

Enhancing national biomass estimates with the use of EO forest data:

Country progress

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GFOI R&D Biomass component

GFOI Session on Tropical Forest Monitoring

LPS, 24 June 2025



GFZ Helmholtz Centre
for Geosciences



Global Forest
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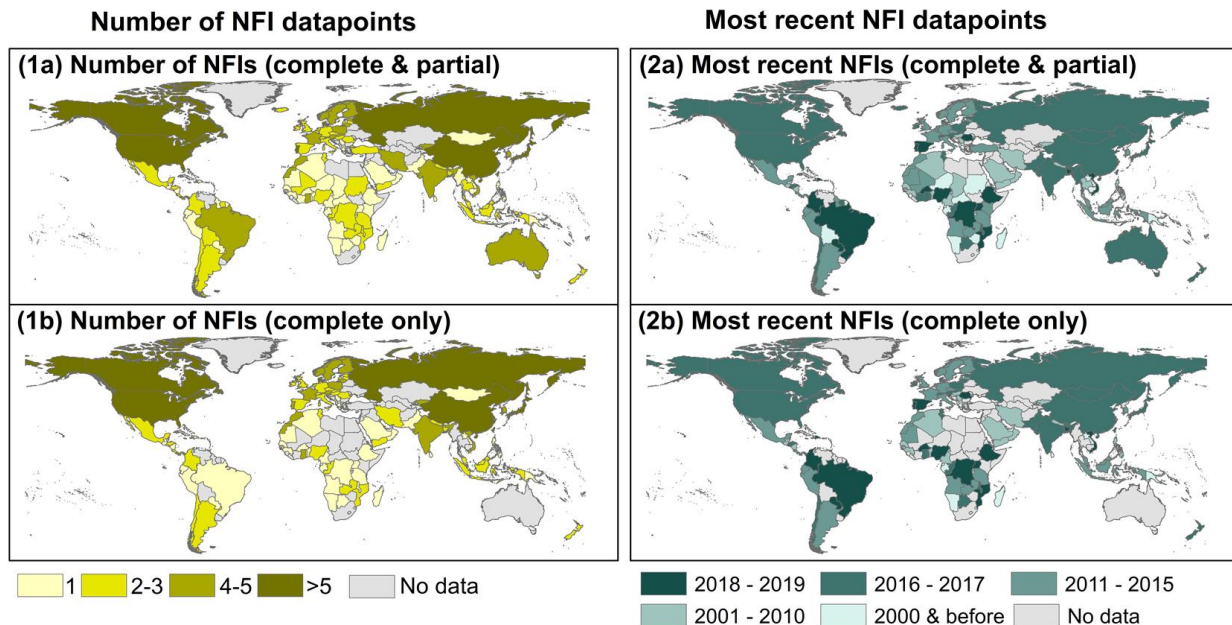
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Ground-based information

Robust and timely forest biomass data is needed for sustainable forest management and climate action

Country progress of National Forest Inventories (NFIs)

- Challenges with incomplete coverage
- Challenges with re-measurements → only round completed

