2083.3	2964.8	3175.7	3224.1	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	1328.6	2129.0	2225.1	2645.1	2831.4	2816.6	7023.2	7728.1
middle-aged	5508.3	6232.3	8014.7	9125.1	9258.7	9776.1	10792.2	10517.7
maturing	4247.2	4514.0	4405.3	4367.8	5037.6	4796.0	4578.3	4954.6
mature and overmature	32019.4	29919.0	28475.7	26462.4	25926.1	23418.3	21860.3	21527.0
Deciduous softwood								
young I class of age	1224.0	722.1	940.5	1147.7	985.7	902.6	-	-
young II class of age	1366.7	1048.8	951.0	1040.0	1051.0	892.9	3063.5	3295.2
middle-aged	2825.0	2723.9	2642.6	2556.3	2776.6	2612.0	2785.7	2851.8
maturing	767.4	1050.9	1122.7	927.8	894.0	829.1	892.6	933.9
mature and overmature	2433.8	2462.5	2643.9	2858.6	2595.7	2571.0	2962.8	3343.2
62. Chita Oblast*								
Coniferous								
young I class of age	659.0	956.3	1603.2	1815.7	1599.3	1410.9	-	-
young II class of age	706.3	858.0	964.3	1082.9	1584.9	2021.4	3130.6	3228.9
middle-aged	3823.9	3822.6	3963.0	4107.6	5389.4	5662.7	5996.6	5597.4
maturing	2998.2	2636.6	2334.5	2325.4	2625.1	2665.0	2395.8	2290.4
mature and overmature	11453.1	10716.1	10268.4	9631.0	8159.8	7382.6	7430.6	7828.9
Deciduous softwood								
young I class of age	259.5	655.3	716.3	632.6	705.0	821.2	-	-
young II class of age	209.4	609.1	1042.8	1167.7	1063.9	805.5	1488.8	1523.5
middle-aged	254.8	657.6	939.4	1059.9	1535.5	2059.7	2548.6	2588.7
maturing	209.6	363.3	378.7	404.6	401.5	366.7	393.4	418.1
mature and overmature	477.9	577.7	706.8	722.9	640.5	484.3	513.5	550.7
63. Republic of Buryatia								
Coniferous								
young I class of age	502.1	901.4	1177.1	1463.2	1351.2	1413.0	-	-
young II class of age	584.5	734.2	810.6	1322.3	1385.4	1431.7	2734.9	2759.1
middle-aged	1718.7	2332.8	3357.4	3780.4	3909.6	4519.4	4675.0	4741.6
maturing	1954.5	1890.1	2070.6	1357.3	1433.2	1682.8	1518.7	1622.8
mature and overmature	9816.4	8868.2	7679.0	7621.2	7425.3	6519.6	6245.6	6199.5
Deciduous softwood								
young I class of age	74.7	137.5	150.6	225.4	236.8	231.1	-	-
young II class of age	96.9	147.9	154.2	185.4	217.3	208.7	471.2	466.9
middle-aged	277.6	327.3	364.4	472.9	534.8	551.9	643.7	684.9
maturing	149.7	142.4	132.7	147.1	138.0	142.6	156.5	168.1
mature and overmature	373.9	390.9	376.2	376.1	326.7	277.0	317.1	332.1
64. Republic of Tuva								
Coniferous								
young I class of age	153.6	112.1	128.9	130.3	234.0	219.1	-	-
young II class of age	190.8	250.5	269.7	286.3	420.2	404.0	616.8	623.8
middle-aged	439.3	792.9	862.4	897.5	1291.3	1667.5	3524.1	2547.3
maturing	265.7	499.4	525.9	518.8	2237.0	2044.8	780.5	1728.9

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
middle-aged	16.41	17.66	23.00	28.64	35.13	38.05	46.88	49.32
Maturing	13.31	12.49	13.06	14.27	14.89	16.15	18.40	19.76
mature and overmature	47.35	50.13	52.34	52.08	49.75	44.63	50.56	54.00
64. Republic of Tuva								
Coniferous								
young I class of age	2.38	1.67	1.88	1.92	3.88	3.58	-	-
young II class of age	4.38	8.62	10.57	11.77	32.44	31.56	34.08	33.78
middle-aged	39.64	82.98	93.03	97.44	146.45	208.41	485.27	331.48
maturing	38.53	66.41	71.73	71.26	321.74	309.48	118.60	261.05
mature and overmature	916.12	846.22	845.36	841.98	515.32	504.71	422.39	421.53
Deciduous softwood								
young I class of age	0.05	0.02	0.04	0.03	0.04	0.05	-	-
young II class of age	0.21	0.44	0.51	0.37	0.35	0.34	0.39	0.39
middle-aged	1.63	4.33	5.04	5.21	7.97	7.47	7.23	7.22
maturing	1.16	2.94	3.28	3.11	4.44	4.04	4.66	4.65
mature and overmature	10.00	17.05	17.88	21.00	16.98	16.04	16.61	16.59
65. Primorie Kray								
Coniferous								
young I class of age	0.15	0.35	2.92	3.88	2.07	2.42	-	-
young II class of age	8.99	7.46	9.20	11.55	14.75	15.44	12.26	10.82
middle-aged	55.26	56.92	82.51	100.87	252.61	235.32	458.02	427.75
maturing	90.38	98.76	103.77	143.35	214.70	257.44	203.08	204.21
mature and overmature	1157.27	1170.30	1088.17	1035.23	758.49	729.38	546.99	539.10
Deciduous hardwood								
young I class of age	2.09	2.65	5.62	5.52	5.01	3.92	-	-
young II class of age	10.32	12.35	17.12	17.18	15.81	14.75	14.86	14.98
middle-aged	41.24	43.17	63.84	66.49	72.83	77.63	92.09	95.01
maturing	40.52	35.32	35.63	35.97	39.31	44.01	47.91	53.23
mature and overmature	192.01	143.69	223.54	227.49	217.48	180.49	187.11	207.95
Deciduous softwood								
young I class of age	0.46	0.96	1.28	1.39	0.99	0.61	-	-
young II class of age	4.26	4.86	5.93	6.72	6.72	5.28	3.37	3.47
middle-aged	24.52	39.62	49.47	53.00	59.51	60.52	61.81	60.63
maturing	22.10	26.47	29.77	29.83	27.35	29.59	34.34	37.87
mature and overmature	71.25	89.47	98.07	108.68	99.09	90.08	104.36	111.92
66. Khabarovsk Kray*								
Coniferous								
young I class of age	18.19	13.30	15.91	24.15	23.60	34.42	-	-
young II class of age	29.28	49.47	73.62	79.66	100.96	127.56	189.37	202.90
middle-aged	607.33	531.51	540.45	566.64	553.10	651.03	850.50	903.77
maturing	557.27	514.68	407.68	406.09	466.79	497.62	554.98	555.64
mature and overmature	3704.60	3205.74	3043.56	3066.65	2919.29	2653.37	2760.44	2883.05

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
Deciduous hardwood								
young I class of age	0.25	0.28	1.37	1.45	1.58	1.28	-	-
young II class of age	0.73	1.11	3.30	4.80	4.75	6.30	8.13	8.89
middle-aged	9.05	13.22	22.87	22.47	23.97	23.49	24.32	24.52
maturing	10.13	12.16	24.85	19.02	20.41	19.98	21.83	21.81
mature and overmature	110.21	111.04	150.39	110.86	114.79	123.23	127.35	126.38
Deciduous softwood								
young I class of age	1.39	1.88	2.70	2.58	4.61	6.33	-	-
young II class of age	3.78	8.62	13.47	16.70	14.68	14.72	31.58	36.47
middle-aged	28.36	55.93	73.88	83.59	111.30	126.49	135.42	140.38
maturing	29.49	32.04	35.52	38.59	54.86	52.37	56.83	62.14
mature and overmature	167.34	198.60	216.34	177.48	155.16	163.10	174.69	189.35
67. Amur Kray								
Coniferous								
young I class of age	11.17	9.14	14.72	15.26	16.14	17.03	-	-
young II class of age	16.79	34.25	64.06	61.65	62.84	76.08	86.25	83.64
middle-aged	174.48	210.96	313.64	361.64	399.34	402.79	390.13	357.52
maturing	185.91	237.09	182.08	206.62	205.89	213.54	227.78	242.44
mature and overmature	1692.37	1359.73	982.59	942.07	923.79	907.21	870.72	889.09
Deciduous hardwood								
young I class of age	0.44	0.16	0.86	0.88	1.93	2.50	-	-
young II class of age	0.80	0.40	1.42	1.85	2.49	3.34	5.84	6.25
middle-aged	3.10	1.74	5.77	6.58	7.63	7.46	7.46	7.62
maturing	2.72	1.46	2.44	2.42	1.97	2.87	2.85	3.20
mature and overmature	9.39	9.15	7.25	3.53	3.40	3.58	3.54	3.58
Deciduous softwood								
young I class of age	4.96	4.40	5.24	5.19	5.68	6.64	-	-
young II class of age	10.81	15.84	18.12	17.96	17.06	20.24	27.70	27.75
middle-aged	48.66	64.55	68.09	104.37	122.53	149.29	145.16	143.13
maturing	20.71	30.92	32.81	45.23	48.41	50.34	55.30	65.13
mature and overmature	96.10	103.43	91.66	88.40	76.16	74.40	79.63	105.49
68. Kamchatka Oblast*								
Coniferous								
young I class of age	0.00	0.13	0.11	0.51	0.60	0.59	-	-
young II class of age	0.34	0.31	0.78	1.22	1.24	1.82	2.46	2.61
middle-aged	4.05	5.59	6.14	4.77	4.25	6.92	7.42	6.37
maturing	4.87	14.74	7.43	5.30	4.40	4.04	8.47	8.57
mature and overmature	158.93	111.56	91.06	94.81	99.55	112.86	113.37	109.42
Deciduous hardwood								
young I class of age	0.00	0.10	0.00	0.00	0.00	0.03	-	-
young II class of age	0.01	0.10	0.03	0.03	0.06	0.07	0.27	0.42
middle-aged	0.11	9.31	13.41	18.50	12.03	9.07	6.11	5.38
maturing	0.14	14.62	22.84	31.53	25.71	25.14	27.76	27.78

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
mature and overmature	514.36	311.21	216.97	188.09	199.68	278.92	463.57	468.30
Deciduous softwood								
young I class of age	0.00	0.09	0.22	0.19	0.20	0.12	-	-
young II class of age	0.08	0.15	0.50	1.07	1.20	1.19	1.99	2.04
middle-aged	0.22	2.47	4.14	8.33	8.64	10.70	21.70	22.52
maturing	0.67	3.96	3.63	4.76	4.70	7.61	16.58	16.69
mature and overmature	69.09	44.76	39.71	42.93	43.98	45.60	64.87	65.23
69. Magadan Oblast*								
Coniferous								
young I class of age	0.28	0.45	0.83	0.41	0.43	3.44	-	-
young II class of age	11.79	11.05	3.84	7.63	7.39	7.19	10.66	10.85
middle-aged	23.27	34.65	29.48	102.59	101.70	73.62	73.71	73.49
maturing	46.72	49.40	20.08	24.23	23.83	15.03	14.97	15.15
mature and overmature	503.25	452.56	347.79	232.80	219.38	240.38	239.12	239.75
Deciduous softwood								
young I class of age	0.00	0.00	0.10	0.03	0.04	0.07	-	-
young II class of age	0.00	0.45	0.38	0.43	0.38	0.35	0.44	0.44
middle-aged	0.53	3.18	5.04	10.00	9.55	9.61	9.67	9.21
maturing	4.18	4.07	3.38	4.37	4.15	3.54	3.58	3.31
mature and overmature	21.57	20.36	19.00	10.99	10.03	19.69	19.73	20.88
70. Sakhalin Oblast								
Coniferous								
young I class of age	1.25	1.23	1.17	1.72	6.39	5.46	-	-
young II class of age	8.99	9.08	17.79	17.39	23.02	16.91	31.77	33.73
middle-aged	40.56	41.71	52.46	61.30	105.04	123.76	133.80	127.08
maturing	45.30	46.39	39.63	43.85	53.01	54.62	53.91	63.82
mature and overmature	465.28	464.03	433.99	445.48	395.50	381.47	313.62	292.31
Deciduous hardwood								
young I class of age	0.91	0.85	0.81	0.86	0.72	0.77	-	-
young II class of age	4.85	4.86	6.70	6.76	6.96	6.85	8.79	6.88
middle-aged	12.01	10.60	11.51	10.99	12.19	15.73	16.33	23.75
maturing	11.12	9.32	8.37	8.30	5.18	5.06	5.27	6.60
mature and overmature	30.62	33.40	27.62	26.16	23.10	21.70	23.58	26.22
Deciduous softwood								
young I class of age	0.06	0.11	0.17	0.19	0.11	0.11	-	-
young II class of age	1.06	0.85	0.78	0.88	1.02	1.04	0.93	0.73
middle-aged	3.64	3.08	4.41	4.83	7.96	8.23	8.96	8.74
maturing	1.75	1.36	1.29	1.39	2.80	2.92	3.83	3.62
mature and overmature	7.16	5.58	4.89	5.69	5.23	5.34	4.96	5.56
71. Republic of Sakha (Yakutia)								
Coniferous								
young I class of age	55.76	75.36	134.17	128.26	114.82	95.73	-	-

Table 5A. Continued

Groups of tree stands and age	Year of account							
	1961	1966	1973	1978	1983	1988	1993	1998
young II class of age	57.45	130.25	116.32	141.36	172.71	322.66	444.44	447.72
middle-aged	1424.99	1373.83	1460.56	1435.87	1535.89	1901.96	1998.21	2013.41
Maturing	1102.95	1070.09	1017.32	929.36	825.16	834.40	805.23	807.61
mature and overmature	8293.29	7770.84	7801.05	7675.34	7055.82	5610.98	5704.32	5229.51
Deciduous softwood								
young I class of age	2.36	2.81	4.72	3.97	1.72	1.87	-	-
young II class of age	2.84	5.77	6.98	8.21	5.53	9.08	11.32	11.08
middle-aged	8.88	10.21	10.99	15.04	20.26	37.34	39.10	39.67
maturing	5.19	5.91	6.50	6.90	6.21	9.32	9.05	9.04
mature and overmature	25.15	23.09	25.70	25.85	23.00	25.14	24.77	24.12

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

** Tree stands I and II classes of age in the reference books of 1993 and 1998 are combined. In the Table their joint growing stock is shown in the line "young II class of age".

Table 6A. **Distribution of stocked forest areas by site quality classes.** Data as of 01.01.1966

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
1. Kaliningrad Oblast									
Coniferous	63.5	82.8	7.2	9.4	4.4	5.7	1.6	2.1	76.7
Deciduous hardwood	35.0	92.8	2.4	6.4	0.3	0.8	0.0	0.0	37.7
Deciduous softwood	56.0	72.1	11.2	14.4	10.5	13.5	0.0	0.0	77.7
2. Archangel Oblast*									
Coniferous	172.8	1.0	812.0	4.8	13566.1	79.4	2527.5	14.8	17078.4
Deciduous softwood	139.3	6.2	397.5	17.7	1561.8	69.5	148.0	6.6	2246.6
3. Vologda Oblast									
Coniferous	295.6	7.1	1134.0	27.4	2399.1	58.0	310.4	7.5	4139.1
Deciduous softwood	800.0	29.2	1035.5	37.8	881.6	32.2	23.3	0.9	2740.4
4. Murmansk Oblast									
Coniferous	0.0	0.0	0.4	0.0	1584.5	49.7	1605.1	50.3	3190.0
Deciduous softwood	0.0	0.0	0.0	0.0	257.1	22.1	907.6	77.9	1164.7
5. Republic of Karelia									
Coniferous	107.9	1.6	629.5	9.1	5565.4	80.3	630.8	9.1	6933.6
Deciduous softwood	169.5	18.3	356.8	38.6	382.2	41.4	15.7	1.7	924.2
6. Komi Republic									
Coniferous	115.8	0.5	870.0	3.9	14115.3	62.8	7375.0	32.8	22476.1
Deciduous softwood	362.5	7.0	717.7	13.9	3170.3	61.5	904.4	17.5	5154.9
7. Leningrad Oblast									
Coniferous	321.7	15.8	986.9	48.4	639.0	31.3	92.9	4.6	2040.5
Deciduous hardwood	0.1	33.3	0.2	66.7	0.0	0.0	0.0	0.0	0.3
Deciduous softwood	471.2	37.3	609.1	48.2	168.4	13.3	15.0	1.2	1263.7
8. Novgorod Oblast									
Coniferous	150.0	24.3	226.3	36.6	194.3	31.4	47.6	7.7	618.2
Deciduous hardwood	0.5	38.5	0.6	46.2	0.2	15.4	0.0	0.0	1.3
Deciduous softwood	415.6	48.0	346.4	40.0	101.8	11.8	2.5	0.3	866.3
9. Pskov Oblast									
Coniferous	141.6	26.4	233.8	43.6	125.9	23.5	34.5	6.4	535.8
Deciduous hardwood	1.4	56.0	0.9	36.0	0.2	8.0	0.0	0.0	2.5
Deciduous softwood	177.0	46.1	140.5	36.6	61.4	16.0	5.1	1.3	384.0
10. Bryansk Oblast									
Coniferous	306.1	91.1	23.1	6.9	6.8	2.0	0.0	0.0	336.0
Deciduous hardwood	48.5	67.3	21.7	30.1	1.9	2.6	0.0	0.0	72.1
Deciduous softwood	288.0	92.6	18.2	5.9	4.7	1.5	0.0	0.0	310.9
11. Vladimir Oblast									
Coniferous	521.5	90.8	31.8	5.5	19.6	3.4	1.2	0.2	574.1

Table 6A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
Deciduous hardwood	5.5	62.5	3.0	34.1	0.3	3.4	0.0	0.0	8.8
Deciduous softwood	328.2	87.4	32.8	8.7	14.4	3.8	0.2	0.1	375.6
12. Ivanovo Oblast									
Coniferous	318.2	90.0	20.4	5.8	14.1	4.0	1.0	0.3	353.7
Deciduous hardwood	1.3	48.1	1.4	51.9	0.0	0.0	0.0	0.0	2.7
Deciduous softwood	335.0	91.0	23.5	6.4	9.7	2.6	0.0	0.0	368.2
13. Tver Oblast									
Coniferous	603.9	58.4	200.0	19.3	177.1	17.1	52.8	5.1	1033.8
Deciduous hardwood	0.2	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Deciduous softwood	728.2	73.7	190.5	19.3	66.6	6.7	2.5	0.3	987.8
14. Kaluga Oblast									
Coniferous	161.3	95.2	5.6	3.3	2.5	1.5	0.0	0.0	169.4
Deciduous hardwood	26.8	72.8	10.0	27.2	0.0	0.0	0.0	0.0	36.8
Deciduous softwood	462.7	96.3	14.6	3.0	3.0	0.6	0.0	0.0	480.3
15. Kostroma Oblast									
Coniferous	710.3	46.5	605.9	39.7	186.4	12.2	25.2	1.6	1527.8
Deciduous hardwood	0.1	25.0	0.3	75.0	0.0	0.0	0.0	0.0	0.4
Deciduous softwood	1270.7	74.2	358.8	20.9	81.0	4.7	2.4	0.1	1712.9
16. Moscow Oblast									
Coniferous	504.9	92.5	25.4	4.7	14.2	2.6	1.5	0.3	546.0
Deciduous hardwood	15.9	41.7	18.7	49.1	3.5	9.2	0.0	0.0	38.1
Deciduous softwood	670.0	86.3	75.0	9.7	31.4	4.0	0.2	0.0	776.6
17. Orel Oblast									
Coniferous	15.2	94.4	0.8	5.0	0.1	0.6	0.0	0.0	16.1
Deciduous hardwood	30.7	66.2	15.7	33.8	0.0	0.0	0.0	0.0	46.4
Deciduous softwood	32.8	92.7	2.4	6.8	0.2	0.6	0.0	0.0	35.4
18. Ryazan Oblast									
Coniferous	265.4	86.5	26.7	8.7	14.1	4.6	0.7	0.2	306.9
Deciduous hardwood	69.5	71.1	26.7	27.3	1.6	1.6	0.0	0.0	97.8
Deciduous softwood	258.0	80.0	35.1	10.9	27.8	8.6	1.7	0.5	322.6
19. Smolensk Oblast									
Coniferous	221.4	77.7	26.8	9.4	26.0	9.1	10.6	3.7	284.8
Deciduous hardwood	2.2	71.0	0.8	25.8	0.1	3.2	0.0	0.0	3.1
Deciduous softwood	441.7	81.4	81.8	15.1	18.7	3.4	0.3	0.1	542.5
20. Tula Oblast									
Coniferous	15.7	95.7	0.6	3.7	0.1	0.6	0.0	0.0	16.4
Deciduous hardwood	70.4	72.5	25.1	25.8	1.6	1.6	0.0	0.0	97.1
Deciduous softwood	107.6	94.0	6.1	5.3	0.8	0.7	0.0	0.0	114.5

Table 6A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
21. Yaroslavl Oblast									
Coniferous	201.1	77.1	21.9	8.4	28.1	10.8	9.8	3.8	260.9
Deciduous hardwood	2.3	71.9	0.9	28.1	0.0	0.0	0.0	0.0	3.2
Deciduous softwood	454.1	82.0	68.1	12.3	29.9	5.4	1.6	0.3	553.7
22. Nizhni Novgorod Oblast									
Coniferous	889.5	68.0	303.1	23.2	98.4	7.5	17.6	1.3	1308.6
Deciduous hardwood	59.4	63.3	32.5	34.6	2.0	2.1	0.0	0.0	93.9
Deciduous softwood	1045.8	82.2	176.2	13.8	49.3	3.9	1.7	0.1	1273.0
23. Kirov Oblast									
Coniferous	744.1	23.8	1315.4	42.1	1002.7	32.1	61.6	2.0	3123.8
Deciduous hardwood	1.2	25.0	2.5	52.1	1.1	22.9	0.0	0.0	4.8
Deciduous softwood	1262.7	51.8	877.4	36.0	291.6	12.0	4.6	0.2	2436.3
24. Republic of Marii El									
Coniferous	368.6	62.2	152.1	25.7	60.2	10.2	12.0	2.0	592.9
Deciduous hardwood	6.7	36.2	10.4	56.2	1.4	7.6	0.0	0.0	18.5
Deciduous softwood	320.5	70.5	94.6	20.8	37.7	8.3	2.1	0.5	454.9
25. Republic of Mordovia									
Coniferous	135.5	94.0	7.4	5.1	1.2	0.8	0.0	0.0	144.1
Deciduous hardwood	50.7	42.1	55.3	45.9	14.5	12.0	0.0	0.0	120.5
Deciduous softwood	223.5	90.7	19.6	8.0	3.4	1.4	0.0	0.0	246.5
26. Chuvash Republic									
Coniferous	119.5	88.4	13.7	10.1	2.0	1.5	0.0	0.0	135.2
Deciduous hardwood	117.0	82.1	25.2	17.7	0.3	0.2	0.0	0.0	142.5
Deciduous softwood	208.0	85.3	33.2	13.6	2.7	1.1	0.0	0.0	243.9
27. Belgorod Oblast									
Coniferous	13.8	93.9	0.8	5.4	0.1	0.7	0.0	0.0	14.7
Deciduous hardwood	101.3	60.7	58.9	35.3	6.7	4.0	0.0	0.0	166.9
Deciduous softwood	7.7	88.5	0.9	10.3	0.1	1.1	0.0	0.0	8.7
28. Voronezh Oblast									
Coniferous	70.8	81.8	13.9	16.1	1.8	2.1	0.1	0.1	86.6
Deciduous hardwood	97.0	53.9	64.1	35.6	19.0	10.5	0.0	0.0	180.1
Deciduous softwood	32.9	86.6	4.1	10.8	1.0	2.6	0.0	0.0	38.0
29. Kursk Oblast									
Coniferous	9.0	95.7	0.4	4.3	0.0	0.0	0.0	0.0	9.4
Deciduous hardwood	65.0	55.1	45.8	38.8	7.2	6.1	0.0	0.0	118.0
Deciduous softwood	25.9	89.3	3.0	10.3	0.1	0.3	0.0	0.0	29.0
30. Lipetsk Oblast									
Coniferous	45.3	95.4	1.8	3.8	0.4	0.8	0.0	0.0	47.5

Table 6A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
Deciduous hardwood	27.9	47.5	28.8	49.1	2.0	3.4	0.0	0.0	58.7
Deciduous softwood	23.1	89.2	2.4	9.3	0.4	1.5	0.0	0.0	25.9
31. Tambov Oblast									
Coniferous	117.6	97.9	2.2	1.8	0.3	0.2	0.0	0.0	120.1
Deciduous hardwood	35.6	60.4	20.7	35.1	2.6	4.4	0.0	0.0	58.9
Deciduous softwood	85.0	85.8	12.7	12.8	1.4	1.4	0.0	0.0	99.1
32. Astrakhan Oblast									
Deciduous hardwood	3.5	39.8	2.5	28.4	2.6	29.5	0.2	2.3	8.8
Deciduous softwood	21.1	38.5	8.1	14.8	25.4	46.4	0.2	0.4	54.8
33. Volgograd Oblast									
Coniferous	4.1	34.2	5.7	47.5	2.2	18.3	0.0	0.0	12.0
Deciduous hardwood	35.2	17.9	85.8	43.7	73.3	37.3	2.1	1.1	196.4
Deciduous softwood	32.3	69.8	8.5	18.4	3.7	8.0	1.8	3.9	46.3
34. Samara Oblast									
Coniferous	58.9	90.1	4.8	7.3	1.7	2.6	0.0	0.0	65.4
Deciduous hardwood	9.3	4.0	108.4	46.6	114.8	49.4	0.0	0.0	232.5
Deciduous softwood	132.6	52.1	101.9	40.0	20.2	7.9	0.0	0.0	254.7
35. Penza Oblast									
Coniferous	196.1	98.9	2.1	1.1	0.1	0.1	0.0	0.0	198.3
Deciduous hardwood	25.5	10.4	193.3	78.8	26.4	10.8	0.0	0.0	245.2
Deciduous softwood	227.0	74.3	72.3	23.7	6.4	2.1	0.0	0.0	305.7
36. Saratov Oblast									
Coniferous	9.9	51.6	6.5	33.9	2.8	14.6	0.0	0.0	19.2
Deciduous hardwood	30.8	11.5	79.2	29.5	155.5	57.9	3.2	1.2	268.7
Deciduous softwood	25.7	33.9	30.5	40.2	19.5	25.7	0.2	0.3	75.9
37. Ulyanovsk Oblast									
Coniferous	247.7	95.7	10.4	4.0	0.7	0.3	0.0	0.0	258.8
Deciduous hardwood	9.9	4.6	88.3	40.9	117.6	54.4	0.3	0.1	216.1
Deciduous softwood	270.8	75.2	75.3	20.9	13.8	3.8	0.0	0.0	359.9
38. Republic of Kalmykia									
Deciduous hardwood	4.9	80.3	1.2	19.7	0.0	0.0	0.0	0.0	6.1
Deciduous softwood	0.8	88.9	0.0	0.0	0.1	11.1	0.0	0.0	0.9
39. Republic of Tatarstan									
Coniferous	130.2	97.9	2.7	2.0	0.1	0.1	0.0	0.0	133.0
Deciduous hardwood	81.4	28.3	178.8	62.2	27.0	9.4	0.4	0.1	287.6
Deciduous softwood	403.4	75.6	125.5	23.5	4.8	0.9	0.0	0.0	533.7
40. Krasnodar Kray*									
Coniferous	38.7	74.6	11.0	21.2	2.1	4.0	0.1	0.2	51.9

Table 6A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
Deciduous hardwood	440.9	39.5	350.6	31.4	294.0	26.4	29.6	2.7	1115.1
Deciduous softwood	51.0	72.5	14.6	20.8	3.9	5.5	0.8	1.1	70.3
41. Stavropol Kray*									
Coniferous	19.8	22.8	25.6	29.5	39.6	45.6	1.9	2.2	86.9
Deciduous hardwood	53.7	28.8	60.3	32.3	65.2	35.0	7.3	3.9	186.5
Deciduous softwood	31.4	23.6	31.2	23.4	55.6	41.7	15.1	11.3	133.3
42. Rostov Oblast									
Coniferous	7.6	42.9	8.8	49.7	1.0	5.6	0.3	1.7	17.7
Deciduous hardwood	25.0	29.8	35.2	42.0	23.0	27.4	0.6	0.7	83.8
Deciduous softwood	16.3	96.4	0.6	3.6	0.0	0.0	0.0	0.0	16.9
43. Republic of Daghestan									
Coniferous	0.3	0.6	6.6	12.1	45.0	82.6	2.6	4.8	54.5
Deciduous hardwood	28.8	15.3	35.4	18.8	96.1	51.0	28.2	15.0	188.5
Deciduous softwood	4.9	6.3	5.5	7.1	53.4	68.5	14.2	18.2	78.0
44. Kabardino-Balkarian Republic									
Coniferous	0.1	1.4	0.4	5.7	5.8	82.9	0.7	10.0	7.0
Deciduous hardwood	50.8	72.0	13.3	18.8	5.8	8.2	0.7	1.0	70.6
Deciduous softwood	8.8	21.6	4.5	11.0	20.7	50.7	6.8	16.7	40.8
45. Republic of North Ossetia									
Coniferous	0.5	6.1	1.5	18.3	4.5	54.9	1.7	20.7	8.2
Deciduous hardwood	99.3	79.2	17.1	13.6	8.4	6.7	0.5	0.4	125.3
Deciduous softwood	8.1	28.9	2.7	9.6	10.8	38.6	6.4	22.9	28.0
46. Chechen Republic and Republic of Ingushetia*									
Coniferous	0.5	6.4	2.4	30.8	3.6	46.2	1.3	16.7	7.8
Deciduous hardwood	154.8	68.0	48.8	21.4	23.1	10.1	1.1	0.5	227.8
Deciduous softwood	13.1	21.6	15.0	24.8	30.0	49.5	2.5	4.1	60.6
47. Kurgan Oblast									
Coniferous	235.6	84.3	37.1	13.3	5.8	2.1	1.1	0.4	279.6
Deciduous softwood	248.9	46.9	242.7	45.7	38.2	7.2	0.8	0.2	530.6
48. Orenburg Oblast									
Coniferous	31.6	89.8	2.8	8.0	0.8	2.3	0.0	0.0	35.2
Deciduous hardwood	37.4	21.9	73.9	43.3	54.5	31.9	4.8	2.8	170.6
Deciduous softwood	86.4	59.1	36.1	24.7	22.5	15.4	1.1	0.8	146.1
49. Perm Oblast*									
Coniferous	549.0	8.9	3031.7	48.9	2489.1	40.1	130.0	2.1	6199.8
Deciduous hardwood	0.1	8.3	0.9	75.0	0.2	16.7	0.0	0.0	1.2
Deciduous softwood	521.0	22.3	1261.2	54.1	536.6	23.0	12.6	0.5	2331.4
50. Sverdlovsk Oblast*									
Coniferous	1061.2	16.9	2369.5	37.6	2064.5	32.8	801.7	12.7	6296.9

Table 6A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
Deciduous hardwood	0.1	14.3	0.6	85.7	0.0	0.0	0.0	0.0	0.7
Deciduous softwood	989.8	25.6	2039.3	52.7	822.3	21.3	17.6	0.5	3869.0
51. Chelyabinsk Oblast									
Coniferous	197.0	31.3	285.2	45.4	146.2	23.3	0.0	0.0	628.4
Deciduous hardwood	2.4	9.3	11.1	43.0	12.3	47.7	0.0	0.0	25.8
Deciduous softwood	242.6	19.4	682.1	54.7	322.9	25.9	0.0	0.0	1247.6
52. Republic of Bashkortostan									
Coniferous	352.6	39.5	412.3	46.2	119.7	13.4	7.3	0.8	891.9
Deciduous hardwood	44.9	5.0	285.1	31.8	544.2	60.6	23.2	2.6	897.4
Deciduous softwood	764.1	24.8	1618.2	52.6	686.8	22.3	6.2	0.2	3075.3
53. Udmurtian Republic									
Coniferous	394.0	51.6	295.2	38.7	73.3	9.6	0.8	0.1	763.3
Deciduous hardwood	2.6	41.3	3.3	52.4	0.4	6.3	0.0	0.0	6.3
Deciduous softwood	407.9	64.8	170.6	27.1	50.8	8.1	0.1	0.0	629.4
54. Altai Kray*									
Coniferous	716.9	20.6	1369.9	39.4	1362.0	39.1	31.7	0.9	3480.5
Deciduous hardwood	0.0	0.0	0.0	0.0	0.1	50.0	0.1	50.0	0.2
Deciduous softwood	608.5	48.5	463.2	36.9	178.4	14.2	3.5	0.3	1253.6
55. Kemerovo Oblast									
Coniferous	411.4	17.1	1173.2	48.9	801.2	33.4	13.5	0.6	2399.3
Deciduous softwood	767.3	53.2	503.5	34.9	170.0	11.8	2.4	0.2	1443.2
56. Novosibirsk Oblast									
Coniferous	221.4	25.1	79.6	9.0	189.8	21.5	390.0	44.3	880.8
Deciduous hardwood	0.0	0.0	0.7	87.5	0.1	12.5	0.0	0.0	0.8
Deciduous softwood	316.3	27.5	455.8	39.7	348.6	30.3	28.6	2.5	1149.3
57. Omsk Oblast									
Coniferous	62.6	8.2	145.5	19.0	349.6	45.5	210.0	27.4	767.7
Deciduous hardwood	0.2	66.7	0.1	33.3	0.0	0.0	0.0	0.0	0.3
Deciduous softwood	596.6	39.0	661.5	43.3	257.4	16.8	12.9	0.8	1528.4
58. Tomsk Oblast									
Coniferous	290.3	3.5	2700.2	32.4	4056.0	48.7	1280.6	15.4	8327.1
Deciduous softwood	1888.4	23.6	4150.1	51.9	1823.5	22.8	128.2	1.6	7990.2
59. Tyumen Oblast*									
Coniferous	238.4	0.8	2708.7	8.6	21294.2	67.4	7342.3	23.2	31583.6
Deciduous softwood	1957.3	16.5	2686.6	22.6	6170.2	51.9	1081.7	9.1	11895.8
60. Krasnoyarsk Kray*									
Coniferous	1936.9	2.2	14630.0	16.8	51367.8	58.8	19369.8	22.2	87304.5
Deciduous softwood	2783.1	15.0	5489.2	29.7	9214.1	49.8	1011.9	5.5	18498.3

