USDA United States Department of Agriculture
Forest Service
Northern Research Station

# New Jersey's Forest Resources, 2006

Research Note NRS-21

This publication provides an overview of forest resource attributes for New Jersey based on an annual inventory conducted by the Forest Inventory and Analysis program at the Northern Research Station of the U.S. Forest Service. These annual estimates, along with web-posted core tables, will be updated annually. For more information regarding past inventory reports for this state, inventory program information, and sampling/estimation procedures, please refer to the citations at the end of this report.

**Table 1. – Annual estimates, uncertainty, and change**

| | Estimate | Sampling Error (%) | *Change Since 2005 (%) |
|---|---|---|---|
| **Forest Land Estimates** | | | |
| Area (1,000 acres) | 2083.3 | 3.4 | -4.1 |
| Number of live trees 1-inch diameter or larger (million trees) | 1096.5 | 7.0 | -10.2 |
| Dry biomass of live trees 1-inch diameter or larger (1,000 tons) | 121293.5 | 4.6 | -15.2 |
| Net volume in live trees (1,000,000 $ft^3$) | 3745.6 | 5.6 | -14.4 |
| Net volume of growing-stock trees (1,000,000 $ft^3$) | 3638.2 | 5.7 | -14.2 |
| Annual net growth of live trees (1,000 $ft^3$/year) | 113,066 | 10.0 | NA |
| Annual mortality of live trees (1,000 $ft^3$/year) | 24,082 | 22.0 | NA |
| Annual removals of live trees (1,000 $ft^3$/year) | 32,463 | 35.0 | NA |
| **Timberland Estimates** | | | |
| Area (1,000 acres) | 1943.9 | 4.0 | -6.4 |
| Number of live trees 1-inch diameter or larger (million trees) | 1010.1 | 7.6 | -14.3 |
| Biomass of live trees 1-inch diameter or larger (1,000 tons) | 114172.1 | 5.1 | -16.9 |
| Net volume in live trees (1,000,000 $ft^3$) | 3548.0 | 6.1 | -15.5 |
| Net volume of growing-stock trees (1,000,000 $ft^3$) | 3446.8 | 6.2 | -15.4 |
| Annual net growth of growing-stock trees (1,000 $ft^3$/year) | 97,166 | 10.0 | NA |
| Annual mortality of growing-stock trees (1,000 $ft^3$/year) | 17,079 | 20.0 | NA |
| Annual removals of growing-stock trees (1,000 $ft^3$/year) | 29,467 | 34.0 | NA |

*Because of high sampling errors, estimates of change between 2005 and 2006 are not statistically significant

