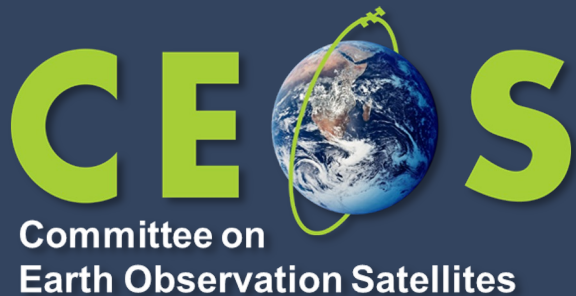


SIT Technical Workshop 2023

Harmonizing Biomass Maps With Policy
Needs: Development of National Prototypes
for the Global Stocktake



Laura Duncanson & Neha Hunka

University of Maryland

Agenda Item 3.2

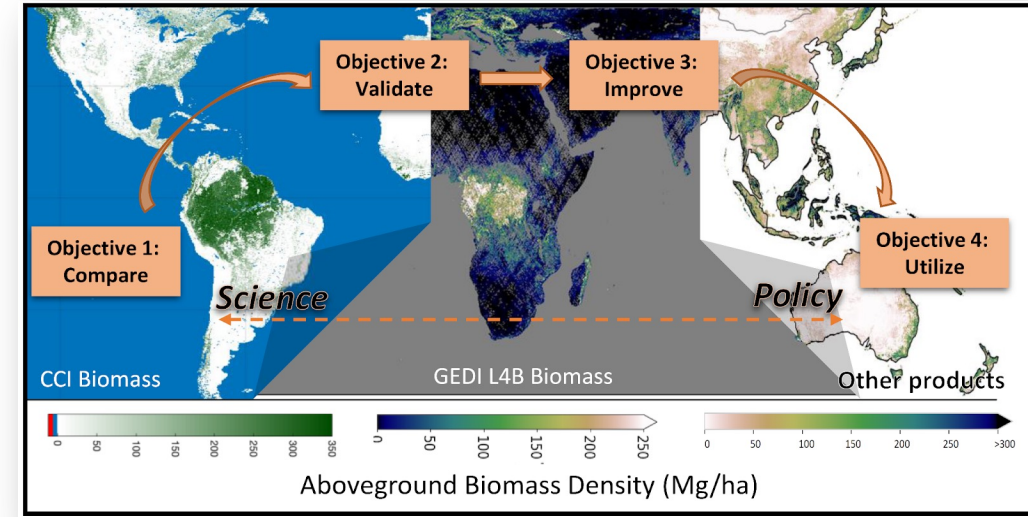
SIT Technical Workshop 2023

18th - 19th October 2023, ESA/ESRIN

Biomass Harmonization



- ❖ Coordinated effort between CEOS agencies and users/producers of aboveground-biomass (AGB) maps. Effort part of LSI AFOLU in collaboration with WGCV LPV.
- ❖ Purpose is to communicate a clear and consistent message on forest AGB products, especially as the number of public datasets grow
- ❖ Increasingly important as new biomass mission launches are approaching (NASA/ISRO's NISAR, ESA's BIOMASS, JAXA ALOS/MOLI)
- ❖ Toward inclusion of EO biomass products in national reporting frameworks (currently missing!)



Supports uptake of CEOS biomass protocol (endorsed in Spring 2021) which recommended consistent and transparent cal/val of biomass products across agencies



biomass
cci



- Version 4 with global maps from 2010, 2017, 2018, 2019 and 2020 in cooperation with