Table 6A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
61. Irkutsk Oblast*									
Coniferous	6306.0	14.3	21726.0	49.4	15419.0	35.1	525.4	1.2	43976.4
Deciduous softwood	1437.4	17.9	4611.9	57.6	1833.4	22.9	125.5	1.6	8008.2
62. Chita Oblast*									
Coniferous	198.3	1.0	3103.6	16.3	15250.2	80.3	437.5	2.3	18989.6
Deciduous softwood	71.3	2.5	975.6	34.1	1791.6	62.6	24.5	0.9	2863.0
63. Republic of Buryatia									
Coniferous	527.1	3.6	1300.6	8.8	11738.8	79.7	1160.2	7.9	14726.7
Deciduous softwood	54.0	4.7	299.0	26.1	747.0	65.2	46.0	4.0	1146.0
64. Republic of Tuva									
Coniferous	97.2	1.3	530.2	7.1	5748.0	76.9	1095.7	14.7	7471.1
Deciduous softwood	30.8	12.1	135.8	53.3	87.3	34.3	0.7	0.3	254.6
65. Primorie Kray									
Coniferous	264.2	4.2	2948.5	46.6	3094.7	48.9	20.7	0.3	6328.1
Deciduous hardwood	107.9	4.7	1061.9	46.1	1078.3	46.9	53.3	2.3	2301.4
Deciduous softwood	340.3	22.1	725.3	47.1	469.5	30.5	3.7	0.2	1538.8
66. Khabarovsk Kray*									
Coniferous	2056.7	6.7	9486.7	31.0	17953.4	58.7	1094.2	3.6	30591.0
Deciduous hardwood	52.7	4.4	493.2	41.3	584.4	48.9	64.5	5.4	1194.8
Deciduous softwood	797.9	26.8	1195.7	40.1	964.3	32.3	23.5	0.8	2981.4
67. Amur Kray									
Coniferous	277.5	1.9	4431.4	30.0	9961.5	67.4	107.1	0.7	14777.5
Deciduous hardwood	3.0	1.0	21.5	6.9	153.1	49.0	135.0	43.2	312.6
Deciduous softwood	352.9	9.2	2084.4	54.5	1382.7	36.2	4.8	0.1	3824.8
68. Kamchatka Oblast*									
Coniferous	28.0	4.0	84.2	12.0	356.0	50.7	234.2	33.3	702.4
Deciduous hardwood	0.0	0.0	3.7	0.1	2215.0	60.6	1439.0	39.3	3657.7
Deciduous softwood	595.9	53.6	57.7	5.2	224.0	20.1	234.2	21.1	1111.8
69. Magadan Oblast*									
Coniferous	12.0	0.1	71.5	0.8	5016.3	55.5	3931.7	43.5	9031.5
Deciduous softwood	126.3	30.5	100.1	24.2	158.8	38.3	29.2	7.0	414.4
70. Sakhalin Oblast									
Coniferous	61.2	2.1	672.2	23.0	2159.8	74.0	24.0	0.8	2917.2
Deciduous hardwood	30.7	3.3	72.4	7.7	751.2	80.2	81.9	8.7	936.2
Deciduous softwood	32.8	16.0	71.5	34.9	93.1	45.5	7.2	3.5	204.6
71. Republic of Sakha (Yakutia)									
Coniferous	1106.4	1.0	987.9	0.9	65089.5	58.8	43498.6	39.3	110682.4

Table 6A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
Deciduous softwood	53.8	3.4	25.6	1.6	1209.4	76.9	284.6	18.1	1573.4

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

Table 7A. **Distribution of stocked forest areas by site quality classes.** Data as of 01.01.1998

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
1. Kaliningrad Oblast									
Coniferous	65.3	77.6	11.7	13.9	6.1	7.2	1.1	1.3	84.2
Deciduous hardwood	42.9	97.3	1.2	2.7	0.0	0.0	0.0	0.0	44.1
Deciduous softwood	72.3	72.5	18.9	19.0	8.5	8.5	0.0	0.0	99.7
2. Archangel Oblast*									
Coniferous	193.7	1.2	1003.8	6.0	12868.8	76.5	2764.4	16.4	16830.7
Deciduous softwood	347.1	9.8	1018.6	28.7	2096.4	59.1	82.3	2.3	3544.4
3. Vologda Oblast									
Coniferous	598.8	15.2	1163.4	29.5	1892.0	48.0	285.0	7.2	3939.2
Deciduous softwood	2385.8	73.7	666.9	20.6	182.7	5.6	3.4	0.1	3238.8
4. Murmansk Oblast									
Coniferous	0.0	0.0	1.8	0.0	1772.3	47.6	1952.7	52.4	3726.8
Deciduous softwood	0.0	0.0	0.3	0.0	185.4	14.3	1114.0	85.7	1299.7
5. Republic of Karelia									
Coniferous	299.9	3.6	1018.5	12.3	6367.7	77.2	561.7	6.8	8247.8
Deciduous softwood	333.4	32.7	417.1	40.9	263.9	25.9	5.2	0.5	1019.6
6. Komi Republic									
Coniferous	303.4	1.3	1166.8	4.9	13867.4	58.5	8361.5	35.3	23699.1
Deciduous softwood	987.7	18.7	1069.4	20.3	2488.7	47.2	731.9	13.9	5277.7
7. Leningrad Oblast									
Coniferous	680.0	29.5	911.2	39.5	630.5	27.4	83.6	3.6	2305.3
Deciduous hardwood	0.0	0.0	0.3	100.0	0.0	0.0	0.0	0.0	0.3
Deciduous softwood	738.0	62.0	364.6	30.6	84.3	7.1	2.9	0.2	1189.8
8. Novgorod Oblast									
Coniferous	369.9	39.4	281.6	30.0	240.1	25.6	47.7	5.1	939.3
Deciduous hardwood	0.7	33.3	1.3	61.9	0.1	4.8	0.0	0.0	2.1
Deciduous softwood	875.8	69.8	304.9	24.3	72.6	5.8	1.5	0.1	1254.8
9. Pskov Oblast									
Coniferous	251.6	41.4	184.1	30.3	142.8	23.5	29.0	4.8	607.5
Deciduous hardwood	0.8	72.7	0.3	27.3	0.0	0.0	0.0	0.0	1.1
Deciduous softwood	324.0	67.3	123.0	25.5	33.5	7.0	1.1	0.2	481.6
10. Bryansk Oblast									
Coniferous	365.3	96.8	9.0	2.4	3.2	0.8	0.0	0.0	377.5
Deciduous hardwood	38.8	82.9	7.9	16.9	0.1	0.2	0.0	0.0	46.8
Deciduous softwood	285.5	93.7	14.6	4.8	4.5	1.5	0.0	0.0	304.6

Table 7A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
11. Vladimir Oblast									
Coniferous	558.5	94.0	22.2	3.7	13.1	2.2	0.3	0.1	594.1
Deciduous hardwood	2.5	41.7	3.5	58.3	0.0	0.0	0.0	0.0	6.0
Deciduous softwood	326.3	88.5	32.2	8.7	10.4	2.8	0.0	0.0	368.9
12. Ivanovo Oblast									
Coniferous	334.1	91.0	15.8	4.3	17.0	4.6	0.1	0.0	367.0
Deciduous hardwood	0.6	25.0	1.5	62.5	0.3	12.5	0.0	0.0	2.4
Deciduous softwood	321.0	90.9	24.0	6.8	8.1	2.3	0.0	0.0	353.1
13. Tver Oblast									
Coniferous	779.6	70.1	139.6	12.6	154.0	13.9	38.3	3.4	1111.5
Deciduous hardwood	0.1	33.3	0.2	66.7	0.0	0.0	0.0	0.0	0.3
Deciduous softwood	866.0	86.2	112.7	11.2	26.3	2.6	0.0	0.0	1005.0
14. Kaluga Oblast									
Coniferous	252.4	96.6	6.6	2.5	2.3	0.9	0.0	0.0	261.3
Deciduous hardwood	19.1	77.3	5.4	21.9	0.2	0.8	0.0	0.0	24.7
Deciduous softwood	385.2	98.4	4.5	1.2	1.6	0.4	0.0	0.0	391.3
15. Kostroma Oblast									
Coniferous	1182.5	74.7	280.2	17.7	111.8	7.1	7.9	0.5	1582.4
Deciduous hardwood	0.0	0.0	0.2	100.0	0.0	0.0	0.0	0.0	0.2
Deciduous softwood	1614.7	90.7	137.6	7.7	27.8	1.6	0.3	0.0	1780.4
16. Moscow Oblast									
Coniferous	715.3	95.8	19.9	2.7	8.1	1.1	3.1	0.4	746.4
Deciduous hardwood	18.8	59.9	12.4	39.5	0.2	0.6	0.0	0.0	31.4
Deciduous softwood	714.8	92.9	44.8	5.8	9.8	1.3	0.4	0.1	769.8
17. Orel Oblast									
Coniferous	27.4	97.9	0.6	2.1	0.0	0.0	0.0	0.0	28.0
Deciduous hardwood	39.4	91.8	3.1	7.2	0.4	0.9	0.0	0.0	42.9
Deciduous softwood	52.7	98.3	0.8	1.5	0.1	0.2	0.0	0.0	53.6
18. Ryazan Oblast									
Coniferous	294.8	91.6	18.3	5.7	8.9	2.8	0.0		322.0
Deciduous hardwood	52.3	67.8	23.5	30.5	1.3	1.7	0.0	0.0	77.1
Deciduous softwood	288.9	87.3	32.7	9.9	9.4	2.8	0.0	0.0	331.0
19. Smolensk Oblast									
Coniferous	299.8	86.1	19.9	5.7	19.9	5.7	8.4	2.4	348.0
Deciduous hardwood	2.9	93.5	0.2	6.5	0.0	0.0	0.0	0.0	3.1
Deciduous softwood	555.9	95.4	21.2	3.6	5.8	1.0	0.1	0.0	583.0
20. Tula Oblast									
Coniferous	29.9	94.6	1.1	3.5	0.6	1.9	0.0	0.0	31.6

Table 7A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
Deciduous hardwood	73.9	70.5	28.5	27.2	2.4	2.3	0.0	0.0	104.8
Deciduous softwood	121.0	97.3	3.4	2.7	0.0	0.0	0.0	0.0	124.4
21. Yaroslavl Oblast									
Coniferous	299.8	86.4	17.3	5.0	23.7	6.8	6.0	1.7	346.8
Deciduous hardwood	0.5	29.4	1.1	64.7	0.1	5.9	0.0	0.0	1.7
Deciduous softwood	446.9	87.3	44.9	8.8	19.6	3.8	0.6	0.1	512.0
22. Nizhni Novgorod Oblast									
Coniferous	1115.8	79.1	204.1	14.5	80.6	5.7	10.1	0.7	1410.6
Deciduous hardwood	20.9	36.9	34.2	60.3	1.6	2.8	0.0	0.0	56.7
Deciduous softwood	1175.3	85.7	155.9	11.4	39.7	2.9	0.6	0.0	1371.5
23. Kirov Oblast									
Coniferous	1045.0	32.9	1249.1	39.4	844.2	26.6	33.7	1.1	3172.0
Deciduous hardwood	1.5	41.7	1.6	44.4	0.5	13.9	0.0	0.0	3.6
Deciduous softwood	1740.1	68.1	671.4	26.3	144.1	5.6	1.4	0.1	2557.0
24. Republic of Marii El									
Coniferous	447.3	80.7	60.8	11.0	41.6	7.5	4.5	0.8	554.2
Deciduous hardwood	4.9	51.0	4.6	47.9	0.1	1.0	0.0	0.0	9.6
Deciduous softwood	457.4	85.2	60.5	11.3	18.6	3.5	0.4	0.1	536.9
25. Republic of Mordovia									
Coniferous	149.3	88.7	10.3	6.1	8.6	5.1	0.2	0.1	168.4
Deciduous hardwood	35.8	47.5	31.2	41.4	8.4	11.1	0.0	0.0	75.4
Deciduous softwood	236.8	79.8	35.7	12.0	23.8	8.0	0.4	0.1	296.7
26. Chuvash Republic									
Coniferous	155.3	91.0	14.3	8.4	1.1	0.6	0.0	0.0	170.7
Deciduous hardwood	74.4	70.2	30.5	28.8	1.1	1.0	0.0	0.0	106.0
Deciduous softwood	212.3	83.2	41.0	16.1	1.9	0.7	0.0	0.0	255.2
27. Belgorod Oblast									
Coniferous	18.1	94.3	0.9	4.7	0.2	1.0	0.0	0.0	19.2
Deciduous hardwood	99.8	58.0	58.8	34.2	13.5	7.8	0.0	0.0	172.1
Deciduous softwood	9.2	82.1	1.4	12.5	0.6	5.4	0.0	0.0	11.2
28. Voronezh Oblast									
Coniferous	80.1	77.3	18.1	17.5	5.3	5.1	0.1	0.1	103.6
Deciduous hardwood	78.5	42.4	70.1	37.9	36.1	19.5	0.3	0.2	185.0
Deciduous softwood	38.2	72.3	8.2	15.5	6.4	12.1	0.0	0.0	52.8
29. Kursk Oblast									
Coniferous	23.1	95.5	0.9	3.7	0.2	0.8	0.0	0.0	24.2
Deciduous hardwood	58.4	42.3	65.9	47.7	13.9	10.1	0.0	0.0	138.2
Deciduous softwood	28.9	85.5	3.5	10.4	1.4	4.1	0.0	0.0	33.8

Table 7A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
30. Lipetsk Oblast									
Coniferous	51.4	94.8	2.3	4.2	0.5	0.9	0.0	0.0	54.2
Deciduous hardwood	29.4	50.2	25.9	44.2	3.3	5.6	0.0	0.0	58.6
Deciduous softwood	27.0	87.9	3.0	9.8	0.7	2.3	0.0	0.0	30.7
31. Tambov Oblast									
Coniferous	138.0	97.3	3.1	2.2	0.8	0.6	0.0	0.0	141.9
Deciduous hardwood	31.5	58.7	20.1	37.4	2.1	3.9	0.0	0.0	53.7
Deciduous softwood	92.0	89.7	7.4	7.2	3.2	3.1	0.0	0.0	102.6
32. Astrakhan Oblast									
Deciduous hardwood	6.1	42.4	3.3	22.9	4.9	34.0	0.1	0.7	14.4
Deciduous softwood	3.8	7.6	11.9	23.8	33.7	67.3	0.7	1.4	50.1
33. Volgograd Oblast									
Coniferous	24.0	42.5	23.1	40.9	9.3	16.5	0.1	0.2	56.5
Deciduous hardwood	16.5	7.0	68.4	29.2	144.0	61.4	5.6	2.4	234.5
Deciduous softwood	16.0	24.4	12.5	19.1	36.8	56.2	0.2	0.3	65.5
34. Samara Oblast									
Coniferous	71.5	91.3	5.6	7.2	1.2	1.5	0.0	0.0	78.3
Deciduous hardwood	25.8	15.1	91.4	53.5	53.3	31.2	0.2	0.1	170.7
Deciduous softwood	163.0	59.5	97.9	35.7	12.9	4.7	0.2	0.1	274.0
35. Penza Oblast									
Coniferous	235.3	94.8	10.6	4.3	2.2	0.9	0.0	0.0	248.1
Deciduous hardwood	14.8	8.7	114.5	67.0	41.5	24.3	0.0	0.0	170.8
Deciduous softwood	300.8	81.2	62.9	17.0	6.7	1.8	0.0	0.0	370.4
36. Saratov Oblast									
Coniferous	27.1	56.1	15.3	31.7	5.9	12.2	0.0	0.0	48.3
Deciduous hardwood	16.0	6.0	65.9	24.9	178.3	67.3	4.9	1.8	265.1
Deciduous softwood	35.4	31.0	48.8	42.8	29.8	26.1	0.1	0.1	114.1
37. Ulyanovsk Oblast									
Coniferous	344.7	96.4	11.2	3.1	1.7	0.5	0.0	0.0	357.6
Deciduous hardwood	6.5	6.2	40.6	38.8	57.4	54.8	0.2	0.2	104.7
Deciduous softwood	336.7	81.9	66.0	16.1	8.5	2.1	0.0	0.0	411.2
38. Republic of Kalmykia									
Deciduous hardwood	2.4	35.3	1.6	23.5	2.7	39.7	0.1	1.5	6.8
Deciduous softwood	0.0	0.0	0.2	25.0	0.6	75.0	0.0	0.0	0.8
39. Republic of Tatarstan									
Coniferous	225.8	98.9	2.4	1.1	0.0	0.0	0.0	0.0	228.2
Deciduous hardwood	85.4	46.9	83.8	46.0	12.8	7.0	0.0	0.0	182.0
Deciduous softwood	477.3	78.3	131.7	21.6	0.8	0.1	0.0	0.0	609.8

Table 7A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
40. Krasnodar Kray*									
Coniferous	59.6	63.7	22.1	23.6	11.4	12.2	0.4	0.4	93.5
Deciduous hardwood	415.2	35.5	419.6	35.9	289.1	24.7	46.4	4.0	1170.3
Deciduous softwood	50.9	64.8	13.5	17.2	13.2	16.8	0.9	1.1	78.5
41. Stavropol Kray*									
Coniferous	29.3	27.0	30.0	27.6	48.6	44.7	0.8	0.7	108.7
Deciduous hardwood	59.0	29.4	71.2	35.5	63.6	31.7	6.7	3.3	200.5
Deciduous softwood	24.1	17.4	34.2	24.6	67.7	48.7	12.9	9.3	138.9
42. Rostov Oblast									
Coniferous	30.1	43.8	28.2	41.0	10.4	15.1	0.1	0.1	68.8
Deciduous hardwood	23.9	21.4	40.6	36.3	46.2	41.3	1.1	1.0	111.8
Deciduous softwood	6.2	31.0	4.9	24.5	8.6	43.0	0.3	1.5	20.0
43. Republic of Daghestan									
Coniferous	0.5	0.8	7.8	11.9	55.3	84.4	1.9	2.9	65.5
Deciduous hardwood	26.2	12.4	35.9	17.0	102.3	48.5	46.6	22.1	211.0
Deciduous softwood	2.6	3.7	3.4	4.8	51.4	72.3	13.7	19.3	71.1
44. Kabardino-Balkaianr Republic									
Coniferous	0.0	0.0	1.0	14.9	5.3	79.1	0.4	6.0	6.7
Deciduous hardwood	36.4	49.5	25.9	35.2	10.7	14.5	0.6	0.8	73.6
Deciduous softwood	13.5	29.4	6.7	14.6	24.6	53.6	1.1	2.4	45.9
45. Republic of North Ossetia									
Coniferous	1.0	13.5	1.2	16.2	4.3	58.1	0.9	12.2	7.4
Deciduous hardwood	96.2	75.1	20.2	15.8	10.1	7.9	1.6	1.2	128.1
Deciduous softwood	10.8	36.9	3.8	13.0	10.7	36.5	4.0	13.7	29.3
46. Chechen Republic and Republic of Ingushetia*									
Coniferous	0.1	1.3	0.8	10.1	7.0	88.6	0.0	0.0	7.9
Deciduous hardwood	124.2	49.1	83.4	33.0	45.0	17.8	0.2	0.1	252.8
Deciduous softwood	10.8	16.1	11.6	17.3	42.3	62.9	2.5	3.7	67.2
47. Kurgan Oblast									
Coniferous	344.6	90.9	16.7	4.4	16.2	4.3	1.8	0.5	379.3
Deciduous softwood	545.5	75.5	142.8	19.8	33.0	4.6	1.0	0.1	722.3
48. Orenburg Oblast									
Coniferous	50.0	84.7	7.7	13.1	1.3	2.2	0.0	0.0	59.0
Deciduous hardwood	20.3	13.4	69.1	45.6	62.0	41.0	0.0	0.0	151.4
Deciduous softwood	82.6	38.3	89.9	41.7	42.9	19.9	0.3	0.1	215.7
49. Perm Oblast*									
Coniferous	676.3	11.7	2381.6	41.2	2644.5	45.8	74.1	1.3	5776.5
Deciduous hardwood	0.0	0.0	1.0	100.0	0.0	0.0	0.0	0.0	1.0

Table 7A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
Deciduous softwood	1510.3	44.1	1570.8	45.9	339.4	9.9	4.8	0.1	3425.3
50. Sverdlovsk Oblast*									
Coniferous	1575.6	23.3	1848.0	27.3	2550.6	37.7	783.6	11.6	6757.8
Deciduous hardwood	0.0	0.0	0.1	100.0	0.0	0.0	0.0	0.0	0.1
Deciduous softwood	1791.0	42.6	1524.4	36.2	778.7	18.5	111.8	2.7	4205.9
51. Chelyabinsk Oblast									
Coniferous	445.3	57.4	253.7	32.7	75.0	9.7	1.8	0.2	775.8
Deciduous hardwood	4.0	11.0	13.0	35.8	18.1	49.9	1.2	3.3	36.3
Deciduous softwood	683.8	44.7	675.0	44.2	167.7	11.0	1.8	0.1	1528.3
52. Republic of Bashkortostan									
Coniferous	675.1	58.3	393.7	34.0	89.4	7.7	0.6	0.1	1158.8
Deciduous hardwood	18.2	3.7	140.3	28.9	320.1	65.9	7.3	1.5	485.9
Deciduous softwood	982.0	29.4	1728.0	51.7	628.8	18.8	2.3	0.1	3341.1
53. Udmurtian Republic									
Coniferous	548.0	70.8	164.3	21.2	61.1	7.9	0.8	0.1	774.2
Deciduous hardwood	1.0	62.5	0.6	37.5	0.0	0.0	0.0	0.0	1.6
Deciduous softwood	582.2	82.5	93.8	13.3	29.4	4.2	0.4	0.1	705.8
54. Altai Kray*									
Coniferous	1013.7	24.1	1443.2	34.2	1693.1	40.2	64.2	1.5	4214.2
Deciduous hardwood	0.3	17.6	0.3	17.6	1.1	64.7	0.0	0.0	1.7
Deciduous softwood	1157.1	62.3	520.2	28.0	177.4	9.6	2.5	0.1	1857.2
55. Kemerovo Oblast									
Coniferous	684.0	27.1	1169.4	46.4	656.5	26.0	11.6	0.5	2521.5
Deciduous softwood	845.3	47.1	623.4	34.8	318.9	17.8	5.8	0.3	1793.4
56. Novosibirsk Oblast									
Coniferous	276.3	28.3	51.1	5.2	182.7	18.7	467.0	47.8	977.1
Deciduous hardwood	0.3	30.0	0.2	20.0	0.5	50.0	0.0	0.0	1.0
Deciduous softwood	574.7	34.7	582.2	35.1	471.2	28.4	29.3	1.8	1657.4
57. Omsk Oblast									
Coniferous	119.8	12.9	132.6	14.3	329.4	35.5	346.4	37.3	928.2
Deciduous hardwood	0.0	0.0	0.1	50.0	0.1	50.0	0.0	0.0	0.2
Deciduous softwood	838.9	50.7	565.5	34.2	241.9	14.6	7.9	0.5	1654.2
58. Tomsk Oblast									
Coniferous	224	2.2	1892	18.8	6184.4	61.5	1760	17.5	10060
Deciduous softwood	2186.1	30.3	3685.2	51.1	1234.7	17.1	106.2	1.5	7212.2
59. Tyumen Oblast*									
Coniferous	981.4	2.6	1174.2	3.1	20621.6	54.0	15427.8	40.4	38205.0
Deciduous softwood	1412.1	15.9	1696.2	19.1	4412.7	49.7	1366.6	15.4	8887.6

Table 7A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
60. Krasnoyarsk Kray*									
Coniferous	2773.4	3.4	12537.7	15.4	52164.9	64.1	13848.7	17.0	81324.7
Deciduous softwood	2678.4	16.4	5080.8	31.1	6781.1	41.5	1783.9	10.9	16324.2
61. Irkutsk Oblast*									
Coniferous	3225.7	7.2	17894.4	40.0	22733.8	50.8	873.5	2.0	44727.4
Deciduous softwood	1519.6	14.6	4397.5	42.2	4160.8	39.9	346.2	3.3	10424.1
62. Chita Oblast*									
Coniferous	115.6	0.6	2715.4	14.3	14545.6	76.8	1569.0	8.3	18945.6
Deciduous softwood	46.0	0.9	1652.0	32.5	3323.1	65.4	59.9	1.2	5081.0
63. Republic of Buryatia									
Coniferous	47.2	0.3	1199.2	7.8	11115.5	72.5	2961.1	19.3	15323.0
Deciduous softwood	24.5	1.5	504.9	30.6	932.7	56.5	189.9	11.5	1652.0
64. Republic of Tuva									
Coniferous	155.8	2.1	1279.2	17.4	4943.7	67.2	979.9	13.3	7358.6
Deciduous softwood	34.0	12.4	153.0	55.7	87.2	31.7	0.7	0.3	274.9
65. Primorie Kray									
Coniferous	248.8	3.9	2077.3	32.8	3980.6	62.9	21.4	0.3	6328.1
Deciduous hardwood	65.7	2.1	856.9	27.4	2113.4	67.6	89.5	2.9	3125.5
Deciduous softwood	301.1	16.5	840.7	46.0	682.1	37.3	5.4	0.3	1829.3
66. Khabarovsk Kray*									
Coniferous	2752.2	6.9	7824.8	19.7	23865.9	59.9	5373.3	13.5	39816.2
Deciduous hardwood	55.5	3.2	465.4	27.0	1157.3	67.2	42.8	2.5	1721.0
Deciduous softwood	1376.4	22.3	2293.6	37.2	2341.8	37.9	159.1	2.6	6170.9
67. Amur Oblast									
Coniferous	358.9	2.5	3127.7	21.4	10245.1	70.1	885.9	6.1	14617.6
Deciduous hardwood	8.5	1.7	91.3	18.8	298.8	61.4	88.2	18.1	486.8
Deciduous softwood	340.2	6.6	2482.8	48.1	2284.7	44.2	55.7	1.1	5163.4
68. Kamchatka Oblast*									
Coniferous	25.6	2.3	188.1	16.6	680.8	60.0	239.5	21.1	1134.0
Deciduous hardwood	0.4	0.0	2.9	0.0	3771.9	63.9	2129.0	36.1	5904.2
Deciduous softwood	38.6	2.8	246.0	17.8	838.5	60.7	259.1	18.7	1382.2
69. Magadan Oblast*									
Coniferous	1.9	0.0	44.5	0.5	3022.6	32.2	6332.1	67.4	9401.1
Deciduous softwood	43.6	13.7	130.4	41.0	127.8	40.2	15.9	5.0	317.7
70. Sakhalin Oblast									
Coniferous	60.5	1.6	437.4	11.4	3065.4	80.2	261.2	6.8	3824.5
Deciduous hardwood	8.5	0.8	66.7	6.4	777.7	75.1	182.6	17.6	1035.5

Table 7A. Continued

Tree stands	II and over		III		IV - V		Va and lower		Total thousand ha
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	
Deciduous softwood	23.7	7.9	74.2	24.7	185.3	61.8	16.7	5.6	299.9
71. Republic of Sakha (Yakutia)									
Coniferous	219.8	0.2	4687.8	3.9	75894.7	63.5	38802.3	32.4	119604.6
Deciduous softwood	9.2	0.5	166.8	8.3	1475.2	73.5	356.3	17.7	2007.5

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

Table 8A. **Clearcut and intermediate felling of tree stands, 1966-1988, thousand m³**
(Compiled from: Dynamic...,1989)

Administrative territory	Groups of tree stands	Year of account							
		1966		1973		1983		1988	
		Clearcut**	Inter-mediate***	Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate
1. Kaliningrad Oblast	Coniferous	119		146		94		92	
	Deciduous	208		139		109		153	
	Total	327	163	285	286	203	251	245	223
2. Archangel Oblast*	Coniferous	25329		24292		20963		22974	
	Deciduous	128		334		1393		1318	
	Total	25457	63	24626	237	22356	348	24292	383
3. Vologda Oblast	Coniferous	11829		12881		7948		7724	
	Deciduous	2146		3348		5279		5441	
	Total	13975	130	16229	312	13227	333	13165	371
4. Murmansk Oblast	Coniferous	1835		1622		1244		1266	
	Deciduous	2		0		0		0	
	Total	1837	36	1622	41	1244	33	1266	29
5. Republic of Karelia	Coniferous	18088		14521		9483		8353	
	Deciduous	268		677		1215		1059	
	Total	18356	125	15198	431	10698	479	9412	612
6. Komi Republic	Coniferous	18838		21404		19295		21557	
	Deciduous	1123		1735		3019		3434	
	Total	19961	61	23139	157	22314	280	24991	311
7. Leningrad Oblast	Coniferous	2511		2721		2284		2750	
	Deciduous	2337		2360		1869		2298	
	Total	4848	331	5081	746	4153	1022	5048	1056
8. Novgorod Oblast	Coniferous	1183		1119		826		1031	
	Deciduous	1713		1234		1590		1596	
	Total	2896	111	2353	284	2416	288	2627	328
9. Pskov Oblast	Coniferous	564		545		611		669	
	Deciduous	565		602		489		568	
	Total	1129	105	1147	239	1100	208	1237	239
10. Bryansk Oblast	Coniferous	411		431		393		384	
	Deciduous	1011		888		846		955	
	Total	1422	296	1319	499	1239	487	1339	422
11. Vladimir Oblast	Coniferous	983		937		1222		1232	
	Deciduous	883		970		809		887	
	Total	1866	361	1907	513	2031	558	2119	566
12. Ivanovo Oblast	Coniferous	534		575		542		554	
	Deciduous	1162		1096		667		723	
	Total	1696	410	1671	528	1209	449	1277	434
13. Tver Oblast	Coniferous	1796		1877		1601		1746	
	Deciduous	2302		2122		1859		1963	
	Total	4098	353	3999	479	3460	480	3709	484

Table 8A. Continued

Administrative territory	Groups of tree stands	Year of account							
		1966		1973		1983		1988	
		Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate
14. Kaluga Oblast	Coniferous	122		108		164		226	
	Deciduous	1214		1107		962		1024	
	Total	1336	219	1215	336	1126	268	1250	268
15. Kostroma Oblast	Coniferous	5724		4384		3015		3218	
	Deciduous	3135		3111		3378		3454	
	Total	8859	144	7495	322	6393	304	6672	301
16. Moscow Oblast	Coniferous	245		331		115		255	
	Deciduous	1271		1013		918		967	
	Total	1516	613	1344	880	1033	801	1222	823
17. Orel Oblast	Coniferous	20		19		10		10	
	Deciduous	133		121		105		110	
	Total	153	51	140	97	115	91	120	85
18. Ryazan Oblast	Coniferous	449		345		532		528	
	Deciduous	912		936		611		707	
	Total	1361	370	1281	463	1143	389	1235	370
19. Smolensk Oblast	Coniferous	448		350		298		325	
	Deciduous	1236		1081		852		983	
	Total	1684	210	1431	350	1150	242	1308	241
20. Tula Oblast	Coniferous	4		1		10		11	
	Deciduous	424		397		362		339	
	Total	428	174	398	207	372	163	350	173
21. Yaroslavl Oblast	Coniferous	284		231		235		238	
	Deciduous	1209		1225		843		991	
	Total	1493	225	1456	336	1078	298	1229	262
22. Nizhni Novgorod Oblast	Coniferous	3541		3294		1594		1643	
	Deciduous	4102		2133		2652		2713	
	Total	7643	895	5427	1136	4246	1329	4356	1372
23. Kirov Oblast	Coniferous	12011		10167		6413		6700	
	Deciduous	3868		5700		5659		6030	
	Total	15879	195	15867	323	12072	361	12730	382
24. Republic of Marii El	Coniferous	1043		773		378		485	
	Deciduous	1136		617		879		953	
	Total	2179	195	1390	323	1257	361	1438	382
25. Republic of Mordovia	Coniferous	215		395		195		194	
	Deciduous	1070		901		733		787	
	Total	1285	283	1296	373	928	323	981	321
26. Chuvash Republic	Coniferous	331		549		337		160	
	Deciduous	1074		782		715		742	
	Total	1405	301	1331	484	1052	458	902	483
27. Belgorod Oblast	Deciduous	98		106		128		128	

Table 8A. Continued

Administrative territory	Groups of tree stands	Year of account							
		1966		1973		1983		1988	
		Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate
	Total	98	113	106	164	128	153	128	152
28. Voronezh Oblast	Coniferous	20		3		20		20	
	Deciduous	331		322		283		288	
	Total	351	190	325	300	303	281	308	292
29. Kursk Oblast	Coniferous	1		3					
	Deciduous	119		64		64		62	
	Total	120	48	67	77	64	92	62	89
30. Lipetsk Oblast	Coniferous	63		73		34		34	
	Deciduous	101		98		124		127	
	Total	164	74	171	91	158	104	161	113
31. Tambov Oblast	Coniferous	213		240		197		197	
	Deciduous	402		286		379		429	
	Total	615	176	526	214	576	217	626	226
32. Astrakhan Oblast	Deciduous	152		118		25		26	
	Total	152	11	118	10	25	25	26	23
33. Volgograd Oblast	Coniferous			3					
	Deciduous	457		228		186		159	
	Total	457	135	231	212	186	216	159	205
34. Samara Oblast	Coniferous	43		56		68		68	
	Deciduous	895		794		512		389	
	Total	938	209	850	320	580	260	457	334
35. Penza Oblast	Coniferous	374		419		414		302	
	Deciduous	1227		959		1135		1153	
	Total	1601	379	1378	426	1549	546	1455	537
36. Saratov Oblast	Coniferous	1		3		3		3	
	Deciduous	292		299		245		224	
	Total	293	188	302	242	248	262	227	262
37. Ulyanovsk Oblast	Coniferous	628		540		495		529	
	Deciduous	1665		1351		1279		1193	
	Total	2293	286	1891	465	1774	467	1722	483
38. Republic of Kalmykia	Deciduous	4		4		0		0	
	Total	4	4	4	4	0	3	0	2
39. Republic of Tatarstan	Coniferous	196		166		86		21	
	Deciduous	2423		2004		1638		1688	
	Total	2619	634	2170	771	1724	842	1709	862
40. Krasnodar Kray*	Coniferous	429		215		115		105	
	Deciduous	2388		1871		1436		1348	
	Total	2817	495	2086	675	1551	661	1453	639
41. Stavropol Kray*	Coniferous	34		24		14		15	
	Deciduous	174		137		120		111	

