



Earth observations for improving national monitoring capacities

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With contributions by many ...

GFZ

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Global Forest Observation Initiative GFOI – a GEO flagship

Global partnership for coordinating international support to tropical countries on forest monitoring and GHG monitoring.



GFOI plenary 9-11. may 2023 at FAO HQ, Rome

<https://www.fao.org/gfoi/>

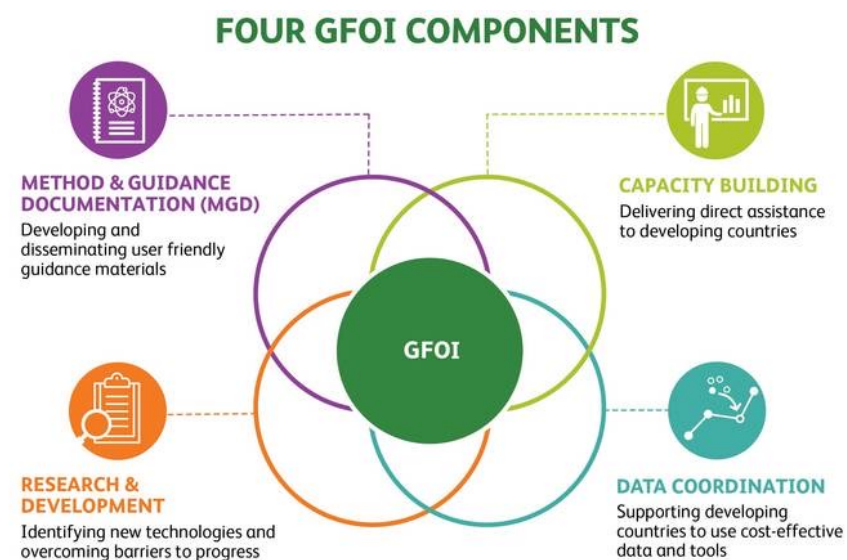
Global Forest Observations Initiative





GFOI – Global Forest Observations Initiative

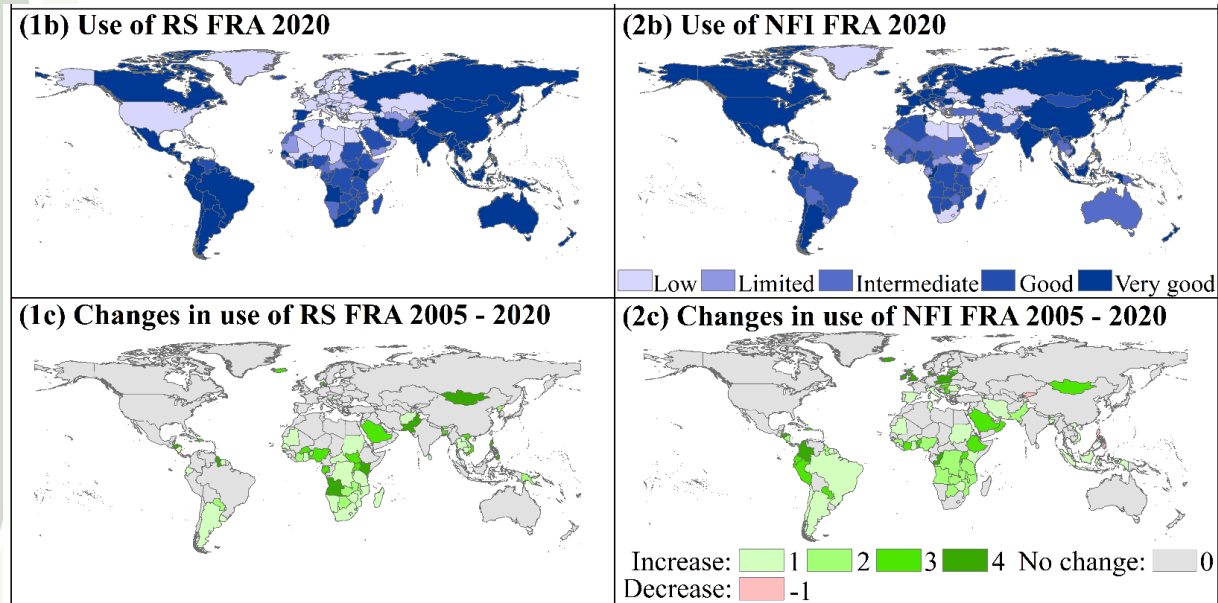
- An informal partnership that coordinates international support to countries in the tropics on forest monitoring and green house gas (GHG) accounting for international reporting purposes.
- **Leads Group:**
 - govts. of Australia, Germany, Norway, the United Kingdom and the United States,
 - Committee on Earth Observation Satellites (CEOS),
 - European Space Agency (ESA),
 - Food and Agriculture Organization of the United Nations (FAO)
 - World Bank.
- **4 GFOI Components:** MGD, Capacity Building, R&D, Data Coordination.



