

# Biomass maps aligned to IPCC 2019 guidance

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## Science Question

- How can Earth Observation (EO) data provide Aboveground Dry Woody Biomass Density (AGBD) estimates that align with IPCC Tier 1 standards for natural forests?
- How can the numerous existing datasets on forests available globally be combined to provide the IPCC global forest status/condition classification (primary, old secondary and young secondary forests)?

## Analysis

- To replicate the IPCC Tier 1 table with AGBD estimates derived from data collected from spaceborne instruments, it was first required to stratify global forests into the same classes as the IPCC does.
- To achieve this, we conducted a Boolean analysis of a suite of existing datasets, including satellite-derived forest tree cover, height, age and land use classification layers.
- EO-based estimates of mean AGBD from the GEDI and ICESat-2, and ESA CCI Biomass map, were then derived for each delineated class.

## Results

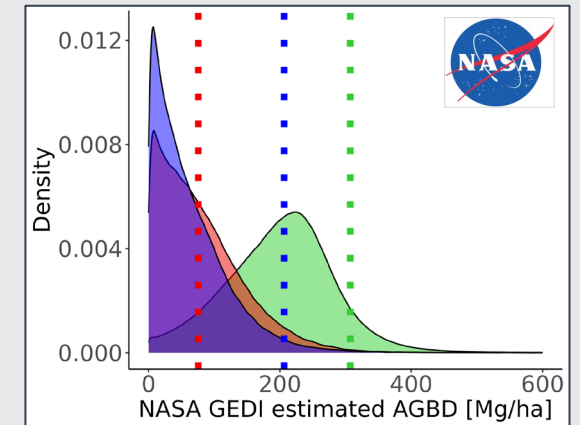
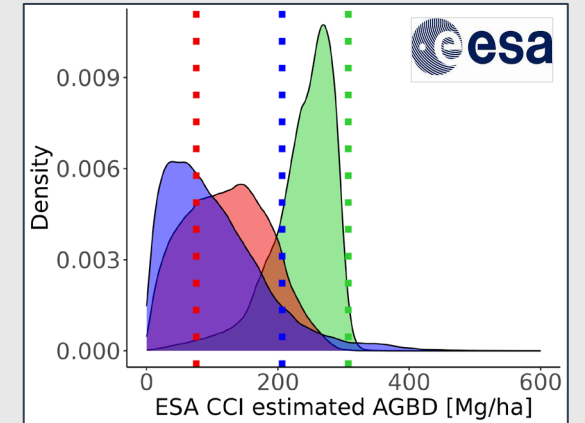
- Across the world's natural forests (excluding planted forests), approximately 1678 Mha of primary forests, 1265 Mha of old secondary forests and 316 Mha of young secondary forests were identified
- Generally, the trends of AGBD across all classes are captured well by the EO-datasets; like the IPCC values, the GEDI/ICESat-2 dataset estimates that primary Asian tropical rainforests and mountain systems harbor some of the highest AGBD globally, while the CCI dataset estimates that primary African rainforests harbor the highest AGBD.

## Significance

The EO-based AGBD estimates are expected to be an independent contribution to the IPCC Emission Factors Database in support of UNFCCC processes, and the forest classification expected to support the generation of other policy-relevant datasets while reflecting ongoing shifts in global forests with climate change.

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EO-based estimates ■ primary forests ■ old secondary forests ■ young secondary forests  
 IPCC values ⋯ primary forests ⋯ old secondary forests ⋯ young secondary forests  
⋯ IPCC, single value for all statuses/conditions

*Figure 1: Distribution of forest aboveground biomass in South American tropical rainforests, derived from NASA GEDI and ESA CCI Biomass initiative.*