Table 8A. Continued

Administrative territory	Groups of tree stands	Year of account							
		1966		1973		1983		1988	
		Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate
	Total	208		161		134		126	
42. Rostov Oblast	Deciduous	151		107		61		50	
	Total	151	53	107	50	61	70	50	80
43. Republic of Daghestan	Coniferous	5		2		2		1	
	Deciduous	51		54		65		61	
	Total	56	53	56	69	67	68	62	69
44. Kabardino-Balkarian Republic	Deciduous	58		56		47		46	
	Total	58	23	56	56	47	19	46	8
45. Republic of North Ossetia	Deciduous	97		85		60		57	
	Total	97	82	85	122	60	66	57	57
46. Chechen Rep.and Rep. of Ingushetia*	Deciduous	240		121		73		67	
	Total	240	90	121	116	73	94	67	91
47. Kurgan Oblast	Coniferous	567		498		539		540	
	Deciduous	1223		1084		786		799	
	Total	1790	146	1582	172	1325	153	1339	167
48. Orenburg Oblast	Coniferous	1		43					
	Deciduous	382		344		240		252	
	Total	383	114	387	201	240	235	252	172
49. Perm Oblast*	Coniferous	23759		21460		14298		13903	
	Deciduous	2057		2699		4202		3844	
	Total	25816	448	24159	672	18500	706	17747	738
50. Sverdlovsk Oblast*	Coniferous	17253		15995		10392		9913	
	Deciduous	6486		6899		6705		7066	
	Total	23739	663	22894	933	17097	1150	16979	1211
51. Chelyabinsk Oblast	Coniferous	990		677		533		539	
	Deciduous	1879		1694		1439		1454	
	Total	2869	295	2371	505	1972	470	1993	488
52. Republic of Bashkortostan	Coniferous	1903		1347		1178		1305	
	Deciduous	3550		3813		4020		4129	
	Total	5453	659	5160	1037	5198	1258	5434	1327
53. Udmurtian Republic	Coniferous	3135		2597		1486		1596	
	Deciduous	881		1110		1475		1614	
	Total	4016	382	3707	518	2961	628	3210	646
54. Altai Kray*	Coniferous	2054		1573		1584		1697	
	Deciduous	782		1013		1150		1162	
	Total	2836	490	2586	628	2734	674	2859	688
55. Kemerovo Oblast	Coniferous	2897		2489		1882		2031	
	Deciduous	749		1015		1214		1244	
	Total	3646	166	3504	276	3096	278	3275	287
56. Novosibirsk Oblast	Coniferous	427		281		224		188	

Table 8A. Continued

Administrative territory	Groups of tree stands	Year of account							
		1966		1973		1983		1988	
		Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate
	Deciduous	611		407		413		496	
	Total	1038	285	688	326	637	360	684	369
57. Omsk Oblast	Coniferous	486		298		355		293	
	Deciduous	921		1185		1244		1334	
	Total	1407	71	1483	182	1599	125	1627	129
58. Tomsk Oblast	Coniferous	6564		5875		4266		4847	
	Deciduous	1329		2159		2760		3691	
	Total	7893	78	8034	229	7026	173	8538	173
59. Tyumen Oblast*	Coniferous	6949		9870		10218		11236	
	Deciduous	1918		2651		3167		4227	
	Total	8867	167	12521	422	13385	541	15463	606
60. Krasnoyarsk Kray*	Coniferous	20812		21755		19945		21229	
	Deciduous	753		985		1499		1561	
	Total	21565	240	22740	570	21444	721	22790	791
61. Irkutsk Oblast*	Coniferous	25760		28268		28330		33878	
	Deciduous	184		732		2489		2676	
	Total	25944	246	29000	450	30819	718	36554	839
62. Chita Oblast*	Coniferous	4322		4367		4567		4905	
	Deciduous	324		331		636		596	
	Total	4646	133	4698	273	5203	371	5501	398
63. Republic of Buryatia	Coniferous	5696		4385		3272		3705	
	Deciduous	37		299		720		39682	
	Total	5733	215	4684	384	3992	496	43387	540
64. Republic of Tuva	Coniferous	416		418		426		488	
	Deciduous	17		8		4		12	
	Total	433	56	426	72	430	75	500	70
65. Primorie Kray	Coniferous	5145		5741		5483		5551	
	Deciduous	458		770		742		798	
	Total	5603	246	6511	479	6225	575	6349	600
66. Khabarovsk Kray*	Coniferous	8291		13315		12758		13068	
	Deciduous	668		1020		1058		1322	
	Total	8959	135	14335	263	13816	426	14390	465
67. Amur Oblast	Coniferous	3077		3517		5347		6135	
	Deciduous	330		283		210		430	
	Total	3407	43	3800	69	5557	72	6565	79
68. Kamchatka Oblast*	Coniferous	563		889		752		743	
	Deciduous	213		137		145		138	
	Total	776	8	1026	32	897	37	881	36
69. Magadan Oblast*	Coniferous	476		476		380		322	
	Deciduous	0		2		0		0	
	Total	476	10	478	10	380	17	322	20

Table 8A. Continued

Administrative territory	Groups of tree stands	Year of account							
		1966		1973		1983		1988	
		Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate	Clearcut	Inter-mediate
70. Sakhalin Oblast	Coniferous	3484		3753		3448		3564	
	Deciduous	10		1		4		6	
	Total	3494	69	3754	99	3452	167	3570	191
71. Republic of Sakha (Yakutia)	Coniferous	3661		3498		4126		4436	
	Deciduous	1		0		0		4	
	Total	3662	23	3498	33	4126	37	4440	37

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

** Clearcut

*** Intermediate felling

Table 9A. **Area of burned and dead stands, 1961-1998**

Administrative territory	Year of account													
	1961		1966		1973		1978		1983		1988		1998	
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%
1. Kaliningrad Oblast	0.0	*0.00*	0.2	*0.00*	0.2	*0.00*	0.2	*0.00*	0.4	*0.00*	0.3	*0.00*	0.2	*0.00*
2. Archangel Oblast*	107.6	*0.19*	96.8	*0.22*	91.7	*0.24*	72.2	*0.24*	45.1	*0.18*	34.6	*0.13*	10.5	*0.04*
3. Vologda Oblast	9.2	*0.02*	2.8	*0.01*	24.4	*0.06*	12.7	*0.04*	2.4	*0.01*	0.3	*0.00*	0.5	*0.00*
4. Murmansk Oblast	357.9	*0.64*	361.8	*0.81*	251.2	*0.65*	188.9	*0.62*	108.0	*0.43*	15.2	*0.06*	21.8	*0.09*
5. Republic of Karelia	65.0	*0.12*	67.5	*0.15*	41.2	*0.11*	47.7	*0.16*	39.0	*0.16*	13.9	*0.05*	10.0	*0.04*
6. Komi Republic	538.2	*0.97*	268.9	*0.60*	91.0	*0.24*	53.9	*0.18*	24.3	*0.10*	12.4	*0.05*	38.5	*0.15*
7. Leningrad Oblast	9.8	*0.02*	4.7	*0.01*	13.6	*0.04*	6.5	*0.02*	6.5	*0.03*	2.8	*0.01*	8.6	*0.03*
8. Novgorod Oblast	1.3	*0.00*	2.3	*0.01*	13.6	*0.04*	4.4	*0.01*	2.8	*0.01*	1.7	*0.01*	7.8	*0.03*
9. Pskov Oblast	2.3	*0.00*	3.1	*0.01*	0.8	*0.00*	1.0	*0.00*	0.3	*0.00*	0.5	*0.00*	0.9	*0.00*
10. Bryansk Oblast	0.7	*0.00*	1.8	*0.00*	0.4	*0.00*	0.3	*0.00*	0.2	*0.00*	0.4	*0.00*	0.2	*0.00*
11. Vladimir Oblast	0.8	*0.00*	0.6	*0.00*	38.3	*0.10*	0.9	*0.00*	2.1	*0.01*	1.0	*0.00*	1.8	*0.01*
12. Ivanovo Oblast	1.6	*0.00*	0.6	*0.00*	4.8	*0.01*	1.1	*0.00*	1.8	*0.01*	1.1	*0.00*	0.6	*0.00*
13. Tver Oblast	2.9	*0.01*	2.4	*0.01*	5.1	*0.01*	3.0	*0.01*	2.2	*0.01*	11.3	*0.04*	3.6	*0.01*
14. Kaluga Oblast	0.6	*0.00*	0.3	*0.00*	0.1	*0.00*	0.6	*0.00*	0.2	*0.00*	0.1	*0.00*	0.5	*0.00*
15. Kostroma Oblast	13.6	*0.02*	4.0	*0.01*	139.1	*0.36*	12.4	*0.04*	7.6	*0.03*	3.2	*0.01*	1.3	*0.01*
16. Moscow Oblast	3.6	*0.01*	0.3	*0.00*	20.2	*0.05*	7.5	*0.02*	1.3	*0.01*	0.7	*0.00*	0.6	*0.00*
17. Orel Oblast	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*
18. Ryazan Oblast	0.9	*0.00*	0.5	*0.00*	27.3	*0.07*	0.4	*0.00*	2.0	*0.01*	1.3	*0.00*	0.1	*0.00*
19. Smolensk Oblast	0.9	*0.00*	0.2	*0.00*	0.3	*0.00*	0.3	*0.00*	0.5	*0.00*	0.2	*0.00*	0.9	*0.00*
20. Tula Oblast	0.0	*0.00*	0.1	*0.00*	0.1	*0.00*	0.1	*0.00*	0.0	*0.00*	0.0	*0.00*	0.1	*0.00*
21. Yaroslavl Oblast	1.0	*0.00*	0.5	*0.00*	6.7	*0.02*	1.9	*0.01*	0.7	*0.00*	2.1	*0.01*	0.4	*0.00*
22. Nizhni Novgorod Oblast	3.7	*0.01*	3.8	*0.01*	349	*0.91*	68.5	*0.23*	8.4	*0.03*	4.5	*0.02*	2.9	*0.01*
23. Kirov Oblast	20.9	*0.04*	2.9	*0.01*	18.5	*0.05*	5.6	*0.02*	3.5	*0.01*	3.2	*0.01*	2.1	*0.01*
24. Republic of Marii El	2.7	*0.00*	1.1	*0.00*	181	*0.47*	42.5	*0.14*	10.4	*0.04*	2.3	*0.01*	0.6	*0.00*
25. Republic of Mordovia	0.1	*0.00*	0.2	*0.00*	28.1	*0.07*	1.3	*0.00*	0.4	*0.00*	1.5	*0.01*	0.5	*0.00*

Table 9A. Continued

Administrative territory	Year of account													
	1961		1966		1973		1978		1983		1988		1998	
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%
26. Chuvash Republic	0.0	*0.00*	0.2	*0.00*	27.7	*0.07*	1.6	*0.01*	6.3	*0.03*	1.4	*0.01*	1.7	*0.01*
27. Belgorod Oblast	0.3	*0.00*	0.1	*0.00*	0.2	*0.00*	0.0	*0.00*	0.3	*0.00*	0.0	*0.00*	0.0	*0.00*
28. Voronezh Oblast	0.1	*0.00*	0.1	*0.00*	1.0	*0.00*	0.4	*0.00*	1.2	*0.00*	0.3	*0.00*	0.7	*0.00*
29. Kursk Oblast	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.1	*0.00*	0.0	*0.00*
30. Lipetsk Oblast	0.1	*0.00*	0.0	*0.00*	1.2	*0.00*	0.2	*0.00*	0.0	*0.00*	0.8	*0.00*	0.1	*0.00*
31. Tambov Oblast	0.0	*0.00*	0.0	*0.00*	12.1	*0.03*	0.6	*0.00*	0.5	*0.00*	0.8	*0.00*	0.1	*0.00*
32. Astrakhan Oblast	0.4	*0.00*	0.6	*0.00*	2.8	*0.01*	4.0	*0.01*	3.1	*0.01*	0.8	*0.00*	0.4	*0.00*
33. Volgograd Oblast	2.4	*0.00*	0.6	*0.00*	6.3	*0.02*	4.2	*0.01*	3.2	*0.01*	1.0	*0.00*	4.8	*0.02*
34. Samara Oblast	0.0	*0.00*	0.0	*0.00*	0.4	*0.00*	0.8	*0.00*	1.5	*0.01*	2.1	*0.01*	1.8	*0.01*
35. Penza Oblast	1.7	*0.00*	0.0	*0.00*	14.6	*0.04*	0.6	*0.00*	0.2	*0.00*	0.3	*0.00*	0.4	*0.00*
36. Saratov Oblast	0.4	*0.00*	0.2	*0.00*	0.4	*0.00*	1.8	*0.01*	1.5	*0.01*	0.4	*0.00*	0.9	*0.00*
37. Ulyanovsk Oblast	0.3	*0.00*	0.1	*0.00*	0.8	*0.00*	0.5	*0.00*	1.2	*0.00*	0.8	*0.00*	0.2	*0.00*
38. Republic of Kalmykia	0.1	*0.00*	1.1	*0.00*	9.6	*0.02*	3.0	*0.01*	2.4	*0.01*	0.7	*0.00*	2.3	*0.01*
39. Republic of Tatarstan	0.3	*0.00*	0.4	*0.00*	5.0	*0.01*	2.7	*0.01*	4.7	*0.02*	5.0	*0.02*	0.7	*0.00*
40. Krasnodar Kray*	0.4	*0.00*	0.7	*0.00*	0.6	*0.00*	0.2	*0.00*	0.3	*0.00*	0.1	*0.00*	0.3	*0.00*
41. Stavropol Kray*	0.8	*0.00*	1.1	*0.00*	1.2	*0.00*	1.4	*0.00*	0.7	*0.00*	0.6	*0.00*	0.5	*0.00*
42. Rostov Oblast	0.2	*0.00*	0.3	*0.00*	0.7	*0.00*	0.7	*0.00*	2.1	*0.01*	2.5	*0.01*	6.7	*0.03*
43. Republic of Daghestan	0.5	*0.00*	0.1	*0.00*	0.6	*0.00*	0.2	*0.00*	0.2	*0.00*	0.3	*0.00*	0.1	*0.00*
44. Kabardino-Balkar Republic	0.0	*0.00*	0.0	*0.00*	0.1	*0.00*	0.1	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*
45. Republic of North Ossetia	0.0	*0.00*	0.1	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*	0.0	*0.00*
46. Chechen Rep. and Rep. of Ingushetia*	0.1	*0.00*	0.1	*0.00*	0.2	*0.00*	0.1	*0.00*	0.1	*0.00*	0.1	*0.00*	0.1	*0.00*
47. Kurgan Oblast	43.1	*0.08*	11.1	*0.02*	3.4	*0.01*	10.7	*0.04*	6.9	*0.03*	1.1	*0.00*	8.1	*0.03*
48. Orenburg Oblast	0.7	*0.00*	0.0	*0.00*	0.4	*0.00*	2.2	*0.01*	2.3	*0.01*	1.1	*0.00*	2.4	*0.01*
49. Perm Oblast*	65.9	*0.12*	55.8	*0.12*	8.5	*0.02*	92.5	*0.31*	35.1	*0.14*	5.7	*0.02*	15.5	*0.06*
50. Sverdlovsk Oblast*	124.8	*0.22*	100.4	*0.22*	34.4	*0.09*	78.9	*0.26*	87.1	*0.35*	37.5	*0.14*	44.2	*0.18*

Table 9A. Continued

Administrative territory	Year of account													
	1961		1966		1973		1978		1983		1988		1998	
	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%	thousand ha	%
51. Chelyabinsk Oblast	7.7	*0.01*	83.1	*0.19*	1.6	*0.00*	25.4	*0.08*	20.5	*0.08*	2.5	*0.01*	11.9	*0.05*
52. Republic of Bashkortostan	5.8	*0.01*	2.6	*0.01*	1.6	*0.00*	3.6	*0.01*	8.2	*0.03*	12.0	*0.05*	3.8	*0.02*
53. Udmurtian Republic	3.0	*0.01*	2.1	*0.00*	1.8	*0.00*	1.1	*0.00*	1.6	*0.01*	1.6	*0.01*	0.3	*0.00*
European-Urals part	**1404.4**	***2.53***	**1007.9**	***2.25***	**1482.9**	***3.85***	**771.4**	***2.55***	**461.3**	***1.84***	**194.2**	***0.73***	**223.0**	***0.90***
54. Altai Kray*	89.9	*0.16*	87.0	*0.19*	63.0	*0.16*	50.9	*0.17*	48.9	*0.19*	42.0	*0.16*	134.1	*0.54*
55. Kemerovo Oblast	28.3	*0.05*	27.0	*0.06*	13.2	*0.03*	10.5	*0.03*	4.7	*0.02*	3.6	*0.01*	4.1	*0.02*
56. Novosibirsk Oblast	20.7	*0.04*	9.3	*0.02*	18.0	*0.05*	37.2	*0.12*	42.7	*0.17*	44.1	*0.17*	27.9	*0.11*
57. Omsk Oblast	34.2	*0.06*	27.5	*0.06*	24.0	*0.06*	13.3	*0.04*	13.8	*0.05*	10.1	*0.04*	29.7	*0.12*
58. Tomsk Oblast	700.5	*1.26*	752.8	*1.68*	473.3	*1.23*	317.4	*1.05*	321.6	*1.28*	280.5	*1.06*	181.8	*0.73*
59. Tyumen Oblast*	1241.6	*2.24*	2139.1	*4.77*	2093.2	*5.43*	1629.9	*5.38*	1490.3	*5.93*	638.6	*2.41*	441.4	*1.77*
60. Krasnoyarsk Kray*	3896.4	*7.02*	3558.9	*7.94*	3612.1	*9.37*	3162.4	*10.44*	3133.7	*12.47*	3194.7	*12.04*	3044.9	*12.24*
61. Irkutsk Oblast*	5075.7	*9.14*	5072.2	*11.31*	4710.6	*12.22*	1942.9	*6.41*	1697.6	*6.76*	4428.8	*16.68*	1933.4	*7.77*
62. Chita Oblast*	1850.1	*3.33*	1504.3	*3.36*	981.1	*2.55*	889.6	*2.94*	565.9	*2.25*	716.2	*2.70*	546.4	*2.20*
63. Republic of Buryatia	788.1	*1.42*	559.4	*1.25*	465.7	*1.21*	351.5	*1.16*	379.1	*1.51*	383.4	*1.44*	279.9	*1.13*
64. Republic of Tuva	255.1	*0.46*	220.2	*0.49*	214.3	*0.56*	215.9	*0.71*	215.0	*0.86*	215.5	*0.81*	245.9	*0.99*
65. Primorie Kray	431.3	*0.78*	308.5	*0.69*	261.0	*0.68*	109.8	*0.36*	178.3	*0.71*	190.2	*0.72*	62.4	*0.25*
66. Khabarovsk Kray*	7206.7	*12.98*	4247.5	*9.47*	4363.4	*11.32*	5127.6	*16.92*	4496.4	*17.90*	3384.1	*12.75*	1871.0	*7.52*
67. Amur Oblast	884.5	*1.59*	732.2	*1.63*	676.4	*1.75*	683.9	*2.26*	777.2	*3.09*	664.9	*2.50*	528.4	*2.12*
68. Kamchatka Oblast*	142.3	*0.26*	26.6	*0.06*	29.0	*0.08*	24.9	*0.08*	24.2	*0.10*	12.0	*0.05*	124.1	*0.50*
69. Magadan Oblast*	5875.1	*10.58*	5741.9	*12.81*	5315.8	*13.79*	4288.2	*14.15*	4226.1	*16.82*	3220.2	*12.13*	3390.5	*13.63*
70. Sakhalin Oblast	746.2	*1.34*	705.0	*1.57*	538.0	*1.40*	634.9	*2.10*	356.1	*1.42*	333.8	*1.26*	280.1	*1.13*
71. Republic of Sakha (Yakutia)	24855.4	*44.76*	18109.3	*40.39*	13210.0	*34.27*	10037.1	*33.13*	6690.4	*26.63*	8587.5	*32.35*	11529.3	*46.34*
Asia part	**54122.1**	***97.47***	**43828.7**	***97.75***	**37062.1**	***96.15***	**29527.9**	***97.45***	**24662.0**	***98.16***	**26350.2**	***99.27***	**24655.3**	***99.10***
Russia	**55526.5**	***100.0***	**44836.6**	***100.0***	**38545.0**	***100.00***	**30299.3**	***100.00***	**25123.3**	***100.00***	**26544.4**	***100.00***	**24878.3**	***100.00***

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

Table 10. **Drained area of forest ecosystems**
(Compiled from database of the SFFA, 01.01.1998)

Administrative territory	Drained area		It is need to recovery		Stocked area thousand ha
	thousand ha	%**	thousand ha	%**	
1. Kaliningrad Oblast	91	40.0	60	26.2	228.3
2. Archangel Oblast*	314	1.5	21	0.1	20375.1
3. Vologda Oblast	225	3.1	73	1.0	7178.1
5. Republic of Karelia	315	3.4	127	1.4	9267.4
6. Komi Republic	94	0.3	59	0.2	29229.3
7. Leningrad Oblast	274	7.8	202	5.8	3495.4
8. Novgorod Oblast	116	5.3	60	2.7	2199.4
9. Pskov Oblast	147	13.5	59	5.4	1090.2
10. Bryansk Oblast	8	1.1	6	0.8	733.4
13. Tver Oblast	42	2.0	13	0.6	2116.8
15. Kostroma Oblast	35	1.0	5	0.1	3363.0
16. Moscow Oblast	10	0.7	10	0.7	1547.6
18. Ryazan Oblast	36	4.9	27	3.7	731.3
19. Smolensk Oblast	10	1.1	4	0.4	934.6
21. Yaroslavl Oblast	58	6.7	44	5.1	860.5
22. Nizhni Novgorod Oblast	70	2.5	6	0.2	2840.6
23. Kirov Oblast	8	0.1	2	0.0	5732.6
24. Republic of Marii El	11	1.0	8	0.8	1100.8
49. Perm Oblast*	6	0.1	2	0.0	9202.8
52. Republic of Bashkortostan	8	0.2	4	0.1	5000.8
53. Udmurtian Republic	14	0.9	13	0.9	1481.6
56. Novosibirsk Oblast	1	0.1	1	0.1	2653.9
58. Tomsk Oblast	11	0.1	1	0.0	17279.0
59. Tyumen Oblast*	4	0.0	4	0.0	47983.5

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.
** Percent of stocked area of administrative territory.

Table 11A. **Relative change of areas ($\Delta S^{\%}$) and growing stock ($\Delta M^{\%}$) of stands in periods between accounts, 1961-1998, percent**

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
1. Kaliningrad Oblast														
Coniferous														
young	-21.4	-4.8	15.4	8.9	22.1	6.4	-11.2	21.5	14.0	0.8	-9.1	32.3	10.8	2.3
middle-aged	53.9	56.2	15.0	31.8	-0.7	0.3	-9.0	-9.6	-3.7	-3.5	11.5	15.3	-3.1	-7.5
maturing	-31.8	-36.5	-14.6	-1.3	-3.4	-5.8	3.5	9.0	-6.8	-10.0	-12.2	-10.6	-12.5	-13.4
mature & overmature	0.0	-7.9	-16.1	-7.1	-26.9	-27.0	49.1	55.2	-22.4	-24.8	-27.3	-29.9	-12.5	-15.4
Deciduous hardwood														
young	11.2	-7.7	6.2	13.9	13.9	1.2	-19.2	16.9	3.2	0.0	-27.7	-1.0	5.3	3.1
middle-aged	75.0	79.0	14.3	26.7	1.4	1.7	3.7	5.1	-0.9	-0.8	16.9	21.9	0.4	3.2
maturing	0.0	3.1	6.1	22.4	-2.9	-7.3	64.7	72.4	0.0	-0.8	1.8	10.8	-1.8	-13.2
mature & overmature	160.0	112.5	3.8	9.8	-37.0	-25.0	88.2	66.7	-18.8	-18.6	-3.8	1.8	-12.0	-12.1
Deciduous softwood														
young	3.0	38.9	-21.9	-1.0	7.9	8.1	-49.8	-52.3	-2.6	-3.9	-33.6	-46.9	14.7	7.7
middle-aged	71.4	107.7	67.1	101.6	6.1	10.0	48.6	54.5	-1.1	-0.1	8.7	28.1	0.0	-0.4
maturing	-7.8	15.8	-5.7	27.3	-4.0	-3.6	6.3	11.1	0.0	-2.4	31.4	42.4	0.0	0.3
mature & overmature	3.4	-2.1	-2.8	25.5	-26.1	-25.4	0.0	12.1	-15.4	-18.2	55.5	57.9	-3.5	-5.2
2. Archangel Oblast*														
Coniferous														
young	38.0	32.4	57.2	10.5	7.5	-8.8	14.0	6.3	7.7	21.1	3.6	18.7	-0.3	5.8
middle-aged	25.7	32.0	15.2	14.4	12.5	13.6	6.2	10.6	13.1	16.0	2.4	1.2	12.5	7.9
maturing	-8.2	-8.6	-17.4	-11.8	-9.1	-6.0	-5.4	-2.6	8.5	11.3	-3.0	11.8	12.6	10.1
mature & overmature	-0.8	-0.2	-6.6	-3.4	-7.4	-7.6	-3.0	-3.5	-5.1	-4.9	2.9	2.6	-1.8	-2.4
Deciduous softwood														
young	14.7	4.6	20.8	-8.7	8.7	7.4	3.6	9.4	0.1	26.7	0.2	47.7	15.9	14.7
middle-aged	42.0	43.0	-3.6	0.9	14.5	29.6	19.7	14.0	12.5	22.1	34.0	52.8	16.1	9.5
maturing	22.3	24.3	44.6	55.7	13.9	28.8	4.0	8.4	-6.7	5.1	33.8	53.8	4.0	1.6
mature & overmature	4.6	9.9	-9.5	-10.2	-5.7	-7.1	-15.8	-10.5	-7.8	-5.7	14.6	26.1	9.3	10.3
3. Vologda Oblast														
Coniferous														
young	11.3	28.3	27.7	15.1	-8.3	-8.8	23.1	-1.3	8.8	9.1	-21.4	-7.1	18.5	11.3
middle-aged	5.1	10.8	3.3	8.5	17.9	26.4	3.0	4.2	-3.6	-3.8	0.7	7.4	5.9	7.0
maturing	-13.4	-15.4	-25.4	-25.2	-9.4	2.0	-2.0	-1.4	14.4	12.4	9.9	23.6	0.4	-0.4
mature & overmature	2.1	5.6	-13.7	-13.4	-9.3	-2.9	-12.7	-15.0	0.1	0.4	-2.0	-1.9	-3.2	-4.0
Deciduous softwood														
young	-24.7	-40.3	-23.4	-45.4	4.6	26.2	10.3	2.6	-7.7	-3.5	4.7	13.3	0.4	3.3
middle-aged	62.0	74.8	25.4	39.2	-6.7	13.8	-0.1	2.2	-12.6	-11.5	-21.0	-21.8	1.0	0.3
maturing	85.0	92.3	-5.8	6.7	73.0	86.9	-1.8	-1.6	16.7	37.4	50.0	59.4	-15.0	-17.5
mature & overmature	8.2	12.2	-15.5	-10.8	22.0	19.9	-8.8	-11.1	36.9	49.3	32.6	43.4	18.1	20.4
4. Murmansk Oblast														
Coniferous														
young	41.6	40.3	61.1	92.6	15.9	4.7	19.6	31.1	6.1	47.9	1.0	8.6	7.2	-1.1
middle-aged	93.4	68.8	120.3	129.2	4.0	2.4	3.6	3.1	-4.2	-4.3	1.5	0.9	-0.5	-0.4
maturing	13.1	-9.4	9.5	10.0	5.7	5.8	-5.0	-6.9	-29.6	-23.0	-9.2	-9.7	-0.4	-0.8
mature & overmature	-15.0	-22.2	-20.8	-27.0	-7.0	-8.7	-4.4	-3.9	9.7	12.5	-1.0	-1.5	-1.3	-1.9
Deciduous softwood														
young	6.4	-10.0	5.2	16.7	12.8	-1.2	5.4	20.5	-29.5	-10.0	-11.7	-1.1	0.0	0.0
middle-aged	120.2	111.0	28.4	36.5	8.6	9.5	8.3	12.0	12.8	37.4	11.9	12.1	-0.4	-0.3

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
maturing	181.7	124.8	24.5	56.7	3.0	2.3	0.8	1.2	-25.1	-12.1	-3.4	-1.4	-0.3	-0.6
mature & overmature	-27.1	-33.5	-19.7	-28.1	-10.1	-8.2	-0.3	-0.4	24.6	23.5	-3.0	-3.7	-0.1	-0.6
5. Republic of Karelia														
Coniferous														
young	23.3	27.1	82.6	43.0	38.0	18.0	37.2	26.8	11.2	37.3	1.4	20.8	4.2	27.4
middle-aged	15.6	25.7	8.9	16.5	4.6	3.4	-5.3	-6.6	-0.3	-3.8	6.9	7.2	4.8	5.1
maturing	-16.6	-14.1	-18.7	-11.8	-7.3	-5.8	22.8	24.8	20.9	28.6	-1.1	7.3	5.0	9.2
mature & overmature	-11.7	-16.4	-12.3	-14.2	-13.1	-13.1	-9.1	-10.6	-5.8	-2.4	-2.6	0.6	-0.7	1.8
Deciduous softwood														
young	-6.3	-4.9	42.6	15.4	5.5	0.7	1.0	2.7	-26.6	-4.8	-22.8	-7.5	-28.9	-37.7
middle-aged	52.1	64.5	-8.2	1.0	-0.1	-0.2	-7.6	-11.5	5.4	5.4	8.2	10.0	15.5	17.1
maturing	-27.3	-5.6	33.4	46.0	-3.6	-5.9	19.0	17.8	-6.0	-4.8	5.2	8.7	9.1	16.6
mature & overmature	-7.1	11.2	24.7	34.1	-2.6	-2.8	4.5	13.6	3.2	2.6	-3.1	1.0	31.0	39.8
6. Komi Republic														
Coniferous														
young	51.0	57.3	50.0	35.4	22.8	7.7	6.2	9.1	3.2	7.4	-6.4	-0.6	-1.4	-0.7
middle-aged	12.1	19.9	11.9	16.4	11.3	12.2	13.8	9.3	11.6	9.1	36.7	30.3	18.8	11.4
maturing	-8.4	-6.7	-26.8	-12.7	-7.4	-5.0	9.1	8.7	6.2	8.9	56.5	27.6	8.3	8.2
mature & overmature	0.2	0.4	-18.2	-7.5	-1.3	-1.1	-2.3	-2.1	-3.5	-4.4	16.1	7.4	-1.4	-2.3
Deciduous softwood														
young	4.9	7.9	-24.2	-43.7	6.8	-3.1	4.6	18.1	0.8	0.0	6.7	51.7	2.8	3.7
middle-aged	10.3	28.0	35.8	35.2	14.1	22.0	9.7	17.6	16.5	13.7	23.6	30.5	1.5	4.6
maturing	12.8	29.4	-19.5	-5.7	-6.2	-4.2	-3.7	-3.5	-1.9	5.3	70.2	101.5	45.8	30.0
mature & overmature	-3.7	9.9	-29.5	-9.8	-8.0	-5.6	-5.3	-5.5	-9.4	-8.6	19.7	25.0	1.8	1.6
7. Leningrad Oblast														
Coniferous														
young	10.7	19.9	10.7	8.0	10.1	8.2	-1.1	-2.2	4.8	12.3	3.0	-4.3	-4.9	23.1
middle-aged	-0.6	3.6	0.6	21.8	1.6	6.6	-23.7	-24.5	-12.6	-18.6	-7.4	-5.8	-8.0	-7.2
maturing	-1.4	-6.2	6.8	17.4	0.1	8.0	57.3	65.0	12.4	12.2	2.8	5.9	-3.0	-2.5
mature & overmature	18.5	21.4	6.0	12.7	6.2	9.4	24.0	38.8	21.0	29.2	4.1	4.1	11.2	11.3
Deciduous hardwood														
young	-	-	-	-	-	-	-100.0	-	-	-	-100.0	-100.0	-	-
middle-aged	0.0	100.0	100.0	0.0	-50.0	-50.0	300.0	300.0	-50.0	-50.0	50.0	50.0	-33.3	33.3
maturing	-	-	-100.0	-	-	-	-	-	-	-	-	-	-	-
mature & overmature	0.0	0.0	-100.0	-100.0	-	-	-	-	-	-	-	-	-	-
Deciduous softwood														
young	-22.2	-31.0	-7.0	9.0	-19.3	-11.1	-17.2	-9.2	-28.5	-16.0	-0.1	-2.3	-32.8	-32.4
middle-aged	15.0	23.0	3.1	20.8	0.2	14.1	-10.8	-9.8	-12.5	-13.9	0.0	1.3	-12.1	-11.6
maturing	-8.2	21.5	6.5	19.7	-2.7	4.0	6.5	13.3	18.3	23.5	-0.4	-0.9	17.2	19.6
mature & overmature	39.6	56.7	5.4	14.4	-3.2	3.1	7.5	16.0	7.6	10.7	-4.4	-5.1	54.1	59.3
8. Novgorod Oblast														
Coniferous														
young	0.5	36.1	28.4	4.1	-6.0	11.1	21.2	3.8	7.3	37.9	17.3	7.3	-5.2	37.0
middle-aged	4.2	2.6	-3.4	-1.6	3.9	27.9	-0.7	-0.3	11.4	-1.2	21.9	29.5	3.3	9.9
maturing	27.6	32.7	-6.5	-6.6	-9.9	6.8	-0.8	-1.0	45.4	51.7	-1.5	-2.1	13.0	13.2
mature & overmature	22.7	29.8	-21.0	-25.2	59.6	109.6	-8.5	-10.8	39.8	61.2	-12.3	-14.5	13.1	14.0
Deciduous hardwood														
young	0.0	-	0.0	0.0	-100.0	-100.0	-	-	-	-	-	-	-	-