<https://www.fao.org/gfoi/en/>



National Forest Monitoring/Data Assessment based on FAO's FRA 2020



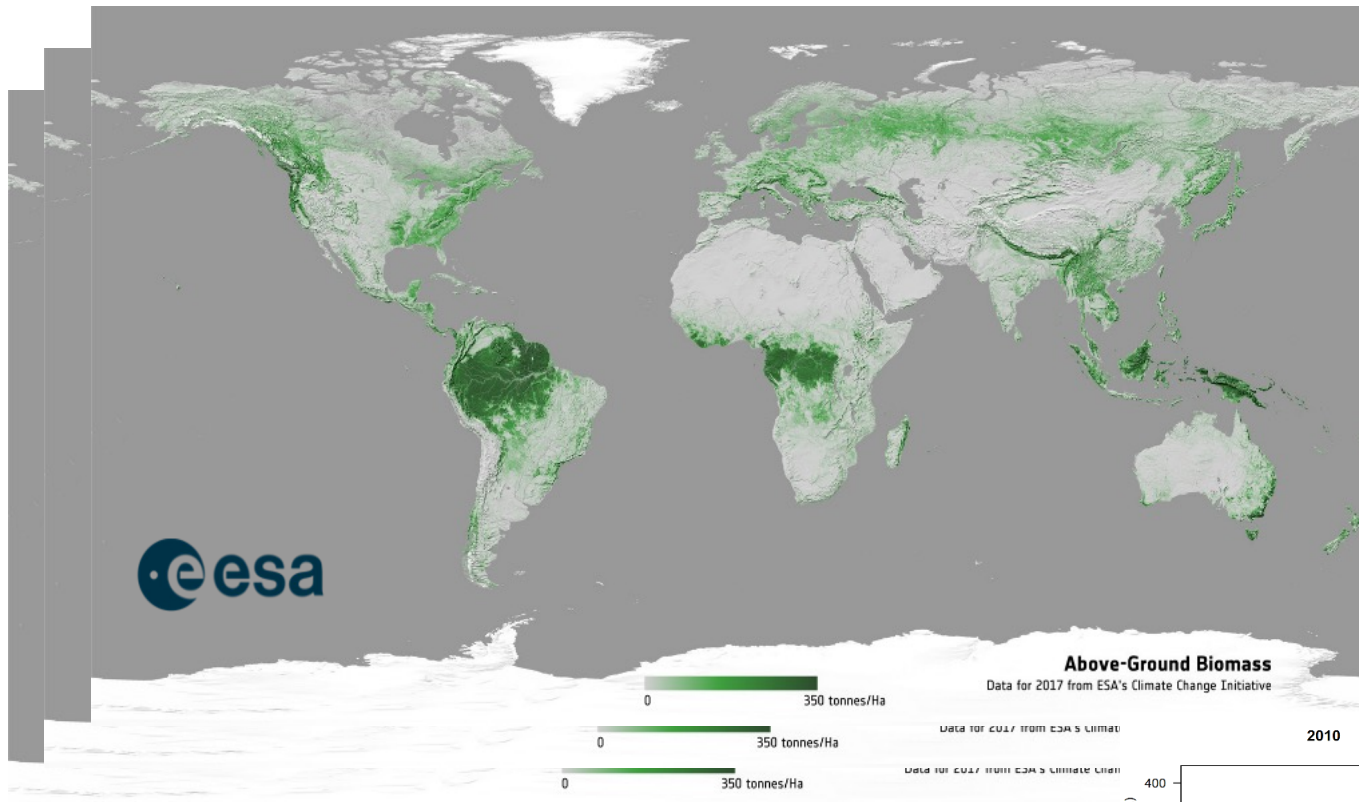
Nesha et al., 2021. [An assessment of data sources, data quality and changes in national forest monitoring capacities in the Global Forest Resources Assessment 2005–2020](#), ERL