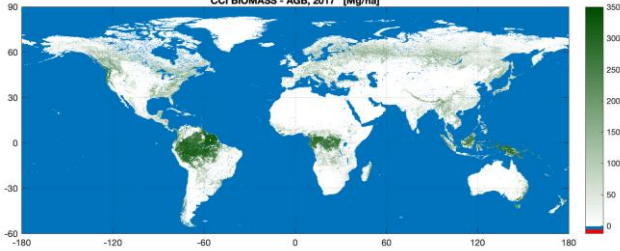


EO biomass information availability

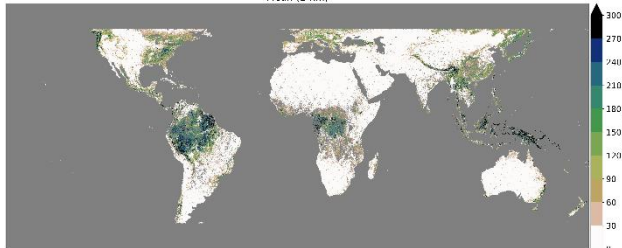


biomass
cci

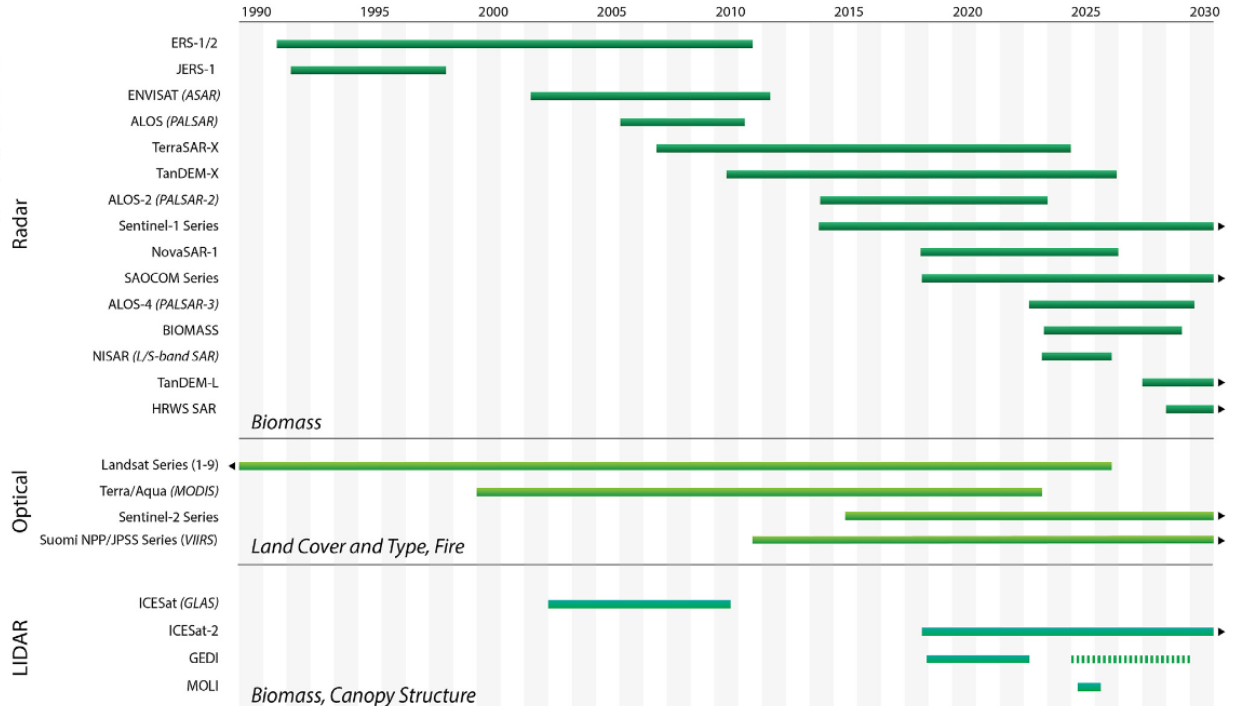
CCI BIOMASS - AGB, 2017 [Mg/ha]



Mean (1-km)



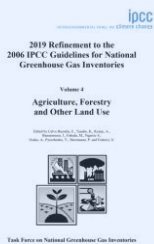
And more space based mission to come



Ochiai et al. 2023. Towards a roadmap for space-based observations of the land sector for the UNFCCC global stocktake. iScience.

Guidance and recommendations

How can biomass maps support biomass/ biomass change estimation?



2019 -
2020



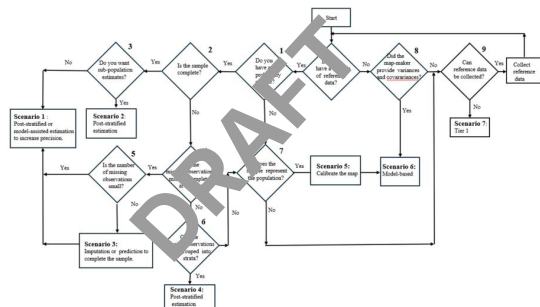
Group of experts [EO, NFI, country rep.] working on a more extensive recipe



Potsdam workshop
(Oct 2024)



Enhancing biomass estimates

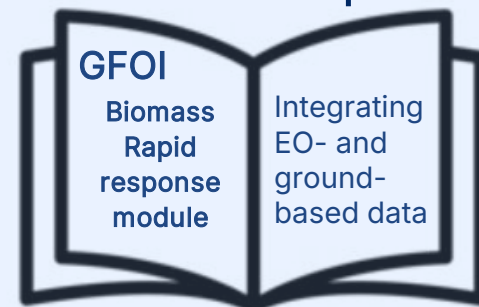


Rapid response module (in prep.)