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
middle-aged	400.0	550.0	-20.0	-7.7	0.0	8.3	0.0	23.1	12.5	6.3	22.2	11.8	0.0	-15.8
maturing	-50.0	100.0	100.0	0.0	0.0	50.0	0.0	-16.7	150.0	60.0	0.0	-12.5	0.0	71.4
mature & overmature	-50.0	-50.0	-100.0	-100.0	-	-	0.0	0.0	100.0	66.7	0.0	0.0	100.0	40.0
Deciduous softwood														
young	-27.2	-22.5	-1.8	-8.1	-44.9	2.9	3.3	-0.2	-41.6	-43.5	15.3	8.6	-1.3	-4.1
middle-aged	35.9	52.6	0.5	4.2	2.5	37.7	-0.5	-0.4	-7.4	-3.2	18.7	18.0	0.5	2.2
maturing	75.6	98.4	-8.2	-11.2	33.2	82.8	-2.1	-2.3	31.0	35.9	2.6	2.0	54.2	52.7
mature & overmature	91.5	129.5	-22.8	-25.8	55.9	100.7	-12.9	-14.2	67.5	74.5	-9.6	-10.1	97.6	100.3
9. Pskov Oblast														
Coniferous														
young	-9.2	30.5	10.9	3.1	-16.6	20.8	13.4	2.4	-16.5	-9.1	8.5	1.3	-24.4	-13.5
middle-aged	-2.6	-1.1	5.5	7.5	17.9	49.6	0.1	0.1	30.8	34.2	1.2	0.4	0.1	3.3
maturing	26.6	24.9	-6.7	-4.0	19.0	46.7	-1.0	-1.5	8.8	25.1	-1.0	-1.9	18.3	19.5
mature & overmature	45.6	43.0	-11.7	-10.4	17.1	43.3	-15.6	-18.8	15.0	37.9	-15.2	-17.4	26.2	26.8
Deciduous hardwood														
young	150.0	600.0	-30.0	-21.4	-28.6	-45.5	-10.0	16.7	-66.7	-57.1	0.0	0.0	-66.7	-66.7
middle-aged	200.0	200.0	66.7	66.7	-20.0	-20.0	25.0	50.0	40.0	66.7	0.0	-10.0	0.0	22.2
maturing	-100.0	-100.0	-	-	0.0	200.0	0.0	-33.3	100.0	100.0	0.0	0.0	0.0	-25.0
mature & overmature	100.0	100.0	0.0	0.0	0.0	100.0	0.0	25.0	-50.0	-60.0	0.0	0.0	0.0	0.0
Deciduous softwood														
young	-29.5	-31.6	7.4	6.7	-43.1	-5.1	10.3	4.3	-57.7	-43.9	23.1	6.0	24.3	-20.6
middle-aged	70.7	97.1	3.3	8.4	35.8	87.8	-0.6	0.0	-12.0	-8.0	6.6	5.4	-20.0	-16.3
maturing	35.2	50.3	-0.4	3.6	0.2	41.0	-1.1	-0.4	43.3	54.4	3.4	2.8	29.7	30.1
mature & overmature	19.1	26.1	-7.3	-1.5	3.0	29.5	-9.8	-11.6	46.0	67.3	-3.9	-5.0	74.6	72.1
10. Bryansk Oblast														
Coniferous														
young	10.7	21.9	23.3	3.1	-16.2	40.8	10.0	0.4	-26.7	-11.3	-11.9	-12.6	-7.6	-15.8
middle-aged	-1.6	-2.3	1.6	-0.1	29.5	39.4	0.1	0.0	34.7	40.6	17.3	26.6	13.2	16.8
maturing	28.0	23.1	-4.7	-4.2	27.2	39.9	1.7	0.6	24.6	22.5	9.0	17.3	10.5	13.7
mature & overmature	-7.3	-13.5	-34.6	-37.2	25.1	34.2	-38.9	-40.1	49.3	51.4	-5.7	3.7	7.6	10.1
Deciduous hardwood														
young	30.2	6.2	15.5	3.5	-57.0	-25.8	6.3	9.1	-47.1	-27.8	-17.3	-3.8	-7.5	-8.0
middle-aged	16.5	-8.5	0.8	-1.3	12.7	15.8	0.0	1.4	-9.8	5.7	-4.0	5.9	-1.3	3.1
maturing	7.1	3.5	-3.2	-2.8	-14.3	-13.5	1.3	-2.7	-19.0	-11.1	-3.1	0.0	6.5	7.0
mature & overmature	31.0	12.4	-25.3	-25.4	80.3	78.5	-12.5	-14.1	-13.4	-8.7	0.0	3.2	8.2	15.9
Deciduous softwood														
young	-9.4	2.1	9.5	-0.9	-44.1	-4.4	6.8	-0.5	-41.6	-47.2	-8.8	-18.9	-23.4	-26.1
middle-aged	5.7	6.1	3.8	2.0	34.9	42.9	-0.6	0.1	25.1	45.8	-4.0	0.1	-7.2	-1.8
maturing	8.1	16.2	-6.3	-7.0	14.9	18.8	0.4	-1.3	-13.1	-5.9	9.3	11.0	18.1	23.3
mature & overmature	22.8	28.1	-43.6	-49.5	120.5	147.1	-27.1	-29.6	12.2	22.6	12.6	15.6	27.2	29.4
11. Vladimir Oblast														
Coniferous														
young	-2.4	12.0	-0.8	15.6	17.5	11.2	-8.0	-2.1	-4.9	-5.7	-4.0	-8.1	-10.8	-10.0
middle-aged	7.2	3.9	-1.4	2.9	-2.0	0.3	8.2	9.0	4.9	8.1	8.8	11.7	11.3	18.8
maturing	46.2	45.3	1.1	3.3	0.8	5.2	1.3	-1.4	-0.2	3.1	-3.0	-1.4	-3.0	2.8
mature & overmature	25.4	27.1	-2.7	-2.9	-4.4	-0.1	-7.9	-10.8	20.9	22.5	-17.0	-16.0	40.9	51.1
Deciduous hardwood														
young	-20.0	-20.0	-43.8	-50.0	-11.1	-50.0	-25.0	0.0	-16.7	200.0	-20.0	33.3	-100.0	-100.0
middle-aged	-3.4	-2.8	35.7	40.0	-7.9	0.0	2.9	4.1	-33.3	-29.4	4.2	5.6	-12.0	2.6

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
maturing	50.0	44.4	-22.2	-19.2	0.0	14.3	-14.3	-16.7	-8.3	-5.0	9.1	5.3	-41.7	-15.0
mature & overmature	160.0	115.8	-3.8	-17.1	16.0	61.8	-13.8	-12.7	24.0	18.8	0.0	1.8	0.0	5.2
Deciduous softwood														
young	-36.4	-26.8	-26.7	-17.1	-16.1	-14.6	11.2	-16.7	-16.5	-19.7	4.8	3.7	1.9	14.9
middle-aged	2.8	5.4	13.0	18.0	8.9	14.1	-0.6	-0.2	-7.8	-5.0	1.8	4.7	-5.9	1.6
maturing	37.5	41.8	-16.0	-15.0	-12.1	-6.8	10.4	10.5	11.2	14.5	-0.5	-0.5	9.7	15.4
mature & overmature	119.3	124.7	-25.1	-24.3	-1.7	1.3	34.5	35.7	3.4	4.4	-13.7	-11.0	104.7	109.8
12. Ivanovo Oblast														
Coniferous														
young	-0.9	54.4	39.9	6.2	-4.3	50.9	-6.6	-24.3	-6.1	29.3	9.9	-0.3	-27.5	-21.5
middle-aged	-8.5	-7.3	0.7	0.3	2.9	9.2	12.4	-1.3	6.0	23.4	1.3	1.4	-12.1	-3.1
maturing	53.0	46.4	-6.0	-6.9	21.0	26.0	2.2	-2.0	4.8	14.2	-4.0	-3.9	-5.5	2.0
mature & overmature	95.2	84.8	-60.5	-63.1	93.8	128.3	124.8	104.0	-37.1	-33.4	-27.9	-29.4	81.9	106.0
Deciduous hardwood														
young	50.0	-	0.0	0.0	-100.0	-100.0	-	-	-	-	0.0	-	-100.0	-
middle-aged	-53.3	-38.9	-14.3	-18.2	0.0	-22.2	-33.3	-28.6	25.0	20.0	0.0	0.0	-60.0	-50.0
maturing	200.0	366.7	0.0	7.1	-33.3	-40.0	-50.0	-66.7	0.0	66.7	0.0	0.0	-33.3	-40.0
mature & overmature	100.0	128.6	12.5	-6.3	33.3	60.0	50.0	41.7	-16.7	-8.8	0.0	0.0	33.3	19.4
Deciduous softwood														
young	-47.5	-27.7	21.0	7.5	-40.8	-27.1	-39.4	-65.2	29.6	103.9	4.6	1.9	-27.6	-31.1
middle-aged	21.1	33.6	4.7	4.6	14.9	33.1	-26.2	-40.6	40.8	90.5	-0.3	-0.6	-15.0	-12.1
maturing	6.8	21.1	-8.1	-9.4	-2.5	4.8	41.0	25.6	-34.3	-19.2	-3.4	-4.3	35.6	45.3
mature & overmature	107.7	131.4	-54.6	-59.7	63.2	80.3	75.9	62.2	-33.3	-22.0	-16.1	-16.4	101.4	115.7
13. Tver Oblast														
Coniferous														
young	-3.0	66.3	24.0	0.5	-13.0	13.3	16.9	1.9	-16.3	-6.3	11.8	1.6	-8.6	0.2
middle-aged	11.4	34.7	24.3	35.8	10.7	23.4	0.2	0.0	-1.4	-1.3	-0.1	-0.4	7.4	22.1
maturing	-0.4	7.1	-21.2	-21.9	-1.5	10.5	-2.6	-3.5	27.4	38.1	-3.5	-3.8	-4.8	0.2
mature & overmature	11.9	22.0	-36.5	-42.9	30.1	51.5	-14.4	-17.7	50.8	71.2	-12.7	-14.6	-8.7	-9.4
Deciduous softwood														
young	-33.9	-19.5	12.0	3.8	-43.9	-2.9	3.5	0.3	-43.0	-35.1	15.9	0.7	-20.2	-37.7
middle-aged	71.8	122.0	4.5	7.6	6.6	26.6	0.5	0.1	26.7	58.8	-0.3	-3.3	-13.0	-13.0
maturing	5.7	34.7	-10.6	-9.9	54.5	83.4	-2.2	-3.3	-13.7	0.5	-3.5	-4.9	37.6	38.5
mature & overmature	12.5	33.0	-34.3	-35.6	48.8	69.2	-15.2	-17.1	11.9	24.6	-14.3	-15.1	65.0	63.7
14. Kaluga Oblast														
Coniferous														
young	31.0	50.8	44.9	2.4	-3.9	56.0	14.3	2.5	-8.9	32.7	9.6	1.0	-12.0	-11.6
middle-aged	4.3	16.8	-5.1	-5.7	40.1	38.2	-0.4	-0.4	11.8	24.4	3.3	5.5	9.2	18.2
maturing	10.3	12.2	-13.2	-15.3	22.3	34.1	10.6	9.7	28.4	40.5	-2.1	-2.0	5.8	18.4
mature & overmature	81.0	83.2	-34.3	-34.1	95.7	107.8	-38.5	-40.4	141.0	164.6	-19.0	-18.6	50.6	67.1
Deciduous hardwood														
young	38.7	48.0	11.5	18.9	-44.0	0.0	0.0	6.8	-23.1	-6.4	-8.0	9.1	-47.8	-56.3
middle-aged	-19.8	-22.1	3.0	2.7	20.2	36.2	-2.4	-1.4	0.0	19.6	0.0	-1.2	-34.4	-28.6
maturing	57.1	48.6	1.5	8.4	-17.9	-10.3	7.3	3.8	13.6	37.0	-3.0	-0.7	-15.4	-8.8
mature & overmature	49.2	39.0	-9.3	-10.5	8.0	11.1	-5.3	-6.5	-10.0	1.9	-1.2	-1.9	10.0	30.8
Deciduous softwood														
young	-10.1	6.0	-1.4	-4.8	-60.2	-41.3	7.3	2.5	-59.5	-53.7	27.8	11.4	-39.7	-51.2
middle-aged	51.2	65.3	-3.6	-4.0	64.1	92.4	-0.7	-0.5	2.6	26.0	-1.1	-2.5	-20.0	-14.9
maturing	4.3	16.7	-6.0	-6.7	-11.1	4.3	-0.6	-0.8	-11.3	0.3	-2.2	-3.1	3.6	5.0

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
mature & overmature	11.0	15.8	-25.4	-27.0	8.7	19.9	-15.8	-16.8	32.0	46.3	-10.6	-10.6	42.2	47.6
15. Kostroma Oblast														
Coniferous														
young	27.5	93.8	30.8	-1.2	-3.1	33.0	27.3	2.8	-19.0	-5.4	14.2	4.2	-16.0	19.4
middle-aged	1.4	7.9	1.1	1.6	25.1	33.6	-0.7	-0.5	62.3	71.2	-0.2	-0.1	-4.4	4.6
maturing	-16.5	-19.9	-2.6	-1.5	-4.7	4.1	-2.1	-3.5	-0.6	6.8	-1.4	-2.5	19.0	32.9
mature & overmature	-10.6	-7.9	-29.2	-32.5	-3.7	3.7	-17.3	-19.1	8.7	16.5	-14.1	-15.7	0.8	12.5
Deciduous hardwood														
young	-100.0	-100.0	-	-	-	-	-	-	-	-	-	-	-	-
middle-aged	-50.0	-50.0	0.0	0.0	-100.0	-100.0	-	-	-	-	0.0	0.0	-100.0	-100.0
maturing	-	-	0.0	0.0	0.0	0.0	-50.0	0.0	0.0	-50.0	0.0	0.0	-100.0	-100.0
mature & overmature	0.0	0.0	0.0	0.0	0.0	200.0	200.0	0.0	-66.7	-33.3	0.0	0.0	100.0	150.0
Deciduous softwood														
young	-28.8	-39.8	0.3	-14.6	-15.3	31.7	-0.6	0.9	-25.7	-10.3	4.4	1.8	-17.3	-24.6
middle-aged	91.7	111.9	5.2	4.9	4.1	34.9	-0.3	-0.4	-5.4	3.4	0.2	0.0	-19.9	-26.0
maturing	30.3	52.8	1.7	1.8	28.3	45.4	-2.6	-2.6	65.0	76.8	-4.1	-4.9	72.0	74.2
mature & overmature	-0.9	1.6	-25.7	-28.2	4.6	18.4	-24.9	-25.5	50.2	50.4	-22.7	-23.3	118.7	123.5
16. Moscow Oblast														
Coniferous														
young	12.3	1.9	8.4	37.8	12.5	0.0	-11.0	23.1	9.7	-1.7	-26.2	-16.5	12.6	3.2
middle-aged	-4.9	-5.3	35.8	44.3	-0.8	-0.6	27.1	35.8	-23.0	-24.8	-6.4	1.5	-0.4	0.0
maturing	8.8	4.6	-35.0	-30.1	-5.4	-4.4	72.8	76.3	96.5	94.3	35.0	58.1	-1.6	-1.1
mature & overmature	-22.2	-29.3	-4.1	-9.0	-23.4	-26.7	100.0	144.6	348.6	384.0	87.6	132.5	-13.0	-13.1
Deciduous hardwood														
young	26.8	47.6	-24.0	-19.4	3.8	-8.0	-30.5	100.0	1.8	0.0	-48.3	-26.1	3.3	0.0
middle-aged	-7.7	-8.8	0.4	5.8	-0.9	0.9	-5.8	14.8	-2.3	-0.8	-15.4	-3.2	2.8	-0.5
maturing	20.0	5.4	133.3	151.3	-1.8	-2.0	-16.4	-13.5	0.0	1.2	-17.4	-19.0	-7.9	1.5
mature & overmature	-7.1	2.1	103.8	85.7	-7.5	-6.6	6.1	16.5	-3.8	-4.0	30.0	37.9	3.1	-0.8
Deciduous softwood														
young	5.2	0.6	-62.7	-49.1	-5.2	-12.3	-34.0	-41.1	-1.6	-1.9	-6.0	-2.0	4.2	0.0
middle-aged	-5.2	-5.9	20.7	36.3	0.1	0.2	2.2	24.1	-2.5	-1.9	-10.9	-3.6	0.0	0.5
maturing	-2.4	-6.0	-9.1	-1.2	-2.2	-1.7	13.0	26.1	-4.0	-4.6	27.7	43.9	-1.3	-4.0
mature & overmature	-22.4	-27.5	18.4	25.2	-16.0	-18.4	70.2	95.6	-12.4	-13.2	72.2	88.5	-4.6	-4.4
17. Orel Oblast														
Coniferous														
young	34.2	140.0	46.2	3.6	-5.2	88.5	4.8	0.6	-30.5	-17.0	15.9	3.6	-16.1	-21.1
middle-aged	-48.5	-38.5	170.6	140.6	28.3	75.3	6.8	5.9	31.7	41.3	31.3	34.7	58.7	83.1
maturing	42.1	58.3	-3.7	7.0	-65.4	-55.7	0.0	-14.8	211.1	204.3	-71.4	-68.6	-62.5	-72.7
mature & overmature	120.0	108.3	-36.4	-44.0	-28.6	7.1	-40.0	-33.3	366.7	260.0	-100.0	-100.0	-	-
Deciduous hardwood														
young	5.1	78.0	22.1	1.1	-53.4	-27.8	8.6	1.5	-21.8	43.9	10.1	2.1	-26.8	-6.2
middle-aged	-11.2	10.4	0.0	-2.2	107.9	123.0	3.8	2.7	-2.9	26.5	4.9	6.4	14.3	57.9
maturing	76.5	91.7	6.7	4.3	9.4	22.9	-2.9	0.0	2.9	15.3	-11.4	-14.7	-90.3	-89.7
mature & overmature	122.2	113.8	-35.0	-30.6	0.0	4.7	-26.9	-31.1	115.8	158.1	-29.3	-27.5	-89.7	-89.7
Deciduous softwood														
young	-34.0	23.2	8.6	1.2	-67.2	-67.4	-10.3	3.6	-44.2	-51.7	-24.1	-42.9	104.5	225.0
middle-aged	-1.3	17.6	0.0	3.7	167.6	202.4	2.0	-0.8	4.5	37.3	-6.6	-4.7	56.3	59.5
maturing	6.0	29.4	0.0	-3.4	45.3	65.9	2.6	4.3	-10.1	2.0	-36.6	-46.0	148.9	221.0
mature & overmature	137.0	182.6	-43.8	-47.7	63.9	98.5	-33.9	-37.8	82.1	111.9	50.7	37.1	-33.6	-25.0

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
18. Ryazan Oblast														
Coniferous														
young	6.9	18.8	-1.7	30.2	14.1	0.4	-23.0	-13.4	13.2	2.0	-30.5	-24.2	12.5	1.4
middle-aged	-5.5	-5.8	12.0	24.3	-0.7	-1.3	18.2	18.7	-0.6	-0.2	7.3	26.4	1.1	0.7
maturing	7.2	2.3	-3.1	7.9	-3.2	-4.4	46.7	53.1	-3.4	-3.3	13.5	32.1	-1.7	-1.5
mature & overmature	15.4	12.8	40.0	44.0	-38.1	-37.7	126.9	141.6	-41.1	-41.9	77.7	124.4	-28.7	-26.8
Deciduous hardwood														
young	12.2	55.6	-46.2	-34.2	12.8	3.1	-39.4	-21.8	14.8	3.8	-42.7	-21.3	13.3	1.2
middle-aged	9.3	27.6	23.8	46.1	-1.6	-1.0	-16.5	-11.6	1.0	0.1	-14.4	0.7	0.8	0.4
maturing	-2.0	13.7	1.0	14.4	-4.1	-2.0	21.5	28.7	0.0	-1.6	23.9	34.0	0.0	-0.3
mature & overmature	47.7	81.2	16.9	25.6	-21.1	-23.6	133.3	150.0	-10.0	-9.7	26.2	35.4	-2.5	-1.6
Deciduous softwood														
young	-24.0	-23.5	-50.3	-37.6	55.5	7.1	-15.4	-0.4	12.5	2.1	-7.6	21.5	7.7	2.0
middle-aged	15.7	25.7	5.6	32.0	-1.8	-1.7	23.7	44.5	-0.7	-0.2	-22.2	-18.5	0.2	-0.2
maturing	4.0	14.6	14.8	32.2	-4.0	-4.8	-24.9	-15.9	-7.3	-7.9	49.6	53.6	-0.5	-0.5
mature & overmature	-7.4	-10.0	46.6	66.9	-32.8	-32.1	34.2	46.1	-28.4	-27.5	144.0	155.5	-4.8	-4.0
19. Smolensk Oblast														
Coniferous														
young	10.7	43.2	24.4	27.0	7.4	4.2	17.8	3.1	-3.2	23.6	11.5	3.3	-32.6	-7.6
middle-aged	38.2	53.3	18.0	21.5	9.0	20.9	0.0	0.1	6.6	22.8	11.0	6.8	-24.5	-14.0
maturing	7.8	13.9	-3.7	-1.2	-4.3	-1.1	-2.9	-3.1	57.7	76.2	-3.7	-4.6	19.8	40.4
mature & overmature	2.6	-3.2	-26.8	-33.7	-15.0	-15.1	-23.1	-26.7	67.6	103.2	-19.6	-22.2	72.1	107.3
Deciduous hardwood														
young	-41.9	-28.6	-27.8	0.0	76.9	240.0	-17.4	5.9	-26.3	-22.2	0.0	7.1	-78.6	-80.0
middle-aged	40.0	133.3	28.6	28.6	-22.2	-22.2	14.3	28.6	87.5	188.9	0.0	-7.7	33.3	41.7
maturing	50.0	33.3	33.3	75.0	0.0	0.0	-25.0	-28.6	-33.3	0.0	0.0	0.0	50.0	20.0
mature & overmature	-25.0	-28.6	-33.3	-20.0	-50.0	-50.0	0.0	-50.0	100.0	200.0	0.0	0.0	150.0	300.0
Deciduous softwood														
young	20.9	51.4	-15.3	-8.4	-42.9	-32.9	1.1	-0.8	-67.5	-63.9	26.2	15.1	-1.9	-2.9
middle-aged	81.4	98.9	35.0	51.5	37.5	51.1	-0.1	-0.9	-6.0	13.7	11.8	10.3	-15.0	-0.6
maturing	19.2	36.6	-8.1	0.5	-12.3	-7.9	-2.5	-3.9	36.9	50.8	-2.7	-2.2	64.2	90.8
mature & overmature	32.8	51.5	-18.5	-16.2	-12.9	-12.6	-23.1	-23.9	55.7	67.9	-17.7	-18.7	111.5	140.9
20. Tula Oblast														
Coniferous														
young	9.4	44.1	57.1	112.2	21.8	-1.0	-17.4	43.7	24.7	-0.7	-19.8	-2.0	21.1	4.9
middle-aged	13.6	17.1	64.0	136.6	-4.9	-3.1	33.3	46.8	-3.8	-9.4	58.0	80.0	1.3	4.9
maturing	-14.8	-16.1	-56.5	-48.9	-10.0	-8.3	111.1	154.5	10.5	17.9	4.8	7.6	0.0	-2.8
mature & overmature	-35.3	-35.9	-90.9	-96.0	-100.0	0.0	-	1300.0	25.0	0.0	140.0	214.3	8.3	-2.3
Deciduous hardwood														
young	14.2	5.4	4.4	19.1	11.7	2.1	-30.8	4.2	11.1	0.5	-25.1	3.5	16.9	8.7
middle-aged	5.0	1.3	47.5	69.4	0.6	0.1	-3.2	8.0	0.4	-0.5	-0.2	8.9	2.1	4.0
maturing	-2.2	-8.8	-42.9	-33.1	3.8	-3.6	31.5	19.6	-1.4	1.6	22.9	37.7	-2.3	-0.6
mature & overmature	3.3	-4.2	-38.1	-38.6	-20.5	-15.7	87.1	72.9	-12.1	-20.6	49.0	87.7	2.6	4.6
Deciduous softwood														
young	11.0	-2.8	-55.0	-41.9	12.7	-1.6	-28.6	-18.3	5.3	-4.1	-16.0	10.6	11.9	28.8
middle-aged	5.9	1.6	29.8	43.7	0.5	0.0	26.4	44.8	-2.2	-0.4	7.1	22.8	15.7	24.9
maturing	-2.5	-3.4	-12.4	-4.3	-0.4	-0.4	-33.5	-28.8	0.0	-0.9	-23.0	-14.0	-3.5	-6.1
mature & overmature	-26.5	-26.2	-3.0	5.5	-27.1	-24.1	105.4	124.9	-17.0	-15.7	32.2	39.0	-3.6	-2.5

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
21. Yaroslavl Oblast														
Coniferous														
young	19.4	45.4	8.4	23.5	33.9	3.1	-9.9	6.4	17.7	1.9	-15.0	22.2	12.2	1.6
middle-aged	-7.3	1.4	10.5	21.0	-0.7	-0.5	9.8	15.0	-0.4	-0.5	-9.1	2.8	-0.3	-0.2
maturing	13.9	26.1	3.5	8.4	-0.9	-1.1	24.9	36.9	-2.5	-2.6	2.6	14.4	-0.2	-0.5
mature & overmature	-11.2	-5.2	4.5	2.1	-22.8	-25.9	48.6	59.7	-16.2	-20.5	70.9	123.6	-8.9	-8.8
Deciduous hardwood														
young	33.3	0.0	-50.0	-40.0	0.0	0.0	-50.0	-33.3	0.0	0.0	-100.0	-100.0	-	-
middle-aged	0.0	3.4	-26.1	-26.7	-5.9	-4.5	25.0	42.9	0.0	-3.3	-85.0	-72.4	0.0	0.0
maturing	0.0	-50.0	600.0	900.0	0.0	-10.0	-85.7	-88.9	0.0	0.0	100.0	200.0	0.0	0.0
mature & overmature	-	-	-	-	0.0	0.0	-100.0	-100.0	-	-	-	-	0.0	0.0
Deciduous softwood														
young	-28.4	-16.9	-52.3	-43.5	8.8	0.0	-50.1	-46.5	-0.7	-0.5	-33.3	-43.9	1.8	2.7
middle-aged	97.7	131.0	0.5	7.5	-0.7	-0.1	4.2	15.7	-0.1	-0.4	-23.8	-17.4	0.1	-0.4
maturing	14.4	44.3	8.0	2.7	-2.5	-2.9	15.6	26.7	-2.5	-3.0	45.2	54.4	0.0	-0.7
mature & overmature	-48.4	-42.8	85.6	80.1	-20.8	-23.5	16.0	24.1	-20.4	-22.3	121.0	151.1	-4.4	-4.3
22. Nizhni Novgorod Oblast														
Coniferous														
young	11.4	50.6	9.7	0.4	-0.9	57.0	20.2	1.9	-10.2	0.5	8.1	0.3	-13.3	6.2
middle-aged	5.1	19.3	-13.6	-8.8	23.2	34.2	-1.3	-1.2	21.9	19.6	0.3	-1.5	45.6	50.6
maturing	-8.4	0.5	-26.3	-21.9	4.4	13.4	-7.3	-8.0	17.4	16.9	-5.1	-7.3	-2.3	-3.6
mature & overmature	-18.9	-19.8	-44.4	-45.7	1.6	11.3	-24.9	-26.1	42.6	44.2	-17.4	-19.5	-19.5	-18.6
Deciduous hardwood														
young	-4.4	21.0	11.8	2.0	-48.1	-15.7	3.5	0.8	-61.7	-60.0	8.9	5.8	-56.1	-61.8
middle-aged	46.9	71.1	0.0	0.9	18.5	29.0	-1.6	-1.4	-21.4	-25.2	1.0	-1.3	-25.5	-18.0
maturing	-21.7	-7.8	-2.8	-1.7	137.1	151.7	-4.8	-6.8	46.8	41.9	-0.9	-3.1	-26.1	-21.9
mature & overmature	-5.9	-1.4	-20.0	-20.1	54.7	59.1	-7.1	-9.3	41.3	36.7	-6.2	-7.5	15.6	19.0
Deciduous softwood														
young	-13.4	16.2	-2.9	-3.7	-1.8	16.4	14.1	1.5	-31.7	-29.5	8.7	0.7	-27.0	11.5
middle-aged	33.3	54.0	6.5	13.1	33.7	60.8	-0.9	-0.9	10.8	10.3	2.6	1.6	14.5	24.6
maturing	-0.5	16.0	-13.6	-9.4	22.9	43.6	-8.3	-9.3	39.5	37.6	-8.2	-9.9	25.7	34.7
mature & overmature	-2.6	2.1	-40.6	-40.1	11.4	27.8	-28.8	-29.8	56.4	50.7	-24.8	-27.7	55.2	64.7
23. Kirov Oblast														
Coniferous														
young	44.1	23.0	29.5	23.3	6.6	11.5	-0.9	13.1	-1.6	-9.2	-8.9	8.2	21.2	5.3
middle-aged	-9.0	-11.4	0.7	5.4	16.3	20.5	5.1	6.2	8.1	8.2	1.6	3.1	3.4	3.5
maturing	-20.1	-22.6	-28.2	-25.6	-5.2	-3.0	-7.0	-5.3	-5.9	-5.3	1.1	3.4	3.3	3.2
mature & overmature	-6.4	-8.2	-9.5	-6.7	-13.8	-12.5	-2.8	-1.7	-2.6	-2.2	0.2	4.4	-5.8	-5.6
Deciduous hardwood														
young	160.0	100.0	-15.4	0.0	9.1	-100.0	-100.0	-	-	-	-	-	-	-
middle-aged	0.0	5.0	47.1	52.4	-4.0	0.0	-41.7	-50.0	-7.1	-12.5	-15.4	21.4	0.0	-17.6
maturing	33.3	25.0	50.0	40.0	-66.7	-14.3	100.0	-16.7	-25.0	-20.0	33.3	75.0	0.0	0.0
mature & overmature	-6.7	0.0	14.3	13.6	12.5	8.0	38.9	70.4	0.0	4.3	-8.0	-14.6	-8.7	-7.3
Deciduous softwood														
young	17.9	-13.2	-16.6	-15.9	18.5	49.0	-6.3	21.0	-8.6	2.6	-8.1	-11.7	0.6	0.1
middle-aged	30.4	32.2	26.2	36.6	0.3	9.9	7.4	22.7	8.8	10.1	11.7	12.6	0.7	0.3
maturing	24.6	21.5	35.8	50.8	8.6	14.2	32.6	41.0	0.6	6.8	21.4	27.3	-0.2	-0.6
mature & overmature	1.6	1.3	-8.3	-1.0	-11.0	-10.3	-5.1	-1.8	-5.8	-7.6	7.6	6.8	-7.0	-7.6

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
24. Republic of Marii El														
Coniferous														
young	12.8	22.1	-21.6	8.4	11.5	4.0	19.4	2.7	-11.8	-21.5	7.1	0.8	-18.9	8.8
middle-aged	-17.4	-20.7	46.2	76.7	19.1	18.7	-0.2	-0.3	22.5	16.5	-3.4	-2.5	18.3	28.5
maturing	-5.6	-5.2	-20.7	-4.6	2.9	1.4	-2.0	-2.0	3.4	4.3	-4.3	-5.2	23.0	31.5
mature & overmature	-5.1	-7.2	-44.6	-41.4	-6.9	-7.3	-15.4	-16.4	26.6	20.8	-12.2	-13.9	-22.0	-20.8
Deciduous hardwood														
young	34.4	100.0	-11.6	-23.1	-26.3	-30.0	-46.4	-28.6	-40.0	-50.0	22.2	0.0	-27.3	0.0
middle-aged	-20.9	-24.5	17.0	35.0	16.1	18.5	-4.2	-3.9	-47.8	-52.0	2.8	-3.4	13.5	28.1
maturing	38.5	50.0	22.2	27.3	-4.5	7.1	-9.5	-13.3	-10.5	-23.1	0.0	0.0	-5.9	-3.3
mature & overmature	47.9	68.4	-40.8	-36.7	-14.3	-13.6	-8.3	-5.7	60.6	63.6	-3.8	-1.9	-41.2	-42.5
Deciduous softwood														
young	1.7	15.0	-29.5	25.1	38.2	8.4	7.9	-4.4	-16.6	-16.3	1.3	0.2	-8.7	60.0
middle-aged	-5.5	-6.8	37.8	86.4	10.6	12.2	-0.8	-1.2	7.8	10.2	-1.0	-1.3	7.9	15.6
maturing	33.1	35.3	-16.5	4.5	3.3	3.4	-7.3	-8.0	57.8	71.4	-7.4	-7.3	38.2	41.6
mature & overmature	13.4	10.1	-27.2	-14.3	-6.1	-6.5	-17.1	-17.8	27.3	24.0	-16.6	-18.0	56.3	69.2
25. Republic of Mordovia														
Coniferous														
young	15.8	55.2	21.5	7.7	-7.5	19.0	25.9	0.1	-19.7	8.2	12.4	0.5	-23.7	-11.5
middle-aged	9.7	4.2	-4.8	12.4	-7.6	-21.7	0.0	-3.4	70.3	72.6	0.3	-0.4	60.2	80.3
maturing	0.0	-11.8	-11.9	-10.6	19.9	25.8	-4.3	-11.9	-3.9	4.0	-8.1	-8.7	-0.6	9.1
mature & overmature	95.2	82.7	-51.2	-52.6	70.0	69.7	-35.3	-41.4	9.1	14.9	-34.7	-34.5	23.4	45.7
Deciduous hardwood														
young	-24.2	-15.0	13.9	0.0	-46.7	-29.0	16.1	2.4	-37.9	-23.4	12.7	-2.0	-29.4	-7.3
middle-aged	-3.9	-5.8	-0.8	-1.2	29.0	30.0	-0.2	-1.3	3.4	22.6	-140.9	-0.3	-285.1	-7.0
maturing	39.0	38.6	-13.4	-12.7	-19.0	-19.7	-5.2	-5.3	-23.9	-9.3	827.7	-4.1	-88.1	29.1
mature & overmature	68.7	62.6	-47.3	-46.0	102.3	86.8	-24.2	-24.4	-16.3	-4.7	-14.2	-14.7	18.6	27.1
Deciduous softwood														
young	-52.8	-41.0	12.6	-2.1	4.2	-1.7	10.4	0.4	-14.0	5.3	9.2	0.7	-10.0	31.1
middle-aged	44.1	33.6	-3.3	-5.3	19.4	46.2	-0.6	-1.1	11.0	21.9	0.4	-0.1	-2.0	2.4
maturing	23.1	43.7	-13.7	-15.9	-7.5	-0.6	-8.8	-10.4	12.6	17.3	-10.9	-12.3	78.2	100.2
mature & overmature	233.6	261.2	-56.1	-52.1	83.2	78.5	-38.0	-38.1	84.7	85.3	-32.2	-31.7	89.5	113.0
26. Chuvash Republic														
Coniferous														
young	2.3	47.2	23.8	-2.9	-7.2	31.4	21.1	0.9	-1.6	18.6	11.0	-0.6	-1.2	39.2
middle-aged	-25.8	-27.1	-3.8	-4.2	42.0	57.0	-3.1	-4.1	40.8	46.8	-0.5	-1.0	7.1	11.3
maturing	-23.0	-24.2	-7.2	-6.8	11.1	26.1	-3.0	-5.4	18.6	22.9	4.3	2.6	24.2	22.2
mature & overmature	40.9	46.8	-35.3	-35.3	-7.0	-7.5	-30.2	-25.1	-30.2	-34.8	-20.6	-23.0	-11.7	-10.8
Deciduous hardwood														
young	5.5	7.0	15.7	-2.7	-27.5	22.6	5.1	-0.2	-33.9	-39.6	5.5	-2.3	-28.8	-31.3
middle-aged	-0.5	2.0	-1.1	-4.1	25.3	38.2	-3.3	10.6	25.7	-3.0	-0.5	0.5	-4.6	-16.0
maturing	60.6	56.2	-9.4	-7.9	8.3	10.5	-9.6	-11.2	12.8	-7.8	-9.4	-7.4	8.3	-3.4
mature & overmature	2.1	-3.9	-21.4	-22.0	-18.5	-25.2	-20.3	-21.0	-12.2	-22.0	5.8	3.5	-34.1	-47.2
Deciduous softwood														
young	-8.2	7.3	3.3	-5.3	4.4	33.3	10.5	3.0	-29.3	-26.9	9.8	8.7	-11.1	22.2
middle-aged	0.0	7.4	-2.5	-3.6	15.3	36.8	-2.2	-1.1	35.8	35.3	0.1	-3.2	3.2	8.4
maturing	-4.5	0.3	-10.8	-11.4	11.8	30.4	-4.1	-4.9	-3.7	-6.4	-13.7	-14.4	23.2	17.5
mature & overmature	24.4	25.0	-45.7	-48.2	48.0	72.9	-32.8	-33.5	39.5	35.1	-24.5	-23.6	60.1	48.1

