biomass is proportional to SAR height with 15 t/ha change in biomass per m height change, and no tendency of saturation up to 350 t/ha. This relationship was fairly stable for a range of acquisition settings, and during spring, summer, and autumn. This means that changes in biomass and carbon can be extracted from repeated acquisitions. We compared InSAR and radargrammetry and obtained almost identical relationships. This means that we can apply both InSAR from bi-static Tandem-X data or radargrammetry from repeat-pass acquisitions with other missions. The accuracy has been fairly good in comparison with other satellite remote sensing methods, with RMSE values of about 55 t/ha (42%) at the plot level for 250 m^2 plots and about 25 t/ha (19%) at the stand level. Testing this in Indonesia and Tanzania has also provided promising results for REDD, including logging detection.

Forest aboveground biomass estimation in China. Wu, B., Zeng, Y., Zhao, D. (*Chinese Academy of Sciences, China; wubf@irsa.ac.cn; yuanz@irsa.ac.cn; zhaodan@irsa.ac.cn*).

In order to study the carbon cycling in China, we estimated China's forest aboveground biomass (AGB) in 2012 with eight separate sub-areas. More than 5 000 sample plots of different forest types, which included coniferous forest, deciduous forest, and mixed forest, were surveyed nationwide, and airborne LiDAR data was acquired in five sub-areas, each covering 60~200 km^2, respectively. The sample plots and LiDAR data provided a typical AGB sample dataset, while the LiDAR and Geoscience Laser Altimeter System (GLAS) data provided a precise canopy height dataset. Combining these two datasets, a continuous canopy height dataset with MODIS Bidirectional Reflectance Distribution Function (BRDF) product was inversed, and then the AGB in each sub-area was extrapolated with the canopy height dataset, MODIS data, and some other auxiliary data. The extrapolation model was a forest type based remote sensing model of which the main inputs were canopy height time series analyzed parameters of MODIS vegetation indices, and LAI data, terrain elevations, and China's land cover product. Finally, the models were applied according to the different forest typed in each sub-area to get China's AGB.

C-17 New developments in the use of remote sensing and national forest inventories for estimation and mapping

Organizers: Gregory Reams (U.S. Forest Service) & Ken MacDicken (UN-FAO, Italy)

Origin and methodological aspects of national forest inventory in Brazil (NFI-BR). David, H., Netto, S.P. (*University of Paraná, Brazil; hassancamil@gmail.com; sylviopelliconetto@gmail.com*).

Brazil is recognized worldwide as a country with exuberant biodiversity, especially when it comes to the Amazon rainforest. However the information about the Brazilian forest resources is still incipient, due to lack of researches at national level. Some researches had been conducted, but with particular objectives and methodologies, especially the case of FAO mission in the Amazon and the RADAMBRASIL, both happened between the 1950s and 1970s. Aiming at the establishment of public policies and the recognition of forest resources, the Brazilian Forest Service started the National Forest Inventory in Brazil (NFI-BR) in 2011, including landscape and socio-environmental surveys, besides data collection of soil and forest species. A systematic grid was used, in which each point was allocated every 400 km^2, having a cluster composed of four subunits of 1 000 m^2 each, except in the Amazon, where this area will be increased to 2 000 m^2. The grid can be intensified in the future to 100 km^2 or 25 km^2. Until mid-year 2013, the inventory of the Santa Catarina State was carried out completely and partially in Parana, Rio de Janeiro, and Rio Grande do Sul States. The forecast for the beginning of the NFI in the Amazon rainforest is in 2014.

Development of carbon monitoring methods in Ecuador. Granja, D., Segura Ramos, D. (*Ecuador Ministry of the Environment, Ecuador; agranja@ambiente.gob.ec; dsegura@ambiente.gob.ec*).

In recent years, Ecuador has made significant progress in the area of assessment of forest resources by providing an information base for their natural resource monitoring system. Currently there are three important components to the system: (1) a historical deforestation map, whose main objective is to build the historical setting of spatially explicit deforestation at the national level; 2) a continental ecosystems map, aimed at identifying priority areas for conservation, restoration, and sustainable use of natural resources; and 3) the national forest assessment, whose main objectives are to improve the management of forests and associated resources and facilitate participation in REDD + mechanisms. These three initiatives of the Ministry of Environment of Ecuador (MAE) are the basis for its Monitoring Natural Heritage of Ecuador program. MAE has developed this program with technical and financial support from the Food and Agriculture Organization (FAO), the Organization of the Amazon Cooperation Treaty (OTCA), among other national and institutional partners.

Preliminary results of the global forest biomass survey. Healey, S. (*U.S. Forest Service, USA; seanhealey@fs.fed.us*), Lindquist, E. (*United Nations Food and Agriculture Organization, Italy; Erik.Lindquist@fao.org*).

Many countries do not yet have well-established national forest inventories, and among those that do, significant methodological differences exist, particularly in the estimation of standing forest biomass. Global space-based LiDAR (Light Detection and Ranging) from NASA's now-completed ICESat mission provided consistent, high-quality measures of canopy height and density. The United Nations Food and Agriculture Organization, together with the United States Forest Service, has coordinated an international effort to calibrate ICESat measurements with field measurements of aboveground biomass, and is using these measurements in a model-based estimation context around the world. This effort is called the Global Forest Biomass Inventory (GFBI), and each contributing country to the 2015 Global Forest Resources Assessment will be provided with LiDAR-based, national-level biomass density estimates. It is anticipated that many countries now reporting aboveground biomass using only international defaults will choose to report GFBI numbers. Project methodology will be described in this presentation, and preliminary estimates for cooperating countries will be discussed.