



First mission – towards a global harmonised in-situ data repository for forest biomass datasets validation

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Global measurements of forest height, biomass are urgently needed as essential climate and ecosystem variables, but can benefit from greater co-operation between remote sensing (RS) and forest ecological communities. The Forest Observation System – FOS (<https://forest-observation-system.net/>) is an international cooperation to establish a global in-situ forest biomass database to support earth observation and to encourage investment in relevant field-based observations and science. FOS aims to link the RS community with ecologists who measure forest biomass and estimating biodiversity in the field for a common benefit. The benefit of FOS for the RS community is the partnering of the most established teams and networks that manage permanent forest plots globally; to overcome data sharing issues and

introduce a standard biomass data flow from tree-level measurement to the plot-level aggregation served in the most suitable form for the RS. Ecologists benefit from the FOS with improved access to global biomass information, data standards, gap identification and potentially improved funding opportunities to address the known gaps and deficiencies in the data. FOS closely collaborate with the CTFS-ForestGEO, the ForestPlots.net (incl. RAINFOR, AfriTRON and T-FORCES), AusCover, TmFO and the IIASA network. FOS is an open initiative with other networks and teams most welcome to join. The online database provides open access for: forest plot location, canopy height and above-ground biomass. Plot size is 0.25 ha or larger. The database will be essential for validating and calibrating satellite observations and various models. Comparison of plot biomass data with available global and regional maps (incl. IIASA global biomass map by Kindermann et al., 2013; Boreal and temperate forest by Thurner et al., 2013; NASA tropical by Saatchi et al., 2011; WHRC tropical by Baccini et al., 2012; WUR pan-tropical by Avitabile et al., 2016; IB-CAS global map by Hu et al., 2016; GlobBiomass map by Santoro et al., 2018) shows wide range of uncertainties associated with biomass estimation.