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
27. Belgorod Oblast														
Coniferous														
young	22.9	21.6	29.1	3.2	6.9	118.8	1.1	-1.4	-12.3	39.9	1.8	0.5	-29.3	6.7
middle-aged	9.1	4.2	0.0	0.0	150.0	124.0	-3.3	0.0	82.8	82.1	-1.9	-1.0	42.3	118.8
maturing	0.0	100.0	0.0	0.0	200.0	400.0	0.0	0.0	100.0	40.0	0.0	0.0	-100.0	-100.0
mature & overmature	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	-100.0	-100.0
Deciduous hardwood														
young	-7.1	23.3	10.3	0.2	-42.0	-51.7	3.2	3.2	-35.9	-10.2	5.4	2.3	-33.9	-37.9
middle-aged	6.8	30.2	-0.3	-0.1	38.9	34.3	0.2	0.5	19.7	43.7	0.2	-0.2	18.6	31.5
maturing	42.9	79.1	-13.6	-13.4	85.3	80.0	-2.3	-1.7	-16.3	-23.7	-0.7	-2.2	-43.4	-47.3
mature & overmature	-21.4	-18.6	-25.0	-25.7	87.9	76.9	-30.6	-36.2	86.0	67.0	-26.3	-27.2	-35.6	-33.6
Deciduous softwood														
young	7.9	60.0	7.3	0.0	-11.4	-12.5	0.0	14.3	-38.5	-50.0	8.3	12.5	-15.4	0.0
middle-aged	-26.7	-23.5	-9.1	-7.7	130.0	133.3	8.7	7.1	164.0	190.0	-3.0	-2.3	-9.4	16.5
maturing	31.6	54.2	-16.0	-18.9	-57.1	-46.7	22.2	-12.5	-27.3	-7.1	0.0	7.7	112.5	135.7
mature & overmature	11.1	6.7	-30.0	-25.0	200.0	258.3	-14.3	-23.3	-27.8	-6.1	0.0	-16.1	15.4	15.4
28. Voronezh Oblast														
Coniferous														
young	23.6	1.7	9.2	84.6	7.6	0.9	-15.6	24.4	2.6	-1.6	-21.1	14.2	4.6	-0.7
middle-aged	23.3	27.9	27.6	50.0	1.2	1.7	47.0	20.8	0.4	0.0	50.0	74.4	6.9	8.9
maturing	-67.9	-69.0	66.7	86.4	0.0	4.9	220.0	202.3	-2.1	-1.5	8.5	14.8	-39.2	-38.1
mature & overmature	-70.0	-68.0	166.7	175.0	0.0	4.5	112.5	91.3	-17.6	-29.5	71.4	112.9	-75.0	-71.2
Deciduous hardwood														
young	9.0	-1.2	-28.0	-20.7	15.8	0.8	-24.4	-16.6	11.3	1.4	-28.1	-11.0	18.9	2.6
middle-aged	1.1	2.9	15.5	22.2	-0.6	-0.9	17.1	14.7	-0.4	-0.5	2.6	11.5	19.0	20.0
maturing	-12.3	-16.1	-7.4	-8.2	-6.7	-4.6	-3.8	5.1	-8.0	-7.3	14.1	8.3	-57.8	-61.0
mature & overmature	-36.7	-28.7	84.9	42.3	-29.7	-24.9	-5.0	-14.8	-26.1	-24.9	130.6	100.0	-53.1	-50.3
Deciduous softwood														
young	30.3	2.5	3.1	-9.8	36.1	2.7	-8.8	36.8	23.6	5.8	-17.2	5.5	23.1	-3.4
middle-aged	-2.3	-2.3	41.9	75.3	-3.3	1.3	-2.5	0.0	-3.5	-6.0	52.3	45.1	23.7	45.6
maturing	-8.5	-7.2	-33.3	-23.2	-15.3	-13.4	24.6	19.4	-9.2	-8.9	-15.9	-8.9	-19.0	-15.7
mature & overmature	-43.0	-43.8	45.6	47.5	-41.0	-39.0	63.3	70.8	-32.5	-38.2	109.3	127.7	-43.4	-46.3
29. Kursk Oblast														
Coniferous														
young	9.1	43.2	66.7	105.7	36.7	22.9	-7.3	9.0	17.1	8.2	-12.4	26.6	8.3	-1.0
middle-aged	25.0	31.3	10.0	28.6	22.7	14.8	70.4	69.4	0.0	0.0	50.0	63.8	-1.4	-2.9
maturing	-66.7	-62.5	0.0	-33.3	100.0	50.0	-100.0	-100.0	-	-	-	-	25.0	0.0
mature & overmature	0.0	-50.0	-100.0	-100.0	-	-	-	-	-	-	-	-	-	-
Deciduous hardwood														
young	0.5	5.8	-11.3	-1.7	9.9	4.3	-43.2	-21.7	3.9	-1.0	-21.4	45.5	4.2	0.0
middle-aged	4.3	18.8	56.0	59.5	0.7	0.8	47.9	43.2	-0.7	0.1	3.6	32.9	1.4	2.3
maturing	-11.3	-12.6	-9.1	-3.9	-20.0	-9.6	105.0	98.5	2.4	-0.8	53.6	50.0	-12.4	-11.8
mature & overmature	-23.1	-23.3	5.0	9.1	-28.6	-19.4	60.0	48.3	-25.0	-25.6	127.8	87.5	-7.3	-10.0
Deciduous softwood														
young	0.0	15.4	-21.4	2.2	29.8	8.7	-44.6	-28.0	9.2	11.1	-58.9	-55.0	15.4	-11.1
middle-aged	-25.0	-22.2	77.1	89.8	-1.2	2.2	64.3	68.4	-1.4	-2.5	25.0	51.9	1.2	0.0
maturing	30.2	30.5	-26.8	-13.0	-7.3	-6.0	44.7	36.5	-3.6	-3.5	22.6	33.7	-1.5	-3.6
mature & overmature	128.6	112.0	25.0	32.1	-32.5	-27.1	40.7	37.3	-26.3	-25.7	153.6	182.7	-19.7	-12.2

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
30. Lipetsk Oblast														
Coniferous														
young	20.3	36.7	8.0	7.0	-16.2	6.8	15.0	0.3	-24.1	3.0	-16.5	-19.2	7.6	-0.4
middle-aged	40.0	56.4	22.9	22.7	81.4	82.9	3.2	0.3	42.2	55.6	16.2	13.0	8.6	9.4
maturing	-10.4	-11.9	-11.6	-13.6	5.3	6.9	0.0	-1.8	-25.0	-21.5	26.7	25.0	-68.4	-65.7
mature & overmature	-20.0	-26.3	-37.5	-35.6	33.3	21.3	-40.0	-33.3	-8.3	-10.5	9.1	8.8	-91.7	-89.2
Deciduous hardwood														
young	-7.1	33.3	9.5	-3.0	-36.5	32.0	0.0	2.3	-34.4	-26.7	-21.7	-32.3	10.6	1.5
middle-aged	15.6	40.5	3.4	12.5	20.7	23.7	1.5	0.2	7.4	27.4	9.4	11.1	9.1	11.0
maturing	25.7	46.7	-6.8	3.0	34.1	41.2	-3.6	-3.1	17.0	4.3	-17.7	-14.4	-25.5	-25.3
mature & overmature	-13.3	-8.3	-15.4	-4.5	154.5	166.7	-32.1	-30.4	105.3	69.2	12.8	16.7	-75.0	-72.7
Deciduous softwood														
young	-24.0	3.3	30.1	3.2	-10.5	-12.5	-3.5	0.0	-19.5	-17.9	-6.1	-52.2	30.6	45.5
middle-aged	8.3	23.2	-3.1	8.7	33.3	46.7	7.1	4.5	48.9	69.6	-6.0	-27.2	31.0	81.0
maturing	22.1	31.6	-21.7	-15.2	-9.2	0.0	-1.7	-3.8	-27.6	-20.6	7.1	6.2	-28.9	-23.3
mature & overmature	-28.3	-30.4	-2.6	12.5	81.1	105.6	-23.9	-25.0	13.7	22.5	8.6	34.6	-54.0	-62.3
31. Tambov Oblast														
Coniferous														
young	21.3	5.6	8.4	75.4	11.3	0.7	-19.7	-9.9	12.5	1.0	-13.9	15.5	11.6	1.6
middle-aged	42.9	70.8	8.0	22.5	-1.8	-0.3	33.3	23.4	-0.8	-0.7	30.1	58.9	-0.2	0.1
maturing	-21.9	-21.8	-5.5	-1.1	-1.4	-2.8	25.0	31.8	-0.6	-0.9	-7.1	5.0	-1.9	-2.1
mature & overmature	-36.3	-36.2	-26.3	-25.2	-39.3	-34.9	152.9	135.0	-25.6	-25.2	-9.4	0.4	-12.6	-12.3
Deciduous hardwood														
young	10.4	1.7	-47.4	-45.8	10.6	9.4	-24.3	34.3	20.4	6.4	6.5	74.0	15.9	-1.1
middle-aged	-1.9	-0.3	31.8	50.0	0.0	-0.4	-13.8	-13.7	-0.3	0.5	16.4	54.4	-5.6	-5.2
maturing	-10.5	-7.7	33.3	56.0	-7.4	-4.6	20.6	12.8	-5.3	-4.3	-52.8	-54.8	2.9	-1.6
mature & overmature	0.0	-3.7	-13.0	2.5	-40.0	-34.6	191.7	169.8	-27.1	-26.6	-31.4	-44.8	-20.0	-20.7
Deciduous softwood														
young	23.2	0.0	-37.0	-28.7	62.7	7.3	-24.4	22.7	23.3	9.3	-17.3	7.6	4.2	-0.8
middle-aged	12.3	15.8	41.4	52.0	0.7	0.9	13.4	32.2	-0.3	0.0	16.9	29.1	-3.3	-4.5
maturing	-7.9	-1.9	-15.2	-2.2	-4.8	-3.3	-8.6	-1.1	-3.9	-4.6	-4.6	3.0	-1.8	-0.9
mature & overmature	-37.8	-36.2	42.0	87.3	-30.5	-28.6	41.2	39.8	-31.1	-30.6	36.8	40.7	-17.3	-18.9
32. Astrakhan Oblast														
Deciduous hardwood														
young	71.8	83.3	9.0	9.1	-74.0	-50.0	84.2	33.3	-60.0	-62.5	107.1	-100.0	31.0	-
middle-aged	16.7	28.6	28.6	44.4	66.7	0.0	6.7	23.1	40.6	75.0	-6.7	-3.6	2.4	0.0
maturing	-33.3	0.0	150.0	200.0	340.0	133.3	-9.1	-7.1	10.0	-7.7	4.5	0.0	0.0	25.0
mature & overmature	25.0	0.0	-40.0	-50.0	766.7	650.0	-19.2	0.0	90.5	113.3	-2.5	6.3	2.6	-17.6
Deciduous softwood														
young	20.0	52.6	90.4	27.6	-35.5	-2.7	23.6	22.2	-78.6	-81.8	81.1	62.5	41.8	7.7
middle-aged	-33.3	-24.3	-9.2	-15.1	39.1	40.0	3.1	0.0	-9.1	-1.6	0.0	-3.2	-1.1	0.0
maturing	-23.6	-27.5	-16.8	-22.1	-41.6	-35.1	1.9	4.2	39.6	42.0	-1.4	1.4	1.4	-4.2
mature & overmature	31.4	18.5	-30.3	-34.6	28.6	20.9	-3.1	-6.3	22.9	39.5	-4.9	-3.3	-4.7	-1.9
33. Volgograd Oblast														
Coniferous														
young	-10.0	-58.1	201.6	138.5	23.2	122.6	25.6	10.1	17.7	105.3	20.8	0.6	16.5	71.3
middle-aged	18.5	-34.0	0.0	0.0	-15.6	17.1	0.0	0.0	85.2	85.4	-6.0	0.0	66.0	64.5
maturing	1100	4000	-8.3	-2.4	-18.2	-17.5	-5.6	-9.1	-94.1	-96.7	0.0	0.0	-100.0	-100.0

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
mature & overmature	-	-	0.0	-50.0	-100.0	0.0	-	-100.0	-	-	-	-	-	-
Deciduous hardwood														
young	-9.8	-12.4	32.9	7.1	-42.7	-50.5	23.8	16.7	7.4	68.6	15.1	6.8	-38.7	-29.1
middle-aged	-17.7	-9.9	15.6	16.6	-8.0	-30.3	-2.9	-1.9	46.1	57.3	-2.8	-3.1	41.4	43.0
maturing	37.9	17.3	-11.5	-11.8	7.5	-0.3	-8.4	-6.6	-22.9	-19.9	-5.2	-7.2	49.0	46.6
mature & overmature	160.9	136.5	-51.6	-56.6	276.3	245.6	-14.5	-13.6	-53.0	-51.5	-15.2	-16.8	49.4	55.4
Deciduous softwood														
young	-15.8	-46.5	69.1	21.7	-33.2	50.0	15.3	2.4	-45.3	-41.9	38.4	40.0	-53.3	-57.1
middle-aged	-20.8	-15.8	0.0	1.6	51.3	16.9	5.2	2.6	23.1	46.2	0.7	3.5	-1.3	7.6
maturing	-34.3	-20.2	-6.0	-13.3	-20.6	-33.3	-6.0	-2.1	97.9	110.6	4.3	1.0	-1.0	23.0
mature & overmature	57.4	63.6	-36.5	-41.3	101.7	104.7	-8.6	-9.6	19.8	27.7	-11.4	-12.3	54.2	66.1
34. Samara Oblast														
Coniferous														
young	38.5	43.3	52.6	98.4	8.3	4.3	6.6	15.0	-16.6	15.3	4.5	-0.6	-17.5	15.1
middle-aged	45.5	66.7	31.3	46.4	-1.6	1.2	-5.6	-4.3	46.2	42.6	4.1	2.2	28.1	31.0
maturing	6.9	11.7	-27.3	-19.9	-3.6	-3.7	5.6	0.0	1.8	11.6	-3.4	-4.0	-10.7	-8.4
mature & overmature	1.4	-7.0	-10.0	-4.9	-5.9	-7.9	-10.2	0.8	-5.3	-8.5	-2.8	-2.7	-18.1	-22.0
Deciduous hardwood														
young	3.1	154.9	-24.5	-21.3	-34.8	-65.6	2.5	-2.0	-35.0	-10.4	5.2	0.0	-33.2	2.3
middle-aged	-8.1	6.4	15.4	35.9	21.4	39.7	-2.8	-0.5	-21.6	-16.8	-7.8	-7.6	-8.2	-2.8
maturing	25.7	40.9	-2.0	12.6	4.5	17.8	-18.0	-21.7	15.3	29.8	14.5	11.6	-19.8	-17.7
mature & overmature	13.7	21.5	3.4	20.1	-6.5	-7.4	-43.5	-48.0	182.3	204.2	3.1	3.2	6.7	14.2
Deciduous softwood														
young	-6.1	9.8	-8.0	-7.8	6.4	5.6	4.3	-8.0	-11.3	15.3	7.0	-2.5	-31.8	-8.5
middle-aged	18.7	34.5	20.6	37.8	10.0	17.8	-2.9	1.9	20.8	28.8	-5.7	-6.6	36.2	44.4
maturing	15.6	34.5	-19.3	-14.5	-12.1	-7.7	-17.8	-15.2	24.5	36.5	0.0	-5.7	13.1	30.4
mature & overmature	46.9	53.5	-26.7	-23.4	-14.4	-14.2	-39.5	-41.5	44.8	61.9	5.2	0.3	36.9	48.9
35. Penza Oblast														
Coniferous														
young	10.6	38.9	36.3	51.8	19.1	12.8	-23.0	3.6	15.5	2.0	-17.4	0.7	12.2	1.6
middle-aged	28.0	36.7	3.3	13.2	3.0	6.4	35.0	35.4	-3.3	-2.9	4.9	6.4	-2.6	-2.3
maturing	-0.3	-7.5	1.4	19.3	-0.3	5.0	7.7	9.4	-5.0	-3.6	-2.0	-8.3	-2.0	-1.4
mature & overmature	0.0	-9.2	6.2	27.4	-19.6	-18.0	21.7	17.7	-29.7	-28.2	44.2	29.8	-19.8	-17.5
Deciduous hardwood														
young	-15.6	-17.2	-45.8	-44.5	-11.7	-22.9	-53.1	-28.9	11.1	4.4	-38.0	-28.4	22.6	4.4
middle-aged	11.6	18.3	4.6	4.1	-1.1	-3.2	-12.4	-3.9	-0.5	-0.8	-15.0	-15.6	-12.5	-2.7
maturing	-24.9	-19.3	14.4	16.1	0.4	-0.8	6.8	6.5	-1.4	-2.2	-26.4	9.5	47.1	-1.4
mature & overmature	1.9	8.9	21.5	18.4	1.6	10.6	64.6	54.3	-23.7	-25.0	73.5	68.8	-3.5	-3.2
Deciduous softwood														
young	-4.2	13.6	-7.8	7.8	7.6	1.4	-7.9	7.4	14.1	2.3	-15.4	-0.7	9.2	7.5
middle-aged	17.2	28.9	17.9	28.0	5.0	10.7	22.5	28.1	-4.9	-3.9	5.7	8.9	-1.0	-0.8
maturing	-8.6	-1.2	-1.6	2.8	-1.0	4.3	-2.0	3.3	-5.3	-6.0	21.6	23.4	-0.4	-0.1
mature & overmature	15.0	14.6	11.8	19.8	-13.1	-10.3	42.3	46.7	-31.8	-30.9	50.2	45.5	-11.3	-9.3
36. Saratov Oblast														
Coniferous														
young	12.3	9.8	47.7	33.9	11.1	37.3	13.3	21.4	26.1	12.0	19.7	3.6	-3.3	23.4
middle-aged	9.5	15.6	4.3	2.7	12.5	34.2	74.1	90.2	38.3	45.4	-3.1	-5.0	85.7	98.5

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
maturing	35.3	22.9	0.0	16.3	-26.1	-10.0	35.3	20.0	-4.3	1.9	0.0	0.0	-40.9	-45.5
mature & overmature	38.5	34.6	16.7	28.6	14.3	20.0	-79.2	-81.5	60.0	90.0	0.0	-5.3	-25.0	-22.2
Deciduous hardwood														
young	-11.8	-7.6	1.8	-10.5	-19.7	-15.7	-0.2	20.9	-10.5	2.6	12.2	3.1	-41.0	-36.4
middle-aged	-4.6	7.6	-10.4	-12.5	-17.8	-24.7	62.9	97.8	-14.1	-4.4	0.3	-0.2	14.6	21.2
maturing	-10.0	-2.1	7.9	8.9	15.6	11.5	-23.5	-9.7	12.7	15.5	-1.5	-1.2	-17.6	-19.5
mature & overmature	16.3	21.9	49.8	48.1	52.5	60.0	-59.6	-56.0	51.7	49.9	-11.5	-11.2	28.6	35.1
Deciduous softwood														
young	-24.0	-22.7	24.8	-10.3	-12.6	-23.0	23.3	42.6	-4.1	22.4	16.0	7.3	-27.9	-30.7
middle-aged	-8.7	3.6	-3.9	1.7	-16.1	-20.3	98.4	148.1	7.0	14.9	-0.3	0.0	29.5	43.8
maturing	1.9	14.1	1.0	4.9	-1.9	-0.4	-34.1	-30.5	18.2	23.7	-3.7	-2.9	-17.9	-9.9
mature & overmature	31.0	52.2	16.4	9.1	52.5	59.1	-31.1	-29.8	8.1	13.2	-10.9	-12.3	79.9	96.6
37. Ulyanovsk Oblast														
Coniferous														
young	8.8	41.9	14.5	55.7	21.8	1.6	-16.6	6.1	18.5	2.1	-0.3	12.5	2.8	13.9
middle-aged	-7.4	2.9	71.3	96.7	-0.5	-0.6	40.7	51.9	-0.6	-0.7	23.6	31.7	17.8	23.8
maturing	3.9	6.2	-13.0	0.2	-1.6	-2.1	1.9	10.7	-2.4	-2.3	-9.5	-7.1	-7.5	-5.8
mature & overmature	30.3	34.0	-1.4	6.8	-23.4	-22.6	18.8	19.2	-20.0	-18.6	-33.0	-32.9	-29.9	-31.0
Deciduous hardwood														
young	-34.4	-25.3	-60.8	-43.8	23.9	2.7	-57.1	-45.3	16.7	0.0	-19.3	-2.4	-17.7	-12.5
middle-aged	0.9	1.0	-3.2	30.1	-0.3	-0.3	-27.3	-25.7	0.8	0.3	-19.5	-10.1	-13.3	-8.3
maturing	13.6	12.1	8.7	24.5	-1.3	-2.3	-23.0	-23.3	-3.3	-2.8	-5.8	2.4	-4.3	-3.1
mature & overmature	26.5	26.1	19.1	36.3	-27.4	-27.4	58.9	47.6	-22.3	-20.8	-14.0	-13.7	-9.8	-6.3
Deciduous softwood														
young	-15.9	-6.2	-23.7	19.6	25.9	2.9	-22.7	-5.4	16.4	3.0	0.8	2.4	-6.9	0.8
middle-aged	24.5	34.4	42.7	107.5	-0.2	-0.3	26.4	34.3	-0.5	-0.3	5.8	10.3	-14.9	-16.4
maturing	-5.3	5.0	-29.5	-14.1	-1.5	-2.1	17.6	24.1	-3.8	-3.8	13.6	16.2	32.5	29.9
mature & overmature	12.1	20.3	-9.3	3.7	-28.3	-28.0	19.6	17.3	-30.1	-29.2	10.3	12.3	72.1	67.8
38. Republic of Kalmykia														
Deciduous hardwood														
young	165.2	100.0	-100.0	-100.0	-	-	78.3	133.3	-68.3	-100.0	61.5	-	-52.4	-100.0
middle-aged	-	-	-	-	-	-	-10.0	20.0	72.2	83.3	-9.7	-18.2	-28.6	-55.6
maturing	-	-	-	-	-	-	-4.8	-40.0	-80.0	-100.0	0.0	-	75.0	-
mature & overmature	-	-	-	-	-	-	-33.3	0.0	700.0	500.0	-18.8	-16.7	138.5	180.0
Deciduous softwood														
young	-	-	200.0	-	33.3	-	25.0	0.0	-100.0	-100.0	-	-	-	-
middle-aged	100.0	0.0	-50.0	0.0	0.0	0.0	0.0	0.0	0.0	-100.0	0.0	-	-100.0	-
maturing	-50.0	-66.7	0.0	0.0	-100.0	-	-	-	-	-	0.0	0.0	100.0	100.0
mature & overmature	400.0	500.0	-60.0	-66.7	0.0	0.0	-50.0	-50.0	100.0	100.0	0.0	0.0	50.0	100.0
39. Republic of Tatarstan														
Coniferous														
young	17.8	27.8	71.0	47.8	1.5	28.1	5.4	11.9	-3.1	17.1	-7.4	13.2	7.5	11.1
middle-aged	-8.0	-6.5	-6.2	-2.8	27.4	31.1	37.2	32.8	15.9	16.6	17.0	19.8	6.2	6.9
maturing	-5.0	-12.0	13.5	16.0	-0.9	5.6	5.6	12.4	14.9	13.0	14.5	15.2	-2.0	0.6
mature & overmature	3.4	-3.9	-24.5	-23.8	-27.2	-29.6	-24.1	-18.9	4.8	-5.8	16.7	30.9	2.6	1.2
Deciduous hardwood														
young	-6.9	8.4	6.9	1.9	-29.9	-10.3	0.2	-4.9	-24.3	-31.0	-12.1	-9.4	-1.9	-8.9
middle-aged	17.9	28.5	8.7	16.2	12.8	31.9	-1.3	-1.2	-23.8	-30.5	-7.4	-10.2	-15.0	-12.5
maturing	-3.8	-1.7	-9.7	-5.1	30.2	31.7	5.8	1.9	-2.3	-17.2	1.9	2.9	-8.7	-11.9

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
mature & overmature	4.4	4.3	-14.9	-9.2	-1.9	-4.6	-14.7	-26.5	-26.4	-30.9	-9.3	-9.8	11.6	7.3
Deciduous softwood														
young	-19.7	-18.3	12.1	8.5	-16.0	42.8	2.8	-1.9	-17.6	-9.8	0.4	-2.2	-6.9	-14.8
middle-aged	-5.3	2.3	8.1	16.0	7.2	26.4	1.5	6.6	25.5	24.7	2.4	2.9	-2.5	1.2
maturing	8.4	12.7	-11.3	-8.4	-2.5	5.9	-1.2	0.9	6.6	5.8	15.0	18.8	26.0	25.3
mature & overmature	1.8	-0.5	-45.1	-44.7	30.0	35.8	-18.7	-17.9	58.0	51.3	-0.6	1.9	27.9	22.2
40. Krasnodar Kray*														
Coniferous														
young	136.8	100.0	237.8	183.3	25.7	305.9	24.1	11.6	35.4	137.7	18.1	5.5	0.8	-1.0
middle-aged	-46.1	-37.6	47.9	19.5	-35.2	-55.4	17.4	34.4	27.8	25.6	-2.9	-1.3	11.9	13.3
maturing	-6.4	37.4	6.8	-20.9	-37.2	-51.0	53.1	72.1	8.0	8.5	-4.9	-5.2	-2.6	3.1
mature & overmature	-47.0	-56.4	-6.8	-3.8	1.5	4.3	-10.8	-10.5	34.6	50.9	1.7	-0.6	-1.2	0.9
Deciduous hardwood														
young	-16.1	-11.3	13.2	-2.9	-8.5	94.4	10.8	1.8	-26.8	-22.7	10.9	1.7	0.3	1.2
middle-aged	28.4	37.6	17.3	18.2	-24.0	-32.0	9.5	19.2	36.7	68.3	2.0	2.6	4.9	5.9
maturing	-10.0	-9.5	-10.8	-11.1	-11.8	-8.2	-0.1	1.8	1.3	6.2	-1.3	-0.8	6.6	6.8
mature & overmature	-3.5	-6.9	-15.1	-14.7	33.9	39.9	-10.2	-12.1	-0.3	12.9	-4.2	-4.2	-4.4	-3.7
Deciduous softwood														
young	-11.8	-5.1	-2.5	-29.0	-22.3	-12.1	1.3	12.1	-26.5	-20.0	14.0	5.8	6.2	-1.8
middle-aged	-27.8	-29.1	0.0	-4.5	24.8	25.0	7.5	7.5	21.0	47.1	4.2	4.7	11.6	13.6
maturing	61.3	52.8	-2.0	-0.7	3.1	16.3	-5.0	-4.5	-6.3	12.7	5.6	1.8	4.2	12.8
mature & overmature	12.7	8.2	-3.2	-9.3	9.1	16.2	-7.0	-10.3	13.3	12.4	-5.4	-5.6	9.4	13.1
41. Stavropol Kray*														
Coniferous														
young	116.3	205.0	39.8	6.6	-11.5	-1.5	10.4	20.3	-5.5	14.3	5.8	2.3	-47.2	-38.9
middle-aged	-4.4	-33.5	12.0	14.9	52.0	73.1	0.3	0.8	19.7	47.5	0.0	0.3	-2.2	-1.4
maturing	0.0	-20.9	9.8	15.6	-14.1	-1.4	0.0	2.8	24.4	77.0	0.0	0.0	-9.3	-13.2
mature & overmature	0.9	-27.1	7.3	9.0	-6.3	6.6	0.0	-2.8	-7.7	31.8	-0.3	-0.1	22.8	22.2
Deciduous hardwood														
young	3.8	69.6	18.4	-4.9	-33.2	15.2	1.5	-2.1	-54.0	-79.8	6.8	2.7	-38.7	-27.3
middle-aged	-6.6	14.8	-4.1	-3.9	35.5	32.4	2.2	1.6	39.0	77.0	2.4	1.5	-8.0	1.1
maturing	54.7	83.7	-1.0	-1.5	-5.5	2.4	2.0	0.0	-35.7	-25.9	6.7	3.6	41.7	31.6
mature & overmature	8.0	1.1	-2.8	-5.7	8.2	15.6	-3.0	-1.3	15.1	40.7	0.7	0.6	11.5	8.3
Deciduous softwood														
young	-40.2	-32.4	19.2	4.3	-55.4	-43.8	7.2	0.0	-39.3	-44.4	14.8	0.0	-51.6	-40.0
middle-aged	-1.1	-4.6	-0.7	-1.1	16.2	35.5	2.8	3.6	46.5	77.0	-17.7	0.4	-22.3	-36.0
maturing	87.4	70.9	5.5	5.0	-10.8	13.3	-0.9	0.4	-5.0	16.3	42.7	-1.1	-19.9	14.9
mature & overmature	14.4	27.7	-3.2	-5.4	10.2	32.9	-3.3	-5.6	-9.1	7.9	-2.1	-2.8	33.3	40.8
42. Rostov Oblast														
Coniferous														
young	84.6	-6.7	175.0	535.7	20.7	10.1	18.6	163.3	8.1	-0.8	4.2	56.6	-0.5	-11.5
middle-aged	30.4	22.7	-6.7	-3.7	3.6	-3.8	13.8	96.0	0.0	0.0	63.6	63.3	-3.7	-2.5
maturing	0.0	50.0	233.3	566.7	20.0	0.0	-100.0	-100.0	-	-	-	-	-100.0	-100.0
mature & overmature	-	-	-	-	-100.0	0.0	-	-100.0	-	-	-	-	-	-
Deciduous hardwood														
young	54.2	1.5	16.8	79.4	6.7	-3.3	-11.3	80.5	4.8	2.8	-37.8	-15.5	5.1	-7.6
middle-aged	-7.7	-1.6	20.6	0.0	-0.5	-4.9	48.1	76.9	-0.9	-1.0	74.4	74.1	1.4	5.9
maturing	15.9	27.0	2.0	-7.4	-1.9	0.0	-51.0	-47.1	-2.0	-4.3	161.2	115.9	-18.8	-23.2
mature & overmature	-10.2	-20.0	111.4	165.0	-28.0	-24.5	-22.4	-30.0	-23.1	-25.0	130.0	116.7	-29.3	-28.6