Nesha et al., 2022. [Exploring characteristics of national forest inventories for integration with global space-based forest biomass data, STOTEN](#)

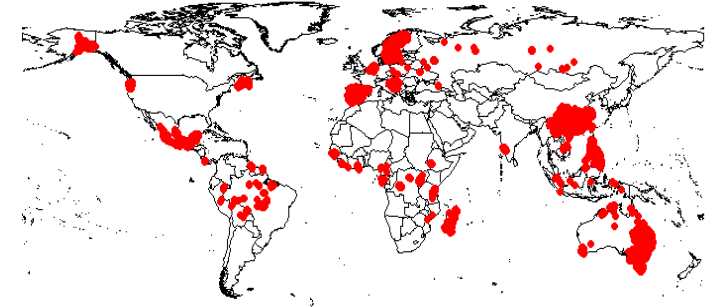
- Continuous improvement in the use of RS for area & change estimation based on free and open satellite data
- National forest inventory (NFI) data improvements widespread in tropics, mostly one-time NFI's
- Importance of both international support and countries own investments
- Key issues for future:
 - Sustain progress
 - Fill remaining gaps
 - Respond to evolving needs
 - Space-based biomass estimation and NFI's



Aboveground biomass estimation using satellite data

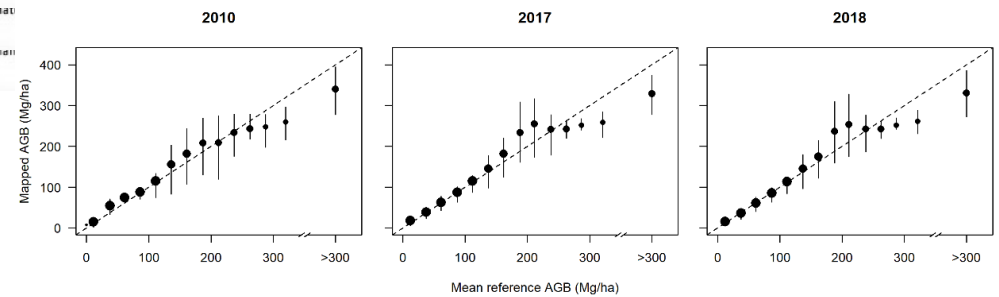


Global reference database (~109.000 plots)