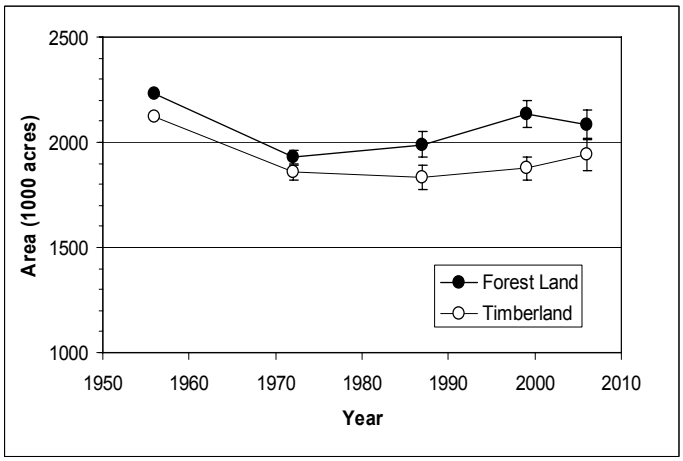


**Figure 1. – Area of timberland and forest land by year.**

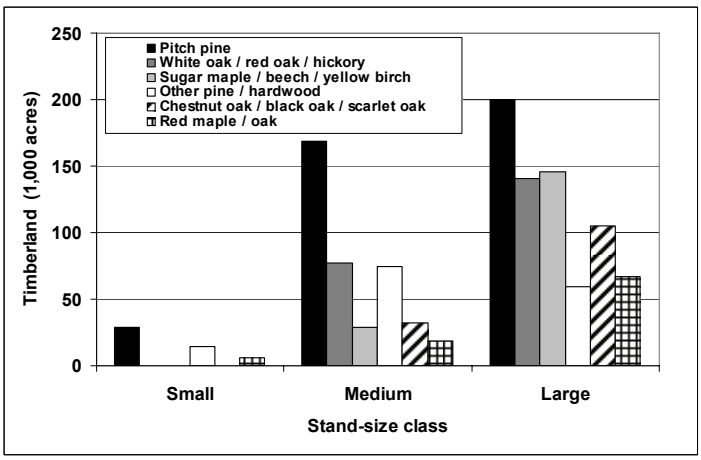


**Figure 2. – Area of timberland for top six forest types by stand size class.**

**Table 2. – Top 10 species by statewide volume estimates**

| Rank* | Species | Volume of live trees on timberland (1,000,000 ft$^3$) | Sampling Error (%) | Change since 2005 (%)** | Volume of sawtimber trees on timberland (1,000,000 bdft) | Sampling Error (%) | Change since 2005 (%) |
|---|---|---|---|---|---|---|---|
| 1 | Pitch pine | 514.6 | 12.3 | -15.8 | 1,337.90 | 14 | -22.9 |
| 2 | Red maple | 452.5 | 15 | 3.1 | 1,119.40 | 18.8 | 6.4 |
| 3 | Atlantic white-cedar | 279.8 | 42.9 | -11 | 872.7 | 45.8 | -3.7 |
| 4 | White oak | 222.8 | 16.3 | -2.1 | 605.4 | 24.8 | -10.8 |
| 5 | Northern red oak | 219.4 | 19.3 | -29.6 | 881.2 | 21 | -29.8 |
| 6 | Yellow-poplar | 210.1 | 28.6 | -25.3 | 1,001.40 | 30.6 | -27.9 |
| 7 | Sweetgum | 185.4 | 31.1 | -31 | 684 | 33.4 | -32.1 |
| 8 | White ash | 184.4 | 21 | -25.4 | 602.4 | 30.4 | -28.1 |
| 9 | Black oak | 180.8 | 21.6 | 0.7 | 585.8 | 28.1 | -10.6 |
| 10 | Chestnut oak | 162.0 | 22.1 | 0.7 | 539.2 | 27 | -3 |
| | Other softwood species | 101.1 | 29.3 | 82.2 | 259.5 | 38.9 | 202.8 |
| | Other hardwood species | 835.1 | 9.7 | 97.6 | 2,108.40 | 12.8 | 57.5 |
| | **All species** | **3,548.00** | **6.1** | **-15.5** | **10,597.30** | **7.7** | **-19.2*** ** |

*Considering sampling error, estimates for species ranked first and second overlap and estimates for species ranked 3-10 overlap, therefore estimates of pitch pine and red maple volume are statistically the same and volume estimates for the remaining eight species are statistically the same.
**For individual species, 2006 estimates overlap those for 2005, therefore estimates of change are not significant.
***Although the estimated sawtimber volume is down from the 2005 estimate, it is still 32 percent above the sawtimber volume estimate in 1999.

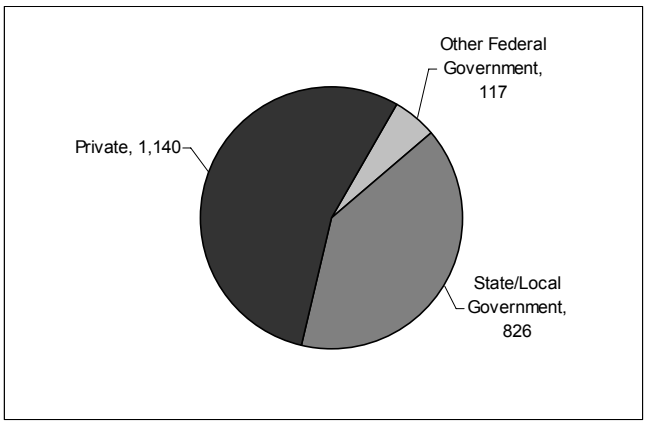


**Figure 3. – Area of forest land (1,000 acres) by ownership group.**

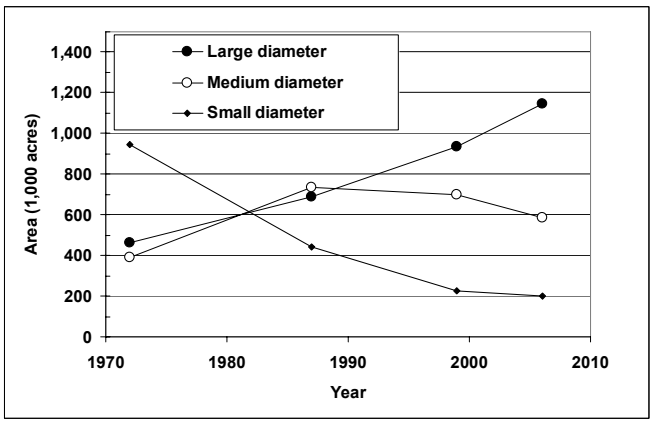


**Figure 4. – Area of timberland by stand size class and year.**

# New Jersey Issue Update – Data Accuracy

In 2006, FIA completed the third year of its annual forest inventory of New Jersey. During these 3 years, 441 plots were measured, 42 percent of which were in a forested condition. These plots represent 54 percent of the total number of plots that FIA will establish in New Jersey. Over the next 2 years the remaining 46 percent of the plots will be measured, completing a full cycle of data collection. Currently, there are low numbers of plots to base estimates on for the 2004, 2005 and 2006 annual inventories, and as a consequence, estimates for these years have high sampling errors and comparisons to previous estimates are very course. Measurement of additional plots over the next 2 years will reduce sampling errors to acceptable levels and allow meaningful comparisons to previous inventories. After a complete cycle of plots is collected, future annual estimates will be based on a rolling average of the most current complete set of plots.