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
Deciduous softwood														
young	50.0	0.0	44.4	300.0	28.2	6.3	-59.0	0.0	31.7	11.8	-37.0	-31.6	20.6	-7.7
middle-aged	-11.6	-6.7	34.2	28.6	-5.9	-13.9	112.5	248.4	-2.0	-3.7	-9.0	11.5	-1.1	3.4
maturing	-18.5	-17.4	36.4	68.4	-13.3	-18.8	19.2	57.7	-9.7	-7.3	17.9	13.2	-6.1	-9.3
mature & overmature	-17.9	-27.0	20.0	29.2	-15.2	-17.9	-19.6	0.0	-17.8	-15.9	29.7	27.6	-20.8	-23.0
43. Republic of Daghestan														
Coniferous														
young	7.1	5.8	10.8	0.0	-30.1	-3.6	6.5	3.8	-44.4	-32.7	3.6	2.7	26.3	5.3
middle-aged	-1.9	-12.0	0.0	1.6	78.9	128.5	-0.8	0.5	40.1	81.0	-0.6	0.3	-0.2	0.0
maturing	-3.7	-17.0	1.0	0.8	-35.2	-16.4	0.0	0.0	-17.6	0.9	0.0	0.0	0.0	0.0
mature & overmature	12.5	-12.9	-0.9	-1.2	-56.9	-47.5	0.0	0.0	-52.0	-36.9	0.0	0.0	0.0	0.0
Deciduous hardwood														
young	-41.3	-32.3	9.4	3.4	-58.2	-47.6	-0.9	8.2	-46.5	-41.2	0.0	-2.9	31.6	20.6
middle-aged	4.1	29.9	-2.7	-1.6	45.3	51.0	1.8	2.5	19.0	60.4	-3.6	-5.1	6.5	5.6
maturing	80.6	110.5	-2.9	-1.6	-12.3	-7.9	-3.4	-4.8	-16.1	-2.2	-3.6	-5.9	4.3	5.5
mature & overmature	105.7	114.1	-10.6	-9.7	-9.8	8.0	-3.4	-3.5	-33.9	-34.3	-1.8	-2.5	1.8	1.0
Deciduous softwood														
young	-24.8	-38.5	8.5	25.0	-44.1	-70.0	1.8	0.0	-62.1	-16.7	4.5	0.0	4.3	0.0
middle-aged	-15.0	-14.3	-0.4	-1.0	12.8	53.7	-1.0	0.7	41.8	103.4	0.2	1.0	-1.7	-2.6
maturing	11.5	6.4	-0.7	-1.2	-7.6	8.5	0.0	-1.1	-13.5	28.4	0.0	0.0	-0.9	-0.9
mature & overmature	45.0	49.1	-4.7	-7.1	12.6	20.5	-0.7	-3.5	-47.3	-28.3	0.6	-1.0	1.9	2.1
44. Kabardino-Balkarian Republic														
Coniferous														
young	50.0	0.0	16.7	0.0	42.9	150.0	-10.0	0.0	-44.4	-80.0	20.0	0.0	0.0	0.0
middle-aged	2.7	-2.3	0.0	-4.8	-13.2	-15.0	-21.2	-17.6	-23.1	-14.3	0.0	0.0	30.0	25.0
maturing	21.4	9.5	0.0	4.3	-23.5	-29.2	-7.7	0.0	-16.7	-11.8	0.0	0.0	-10.0	20.0
mature & overmature	-18.2	-33.3	0.0	-7.1	88.9	76.9	5.9	13.0	66.7	61.5	-6.7	0.0	-7.1	14.3
Deciduous hardwood														
young	23.4	34.1	-0.5	6.1	-55.6	-48.8	20.9	12.9	-48.2	-47.1	5.3	-2.7	8.3	-2.8
middle-aged	39.6	27.2	-0.5	-1.2	85.5	98.8	0.9	0.0	12.6	24.4	0.3	0.7	2.0	0.5
maturing	59.0	22.5	5.3	-2.0	-45.3	-46.1	15.8	-1.5	-17.0	-4.6	0.0	0.8	0.0	-0.8
mature & overmature	-33.5	-43.2	-2.8	-9.9	-3.4	-5.5	-12.4	-6.5	33.6	42.8	0.0	-1.9	-1.0	-1.5
Deciduous softwood														
young	-33.9	-55.2	23.2	161.5	-71.3	-79.4	-3.4	28.6	-17.9	-22.2	13.0	14.3	7.7	12.5
middle-aged	7.4	6.8	-5.9	-6.4	41.7	27.3	-0.7	10.7	68.9	83.9	0.4	72.8	-1.3	-40.1
maturing	88.9	96.2	-8.8	-21.6	59.7	72.5	-7.1	-4.3	-3.3	34.8	1.1	-89.9	2.2	0.0
mature & overmature	9.9	15.7	-1.3	-10.4	24.0	68.6	-4.2	-9.0	-37.2	-12.1	-3.5	-1.7	1.8	3.5
45. Republic of North Ossetia														
Coniferous														
young	-10.3	-35.3	0.0	0.0	-73.1	-54.5	14.3	20.0	12.5	16.7	-11.1	0.0	-12.5	0.0
middle-aged	18.2	-14.3	-15.4	-20.0	87.9	100.0	0.0	4.2	1.6	40.0	-1.6	-2.9	1.6	0.0
maturing	-33.3	-62.5	0.0	0.0	-66.7	-66.7	-50.0	0.0	200.0	200.0	0.0	33.3	0.0	0.0
mature & overmature	57.1	42.9	-54.5	-50.0	-100.0	-80.0	-	-100.0	-	-	-	-	0.0	0.0
Deciduous hardwood														
young	-25.4	28.0	-1.3	-1.7	-54.8	-55.7	2.2	2.0	-53.6	-59.7	7.8	1.6	13.0	-1.6
middle-aged	60.9	91.1	-1.1	-1.0	71.7	61.0	-1.2	-1.1	-0.8	2.2	-0.8	0.1	-0.1	-0.1
maturing	1.5	-16.5	-1.4	-1.5	8.0	13.8	-2.7	-1.0	17.4	15.2	0.0	0.3	-0.6	-0.9

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
mature & overmature	-14.2	-6.4	-0.3	-6.4	-34.8	-32.8	-4.9	-10.6	35.3	45.0	1.3	-3.1	-0.3	-0.4
Deciduous softwood														
young	-57.6	-26.9	0.0	-5.3	-64.3	-83.3	6.7	0.0	-43.8	66.7	11.1	0.0	30.0	0.0
middle-aged	46.1	40.0	-6.0	-5.2	10.7	38.4	1.3	6.9	-15.3	-12.0	1.5	-1.1	-2.2	-4.3
maturing	-2.7	36.4	-8.3	-6.7	97.0	92.9	-6.2	-7.4	16.4	34.0	1.4	0.0	4.2	6.0
mature & overmature	-14.5	-10.5	-18.9	-15.7	48.8	39.5	0.0	-6.7	12.5	37.5	0.0	-1.3	1.4	-2.6
46. Chechen Republic and Republic of Ingushetia*														
Coniferous														
young	-6.3	-25.0	-6.7	33.3	7.1	25.0	6.7	20.0	-12.5	16.7	0.0	0.0	0.0	14.3
middle-aged	36.4	18.4	31.1	17.8	0.0	0.0	1.7	3.8	-6.7	20.0	0.0	0.0	1.8	0.0
maturing	7.1	0.0	-73.3	-80.0	0.0	25.0	0.0	0.0	75.0	100.0	0.0	0.0	0.0	0.0
mature & overmature	-66.7	-46.2	-100.0	-100.0	-	-	-	-	-	-	0.0	0.0	0.0	0.0
Deciduous hardwood														
young	-11.6	5.2	-24.1	-24.4	-21.5	-33.4	-37.5	-43.2	-33.5	-29.7	5.9	11.6	18.9	19.3
middle-aged	80.2	89.3	84.4	94.9	15.4	21.1	13.1	17.7	-5.0	-0.8	4.3	4.5	10.9	10.8
maturing	10.7	10.9	-13.0	3.2	-6.1	-8.3	4.1	18.0	-30.1	-29.4	1.7	2.2	37.9	35.2
mature & overmature	-27.8	-31.3	-35.7	-46.1	-9.5	-11.7	3.7	23.0	-22.0	-25.1	2.8	2.4	32.2	35.2
Deciduous softwood														
young	-12.5	-18.9	-54.8	-50.0	10.5	0.0	-28.6	-6.7	-13.3	7.1	0.0	0.0	0.0	0.0
middle-aged	76.5	74.1	84.8	119.8	-1.3	-0.5	5.0	8.1	2.5	18.4	0.7	1.4	4.1	4.5
maturing	10.1	-5.5	-12.6	25.0	6.6	9.2	9.9	22.5	-21.3	-5.7	0.0	0.0	24.3	18.3
mature & overmature	-26.5	-30.7	-32.2	-37.9	-0.8	3.4	-10.6	3.3	-23.6	-0.8	0.0	0.0	35.7	30.4
47. Kurgan Oblast														
Coniferous														
young	9.2	65.5	51.4	4.1	-1.1	79.8	14.3	1.1	-12.5	27.2	-9.9	-7.5	6.3	-5.0
middle-aged	-13.1	3.3	-0.4	0.2	0.0	10.9	0.2	0.4	52.5	48.2	18.6	11.0	40.2	57.3
maturing	28.4	41.2	-5.0	-5.0	-4.0	8.7	-1.7	-1.9	-18.9	-14.5	33.9	30.7	-37.3	-37.1
mature & overmature	3.8	0.4	-35.9	-39.8	44.1	57.9	-29.7	-31.0	60.9	81.6	-14.3	-14.8	-49.1	-49.7
Deciduous softwood														
young	-7.2	26.6	16.8	12.4	-45.8	-17.1	18.7	2.6	-35.2	-35.9	-13.8	-9.0	23.3	8.3
middle-aged	43.7	63.0	21.0	31.7	67.2	103.1	1.3	1.8	30.1	62.0	-22.8	-27.5	77.2	75.5
maturing	-0.9	5.2	-4.4	0.9	-11.7	14.0	-13.1	-13.6	17.5	40.5	103.4	93.1	-29.6	-33.1
mature & overmature	-8.0	-8.2	-49.1	-50.0	7.3	29.9	-35.1	-36.9	-23.3	-9.9	24.7	24.1	15.5	17.2
48. Orenburg Oblast														
Coniferous														
young	60.6	44.4	40.7	82.7	14.9	56.8	13.3	53.0	-3.3	3.1	16.6	18.7	-4.6	5.0
middle-aged	3.3	5.0	1.6	6.1	12.7	15.4	22.5	40.0	5.7	3.6	18.5	16.5	33.0	25.0
maturing	12.9	5.9	-31.4	-33.6	-8.3	-7.0	18.2	31.8	11.5	9.2	-13.8	-15.8	-20.0	-15.0
mature & overmature	-4.3	-4.1	11.4	10.8	-3.1	-5.6	-10.5	2.1	1.2	1.2	11.6	9.7	0.0	0.3
Deciduous hardwood														
young	-27.3	-38.0	26.1	9.9	-35.1	-0.9	18.7	3.6	-23.9	-9.6	25.2	19.4	-24.5	-23.6
middle-aged	26.3	53.5	-3.7	-4.4	-26.9	-13.8	2.8	2.9	-19.4	-23.9	3.4	6.5	9.2	19.9
maturing	-2.2	4.2	-17.0	-19.0	121.2	146.3	-4.0	-3.5	26.1	47.0	8.7	8.7	-20.7	-24.7
mature & overmature	42.1	58.7	2.8	5.9	104.5	118.3	-16.3	-17.8	27.9	58.8	9.9	12.3	-16.5	-13.2
Deciduous softwood														
young	-29.8	-20.6	37.0	11.8	-32.0	-8.5	21.7	10.0	-30.8	-20.3	23.7	15.8	-40.3	-42.4
middle-aged	14.9	22.9	4.4	6.3	5.2	26.9	9.6	18.3	17.5	28.3	-0.5	-2.1	49.1	61.6
maturing	33.8	31.8	-8.5	-8.7	12.7	21.8	-1.9	1.0	-20.2	-16.1	11.6	11.1	12.6	25.2

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
mature & overmature	87.1	94.6	-22.2	-22.8	123.7	116.6	-11.3	-14.5	21.3	35.0	5.8	5.6	14.0	35.0
49. Perm Oblast*														
Coniferous														
young	59.6	22.8	77.3	89.9	27.9	14.3	0.9	57.9	21.2	13.4	-9.4	1.1	0.0	20.3
middle-aged	-0.7	0.0	6.7	10.2	5.8	11.6	10.1	15.3	-1.5	-4.7	11.9	-27.4	20.6	83.5
maturing	-7.0	-7.0	-24.9	-22.6	-1.2	2.8	0.5	7.4	-5.9	-6.6	-12.3	36.4	-6.2	-39.7
mature & overmature	-10.5	-11.4	-6.3	0.2	-14.8	-14.9	-7.5	-1.8	-9.3	-12.0	-11.6	-13.5	-5.2	-9.9
Deciduous hardwood														
young	-	-	-	-	80.0	-100.0	-44.4	-	0.0	-	80.0	50.0	-22.2	0.0
middle-aged	0.0	0.0	0.0	0.0	-33.3	0.0	250.0	300.0	-14.3	-25.0	-50.0	-66.7	0.0	-50.0
maturing	0.0	-100.0	100.0	-	0.0	0.0	0.0	100.0	-50.0	-50.0	-100.0	-100.0	-	-
mature & overmature	0.0	0.0	-25.0	-12.5	-16.7	-14.3	-20.0	0.0	50.0	50.0	-100.0	-100.0	-	-
Deciduous softwood														
young	24.0	11.1	32.7	42.3	5.2	29.6	-2.7	58.1	-8.5	-14.1	-4.1	-6.9	-0.5	-6.0
middle-aged	13.9	25.4	57.7	62.2	13.1	28.9	44.9	77.2	7.8	4.4	34.9	36.7	11.9	14.1
maturing	12.8	17.5	-3.1	11.4	1.8	7.6	12.5	36.9	20.4	17.0	27.0	29.1	30.6	33.7
mature & overmature	-4.5	-5.0	-18.6	-6.6	-12.2	-12.5	-15.5	-6.9	-0.9	-2.4	9.3	11.9	6.0	3.4
50. Sverdlovsk Oblast*														
Coniferous														
young	14.8	8.4	32.7	110.5	21.7	16.6	-5.1	32.3	15.3	3.4	-19.1	-9.4	7.1	-2.1
middle-aged	14.5	14.9	55.0	75.8	1.3	9.0	11.5	22.0	-1.4	-1.1	19.0	21.1	3.6	3.1
maturing	-6.8	-7.8	2.3	4.8	0.1	6.6	-0.8	10.6	-5.9	-4.4	11.6	17.9	0.9	0.8
mature & overmature	-10.7	-14.6	-14.0	-17.1	-8.7	-7.5	-3.4	2.7	-2.7	-4.7	-7.9	-9.8	-4.7	-4.6
Deciduous hardwood														
young	-	-	100.0	-	-50.0	-100.0	-100.0	-	-	-	0.0	-	0.0	-
middle-aged	0.0	0.0	0.0	0.0	-100.0	-100.0	-	-	-	-	-	-	-	-
maturing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
mature & overmature	0.0	20.0	-25.0	-16.7	0.0	-20.0	0.0	0.0	-100.0	-100.0	-	-	-	-
Deciduous softwood														
young	7.8	-3.8	-17.3	-0.4	5.9	5.0	-7.2	11.4	0.8	0.8	-19.7	-8.1	3.3	6.1
middle-aged	8.6	6.7	59.0	95.9	-0.3	3.6	20.1	31.6	5.4	6.6	17.2	22.5	4.7	7.5
maturing	-2.5	-7.7	-8.9	11.7	4.0	7.3	18.2	20.5	-1.1	-0.1	55.6	67.0	6.2	6.9
mature & overmature	-11.3	-13.9	-21.3	-13.9	-14.9	-15.3	-12.1	-9.1	-12.0	-12.0	24.8	26.9	-1.3	-0.7
51. Chelyabinsk Oblast														
Coniferous														
young	8.4	13.2	53.2	13.0	-0.4	59.9	18.0	0.4	-14.9	41.6	13.4	0.2	-0.3	5.8
middle-aged	93.4	90.8	3.5	0.9	12.8	51.3	3.2	2.1	11.9	35.2	5.6	4.3	19.8	27.9
maturing	-5.3	-14.8	1.4	-1.9	-1.1	24.4	-2.4	-3.4	8.3	34.3	-3.1	-5.4	-8.8	-6.8
mature & overmature	-15.9	-26.5	-5.5	-13.5	-3.7	16.6	-10.9	-11.9	3.8	28.7	-18.7	-18.3	-20.8	-17.6
Deciduous hardwood														
young	125.0	-10.0	-7.9	111.1	-29.3	21.1	26.8	-4.3	11.5	13.6	10.3	4.0	7.8	0.0
middle-aged	34.2	53.8	82.4	61.7	95.7	149.5	-0.5	0.8	-33.1	-38.9	22.3	16.1	-2.0	-2.3
maturing	-38.2	-35.7	71.4	37.0	38.9	89.2	2.0	0.0	-33.3	-32.9	17.6	6.4	-2.5	-4.0
mature & overmature	-4.7	-9.9	1.6	9.6	-8.8	10.1	-8.8	-9.8	39.4	16.2	-23.4	-19.8	-0.9	0.0
Deciduous softwood														
young	-2.1	-12.6	10.0	-3.5	-51.5	-32.4	21.0	1.5	-12.5	9.4	12.9	8.2	-5.9	-11.3
middle-aged	41.7	37.5	8.0	5.9	1.2	44.9	-0.5	-0.9	19.7	63.8	4.1	2.7	45.4	59.1
maturing	-11.9	-22.0	-6.0	-6.8	48.7	97.8	-1.1	-2.1	-4.3	20.3	-1.2	-3.0	7.1	11.5
mature & overmature	-10.8	-16.5	-4.5	-12.6	18.2	45.3	-11.8	-13.8	6.5	28.4	-13.8	-12.7	-8.8	-9.5

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
52. Republic of Bashkortostan														
Coniferous														
young	22.0	4.7	77.3	48.9	21.2	27.1	6.3	26.5	15.1	24.6	-10.4	13.5	18.1	8.4
middle-aged	-5.6	-3.9	-19.8	-11.9	7.4	14.1	0.2	4.7	-4.4	-5.1	10.4	14.6	4.5	4.8
maturing	-2.0	-4.0	27.1	30.8	2.5	8.0	-0.3	11.0	-2.6	-3.3	-19.7	-15.6	-1.6	-1.7
mature & overmature	-9.0	-11.3	-13.0	-14.2	-13.1	-6.7	4.2	16.7	-2.0	-2.4	13.5	21.1	-2.7	-6.5
Deciduous hardwood														
young	-26.2	-32.2	-26.9	-12.3	-42.1	-33.0	-21.2	-20.9	-29.7	-31.4	-13.5	-13.5	-6.3	-9.6
middle-aged	17.0	29.9	-2.0	13.6	-1.7	6.9	-13.6	-11.2	-24.8	-26.6	-22.5	-23.3	-22.2	-24.0
maturing	19.1	32.7	-20.9	-6.1	13.4	26.8	20.4	21.3	-2.0	-5.6	-8.6	-13.2	-12.0	-12.9
mature & overmature	2.1	6.9	0.3	1.8	0.0	3.8	-3.9	-1.1	-9.6	-12.3	-17.3	-14.0	-1.1	-0.4
Deciduous softwood														
young	-6.3	-12.6	-13.3	-3.3	-6.5	6.3	-3.6	-0.3	-3.4	-1.5	-4.4	-6.3	6.5	0.9
middle-aged	6.8	11.8	10.0	21.8	5.5	23.9	-2.0	9.3	3.6	3.4	-1.3	4.1	-9.4	-11.4
maturing	5.8	10.7	-10.2	-4.9	-2.3	2.0	5.3	10.0	1.9	1.1	7.5	14.8	6.3	8.7
mature & overmature	5.3	7.0	5.6	10.5	0.1	5.0	1.8	9.2	2.4	2.8	7.1	10.6	7.7	8.7
53. Udmurtian Republic														
Coniferous														
young	-0.1	47.4	65.1	6.0	-16.8	26.4	18.9	3.1	-5.4	23.4	15.6	1.5	-12.7	27.7
middle-aged	12.6	19.7	-0.2	-0.1	37.9	50.1	0.2	2.2	14.8	21.5	-1.0	-1.2	-5.6	11.5
maturing	7.2	9.7	-2.5	-2.1	-8.3	2.6	-0.7	-0.8	19.6	26.4	-1.3	-1.8	7.3	27.9
mature & overmature	-18.6	-16.0	-28.7	-29.8	-8.7	1.1	-17.6	-18.3	-6.0	0.1	-15.5	-15.6	-1.8	13.5
Deciduous hardwood														
young	-58.6	-44.4	12.5	20.0	-33.3	50.0	-16.7	-11.1	-93.3	-100.0	0.0	-	0.0	-
middle-aged	71.4	116.7	-29.2	-34.6	11.8	35.3	-5.3	0.0	-44.4	-56.5	-10.0	10.0	0.0	0.0
maturing	33.3	-66.7	0.0	150.0	-25.0	-40.0	0.0	33.3	0.0	-25.0	0.0	0.0	-66.7	-66.7
mature & overmature	450.0	466.7	-18.2	-23.5	-22.2	15.4	14.3	-20.0	-25.0	-25.0	-16.7	-22.2	0.0	14.3
Deciduous softwood														
young	-59.1	11.2	80.6	-1.0	-23.6	15.4	0.1	1.3	-39.7	-50.3	-2.6	-3.6	-24.2	-24.4
middle-aged	62.5	92.5	-0.9	0.6	39.3	66.2	-0.1	0.6	6.5	13.1	0.6	1.0	5.3	9.9
maturing	141.2	188.2	-1.8	-1.8	44.1	51.3	-7.7	-8.4	68.7	81.8	8.5	8.0	1.0	7.0
mature & overmature	65.6	92.2	-25.0	-27.5	2.6	13.9	-25.3	-27.4	43.3	55.7	-41.7	-42.0	165.0	167.2
54. Altai Kray*														
Coniferous														
young	-19.3	19.2	19.4	10.8	12.5	1.2	-12.2	-10.8	2.9	-0.8	-14.5	-16.2	11.3	18.0
middle-aged	46.7	70.7	3.7	-0.6	-6.4	-7.5	11.1	17.9	-1.4	-0.2	18.8	47.6	37.8	37.2
maturing	9.0	13.8	4.4	13.0	1.0	2.5	3.2	6.8	7.8	10.7	3.8	31.5	23.6	18.0
mature & overmature	3.1	-1.7	-15.9	-12.2	3.8	6.8	-2.2	-6.1	-1.8	-1.6	-15.2	-15.0	19.2	19.7
Deciduous softwood														
young	-32.4	-17.5	105.6	87.6	10.2	1.9	-9.0	-7.1	-10.0	-12.2	-13.2	-7.9	-13.1	-10.6
middle-aged	-0.5	9.8	20.1	19.7	-3.0	-0.8	17.4	31.3	12.8	17.3	-6.0	-0.2	23.8	35.2
maturing	50.0	51.0	-1.4	1.6	-1.7	1.8	8.2	19.4	4.3	7.4	-6.1	-3.6	29.0	32.6
mature & overmature	55.7	93.3	-3.2	-19.2	-0.9	1.0	-1.6	5.4	-3.8	-2.7	30.7	38.6	18.5	18.1
55. Kemerovo Oblast														
Coniferous														
young	54.9	74.3	121.5	38.7	4.4	13.9	54.8	31.9	30.5	6.0	-47.4	0.8	30.0	8.3
middle-aged	-1.4	-5.3	38.9	50.0	14.9	14.1	11.9	17.9	-0.5	-0.3	7.5	10.9	2.9	-0.6

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
maturing	-9.6	-13.1	-13.0	-14.8	2.1	11.3	15.3	21.7	1.6	-0.3	7.7	21.7	-0.3	0.2
mature & overmature	-3.6	-4.5	-3.5	-14.0	-4.9	4.3	-9.0	-11.3	-6.7	-5.5	-15.4	-16.8	-5.8	-1.7
Deciduous softwood														
young	31.6	22.3	107.7	50.1	8.7	9.0	53.6	37.6	-1.3	1.3	-17.6	22.7	4.8	0.7
middle-aged	33.4	49.5	9.2	10.0	-1.7	-2.1	46.2	59.4	-1.2	-1.3	69.5	94.7	-0.2	-0.2
maturing	19.9	35.4	-9.9	-8.4	-3.5	0.9	19.1	26.8	-0.9	-0.7	17.2	36.7	-1.1	-0.6
mature & overmature	-4.0	-1.1	-4.0	-5.0	7.6	15.2	-14.2	-9.3	-5.4	-4.9	-13.0	-9.2	-3.3	-1.4
56. Novosibirsk Oblast														
Coniferous														
young	17.5	6.6	38.0	16.2	-6.8	8.1	19.1	32.6	-16.3	-3.1	-26.0	-15.7	12.5	0.0
middle-aged	11.3	23.7	-19.8	-6.0	7.0	14.4	10.5	12.2	6.1	16.3	31.4	21.0	-1.2	-2.7
maturing	-9.4	-20.7	-12.3	-4.7	-19.0	-9.2	7.7	17.8	4.2	9.8	45.2	16.2	0.3	0.1
mature & overmature	-13.2	-27.7	10.1	-0.1	-0.2	9.2	-8.7	-0.1	0.3	0.5	-20.4	-15.3	-0.8	-0.9
Deciduous softwood														
young	12.5	3.1	88.6	53.5	-7.5	-5.2	53.6	80.1	-2.8	1.7	-31.7	-22.5	16.1	5.3
middle-aged	15.0	34.6	18.1	30.2	7.9	13.4	36.3	48.9	-2.7	2.3	22.1	41.5	3.2	3.2
maturing	-4.3	-4.1	30.2	33.5	-2.4	8.0	-5.4	0.6	1.8	2.3	-5.9	6.0	0.8	0.8
mature & overmature	0.1	-0.6	0.6	-0.1	0.0	4.8	-10.4	-7.2	5.3	8.3	19.7	21.8	-0.6	1.9
57. Omsk Oblast														
Coniferous														
young	37.5	3.0	44.9	58.8	33.7	28.0	23.6	14.8	7.0	-4.3	-26.3	16.6	-23.0	0.1
middle-aged	1.7	16.4	69.3	117.7	-2.6	-3.0	4.3	5.9	4.3	11.1	13.9	12.2	-11.9	-13.6
maturing	13.0	3.8	36.4	38.4	13.0	17.0	-1.1	4.5	2.2	4.7	-4.4	0.8	2.5	15.4
mature & overmature	-3.5	-6.9	-29.3	-48.2	7.8	5.2	-7.9	-2.6	-2.6	-0.4	-5.8	1.8	18.9	20.1
Deciduous softwood														
young	37.3	10.1	-13.2	-10.8	22.0	51.5	-1.4	-3.3	-1.0	5.0	-0.8	-8.8	6.3	13.8
middle-aged	-15.8	-9.6	-7.5	14.1	-4.5	-3.8	14.3	22.1	-2.1	5.6	16.1	17.9	-12.4	-11.7
maturing	-10.0	-5.5	18.9	43.7	-4.7	-2.6	-7.4	-6.0	-1.1	6.3	1.8	4.0	-20.4	-15.6
mature & overmature	5.6	4.1	3.2	21.7	-1.8	-0.8	-2.0	-0.9	-0.1	5.3	3.4	3.6	13.2	10.0
58. Tomsk Oblast														
Coniferous														
young	36.9	16.9	108.1	47.0	22.4	12.4	20.2	38.0	8.6	23.9	-4.7	-0.2	8.8	14.0
middle-aged	3.3	1.0	23.7	23.0	3.8	4.8	18.7	17.7	3.0	6.3	16.3	34.9	24.7	39.2
maturing	-4.2	-9.4	28.6	20.0	4.4	10.5	-1.0	1.2	3.9	9.3	7.6	13.1	14.1	25.1
mature & overmature	-7.4	-12.6	-0.1	0.1	2.1	0.1	-2.0	1.7	-0.6	0.9	-10.7	-12.1	-12.3	-17.4
Deciduous softwood														
young	24.4	-0.6	149.5	71.5	15.4	28.1	-0.8	53.8	-8.6	2.1	-11.2	-11.2	29.8	5.8
middle-aged	-12.4	-9.6	-8.0	14.4	11.5	22.6	-11.0	-13.2	-12.4	-22.3	-11.0	-20.1	27.7	32.7
maturing	-7.9	-17.1	-49.5	-30.2	-5.8	5.4	-0.5	1.1	-13.5	-13.4	-39.6	-46.8	-22.9	-22.3
mature & overmature	2.7	3.2	-4.5	20.2	-7.3	-4.6	-2.1	-1.7	4.0	2.8	8.5	5.9	-1.2	-1.1
59. Tyumen Oblast*														
Coniferous														
young	58.3	-3.0	39.4	28.8	33.9	32.5	24.4	5.3	15.5	27.5	6.8	5.7	18.2	8.6
middle-aged	0.6	-1.0	39.4	38.5	0.8	8.2	5.6	9.1	33.5	20.6	76.7	89.0	-4.0	-4.3
maturing	-3.4	-4.2	57.1	48.4	-8.1	-4.7	-1.3	-0.7	5.1	5.7	16.2	6.4	1.4	2.1
mature & overmature	1.4	2.3	-0.1	5.9	-5.9	-9.1	-2.3	-2.2	-9.7	-13.7	-5.1	-16.0	0.0	-0.3

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
Deciduous softwood														
young	20.9	1.3	-15.5	-43.6	-7.6	26.1	4.3	9.0	-25.0	-19.4	-5.5	-9.5	29.0	0.5
middle-aged	1.6	6.7	-11.6	17.2	-6.0	-0.8	0.2	-3.7	-13.0	-21.2	-1.8	-6.2	7.9	16.4
maturing	-1.1	-1.7	-34.9	-24.6	-12.8	-7.1	-0.4	-2.4	-13.6	-5.1	1.2	1.2	1.4	6.3
mature & overmature	3.3	12.8	-8.9	33.8	-9.6	-3.7	-0.3	-3.6	-10.5	-7.1	7.8	3.5	0.5	0.6
60. Krasnoyarsk Kray*														
Coniferous														
young	13.5	56.7	40.1	40.3	19.8	27.8	2.1	-0.1	7.7	8.9	87.7	30.5	17.6	5.4
middle-aged	10.0	22.4	-3.4	-20.4	1.7	3.3	4.7	9.7	-0.8	-2.6	8.5	35.3	-2.4	0.8
maturing	4.4	5.8	-11.6	-19.8	1.9	1.8	10.6	15.5	-2.1	-2.4	4.0	12.0	-1.5	0.7
mature & overmature	-2.6	-4.5	3.8	-1.9	4.9	3.0	-1.3	-1.3	-0.5	-0.6	-24.5	-26.2	-1.1	-1.2
Deciduous softwood														
young	-1.8	5.1	28.8	24.8	34.3	38.0	5.1	14.7	0.6	0.7	-1.8	6.3	7.5	3.7
middle-aged	2.1	0.2	-18.9	-22.8	-1.1	-6.0	10.7	25.9	1.1	1.9	-5.7	6.4	4.7	6.2
maturing	-1.1	0.1	10.7	-4.0	-0.3	1.4	-1.4	4.5	0.8	2.3	-42.7	-26.6	-1.1	-1.3
mature & overmature	-0.5	3.5	-6.2	-0.9	-5.8	-5.3	-5.1	-4.3	-5.4	-4.0	-0.9	6.7	2.5	3.7
61. Irkutsk Oblast*														
Coniferous														
young	32.9	59.9	30.1	7.4	30.2	10.1	7.1	17.0	0.6	5.8	16.3	21.0	10.0	8.4
middle-aged	13.1	25.8	28.6	32.2	13.9	10.3	1.5	11.2	5.6	16.8	10.4	14.1	-2.5	0.4
maturing	6.3	13.4	-2.4	1.1	-0.9	3.3	15.3	21.8	-4.8	1.4	-4.5	-3.3	8.2	10.2
mature & overmature	-6.6	-7.7	-4.8	-1.1	-7.1	-4.8	-2.0	0.6	-9.7	-6.7	-6.7	-3.7	-1.5	-1.3
Deciduous softwood														
young	-31.6	-32.7	6.8	5.5	15.7	19.0	-6.9	2.2	-11.8	-9.1	70.6	8.3	7.6	27.4
middle-aged	-3.6	-4.6	-3.0	1.5	-3.3	-3.4	8.6	16.0	-5.9	-7.0	6.7	11.0	2.4	1.9
maturing	36.9	52.7	6.8	10.1	-17.4	-13.8	-3.6	1.7	-7.3	-3.0	7.7	11.3	4.6	5.7
mature & overmature	1.2	15.5	7.4	17.0	8.1	16.4	-9.2	-5.7	-1.0	5.2	15.2	17.8	12.8	13.3
62. Chita Oblast*														
Coniferous														
young	32.9	55.4	41.5	35.9	12.9	10.1	9.9	24.1	7.8	21.4	-8.8	-4.6	3.1	-1.1
middle-aged	0.0	7.9	3.7	12.0	3.6	3.2	31.2	30.9	5.1	9.4	5.9	9.6	-6.7	-6.8
maturing	-12.1	-10.4	-11.5	-11.1	-0.4	-1.5	12.9	15.9	1.5	6.5	-10.1	-7.2	-4.4	-4.0
mature & overmature	-6.4	-4.3	-4.2	-4.2	-6.2	-4.4	-15.3	-16.1	-9.5	-8.7	0.7	1.8	5.4	6.1
Deciduous softwood														
young	169.7	206.1	39.1	69.5	2.3	9.0	-1.7	-3.6	-8.0	-15.1	-8.5	-12.5	2.3	5.0
middle-aged	158.1	185.1	42.9	60.2	12.8	9.1	44.9	48.7	34.1	42.3	23.7	28.5	1.6	3.7
maturing	73.3	85.3	4.2	25.4	6.8	7.4	-0.8	4.1	-8.7	0.0	7.3	9.2	6.3	8.4
mature & overmature	20.9	21.9	22.3	32.1	2.3	4.7	-11.4	-10.8	-24.4	-19.6	6.0	10.9	7.2	7.0
63. Republic of Buryatia														
Coniferous														
young	50.5	19.6	21.5	54.1	40.1	36.5	-1.8	8.3	4.0	3.1	-3.9	1.6	0.9	2.8
middle-aged	35.7	32.7	43.9	81.4	12.6	9.5	3.4	6.1	15.6	15.6	3.4	6.0	1.4	3.3
maturing	-3.3	-6.8	9.5	15.9	-34.4	-35.5	5.6	8.1	17.4	16.0	-9.8	-6.4	6.9	7.9
mature & overmature	-9.7	-15.0	-13.4	-15.9	-0.8	-13.3	-2.6	-0.3	-12.2	-10.2	-4.2	-4.9	-0.7	-1.2
Deciduous softwood														
young	66.3	34.6	6.8	21.0	34.8	29.5	10.5	29.3	-3.1	-0.4	7.1	2.2	-0.9	1.3
middle-aged	17.9	7.6	11.3	30.2	29.8	24.5	13.1	22.7	3.2	8.3	16.6	23.2	6.4	5.2
maturing	-4.9	-6.2	-6.8	4.6	10.9	9.3	-6.2	4.3	3.3	8.5	9.7	13.9	7.4	7.4