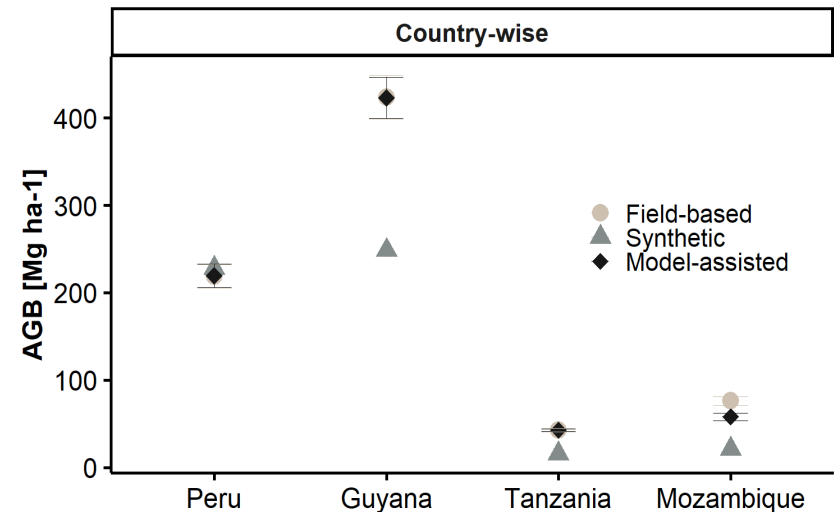
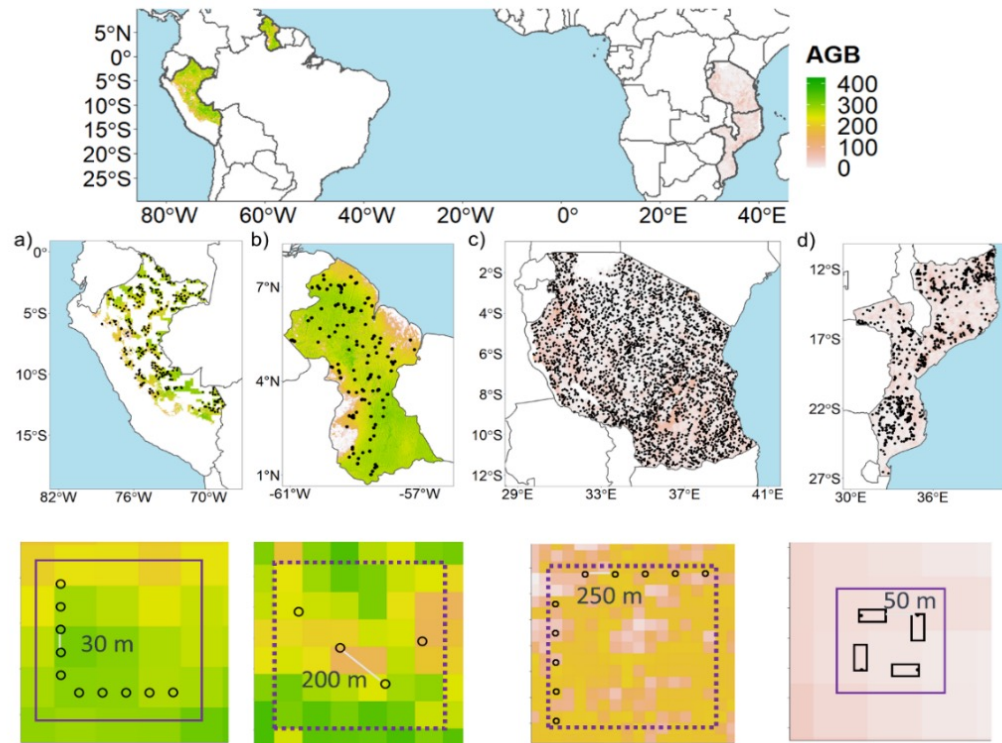


Biomass harmonization for Global Stocktake
UNFCCC COP 26 dashboard:
<https://ceos.org/gst/>
<https://earthdata.nasa.gov/maap-biomass>