Further guidance under development

~ Oct 2025



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In progress

Further guidance under development

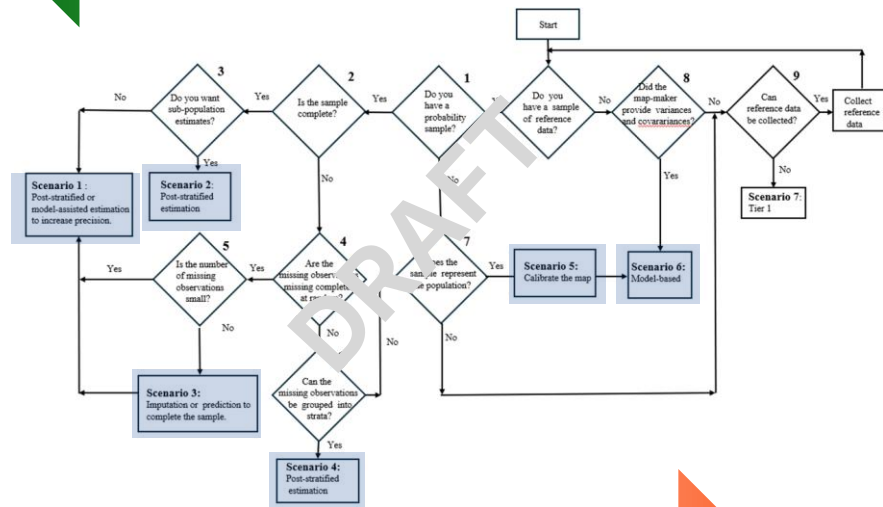
Enhancing biomass estimates integrating ground-based information with EO data

Availability & quality of reference data

Different methodological approaches and inferential strategies based on the availability & quality of reference data, and general purpose for the integration..

Methodological approach

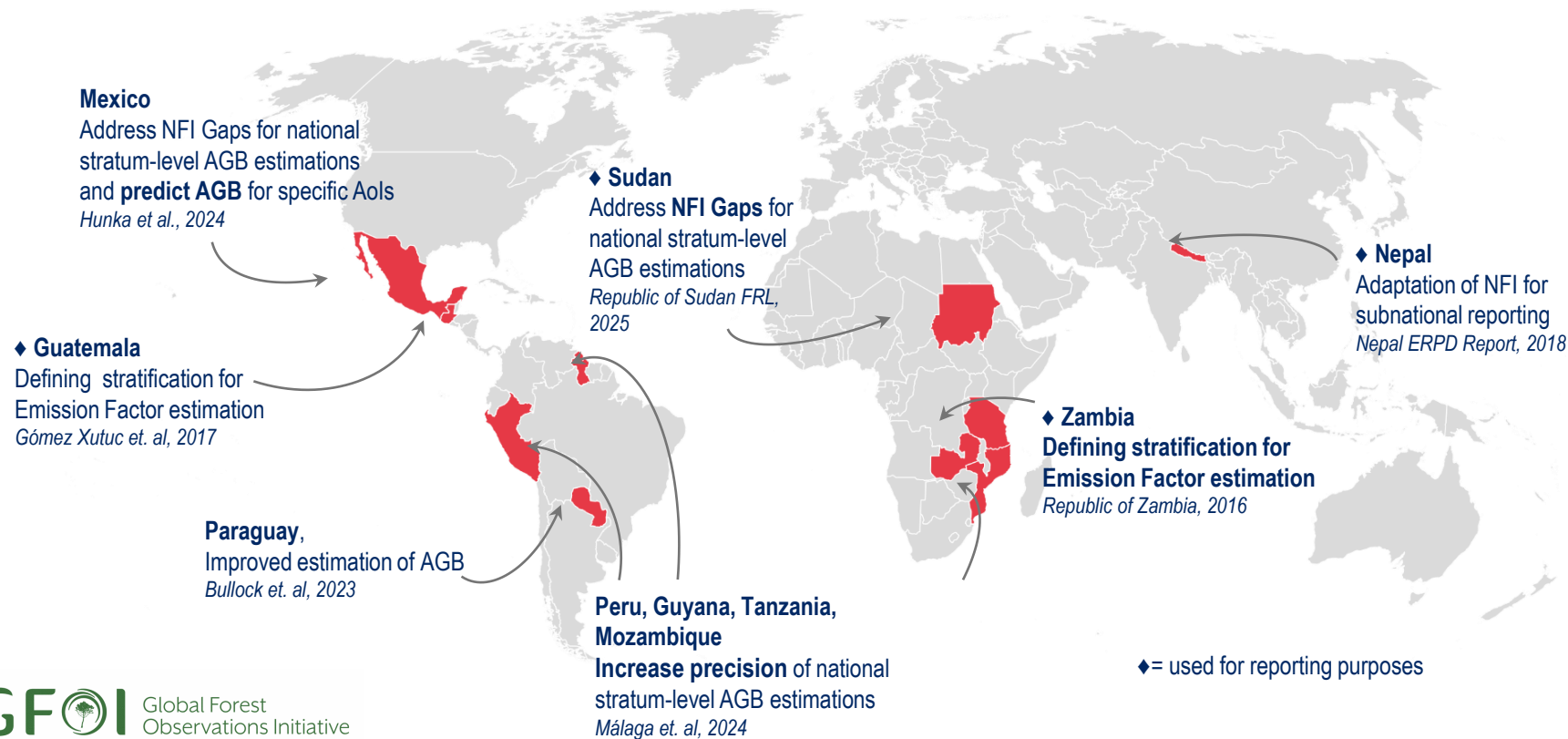
...in progress...



