

# Towards global *in situ* forest biomass data repository: International Forest Biomass Network

Dmitry Schepaschenko (International Institute for Applied Systems Analysis)  
Jérôme Chave (Université Toulouse III Paul Sabatier)  
Stuart J. Davies (Smithsonian Tropical Research Institute)  
Christopher Dresel (Spatial Focus GmbH)  
Steffen Fritz (International Institute for Applied Systems Analysis)  
Simon L. Lewis (University College London; University of Leeds)  
Christoph Perger (International Institute for Applied Systems Analysis)  
Oliver Phillips (University of Leeds)  
Klaus Scipal (European Space Agency)

## Abstract

Biomass is an essential indicator for monitoring the Earth's ecosystems and climate. It is a critical input for greenhouse gas accounting, the estimation of forest losses and degradation, renewable energy assessment, the development of climate change mitigation policies such as REDD+, and many other applications. Rapid, recurrent, wall-to-wall biomass assessment is possible with remote sensing (RS) only. However, there is no RS instrument for direct biomass measurement. All available or foreseen methods require extant, diverse, up-to-date, reliable and comparable *in situ* data for calibration/validation.

The International Forest Biomass Network (IFBN) is an international cooperation to establish and maintain a global *in-situ* forest biomass database. The IFBN project is launched under the auspices of the European Space Agency to provide ground biomass data measurements for the Earth Explorer mission BIOMASS. The project aims to establish a data sharing policy and overcome the existing barrier between data providers and users. Another important task is to define the technical requirements to ensure data comparability.

IFBN will include national and international consortia (e.g. AfriTRON, RAINFOR, CTFS-ForestGEO) devoted to coordinating long-term research with permanent sampling forest plots. They have (i) established permanent sampling plots, (ii) proposed robust protocols for accurate tree mapping, and measurement, (iii) monitored existing plots repeatedly, and (iv) established databases with a special emphasis on data quality control at the tree level and valorisation of historical databases.

A minimum set of database values include: principal investigator and institution, plot coordinates, number of trees, forest type and tree species composition, wood density, canopy height, above ground biomass of trees over 10 cm in diameter. Plot size is 1 ha (preferably) or at least 0.25 ha.

This database will be essential for validating and calibrating satellite observations and various models. The focus is to provide ground support for the ESA Earth Explorer BIOMASS mission. We are looking into synergy with other ongoing projects (e.g. GlobBiomass) and other missions (e.g. NASA GEDI, NISAR and JAXA ALOS).

More info: [www.forest-observation-system.net](http://www.forest-observation-system.net)