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
mature & overmature	4.5	5.9	-3.8	4.4	0.0	-0.5	-13.1	-4.5	-15.2	-10.3	14.5	13.3	4.7	6.8
64. Republic of Tuva														
Coniferous														
young	5.3	52.2	9.9	21.0	4.5	10.0	57.0	165.3	-4.8	-3.2	-1.0	-3.0	1.1	-0.9
middle-aged	80.5	109.3	8.8	12.1	4.1	4.7	43.9	50.3	29.1	42.3	111.3	132.8	-27.7	-31.7
maturing	88.0	72.4	5.3	8.0	-1.4	-0.7	331.2	351.5	-8.6	-3.8	-61.8	-61.7	121.5	120.1
mature & overmature	-11.2	-7.6	-1.5	-0.1	-0.6	-0.4	-41.2	-38.8	-8.4	-2.1	-19.7	-16.3	-0.1	-0.2
Deciduous softwood														
young	66.3	76.9	34.0	19.6	-14.6	-27.3	0.0	-2.5	-4.6	0.0	6.0	0.0	-1.7	0.0
middle-aged	152.0	165.6	11.2	16.4	-1.9	3.4	44.0	53.0	-6.1	-6.3	-4.8	-3.2	-0.1	-0.1
maturing	117.4	153.4	6.8	11.6	-6.7	-5.2	19.9	42.8	-13.6	-9.0	13.2	15.3	-0.3	-0.2
mature & overmature	15.7	70.5	2.8	4.9	16.1	17.4	-21.7	-19.1	-4.8	-5.5	2.9	3.6	-0.4	-0.1
65. Primorie Kray														
Coniferous														
young	-34.3	-14.6	62.9	55.2	2.2	27.3	-8.9	9.0	9.7	6.2	-12.5	-31.4	-17.6	-11.7
middle-aged	-10.2	3.0	40.1	45.0	20.4	22.3	103.9	150.4	-1.0	-6.8	87.9	94.6	-2.5	-6.6
maturing	5.7	9.3	5.2	5.1	28.0	38.1	51.4	49.8	22.3	19.9	-20.3	-21.1	2.5	0.6
mature & overmature	1.8	1.1	-6.8	-7.0	-7.1	-4.9	-20.7	-26.7	0.2	-3.8	-24.1	-25.0	-1.8	-1.4
Deciduous hardwood														
young	8.1	20.9	33.1	51.6	-0.2	-0.2	-12.6	-8.3	-10.9	-10.3	-35.6	-20.4	0.6	0.8
middle-aged	-6.0	4.7	32.1	47.9	2.9	4.2	10.8	9.5	6.1	6.6	15.6	18.6	-2.3	3.2
maturing	-9.8	-12.8	-7.8	0.9	0.3	1.0	9.6	9.3	13.6	12.0	8.1	8.9	11.7	11.1
mature & overmature	-20.5	-25.2	48.2	55.6	1.3	1.8	-1.6	-4.4	-15.7	-17.0	3.7	3.7	9.4	11.1
Deciduous softwood														
young	-6.3	23.3	38.2	23.9	13.0	12.5	-21.8	-4.9	-20.5	-23.6	-23.0	-42.8	19.6	3.0
middle-aged	42.1	61.6	13.6	24.9	8.9	7.1	5.1	12.3	1.8	1.7	-2.8	2.1	-3.1	-1.9
maturing	12.4	19.8	9.2	12.5	-5.3	0.2	-12.2	-8.3	12.0	8.2	18.7	16.1	10.4	10.3
mature & overmature	27.8	25.6	10.5	9.6	3.0	10.8	-9.6	-8.8	-6.8	-9.1	15.1	15.9	6.5	7.2
66. Khabarovsk Kray*														
Coniferous														
young	-21.5	32.2	12.5	42.6	7.9	15.9	28.0	20.0	27.0	30.0	29.2	16.9	14.4	7.1
middle-aged	-11.6	-12.5	-11.3	1.7	0.4	4.8	3.5	-2.4	14.7	17.7	36.3	30.6	14.7	6.3
maturing	2.5	-7.6	-27.6	-20.8	-1.6	-0.4	20.1	14.9	13.4	6.6	19.8	11.5	4.3	0.1
mature & overmature	-14.9	-13.5	-10.0	-5.1	-3.9	0.8	-2.1	-4.8	-3.2	-9.1	15.1	4.0	9.1	4.4
Deciduous hardwood														
young	49.8	41.8	357.9	236.0	21.5	33.8	8.3	1.3	2.7	19.7	9.6	7.3	17.0	9.3
middle-aged	51.8	46.1	79.6	73.0	13.5	-1.7	2.1	6.7	-7.4	-2.0	5.3	3.5	2.3	0.8
maturing	18.8	20.0	63.8	104.4	-6.9	-23.5	4.0	7.3	2.2	-2.1	8.3	9.3	1.4	-0.1
mature & overmature	-2.0	0.8	19.1	35.4	-21.8	-26.3	-2.9	3.5	8.7	7.4	3.3	3.3	0.3	-0.8
Deciduous softwood														
young	76.8	103.1	76.5	54.0	8.7	19.2	25.9	0.1	20.2	9.1	39.5	50.0	11.6	15.5
middle-aged	95.3	97.2	21.1	32.1	17.8	13.1	31.2	33.1	16.7	13.6	10.6	7.1	9.7	3.7
maturing	2.2	8.6	1.7	10.9	8.2	8.6	36.9	42.2	-1.9	-4.5	8.4	8.5	11.4	9.3
mature & overmature	10.5	18.7	1.5	8.9	-19.6	-18.0	-10.5	-12.6	6.1	5.1	9.7	7.1	8.7	8.4
67. Amur Oblast														
Coniferous														
young	10.4	55.2	109.6	81.6	-7.9	-2.4	-1.5	2.7	9.5	17.9	-2.4	-7.4	7.6	-3.0
middle-aged	22.7	20.9	49.6	48.7	12.6	15.3	8.2	10.4	0.3	0.9	-0.5	-3.1	-5.9	-8.4

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
maturing	36.2	27.5	-15.7	-23.2	11.7	13.5	-1.4	-0.4	3.7	3.7	6.5	6.7	6.3	6.4
mature & overmature	-18.0	-19.7	-23.6	-27.7	-6.8	-4.1	-2.4	-1.9	-0.7	-1.8	-3.2	-4.0	2.1	2.1
Deciduous hardwood														
young	1.4	-54.8	139.5	307.1	0.2	19.7	-0.7	61.9	4.4	32.1	-1.5	0.0	0.2	7.0
middle-aged	-32.6	-43.9	142.5	231.6	15.7	14.0	5.9	16.0	-11.7	-2.2	-0.4	0.0	-5.9	2.1
maturing	-32.3	-46.3	41.8	67.1	3.0	-0.8	-26.8	-18.6	22.3	45.7	-1.0	-0.7	7.3	12.3
mature & overmature	6.5	-2.6	-28.6	-20.8	-34.8	-51.3	-2.3	-3.7	3.4	5.3	-1.0	-1.1	-2.8	1.1
Deciduous softwood														
young	4.4	28.3	29.4	15.4	-6.1	-0.9	-2.5	-1.8	-2.3	18.2	3.1	3.1	-2.7	0.2
middle-aged	26.9	32.7	6.8	5.5	29.0	53.3	8.4	17.4	23.1	21.8	-1.2	-2.8	2.4	-1.4
maturing	44.6	49.3	2.4	6.1	20.1	37.9	2.4	7.0	0.1	4.0	10.0	9.9	21.1	17.8
mature & overmature	1.7	7.6	-16.3	-11.4	-7.6	-3.6	-15.7	-13.8	-4.8	-2.3	5.7	7.0	34.0	32.5
68. Kamchatka Oblast*														
Coniferous														
young	-28.7	29.4	80.4	102.3	95.4	94.4	25.1	6.4	32.7	31.0	10.7	2.1	23.8	6.1
middle-aged	6.7	38.0	21.7	9.8	-17.2	-22.3	-7.6	-10.9	66.9	62.8	44.8	7.2	-7.8	-14.2
maturing	186.1	202.7	-42.1	-49.6	-24.6	-28.7	-14.8	-17.0	-4.0	-8.2	577.8	109.7	0.4	1.2
mature & overmature	-46.4	-29.8	-23.3	-18.4	4.0	4.1	2.9	5.0	19.9	13.4	46.1	0.5	-3.1	-3.5
Deciduous hardwood														
young	0.0	1900.0	33.3	-85.0	-20.0	0.0	206.3	100.0	75.5	66.7	145.3	170.0	41.2	55.6
middle-aged	6916	8363	83.1	44.0	80.9	38.0	-17.0	-35.0	-32.5	-24.6	-24.9	-32.6	-12.3	-11.9
maturing	11750.0	10342.9	65.5	56.2	62.7	38.0	-8.2	-18.5	-0.7	-2.2	20.1	10.4	1.0	0.1
mature & overmature	-38.7	-39.5	-29.7	-30.3	-4.4	-13.3	7.9	6.2	32.2	39.7	61.4	66.2	0.6	1.0
Deciduous softwood														
young	192.7	200.0	147.2	200.0	42.5	75.0	7.2	11.1	4.1	-6.4	28.4	51.9	6.8	2.5
middle-aged	1015	1022	101.4	67.6	123.4	101.2	5.7	3.7	15.8	23.8	106.9	102.8	2.7	3.8
maturing	405.6	491.0	12.4	-8.3	36.6	31.1	-2.6	-1.3	47.1	61.9	112.2	117.9	0.8	0.7
mature & overmature	-53.7	-35.2	-16.0	-11.3	2.1	8.1	1.9	2.4	3.4	3.7	46.8	42.3	0.6	0.6
69. Magadan Oblast*														
Coniferous														
young	-9.9	-4.7	-14.1	-59.4	18.4	72.2	-1.8	-2.7	281.3	35.9	-1.5	0.3	2.1	1.8
middle-aged	53.7	48.9	-3.2	-14.9	198.5	248.0	-0.8	-0.9	3.7	-27.6	-0.7	0.1	-0.4	-0.3
maturing	30.7	5.7	-59.7	-59.4	18.3	20.7	-0.1	-1.7	-13.2	-36.9	-0.4	-0.4	1.2	1.2
mature & overmature	-6.1	-10.1	-12.0	-23.2	-32.2	-33.1	-4.0	-5.8	15.0	9.6	-0.4	-0.5	0.2	0.3
Deciduous softwood														
young	-	-	18.9	6.7	6.0	-4.2	-6.3	-8.7	4.7	0.0	0.6	4.8	5.1	0.0
middle-aged	277.3	500.0	22.2	58.5	103.1	98.4	-3.5	-4.5	1.8	0.6	1.0	0.6	-3.4	-4.8
maturing	-6.8	-2.6	-34.8	-17.0	-9.3	29.3	-4.1	-5.0	1.1	-14.7	1.7	1.1	-3.8	-7.5
mature & overmature	-12.4	-5.6	-20.7	-6.7	-64.1	-42.2	-6.9	-8.7	70.0	96.3	0.3	0.2	7.8	5.8
70. Sakhalin Oblast														
Coniferous														
young	10.7	0.7	48.5	83.9	27.8	0.8	82.7	53.9	2.1	-23.9	15.9	42.0	7.4	6.2
middle-aged	-0.3	2.8	0.5	25.8	17.0	16.9	56.9	71.4	8.8	17.8	7.4	8.1	-4.4	-5.0
maturing	-0.6	2.4	-18.7	-14.6	13.0	10.6	12.6	20.9	0.3	3.0	0.5	-1.3	17.4	18.4
mature & overmature	-0.5	-0.3	-8.2	-6.5	6.6	2.6	-7.6	-11.2	-4.7	-3.5	-12.0	-17.8	-2.3	-6.8
Deciduous hardwood														
young	4.8	-0.9	26.4	31.5	3.1	1.5	12.9	0.8	0.2	-0.8	14.8	15.4	-20.2	-21.7
middle-aged	-10.5	-11.7	5.5	8.6	-4.0	-4.5	20.3	10.9	22.5	29.0	1.8	3.8	27.8	45.4
maturing	-12.0	-16.2	-4.0	-10.2	-1.9	-0.8	-42.5	-37.6	-0.9	-2.3	3.0	4.2	17.1	25.2

Table 11A. Continued

Groups of tree stands and age	1966-1961		1973-1966		1978-1973		1983-1978		1988-1983		1993-1988		1998-1993	
	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$	$\Delta S^{\%}$	$\Delta M^{\%}$
mature & overmature	12.5	9.1	-13.0	-17.3	-3.8	-5.3	-17.7	-11.7	-3.5	-6.1	9.2	8.7	12.2	11.2
Deciduous softwood														
young	30.4	-14.3	8.8	-1.0	12.4	12.6	-21.7	5.6	0.4	1.8	-15.1	-19.1	-10.8	-21.5
middle-aged	-7.1	-15.4	27.7	43.2	7.1	9.5	55.7	64.8	-0.1	3.4	2.2	8.9	-0.3	-2.5
maturing	-24.6	-22.3	-20.4	-5.1	7.1	7.8	106.1	101.4	4.0	4.3	23.3	31.2	-11.1	-5.5
mature & overmature	-22.0	-22.1	-7.5	-12.4	11.2	16.4	-9.1	-8.1	1.6	2.1	-3.8	-7.1	15.0	12.1
71. Republic of Sakha (Yakutia)														
Coniferous														
young	15.1	81.6	67.4	21.8	21.9	7.6	3.4	6.6	4.9	45.5	-0.3	6.2	-7.3	0.7
middle-aged	-3.6	-3.6	6.8	6.3	0.8	-1.7	15.0	7.0	22.3	23.8	4.3	5.1	9.5	0.8
maturing	-0.5	-3.0	-5.9	-4.9	-4.4	-8.6	-4.5	-11.2	0.2	1.1	-5.8	-3.5	8.7	0.3
mature & overmature	-6.2	-6.3	3.5	0.4	-1.0	-1.6	-2.9	-8.1	-13.0	-20.5	2.5	1.7	-12.1	-8.3
Deciduous softwood														
young	13.1	65.0	21.6	36.4	9.3	4.1	-37.8	-40.5	8.7	51.0	2.8	3.4	-2.6	-2.1
middle-aged	33.6	15.0	8.3	7.6	48.4	36.9	11.8	34.7	61.5	84.3	3.9	4.7	1.9	1.5
maturing	20.6	13.9	13.0	10.0	23.2	6.2	-33.3	-10.0	12.8	50.1	0.9	-2.9	-0.7	-0.1
mature & overmature	-27.6	-8.2	17.8	11.3	-0.7	0.6	-19.1	-11.0	-23.3	9.3	-3.2	-1.5	-2.9	-2.6

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

Table 12A. **Relative change of average annual stock in tree stands in periods between accounts, 1961-1998, percent**

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
1. Kaliningrad Oblast							
Coniferous							
middle-aged	0.29	2.09	0.21	-0.13	0.05	0.68	-0.92
maturing	-1.38	2.22	-0.49	1.05	-0.67	0.37	-0.22
mature and overmature	-1.57	1.54	-0.03	0.82	-0.62	-0.73	-0.66
Deciduous hardwood							
middle-aged	0.46	1.55	0.07	0.27	0.02	0.86	0.55
maturing	0.62	2.20	-0.92	0.93	-0.15	1.77	-2.33
mature and overmature	-3.65	0.82	3.82	-2.29	0.04	1.16	-0.02
Deciduous softwood							
middle-aged	4.23	4.93	0.47	0.76	0.19	3.57	-0.08
maturing	5.12	4.70	0.09	0.95	-0.48	1.68	0.07
mature and overmature	-1.07	4.04	0.15	3.28	-0.68	0.31	-0.36
2. Archangel Oblast*							
Coniferous							
middle-aged	1.01	-0.09	0.19	0.81	0.53	-0.24	-0.81
maturing	-0.09	0.98	0.68	0.60	0.52	3.07	-0.45
mature and overmature	0.13	0.49	-0.04	-0.10	0.06	-0.05	-0.12
Deciduous softwood							
middle-aged	0.15	0.64	3.13	-0.83	1.71	2.81	-1.14
maturing	0.32	1.59	2.05	0.75	2.54	2.99	-0.46
mature and overmature	1.01	-0.10	-0.29	1.34	0.46	2.00	0.19
3. Vologda Oblast							
Coniferous							
middle-aged	1.07	0.73	1.44	0.23	-0.05	1.34	0.20
maturing	-0.45	0.04	2.53	0.11	-0.35	2.48	-0.15
mature and overmature	0.67	0.04	1.42	-0.51	0.05	0.02	-0.16
Deciduous softwood							
middle-aged	1.58	1.96	3.27	0.49	0.24	-0.19	-0.14
maturing	0.78	1.79	2.93	0.02	3.55	1.25	-0.60
mature and overmature	0.73	0.67	-0.50	-0.40	1.81	1.62	0.38
4. Murmansk Oblast							
Coniferous							
middle-aged	-2.55	0.57	-0.31	-0.09	-0.01	-0.12	0.02
maturing	-3.98	0.06	0.01	-0.40	1.87	-0.11	-0.07
mature and overmature	-1.68	-1.12	-0.35	0.10	0.51	-0.11	-0.13
Deciduous softwood							
middle-aged	-0.84	1.16	0.13	0.63	4.37	0.03	0.02
maturing	-4.04	4.61	-0.12	0.08	3.47	0.43	-0.04
mature and overmature	-1.76	-1.20	0.47	-0.04	-0.19	-0.16	-0.09

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
5. Republic of Karelia							
Coniferous							
middle-aged	1.76	1.00	-0.24	-0.28	-0.71	0.05	0.05
maturing	0.60	1.21	0.31	0.31	1.27	1.70	0.79
mature and overmature	-1.07	-0.31	0.00	-0.34	0.72	0.66	0.49
Deciduous softwood							
middle-aged	1.64	1.32	-0.03	-0.83	-0.01	0.34	0.27
maturing	5.99	1.79	-0.34	-0.22	0.24	0.65	1.38
mature and overmature	3.95	1.34	-0.03	1.80	-0.11	0.86	1.35
6. Komi Republic							
Coniferous							
middle-aged	1.39	0.57	0.16	-0.80	-0.45	-0.95	-1.24
maturing	0.38	2.76	0.53	-0.08	0.52	-3.70	-0.01
mature and overmature	0.05	1.86	0.04	0.04	-0.19	-1.50	-0.18
Deciduous softwood							
middle-aged	3.21	-0.08	1.17	1.26	-0.49	1.12	0.60
maturing	2.93	1.98	0.50	0.05	1.46	3.68	-2.16
mature and overmature	2.84	2.81	0.68	-0.04	0.19	0.89	-0.03
7. Leningrad Oblast							
Coniferous							
middle-aged	0.85	3.01	0.97	-0.21	-1.37	0.34	0.17
maturing	-0.98	1.41	1.58	0.98	-0.03	0.60	0.09
mature and overmature	0.49	0.90	0.61	2.39	1.36	-0.01	0.03
Deciduous softwood							
middle-aged	1.38	2.53	2.70	0.21	-0.34	0.26	0.12
maturing	6.45	1.89	1.27	1.32	0.88	-0.11	0.41
mature and overmature	2.45	1.28	1.20	1.63	0.58	-0.15	0.67
8. Novgorod Oblast							
Coniferous							
middle-aged	-0.29	0.27	4.63	0.09	-2.26	1.25	1.27
maturing	0.80	0.00	3.70	-0.03	0.87	-0.12	0.03
mature and overmature	1.16	-0.77	6.27	-0.49	3.06	-0.50	0.17
Deciduous softwood							
middle-aged	2.47	0.54	7.01	0.01	0.90	-0.12	0.36
maturing	2.60	-0.43	10.83	-0.03	0.75	-0.10	-0.19
mature and overmature	3.97	-0.42	11.62	-0.20	0.83	-0.11	0.27
9. Pskov Oblast							
Coniferous							
middle-aged	0.31	0.28	5.38	-0.01	0.52	-0.15	0.64
maturing	-0.26	0.40	4.66	-0.09	2.99	-0.18	0.19
mature and overmature	-0.36	0.21	4.48	-0.76	3.98	-0.53	0.11

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
Deciduous softwood							
middle-aged	3.09	0.72	10.05	0.09	0.92	-0.23	0.92
maturing	2.23	0.57	8.20	0.13	1.54	-0.11	0.06
mature and overmature	1.18	0.83	5.72	-0.38	2.92	-0.24	-0.28
10. Bryansk Oblast							
Coniferous							
middle-aged	-0.14	-0.24	1.53	-0.01	0.87	1.58	0.64
maturing	-0.76	0.08	2.00	-0.21	-0.33	1.52	0.59
mature and overmature	-1.34	-0.57	1.45	-0.41	0.28	1.99	0.46
Deciduous hardwood							
middle-aged	-4.29	-0.30	0.54	0.29	3.44	2.08	0.88
maturing	-0.66	0.05	0.19	-0.79	1.94	0.65	0.11
mature and overmature	-2.84	-0.03	-0.20	-0.37	1.08	0.63	1.41
Deciduous softwood							
middle-aged	0.08	-0.26	1.53	0.09	3.31	0.86	1.15
maturing	1.49	-0.11	0.83	-0.28	1.66	0.30	0.87
mature and overmature	0.86	-0.84	9.45	-0.31	1.84	0.55	0.35
11. Vladimir Oblast							
Coniferous							
middle-aged	-0.62	0.63	0.47	0.15	0.62	0.53	1.35
maturing	-0.13	0.30	0.88	-0.53	0.66	0.35	1.20
mature and overmature	0.27	-0.04	0.90	-0.63	0.26	0.25	1.44
Deciduous hardwood							
middle-aged	0.14	0.45	1.71	0.24	1.18	0.27	3.33
maturing	-0.74	0.55	2.86	-0.56	0.73	-0.70	9.14
mature and overmature	-3.40	-1.97	7.89	0.25	-0.85	0.35	1.03
Deciduous softwood							
middle-aged	0.50	0.71	0.93	0.08	0.61	0.57	1.59
maturing	0.63	0.15	1.27	0.01	0.60	0.00	1.04
mature and overmature	0.49	0.13	0.81	0.18	0.20	0.61	0.50
12. Ivanovo Oblast							
Coniferous							
middle-aged	0.28	-0.06	1.23	-2.44	3.29	0.01	2.04
maturing	-0.86	-0.12	0.82	-0.81	1.80	0.02	1.57
mature and overmature	-1.07	-0.95	3.55	-1.85	1.19	-0.41	2.65
Deciduous hardwood							
middle-aged	6.19	-0.65	-4.44	1.43	-0.80	0.00	5.00
maturing	11.11	1.02	-2.00	-6.67	13.33	0.00	-2.00
mature and overmature	2.86	-2.38	4.00	-1.11	1.88	0.00	-2.10
Deciduous softwood							
middle-aged	2.07	-0.01	3.48	-3.39	7.07	-0.06	0.66
maturing	2.67	-0.20	1.59	-2.25	4.62	-0.18	1.42

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
mature and overmature	2.28	-0.73	7.54	-0.95	3.39	-0.06	1.42
13. Tver Oblast							
Coniferous							
middle-aged	4.17	1.32	2.29	-0.03	0.03	-0.06	2.73
maturing	1.52	-0.13	2.45	-0.19	1.68	-0.06	1.05
mature and overmature	1.80	-1.44	3.29	-0.77	2.70	-0.45	-0.16
Deciduous softwood							
middle-aged	5.83	0.45	3.82	-0.07	5.07	-0.58	0.02
maturing	5.49	0.10	6.48	-0.15	3.28	-0.28	0.13
mature and overmature	3.64	-0.19	6.19	-0.30	2.27	-0.17	-0.17
14. Kaluga Oblast							
Coniferous							
middle-aged	2.39	-0.09	-0.28	-0.01	2.24	0.42	1.65
maturing	0.35	-0.34	1.93	-0.16	1.88	0.02	2.39
mature and overmature	0.24	0.05	1.24	-0.60	1.96	0.09	2.19
Deciduous hardwood							
middle-aged	-0.56	-0.04	2.66	0.19	3.92	-0.25	1.77
maturing	-1.09	0.97	1.84	-0.64	4.13	0.48	1.55
mature and overmature	-1.37	-0.20	0.58	-0.25	2.64	-0.13	3.79
Deciduous softwood							
middle-aged	1.86	-0.06	5.89	0.02	4.57	-0.28	1.29
maturing	2.38	-0.09	3.27	-0.05	2.63	-0.18	0.27
mature and overmature	0.88	-0.23	3.02	-0.21	2.16	0.01	0.77
15. Kostroma Oblast							
Coniferous							
middle-aged	1.27	0.08	1.37	0.03	1.09	0.03	1.87
maturing	-0.82	0.16	1.85	-0.28	1.50	-0.22	2.33
mature and overmature	0.60	-0.67	1.52	-0.42	1.44	-0.36	2.33
Deciduous softwood							
middle-aged	2.11	-0.04	5.86	-0.01	1.86	-0.04	-1.52
maturing	3.46	0.02	3.37	0.00	1.43	-0.16	0.25
mature and overmature	0.50	-0.36	3.72	-0.17	0.02	-0.17	0.44
16. Moscow Oblast							
Coniferous							
middle-aged	-0.10	0.90	0.04	1.36	-0.46	1.69	0.08
maturing	-0.76	1.10	0.20	0.40	-0.22	3.43	0.09
mature and overmature	-1.82	-0.73	-0.87	4.46	1.58	4.79	-0.02
Deciduous hardwood							
middle-aged	-0.24	0.76	0.36	4.36	0.32	2.88	-0.66
maturing	-2.43	1.10	-0.05	0.67	0.24	-0.40	2.03
mature and overmature	1.99	-1.27	0.21	1.95	-0.04	1.21	-0.75
Deciduous softwood							

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
middle-aged	-0.14	2.22	0.01	4.28	0.12	1.64	0.10
maturing	-0.75	1.12	0.11	2.36	-0.13	2.54	-0.56
mature and overmature	-1.33	0.96	-0.39	3.56	-0.17	1.89	0.05
17. Orel Oblast							
Coniferous							
middle-aged	3.89	-1.58	7.34	-0.16	1.44	0.51	3.07
maturing	2.28	1.59	5.57	-2.96	-0.43	2.00	-5.45
mature and overmature	-1.06	-1.71	10.00	2.22	-4.57	-	-
Deciduous hardwood							
middle-aged	4.86	-0.31	1.45	-0.22	6.07	0.29	7.63
maturing	1.72	-0.31	2.48	0.59	2.39	-0.74	1.38
mature and overmature	-0.76	0.96	0.93	-1.15	3.92	0.50	0.00
Deciduous softwood							
middle-aged	3.85	0.54	6.97	-0.21	6.30	0.42	0.40
maturing	4.42	-0.49	4.12	0.22	2.71	-2.96	5.79
mature and overmature	3.85	-0.56	12.32	-0.72	3.28	-1.81	2.61
18. Ryazan Oblast							
Coniferous							
middle-aged	-0.05	1.57	-0.12	0.09	0.07	3.55	-0.08
maturing	-0.91	1.62	-0.25	0.87	0.01	3.29	0.04
mature and overmature	-0.45	0.40	0.14	1.30	-0.27	5.26	0.54
Deciduous hardwood							
middle-aged	3.36	2.58	0.12	1.19	-0.16	3.53	-0.08
maturing	3.22	1.88	0.44	1.19	-0.32	1.63	-0.06
mature and overmature	4.53	1.06	-0.64	1.43	0.07	1.46	0.18
Deciduous softwood							
middle-aged	1.73	3.78	0.02	3.41	0.08	0.97	-0.08
maturing	2.04	2.48	-0.14	2.49	-0.13	0.53	0.00
mature and overmature	-0.57	2.90	0.10	2.63	0.26	0.94	0.15
19. Smolensk Oblast							
Coniferous							
middle-aged	2.19	0.43	2.20	0.01	3.04	-0.75	2.80
maturing	1.13	0.37	0.67	-0.04	2.35	-0.20	3.44
mature and overmature	-1.14	-1.34	-0.03	-0.94	4.24	-0.63	4.10
Deciduous hardwood							
middle-aged	13.33	0.00	0.00	2.50	10.81	-1.54	1.25
maturing	-2.22	4.46	0.00	-0.95	10.00	0.00	-4.00
mature and overmature	-0.95	2.86	0.00	-10.00	10.00	0.00	12.00
Deciduous softwood							
middle-aged	1.94	2.35	2.01	-0.12	4.19	-0.27	3.37
maturing	2.92	1.22	0.94	-0.32	2.04	0.11	3.24
mature and overmature	2.81	0.32	0.08	-0.25	1.56	-0.25	2.78

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
maturing	-1.25	-0.95	31.43	-11.67	1.33	6.25	0.00
mature and overmature	1.43	-0.08	-0.80	4.53	0.87	-1.43	0.30
Deciduous softwood							
middle-aged	0.27	1.48	1.52	2.84	0.26	0.16	-0.09
maturing	-0.50	2.14	0.83	1.17	1.23	0.98	-0.07
mature and overmature	-0.05	1.04	0.16	0.78	-0.38	-0.16	-0.12
24. Republic of Marii El							
Coniferous							
middle-aged	-0.81	2.98	-0.06	-0.02	-0.97	0.18	1.71
maturing	0.10	2.89	-0.28	-0.01	0.17	-0.18	1.38
mature and overmature	-0.45	0.81	-0.08	-0.23	-0.92	-0.38	0.28
Deciduous hardwood							
middle-aged	-0.92	2.20	0.41	0.05	-1.61	-1.20	2.56
maturing	1.67	0.59	2.45	-0.84	-2.81	0.00	0.54
mature and overmature	2.77	1.00	0.16	0.57	0.38	0.40	-0.43
Deciduous softwood							
middle-aged	-0.27	6.94	0.23	-0.08	0.43	-0.06	1.43
maturing	0.32	3.00	0.05	-0.14	1.73	0.02	0.49
mature and overmature	-0.57	1.84	-0.10	-0.18	-0.51	-0.33	1.66
25. Republic of Mordovia							
Coniferous							
middle-aged	-0.99	2.58	-3.06	-0.67	0.27	-0.13	2.51
maturing	-2.36	0.21	0.98	-1.59	1.64	-0.13	1.95
mature and overmature	-1.29	-0.40	-0.04	-1.90	1.07	0.08	3.61
Deciduous hardwood							
middle-aged	-0.39	-0.06	0.15	-0.23	3.72	-68.70	-30.06
maturing	-0.05	0.12	-0.17	-0.01	3.83	-17.93	196.07
mature and overmature	-0.72	0.37	-1.53	-0.05	2.78	-0.12	1.44
Deciduous softwood							
middle-aged	-1.46	-0.28	5.54	-0.09	1.96	-0.09	0.89
maturing	3.34	-0.32	1.60	-0.38	0.84	-0.32	2.46
mature and overmature	1.65	0.58	-2.18	-0.02	0.06	0.16	2.48
26. Chuvash Republic							
Coniferous							
middle-aged	-0.36	-0.06	2.13	-0.22	0.86	-0.10	0.79
maturing	-0.30	0.07	2.69	-0.50	0.74	-0.33	-0.32
mature and overmature	0.84	0.01	-0.11	1.45	-1.31	-0.60	0.20
Deciduous hardwood							
middle-aged	0.50	-0.42	2.05	2.88	-4.56	0.18	-2.39
maturing	-0.55	0.24	0.40	-0.35	-3.64	0.46	-2.17
mature and overmature	-1.17	-0.12	-1.64	-0.17	-2.23	-0.43	-3.97
Deciduous softwood							

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
maturing	-1.25	-0.95	31.43	-11.67	1.33	6.25	0.00
mature and overmature	1.43	-0.08	-0.80	4.53	0.87	-1.43	0.30
Deciduous softwood							
middle-aged	0.27	1.48	1.52	2.84	0.26	0.16	-0.09
maturing	-0.50	2.14	0.83	1.17	1.23	0.98	-0.07
mature and overmature	-0.05	1.04	0.16	0.78	-0.38	-0.16	-0.12
24. Republic of Marii El							
Coniferous							
middle-aged	-0.81	2.98	-0.06	-0.02	-0.97	0.18	1.71
maturing	0.10	2.89	-0.28	-0.01	0.17	-0.18	1.38
mature and overmature	-0.45	0.81	-0.08	-0.23	-0.92	-0.38	0.28
Deciduous hardwood							
middle-aged	-0.92	2.20	0.41	0.05	-1.61	-1.20	2.56
maturing	1.67	0.59	2.45	-0.84	-2.81	0.00	0.54
mature and overmature	2.77	1.00	0.16	0.57	0.38	0.40	-0.43
Deciduous softwood							
middle-aged	-0.27	6.94	0.23	-0.08	0.43	-0.06	1.43
maturing	0.32	3.00	0.05	-0.14	1.73	0.02	0.49
mature and overmature	-0.57	1.84	-0.10	-0.18	-0.51	-0.33	1.66
25. Republic of Mordovia							
Coniferous							
middle-aged	-0.99	2.58	-3.06	-0.67	0.27	-0.13	2.51
maturing	-2.36	0.21	0.98	-1.59	1.64	-0.13	1.95
mature and overmature	-1.29	-0.40	-0.04	-1.90	1.07	0.08	3.61
Deciduous hardwood							
middle-aged	-0.39	-0.06	0.15	-0.23	3.72	-68.70	-30.06
maturing	-0.05	0.12	-0.17	-0.01	3.83	-17.93	196.07
mature and overmature	-0.72	0.37	-1.53	-0.05	2.78	-0.12	1.44
Deciduous softwood							
middle-aged	-1.46	-0.28	5.54	-0.09	1.96	-0.09	0.89
maturing	3.34	-0.32	1.60	-0.38	0.84	-0.32	2.46
mature and overmature	1.65	0.58	-2.18	-0.02	0.06	0.16	2.48
26. Chuvash Republic							
Coniferous							
middle-aged	-0.36	-0.06	2.13	-0.22	0.86	-0.10	0.79
maturing	-0.30	0.07	2.69	-0.50	0.74	-0.33	-0.32
mature and overmature	0.84	0.01	-0.11	1.45	-1.31	-0.60	0.20
Deciduous hardwood							
middle-aged	0.50	-0.42	2.05	2.88	-4.56	0.18	-2.39
maturing	-0.55	0.24	0.40	-0.35	-3.64	0.46	-2.17
mature and overmature	-1.17	-0.12	-1.64	-0.17	-2.23	-0.43	-3.97
Deciduous softwood							