Increase risk of biased

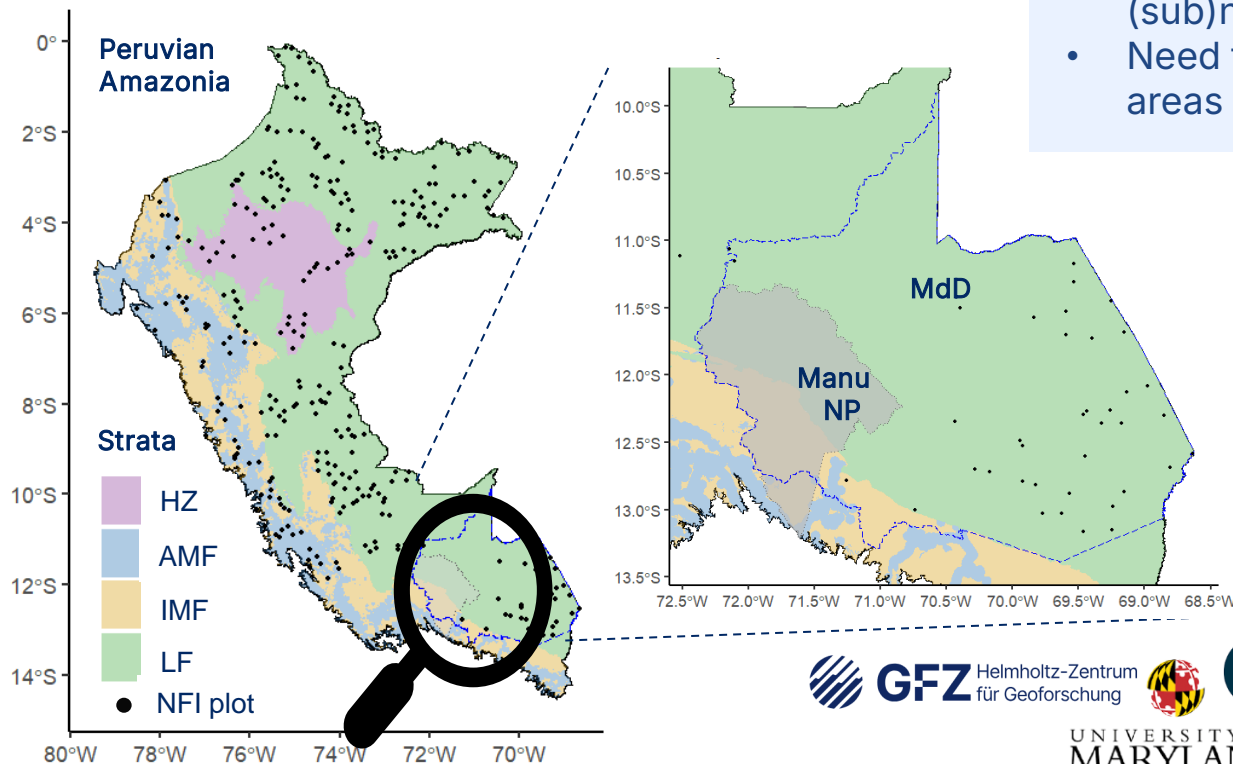
Increase in complexity and computational power