Looking at estimates of sawtimber volume illustrates how estimates in the initial stages of the FIA annual inventory process can vary. The 2004 estimate showed a 33 percent increase in sawtimber volume over the 1999 estimate with an 18 percent sampling error. The addition of data collected in 2005 caused sawtimber volume to increase again and sawtimber volume to be 63 percent more than the 1999 estimate with the sapling error declining to 11 percent. Plots added in 2006 lowered the sawtimber estimate to 32 percent above the 1999 estimate and sampling error to be further reduced to 8 percent. At this time, annual estimates of change are not meaningful, e.g. the 19 percent decline in sawtimber volume from 2005 to 2006. Rather than change, these differences are more of a reflection of the variability of the data as we sample more plots to arrive at a statistically sound estimate. Looking forward, the addition of plots for 2007 and 2008 will continue to reduce the sampling error. The 2008 sawtimber inventory will probably have a sampling error similar to that in 1999-- 6 percent. Despite the small sample size, data collected so far indicates that sawtimber volume in New Jersey has substantially increased since 1999.

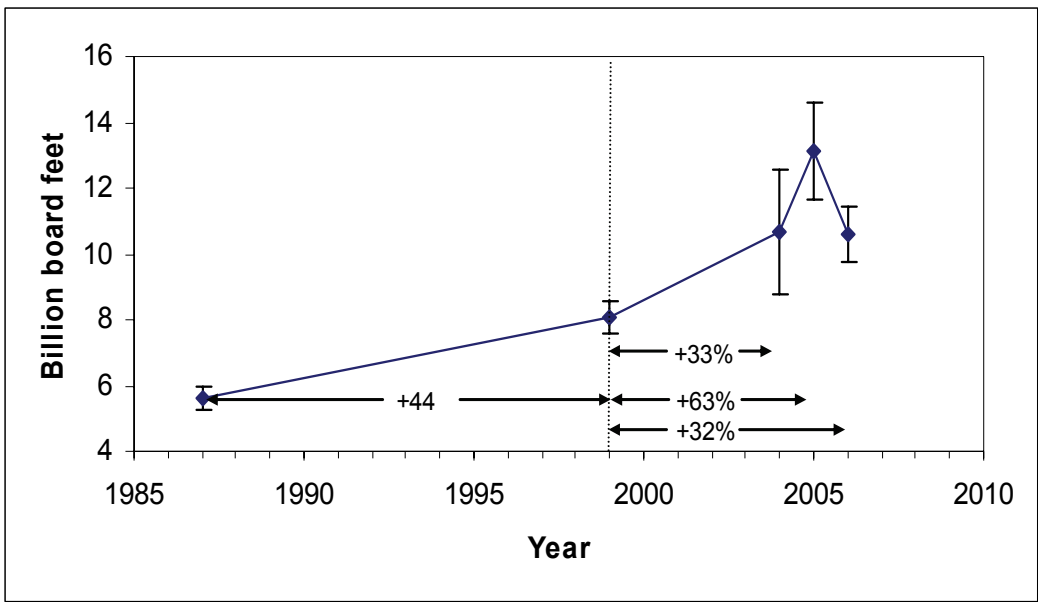


**Figure 5. – Sawtimber volume on timberland in New Jersey 1987, 1999, 2004, 2005, and 2006 with percent change between selected inventories (sampling errors have been converted to confidence intervals at the 67 percent confidence interval).**



## Citation for this Publication

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## FIA Program Information

Bechtold, W.A.; Patterson, P.L. 2005. The enhanced Forest Inventory and Analysis program: national sampling design and estimation procedures. Gen. Tech. Rep. SRS-80. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 85 p.

Smith, W.B. 2002. Forest inventory and analysis: a national inventory and monitoring program, Environmental Pollution. 116: 233-242.

USDA Forest Service. 2007. Forest inventory and analysis national core field guide, Vol. 1, field data collection procedures for phase 2 plots, ver. 4.0 [Online]. Available at www.fia.fs.fed.us/library/field-guides-methods-proc/. (Accessed Aug. 15 2008).

## Additional New Jersey Inventory Information

DiGiovnni, Dawn M.; Scott, Charles T. 1980. Forest statistics for New Jersey-1987. Resour. Bull. NE-112. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 97 p.

Griffith, Douglas M.; Widmann, Richard H. 2001. Forest statistics for New Jersey: 1987 and 1999. Resour. Bull. NE-152. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 70 p.

Ferguson, Roland H.; Mayer, Carl E. 1974. The timber resources of New Jersey. Resour. Bull. NE-34. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 59 p.

Widmann, Richard H. 2005. Forests of the Garden State. Resour. Bull. NE-163. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 20 p.