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
middle-aged	1.48	-0.17	4.41	0.19	-0.07	-0.66	1.02
maturing	1.00	-0.08	4.17	-0.15	-0.57	-0.18	-0.92
mature and overmature	0.10	-0.36	9.17	-0.14	-0.63	0.25	-1.51
27. Belgorod Oblast							
Deciduous hardwood							
middle-aged	4.37	0.03	-0.67	0.05	4.01	-0.08	2.18
maturing	5.07	0.04	-0.57	0.12	-1.78	-0.31	-1.41
mature and overmature	0.72	-0.14	-1.17	-1.61	-2.04	-0.26	0.61
Deciduous softwood							
middle-aged	0.86	0.20	0.73	-0.12	1.97	0.15	5.70
maturing	3.43	-0.42	2.49	-13.26	5.54	1.54	2.18
mature and overmature	-0.80	0.71	16.67	-0.70	6.01	-3.23	0.00
28. Voronezh Oblast							
Coniferous							
middle-aged	0.74	2.51	0.09	-3.55	-0.08	3.26	0.37
maturing	-0.72	1.69	0.98	-1.10	0.11	1.17	0.37
mature and overmature	1.33	0.45	0.91	-1.99	-2.89	4.84	3.03
Deciduous hardwood							
middle-aged	0.36	0.83	-0.08	-0.42	-0.02	1.72	0.17
maturing	-0.86	-0.11	0.45	1.87	0.13	-1.02	-1.50
mature and overmature	2.55	-3.29	1.34	-2.07	0.33	-2.65	1.17
Deciduous softwood							
middle-aged	-0.01	4.78	0.65	0.54	-0.51	-0.94	3.55
maturing	0.28	1.44	0.55	-0.98	0.06	1.67	0.81
mature and overmature	-0.26	0.27	0.26	1.56	-1.68	1.76	-1.02
29. Kursk Oblast							
Deciduous hardwood							
middle-aged	2.77	0.31	0.02	-0.63	0.17	5.66	0.19
maturing	-0.31	0.81	2.60	-0.64	-0.63	-0.47	0.14
mature and overmature	-0.05	0.56	2.56	-1.47	-0.16	-3.54	-0.58
Deciduous softwood							
middle-aged	0.74	1.82	0.38	0.51	-0.21	4.31	-0.23
maturing	0.04	1.97	0.37	-1.23	0.03	1.81	-0.42
mature and overmature	-1.45	1.01	0.86	-0.73	0.16	2.30	1.86
30. Lipetsk Oblast							
Coniferous							
middle-aged	2.34	-0.02	0.17	-0.57	1.87	-0.55	0.14
maturing	-0.34	-0.31	0.30	-0.37	0.93	-0.26	1.71
mature and overmature	-1.57	0.43	-1.81	2.22	-0.48	-0.05	5.95
Deciduous hardwood							
middle-aged	4.32	1.27	0.50	-0.25	3.73	0.32	0.35
maturing	3.33	1.51	1.05	0.11	-2.17	0.80	0.05

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
mature and overmature	1.15	1.83	0.95	0.53	-3.51	0.68	1.82
Deciduous softwood							
middle-aged	2.75	1.68	2.75	-0.36	2.78	-4.51	7.64
maturing	1.56	0.93	2.36	-0.47	1.93	-0.18	1.58
mature and overmature	-0.59	2.16	5.03	-0.16	1.55	4.78	-3.62
31. Tambov Oblast							
Coniferous							
middle-aged	3.90	1.92	0.30	-1.50	0.03	4.42	0.07
maturing	0.04	0.66	-0.27	1.09	-0.06	2.61	-0.04
mature and overmature	0.02	0.22	1.46	-1.42	0.10	2.15	0.08
Deciduous hardwood							
middle-aged	0.32	1.97	-0.09	0.03	0.17	6.52	0.08
maturing	0.63	2.42	0.60	-1.30	0.21	-0.86	-0.89
mature and overmature	-0.73	2.56	1.81	-1.50	0.16	-3.90	-0.17
Deciduous softwood							
middle-aged	0.63	1.51	0.03	3.30	0.06	2.10	-0.26
maturing	1.32	1.86	0.36	1.72	-0.15	1.60	0.19
mature and overmature	0.50	6.47	0.27	-0.30	0.15	0.57	-0.40
32. Astrakhan Oblast							
Deciduous hardwood							
middle-aged	2.04	1.76	-8.00	3.08	4.89	0.66	-0.47
maturing	10	2.86	-9.39	0.43	-3.22	-0.87	5.00
mature and overmature	-4.00	-2.38	-2.69	4.76	2.40	1.79	-3.94
Deciduous softwood							
middle-aged	2.71	-0.84	0.19	-0.44	1.65	-0.65	0.22
maturing	-1.02	-0.75	1.55	0.75	0.34	0.56	-1.09
mature and overmature	-1.97	-0.62	-2.19	-0.50	2.69	0.32	0.59
33. Volgograd Oblast							
Deciduous hardwood							
middle-aged	1.90	0.13	-4.86	0.20	1.53	-0.05	0.23
maturing	-2.99	-0.06	-1.46	0.40	0.80	-0.43	-0.32
mature and overmature	-1.87	-1.50	-1.63	0.23	0.66	-0.37	0.80
Deciduous softwood							
middle-aged	1.27	0.22	-6.88	-0.32	3.74	0.56	1.82
maturing	4.30	-1.04	-2.70	1.05	1.29	-0.63	4.86
mature and overmature	0.79	-0.69	0.94	-0.10	1.32	-0.20	1.54
34. Samara Oblast							
Coniferous							
middle-aged	2.92	1.65	0.58	0.29	-0.48	-0.35	0.45
maturing	0.88	1.45	-0.03	-1.05	1.94	-0.12	0.51
mature and overmature	-1.65	0.81	-0.42	2.45	-0.69	0.01	-0.95
Deciduous hardwood							

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
middle-aged	3.16	2.54	3.01	0.49	1.23	0.03	1.18
maturing	2.42	2.14	2.54	-0.90	2.51	-0.51	0.53
mature and overmature	1.36	2.31	-0.17	-1.60	1.55	0.01	1.40
Deciduous softwood							
middle-aged	2.67	2.46	1.30	0.90	1.32	-0.20	1.21
maturing	3.28	0.68	1.07	0.71	1.93	-1.15	3.07
mature and overmature	0.89	0.46	0.06	-0.81	2.36	-0.92	1.75
35. Penza Oblast							
Coniferous							
middle-aged	1.35	1.37	0.66	0.06	0.08	0.27	0.06
maturing	-1.44	2.54	1.07	0.31	0.28	-1.29	0.13
mature and overmature	-1.84	2.85	0.41	-0.65	0.43	-1.99	0.57
Deciduous hardwood							
middle-aged	1.20	-0.07	-0.43	1.93	-0.05	-0.14	2.25
maturing	1.50	0.21	-0.23	-0.07	-0.16	9.72	-6.59
mature and overmature	1.37	-0.37	1.77	-1.25	-0.33	-0.54	0.07
Deciduous softwood							
middle-aged	2.00	1.44	0.98	0.88	0.20	0.61	0.03
maturing	1.62	0.62	1.08	1.09	-0.15	0.30	0.05
mature and overmature	-0.07	1.15	0.49	0.72	0.26	-0.63	0.47
36. Saratov Oblast							
Coniferous							
middle-aged	1.11	-0.23	3.86	1.85	1.02	-0.39	1.38
maturing	-1.84	2.33	4.35	-2.26	1.30	0.00	-1.54
mature and overmature	-0.56	1.46	1.00	-2.22	3.75	-1.05	0.74
Deciduous hardwood							
middle-aged	2.57	-0.33	-1.68	4.28	2.25	-0.10	1.14
maturing	1.77	0.13	-0.70	3.59	0.50	0.06	-0.47
mature and overmature	0.97	-0.17	0.98	1.76	-0.24	0.08	1.01
Deciduous softwood							
middle-aged	2.68	0.80	-0.86	5.98	1.48	0.05	2.20
maturing	2.39	0.56	0.30	1.14	0.92	0.16	1.97
mature and overmature	3.23	-1.05	1.12	0.26	0.95	-0.30	1.86
37. Ulyanovsk Oblast							
Coniferous							
middle-aged	2.24	2.12	-0.02	1.59	-0.03	1.30	1.01
maturing	0.44	2.16	-0.11	1.74	0.02	0.53	0.37
mature and overmature	0.57	1.19	0.20	0.07	0.34	0.02	-0.31
Deciduous hardwood							
middle-aged	0.02	4.91	0.00	0.43	-0.09	2.35	1.15
maturing	-0.26	2.07	-0.22	-0.06	0.10	1.73	0.26
mature and overmature	-0.07	2.06	-0.02	-1.42	0.40	0.07	0.79

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
Deciduous softwood							
middle-aged	1.59	9.26	-0.01	1.26	0.05	0.84	-0.34
maturing	2.17	2.19	-0.17	1.13	0.00	0.46	-0.39
mature and overmature	1.46	1.86	0.07	-0.52	0.24	0.36	-0.50
38. Republic of Kalmykia							
Deciduous softwood							
middle-aged	-10.00	7.14	0.00	0.00	-20.00	-	-
maturing	-6.67	0.00	-	-	-	0.00	0.00
mature and overmature	4.00	-0.95	0.00	0.00	0.00	0.00	6.67
39. Republic of Tatarstan							
Coniferous							
middle-aged	0.34	0.52	0.57	-0.63	0.12	0.47	0.14
maturing	-1.49	0.31	1.31	1.30	-0.34	0.11	0.54
mature and overmature	-1.41	0.13	-0.67	1.37	-2.02	2.44	-0.28
Deciduous hardwood							
middle-aged	1.79	0.98	3.39	0.02	-1.77	-0.61	0.59
maturing	0.45	0.72	0.23	-0.73	-3.04	0.20	-0.71
mature and overmature	-0.01	0.95	-0.54	-2.75	-1.23	-0.13	-0.77
Deciduous softwood							
middle-aged	1.60	1.14	3.55	0.94	-0.13	0.09	0.76
maturing	0.79	0.42	1.90	0.46	-0.14	0.65	-0.11
mature and overmature	-0.44	0.05	2.11	0.16	-0.85	0.50	-0.90
40. Krasnodar Kray*							
Coniferous							
middle-aged	3.13	-2.74	-6.25	2.91	-0.34	0.33	0.25
maturing	9.37	-3.71	-4.41	2.49	0.08	-0.05	1.17
mature and overmature	-3.56	0.45	0.56	0.07	2.43	-0.46	0.43
Deciduous hardwood							
middle-aged	1.44	0.11	-2.12	1.76	4.63	0.12	0.18
maturing	0.11	-0.04	0.82	0.37	0.96	0.11	0.05
mature and overmature	-0.70	0.07	0.88	-0.44	2.64	-0.02	0.16
Deciduous softwood							
middle-aged	-0.37	-0.64	0.04	-0.01	4.31	0.10	0.35
maturing	-1.05	0.18	2.70	0.10	4.04	-0.72	1.65
mature and overmature	-0.81	-0.88	1.48	-0.65	-0.15	-0.05	0.69
41. Stavropol Kray*							
Coniferous							
middle-aged	-6.09	0.37	2.76	0.08	4.64	0.05	0.17
maturing	-4.17	0.75	2.97	0.56	8.45	0.00	-0.85
mature and overmature	-5.55	0.23	2.77	-0.56	8.56	0.03	-0.10
Deciduous hardwood							

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
middle-aged	4.60	0.03	-0.45	-0.11	5.46	-0.18	1.98
maturing	3.75	-0.07	1.66	-0.40	3.04	-0.58	-1.43
mature and overmature	-1.27	-0.42	1.37	0.36	4.44	-0.02	-0.58
Deciduous softwood							
middle-aged	-0.71	-0.05	3.88	0.13	4.16	4.42	-3.52
maturing	-1.76	-0.07	4.57	0.30	4.48	-6.13	8.70
mature and overmature	2.33	-0.31	4.69	-0.45	3.75	-0.15	1.12
42. Rostov Oblast							
Deciduous hardwood							
middle-aged	1.32	-2.44	-0.89	3.88	-0.01	-0.03	0.87
maturing	1.92	-1.32	0.39	1.57	-0.48	-3.47	-1.09
mature and overmature	-2.18	3.63	0.95	-1.96	-0.50	-1.16	0.22
Deciduous softwood							
middle-aged	1.12	-0.81	-1.19	13.59	-0.36	4.51	0.92
maturing	0.28	4.58	-0.79	7.44	0.52	-0.80	-0.69
mature and overmature	-2.21	1.32	-0.45	5.76	0.45	-0.33	-0.54
43. Republic of Daghestan							
Coniferous							
middle-aged	-2.06	0.23	5.54	0.26	5.85	0.17	0.04
maturing	-2.76	-0.02	5.82	0.00	4.51	0.00	0.00
mature and overmature	-4.52	-0.05	4.36	0.00	6.29	0.00	0.00
Deciduous hardwood							
middle-aged	4.95	0.16	0.78	0.14	6.97	-0.32	-0.16
maturing	3.31	0.20	1.00	-0.30	3.31	-0.48	0.22
mature and overmature	0.81	0.15	3.96	-0.02	-0.12	-0.15	-0.16
Deciduous softwood							
middle-aged	0.16	-0.10	8.21	0.30	8.70	0.15	-0.20
maturing	-0.92	-0.07	3.26	-0.24	9.70	0.00	0.00
mature and overmature	0.57	-0.34	1.65	-0.51	7.19	-0.33	0.03
44. Kabardino-Balkarian Republic							
Coniferous							
middle-aged	-0.98	-0.68	-0.42	0.90	2.29	0.00	-0.77
maturing	-1.96	0.62	-1.47	1.67	1.18	0.00	6.67
mature and overmature	-3.70	-1.02	-1.27	1.35	-0.62	1.43	4.62
Deciduous hardwood							
middle-aged	-1.77	-0.10	1.43	-0.17	2.09	0.08	-0.30
maturing	-4.59	-0.99	-0.29	-2.99	3.00	0.16	-0.16
mature and overmature	-2.93	-1.05	-0.43	1.35	1.38	-0.39	-0.10
Deciduous softwood							
middle-aged	-0.10	-0.07	-3.06	1.63	1.77	14.41	-7.86
maturing	0.77	-1.82	2.81	0.37	7.88	0.00	-0.43
mature and overmature	1.06	-1.30	9.03	-0.80	7.97	0.36	0.34

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
45. Republic of North Ossetia							
Coniferous							
middle-aged	-5.49	-0.78	1.29	0.83	7.56	-0.26	-0.32
maturing	-8.75	0.00	0.00	20.00	0.00	6.67	0.00
mature and overmature	-1.82	1.43	-	-	-	-	0.00
Deciduous hardwood							
middle-aged	3.76	0.01	-1.25	0.03	0.61	0.18	0.00
maturing	-3.54	0.00	1.06	0.35	-0.37	0.06	-0.05
mature and overmature	1.81	-0.88	0.62	-1.19	1.42	-0.86	-0.02
Deciduous softwood							
middle-aged	-0.83	0.12	5.88	1.01	0.77	-0.50	-0.42
maturing	8.03	0.24	-0.90	-0.14	3.03	-0.28	0.35
mature and overmature	0.93	0.45	-2.29	-0.90	4.44	-0.26	-0.79
46. Chechen Republic and Republic of Ingushetia*							
Coniferous							
middle-aged	-2.63	-1.45	0.00	0.41	5.71	0.00	-0.35
maturing	-1.33	-3.57	5.00	0.00	2.86	0.00	0.00
mature and overmature	12.31	-	-	-	-	0.00	0.00
Deciduous hardwood							
middle-aged	1.01	0.82	0.99	0.81	0.90	0.03	-0.02
maturing	0.04	2.65	-0.46	2.68	0.20	0.10	-0.40
mature and overmature	-0.98	-2.31	-0.47	3.71	-0.80	-0.08	0.46
Deciduous softwood							
middle-aged	-0.26	5.01	0.09	0.61	3.11	0.14	0.08
maturing	-2.83	5.38	0.61	2.16	3.97	0.00	-0.96
mature and overmature	-1.13	-0.81	1.24	3.12	5.98	0.00	-0.78
47. Kurgan Oblast							
Coniferous							
middle-aged	3.77	0.08	2.17	0.04	-0.56	-1.29	2.43
maturing	1.99	-0.01	2.66	-0.04	1.10	-0.47	0.05
mature and overmature	-0.66	-0.87	1.91	-0.35	2.57	-0.12	-0.24
Deciduous softwood							
middle-aged	2.69	1.52	5.93	0.06	4.90	-1.20	-0.19
maturing	1.25	0.75	5.38	-0.13	3.91	-1.01	-0.98
mature and overmature	-0.05	-0.13	8.89	-0.51	3.51	-0.09	0.30
48. Orenburg Oblast							
Coniferous							
middle-aged	0.32	0.63	0.48	2.85	-0.41	-0.34	-1.21
maturing	-1.23	-0.46	0.28	2.31	-0.42	-0.46	1.25
mature and overmature	0.05	-0.08	-0.51	2.81	0.00	-0.35	0.05
Deciduous hardwood							
middle-aged	4.30	-0.11	3.57	0.01	-1.11	0.60	1.95

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
maturing	1.31	-0.34	2.27	0.11	3.31	-0.01	-1.01
mature and overmature	2.33	0.43	1.34	-0.36	4.84	0.43	0.80
Deciduous softwood							
middle-aged	1.39	0.27	4.17	1.51	1.83	-0.31	1.68
maturing	-0.31	-0.03	1.97	0.53	1.03	-0.09	2.23
mature and overmature	0.80	-0.08	-1.82	-0.32	2.27	-0.05	3.67
49. Perm Oblast*							
Coniferous							
middle-aged	0.14	0.47	1.09	0.96	-0.65	-7.03	10.42
maturing	0.01	0.43	0.82	1.37	-0.15	11.11	-7.15
mature and overmature	-0.19	0.99	-0.02	1.23	-0.60	-0.43	-1.00
Deciduous softwood							
middle-aged	2.02	0.64	2.01	3.94	-0.62	0.26	0.39
maturing	0.83	2.08	1.21	4.26	-0.57	0.33	0.48
mature and overmature	-0.11	1.71	-0.08	2.30	-0.31	0.47	-0.50
50. Sverdlovsk Oblast*							
Coniferous							
middle-aged	0.07	1.92	1.52	1.87	0.07	0.35	-0.11
maturing	-0.21	0.34	1.30	2.31	0.30	1.13	-0.03
mature and overmature	-0.88	-0.53	0.25	1.28	-0.41	-0.40	0.01
Deciduous softwood							
middle-aged	-0.35	5.27	0.49	1.92	0.22	0.90	0.52
maturing	-1.06	2.95	0.73	0.39	0.19	1.46	0.13
mature and overmature	-0.58	1.05	-0.10	0.81	0.01	0.34	0.13
51. Chelyabinsk Oblast							
Coniferous							
middle-aged	-0.27	-0.35	6.84	-0.22	4.18	-0.24	1.36
maturing	-2.00	-0.47	5.17	-0.22	4.81	-0.48	0.43
mature and overmature	-2.52	-1.21	4.22	-0.24	4.80	0.08	0.83
Deciduous hardwood							
middle-aged	2.93	-1.62	5.50	0.28	-1.73	-1.01	-0.06
maturing	0.82	-2.87	7.24	-0.39	0.14	-1.91	-0.31
mature and overmature	-1.11	1.12	4.14	-0.22	-3.33	0.96	0.18
Deciduous softwood							
middle-aged	-0.60	-0.30	8.09	-0.07	7.37	-0.27	1.88
maturing	-2.30	-0.11	10.45	-0.14	5.13	-0.36	0.82
mature and overmature	-1.29	-1.16	5.68	-0.38	4.11	0.24	-0.15
52. Republic of Bashkortostan							
Coniferous							
middle-aged	0.35	1.41	1.25	0.89	-0.14	0.75	0.06
maturing	-0.41	0.42	1.08	2.26	-0.14	1.03	-0.03
mature and overmature	-0.49	-0.20	1.46	2.39	-0.09	1.34	-0.77

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
Deciduous hardwood							
middle-aged	2.22	2.28	1.74	0.57	-0.47	-0.20	-0.46
maturing	2.30	2.67	2.37	0.14	-0.74	-1.00	-0.21
mature and overmature	0.95	0.22	0.77	0.58	-0.59	0.80	0.14
Deciduous softwood							
middle-aged	0.94	1.69	3.34	2.18	-0.04	1.11	-0.42
maturing	0.94	0.76	0.95	0.90	-0.14	1.36	0.45
mature and overmature	0.32	0.70	0.93	1.46	0.10	0.66	0.17
53. Udmurtian Republic							
Coniferous							
middle-aged	1.27	0.02	1.77	0.40	1.17	-0.03	3.63
maturing	0.46	0.06	2.38	-0.01	1.13	-0.08	3.85
mature and overmature	0.66	-0.22	2.15	-0.17	1.31	-0.03	3.10
Deciduous hardwood							
middle-aged	5.28	-1.10	4.21	1.11	-4.35	4.44	0.00
maturing	-15.00	21.43	-4.00	6.67	-5.00	0.00	0.00
mature and overmature	0.61	-0.93	9.67	-6.00	0.00	-1.33	2.86
Deciduous softwood							
middle-aged	3.70	0.21	5.42	0.10	1.23	0.07	0.88
maturing	3.90	0.00	1.46	-0.11	1.56	-0.09	1.19
mature and overmature	3.22	-0.36	3.02	-0.55	1.73	-0.09	0.17
54. Altai Kray*							
Coniferous							
middle-aged	3.26	-0.60	-0.23	1.22	0.25	4.85	-0.08
maturing	0.89	1.17	0.29	0.71	0.54	5.33	-0.90
mature and overmature	-0.94	0.63	0.59	-0.80	0.05	0.06	0.09
Deciduous softwood							
middle-aged	2.07	-0.05	0.38	2.45	0.79	1.24	1.84
maturing	0.14	0.44	0.72	2.09	0.60	0.53	0.56
mature and overmature	4.82	-2.28	0.39	1.42	0.22	1.21	-0.08
55. Kemerovo Oblast							
Coniferous							
middle-aged	-0.79	1.14	-0.14	1.06	0.05	0.63	-0.69
maturing	-0.79	-0.29	1.80	1.10	-0.37	2.60	0.11
mature and overmature	-0.19	-1.56	1.93	-0.49	0.25	-0.34	0.86
Deciduous softwood							
middle-aged	2.41	0.12	-0.06	1.83	-0.01	2.97	0.01
maturing	2.60	0.22	0.96	1.34	0.04	3.34	0.09
mature and overmature	0.60	-0.15	1.57	1.05	0.09	0.87	0.39
56. Novosibirsk Oblast							
Coniferous							
middle-aged	2.23	2.44	1.38	0.31	1.91	-1.58	-0.30

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
maturing	-2.50	1.23	2.43	1.87	1.08	-4.00	-0.03
mature and overmature	-3.35	-1.33	1.88	1.89	0.04	1.28	-0.02
Deciduous softwood							
middle-aged	3.40	1.73	0.93	1.72	1.04	3.20	0.00
maturing	0.04	0.48	1.60	1.28	0.09	2.54	0.02
mature and overmature	-0.15	-0.10	0.95	0.71	0.56	0.35	0.51
57. Omsk Oblast							
Coniferous							
middle-aged	2.88	4.09	-0.08	0.31	1.31	-0.31	-0.39
maturing	-1.62	0.22	0.72	1.14	0.48	1.08	2.52
mature and overmature	-0.71	-3.82	-0.49	1.15	0.45	1.60	0.19
Deciduous softwood							
middle-aged	1.47	3.08	0.15	1.42	1.57	0.31	0.16
maturing	1.00	3.55	0.34	0.32	1.51	0.43	1.19
mature and overmature	-0.27	2.65	0.19	0.23	1.09	0.03	-0.56
58. Tomsk Oblast							
Coniferous							
middle-aged	-0.45	-0.08	0.18	-0.16	0.63	3.19	2.33
maturing	-1.10	-0.95	1.17	0.44	1.02	1.02	1.93
mature and overmature	-1.13	0.02	-0.40	0.75	0.31	-0.30	-1.18
Deciduous softwood							
middle-aged	0.65	3.20	2.43	-0.45	-2.26	-2.03	0.79
maturing	-1.99	2.76	4.43	0.33	0.01	-2.38	0.17
mature and overmature	0.09	3.53	0.56	0.10	-0.25	-0.48	0.01
59. Tyumen Oblast*							
Coniferous							
middle-aged	-0.33	-0.10	1.47	0.65	-1.93	1.39	-0.06
maturing	-0.16	-0.78	0.75	0.13	0.10	-1.68	0.14
mature and overmature	0.18	0.85	-0.68	0.01	-0.87	-2.30	-0.07
Deciduous softwood							
middle-aged	1.01	4.11	1.18	-0.81	-1.88	-0.90	1.57
maturing	-0.11	1.47	1.74	-0.46	1.96	-0.01	0.97
mature and overmature	1.84	6.10	1.30	-0.73	0.75	-0.80	0.03
60. Krasnoyarsk Kray*							
Coniferous							
middle-aged	2.25	-2.51	0.32	0.96	-0.36	4.94	0.66
maturing	0.27	-1.33	-0.03	0.89	-0.07	1.55	0.44
mature and overmature	-0.39	-0.78	-0.37	0.00	-0.01	-0.45	-0.03
Deciduous softwood							
middle-aged	-0.37	-0.55	-1.21	2.78	0.17	2.56	0.29
maturing	0.24	-2.10	0.30	1.18	0.30	5.61	-0.04
mature and overmature	0.81	0.76	0.10	0.17	0.30	1.54	0.22

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
61. Irkutsk Oblast*							
Coniferous							
middle-aged	2.23	0.40	-0.63	1.92	2.13	0.67	0.61
maturing	1.33	0.52	0.83	1.13	1.31	0.27	0.37
mature and overmature	-0.24	0.56	0.49	0.53	0.67	0.64	0.05
Deciduous softwood							
middle-aged	-0.21	0.64	-0.02	1.41	-0.22	0.82	-0.09
maturing	2.29	0.47	0.67	1.35	0.92	0.69	0.20
mature and overmature	2.84	1.37	1.55	0.71	1.23	0.45	0.08
62. Chita Oblast*							
Coniferous							
middle-aged	1.59	1.15	-0.10	-0.05	0.82	0.70	-0.04
maturing	0.39	0.06	-0.22	0.54	0.98	0.65	0.09
mature and overmature	0.45	0.00	0.38	-0.19	0.18	0.24	0.14
Deciduous softwood							
middle-aged	2.09	2.48	-0.53	0.46	1.22	0.78	0.43
maturing	1.38	3.02	0.11	0.91	1.90	0.36	0.40
mature and overmature	0.16	1.39	0.39	0.13	1.26	0.92	-0.04
63. Republic of Buryatia							
Coniferous							
middle-aged	-0.44	3.72	-0.56	0.52	0.00	0.49	0.36
maturing	-0.73	0.82	-0.31	0.48	-0.24	0.73	0.20
mature and overmature	-1.19	-0.41	-2.54	0.47	0.45	-0.15	-0.09
Deciduous softwood							
middle-aged	-1.74	2.70	-0.94	1.30	0.99	1.13	-0.22
maturing	-0.27	1.63	-0.34	2.03	0.99	0.76	0
mature and overmature	0.25	1.17	-0.10	1.99	1.16	-0.21	0.40
64. Republic of Tuva							
Coniferous							
middle-aged	3.20	0.44	0.13	0.89	2.04	2.03	-1.10
maturing	-1.66	0.37	0.14	0.94	1.05	0.08	-0.13
mature and overmature	0.80	0.20	0.05	0.82	1.40	0.85	-0.03
Deciduous softwood							
middle-aged	1.08	0.74	0.94	1.27	-0.03	0.33	0.00
maturing	3.31	0.68	0.28	4.08	1.07	0.38	0.01
mature and overmature	9.48	0.30	0.26	0.57	-0.16	0.13	0.05
65. Primorie Kray							
Coniferous							
middle-aged	2.95	0.50	0.30	4.57	-1.19	0.72	-0.84
maturing	0.68	-0.02	1.59	-0.22	-0.39	-0.19	-0.37
mature and overmature	-0.14	-0.03	0.49	-1.53	-0.81	-0.25	0.08

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
Deciduous hardwood							
middle-aged	2.28	1.70	0.24	-0.24	0.10	0.53	1.13
maturing	-0.68	1.35	0.14	-0.06	-0.29	0.14	-0.10
mature and overmature	-1.17	0.71	0.08	-0.56	-0.30	0.00	0.32
Deciduous softwood							
middle-aged	2.75	1.61	-0.31	1.25	-0.02	1.02	0.25
maturing	1.32	0.47	1.00	0.93	-0.67	-0.44	-0.01
mature and overmature	-0.35	-0.13	1.41	0.17	-0.49	0.13	0.14
66. Khabarovsk Kray*							
Coniferous							
middle-aged	-0.20	2.08	0.88	-1.14	0.52	-0.83	-1.46
maturing	-1.98	1.35	0.25	-0.86	-1.20	-1.39	-0.79
mature and overmature	0.34	0.78	0.96	-0.55	-1.21	-1.92	-0.85
Deciduous hardwood							
middle-aged	-0.75	-0.52	-2.69	0.90	1.17	-0.34	-0.28
maturing	0.21	3.54	-3.56	0.63	-0.85	0.17	-0.30
mature and overmature	0.57	1.97	-1.15	1.32	-0.24	0.00	-0.20
Deciduous softwood							
middle-aged	0.19	1.57	-0.78	0.25	-0.53	-0.64	-1.09
maturing	1.26	1.30	0.09	0.71	-0.54	0.02	-0.36
mature and overmature	1.48	1.06	0.32	-0.59	-0.19	-0.47	-0.05
67. Amur Oblast							
Coniferous							
middle-aged	-0.29	-0.09	0.47	0.41	0.11	-0.53	-0.53
maturing	-1.27	-1.27	0.32	0.22	0.01	0.04	0.03
mature and overmature	-0.41	-0.77	0.57	0.10	-0.21	-0.18	0.01
Deciduous hardwood							
middle-aged	-3.33	5.25	-0.29	1.90	2.15	0.08	1.71
maturing	-4.14	2.55	-0.74	2.26	3.82	0.06	0.92
mature and overmature	-1.71	1.57	-5.06	-0.29	0.37	-0.02	0.80
Deciduous softwood							
middle-aged	0.90	-0.19	4.54	1.28	-0.21	-0.31	-0.74
maturing	0.65	0.53	3.46	0.75	0.78	-0.02	-0.55
mature and overmature	1.16	0.70	0.97	0.47	0.51	0.24	-0.23
68. Kamchatka Oblast*							
Coniferous							
middle-aged	5.87	-1.39	-1.23	-0.71	-0.49	-5.19	-1.38
maturing	1.16	-1.84	-1.07	-0.51	-0.88	-13.81	0.15
mature and overmature	6.21	0.91	0.02	0.40	-1.09	-6.25	-0.08
Deciduous hardwood							
middle-aged	4.12	-3.05	-4.75	-4.32	2.32	-2.06	0.07
maturing	-2.37	-0.80	-3.03	-2.23	-0.30	-1.61	-0.18

Table 12A. Continued

Groups of tree stands and age	Period between accounts						
	1966-1961	1973-1966	1978-1973	1983-1978	1988-1983	1993-1988	1998-1993
mature and overmature	-0.25	-0.13	-1.87	-0.32	1.13	0.59	0.08
Deciduous softwood							
middle-aged	0.13	-4.83	-2.20	-0.16	1.39	-0.40	0.22
maturing	3.38	-2.97	-0.97	0.20	2.01	0.53	-0.03
mature and overmature	7.96	0.67	1.43	0.10	0.05	-0.62	-0.01
69. Magadan Oblast*							
Coniferous							
middle-aged	-0.62	-1.73	3.32	-0.02	-6.04	0.16	0.02
maturing	-3.82	0.13	0.40	-0.31	-5.47	-0.01	0.01
mature and overmature	-0.86	-1.80	-0.24	-0.38	-0.94	-0.03	0.02
Deciduous softwood							
middle-aged	11.80	5.19	-0.76	-0.10	-0.23	-0.07	-0.27
maturing	0.90	2.55	11.85	-0.23	-3.13	-0.11	-0.77
mature and overmature	1.55	2.00	5.52	-1.11	3.10	-0.02	-0.37
70. Sakhalin Oblast							
Coniferous							
middle-aged	0.63	3.59	-0.03	1.85	1.65	0.13	-0.12
maturing	0.60	0.73	-0.41	1.47	0.55	-0.35	0.17
mature and overmature	0.04	0.27	-0.74	-0.78	0.25	-1.32	-0.91
Deciduous hardwood							
middle-aged	-0.28	0.42	-0.10	-1.57	1.07	0.39	2.75
maturing	-0.96	-0.92	0.22	1.72	-0.28	0.22	1.39
mature and overmature	-0.60	-0.71	-0.32	1.45	-0.53	-0.09	-0.18
Deciduous softwood							
middle-aged	-1.78	2.21	0.39	1.10	0.70	1.32	-0.43
maturing	0.63	2.18	0.15	-0.42	0.05	1.27	1.27
mature and overmature	-0.03	-0.69	1.13	0.21	0.10	-0.70	-0.50
71. Republic of Sakha (Yakutia)							
Coniferous							
middle-aged	0.00	-0.07	-0.50	-1.39	0.25	0.14	-1.59
maturing	-0.50	0.14	-0.88	-1.40	0.19	0.48	-1.54
mature and overmature	-0.01	-0.42	-0.12	-1.07	-1.73	-0.16	0.86
Deciduous softwood							
middle-aged	-2.78	-0.09	-2.13	2.76	2.82	0.15	-0.08
maturing	-1.12	-0.44	-3.01	5.66	6.61	-0.74	0.13
mature and overmature	5.36	-0.92	0.22	2.02	8.50	0.36	0.05

* For analytical purposes, the administrative borders of Republics, Krays and Oblasts, which have changed their territories in accordance with the 1993 Constitution of the Russian Federation, are shown with the 1961 borders.

Scientific publication

Vladislav A. Alexeyev
Richard A. Birdsey
Maxim V. Markov

STATISTICAL DATA ON FOREST FUND OF RUSSIA AND CHANGING OF FOREST PRODUCTIVITY IN THE SECOND HALF OF XX CENTURY

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Alexander B. Volkov

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Boris L. Volkov

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