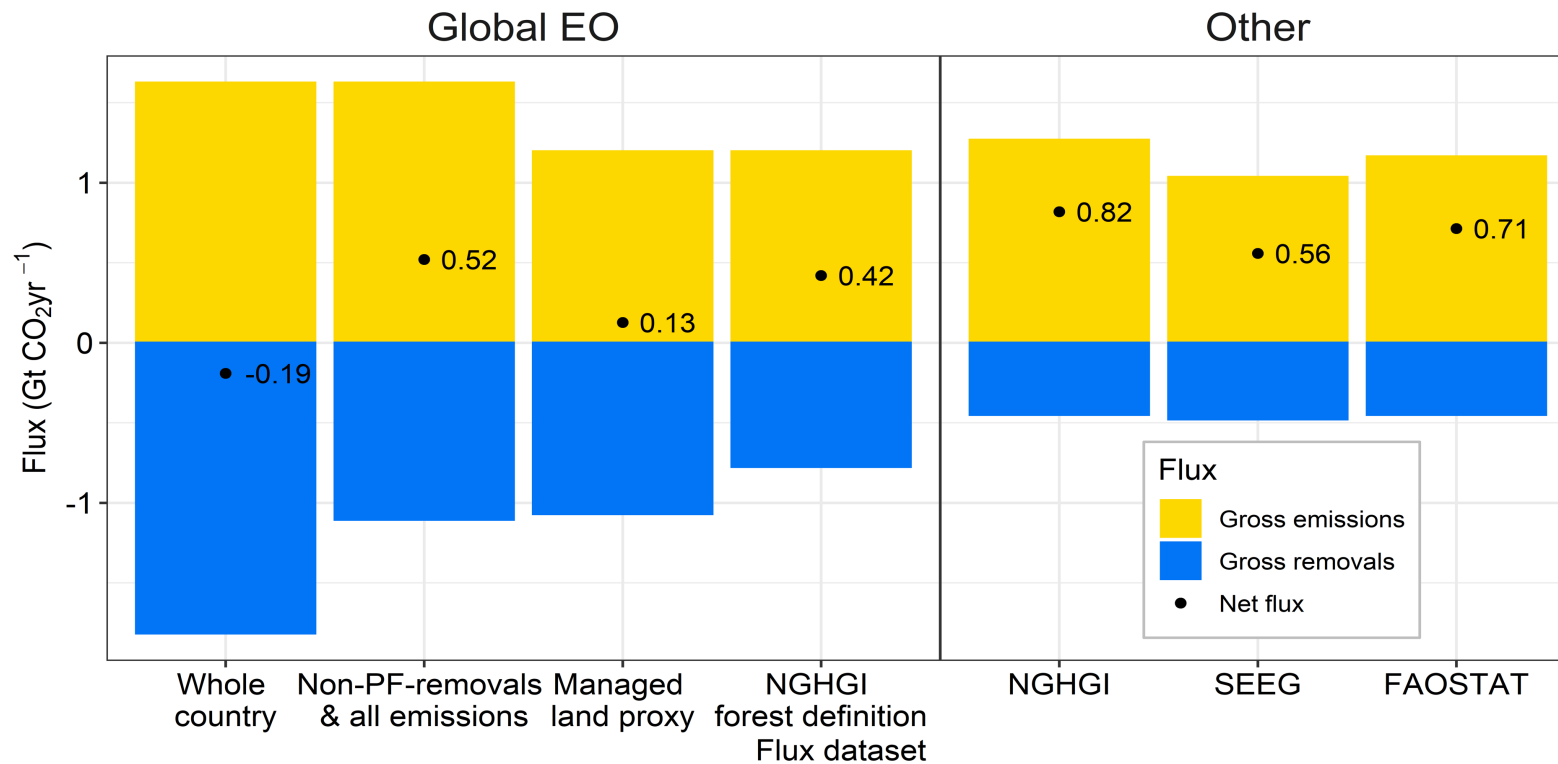
ESA Global aboveground biomass for 2010, 2017, 2018, 2019 2020 at 100m spatial resolution, <http://cci.esa.int/biomass> Santoro et al., 2021, ESSD



Improving the precision in AGB estimates from the use of the global biomass maps by integration with NFI data



Reconciling national and global estimates



Adjustments to the Global Earth Observation (EO) forest-flux estimate to increase comparability with the definitional approach of other flux datasets, including National Greenhouse Gas Inventory (NGHGI) for Brazil. Bars denote the average annual gross emissions/removals and black points and associated text denote the net forest carbon fluxes over the period 2001 to 2020. The left panel shows the impact of adjustments made to the Global EO dataset [16] when considering managed forest/land. Non-PF refers to Non-Primary Forest. Right panel shows other flux datasets, namely the NGHGI of Brazil [23], SEEG-Brazil [24] and FAOSTAT [29] for Brazil. Note the original time-period for NGHGI was 2002 to 2016, and values have been adjusted to reflect the period 2001 to 2020 (see Methods). Uncertainty measures have been excluded from the figure for clarity due to the high uncertainty associated with all flux datasets. Credit: Viola Heinrich

Summarizing remarks

1. Important achievements in country uptake of Earth Observation data for forest/land sector GHG inventories
2. Coordinated efforts among technical community, international organizations and country experts
3. Next key issues:
 - Integration of E with NFIs
 - Estimating forest regrowth and carbon sink
 - Relevance for supporting land use sector climate action
 - Aligning estimates for the global stocktake