Early country examples in the tropics using EO biomass data



From cookbook to practice

Country example: Peruvian Amazonia



Country need:

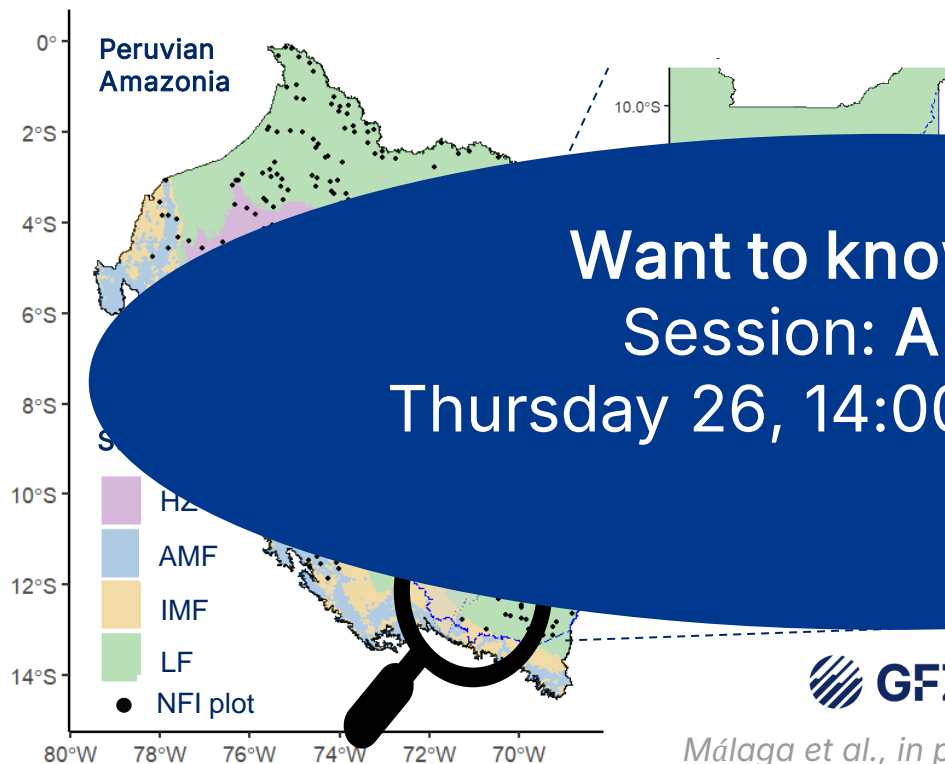
- Interest to enhance the precision of their (sub)national biomass estimates [EO]
- Need for AGB estimates for specific areas of interest

Assessing different inferential techniques **at different scales** [different sampling intensities] → opportunities and challenges

Málaga et al., in prep.

From cookbook to practice

Country example: Peruvian Amazonia



Country need:

- Interest to enhance the precision of their (sub)national biomass estimates [EO]
- Need for AGB estimates for specific areas of interest

Want to know more?
Session: A.02.04
Thursday 26, 14:00-15:30 Hall F2

Key messages

- EO biomass products as an **opportunity to complement** country (sub)national biomass estimates → **representative ground-based information continue to be key** for (sub)national biomass estimates.
- **Different countries have different data availability and needs**, and thus the application of biomass maps is tailored to country circumstances/needs. Still, general recommendation are possible, and are further enriched by more country examples.
→ **Natural progress from research demonstrations to country case studies.**
- A good understanding of the NFI sampling design is needed and hence the **importance building partnership [co-creation] with the country counterparts** (knowledge exchange)

Thank you for your attention

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Questions, comments, feedback,
restaurant recommendations?



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