- Released at GFOI Plenary May 2023

- Consistency: a decade of change

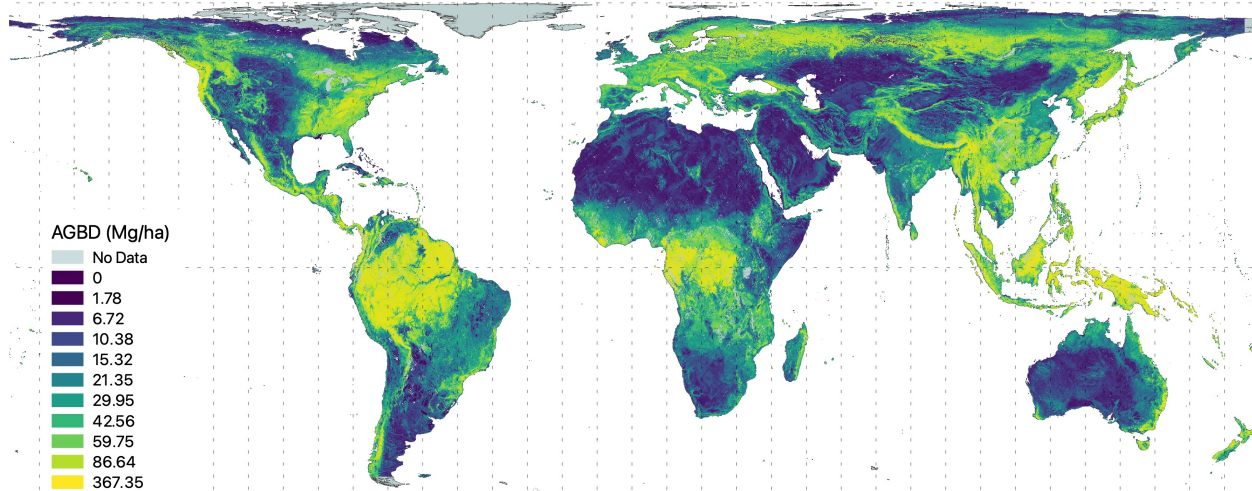
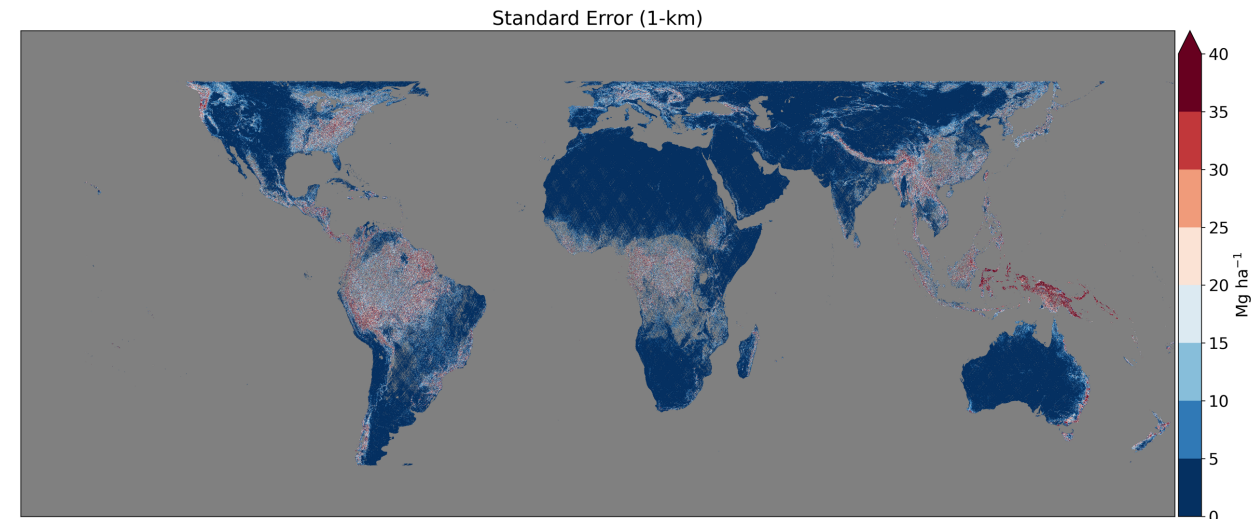
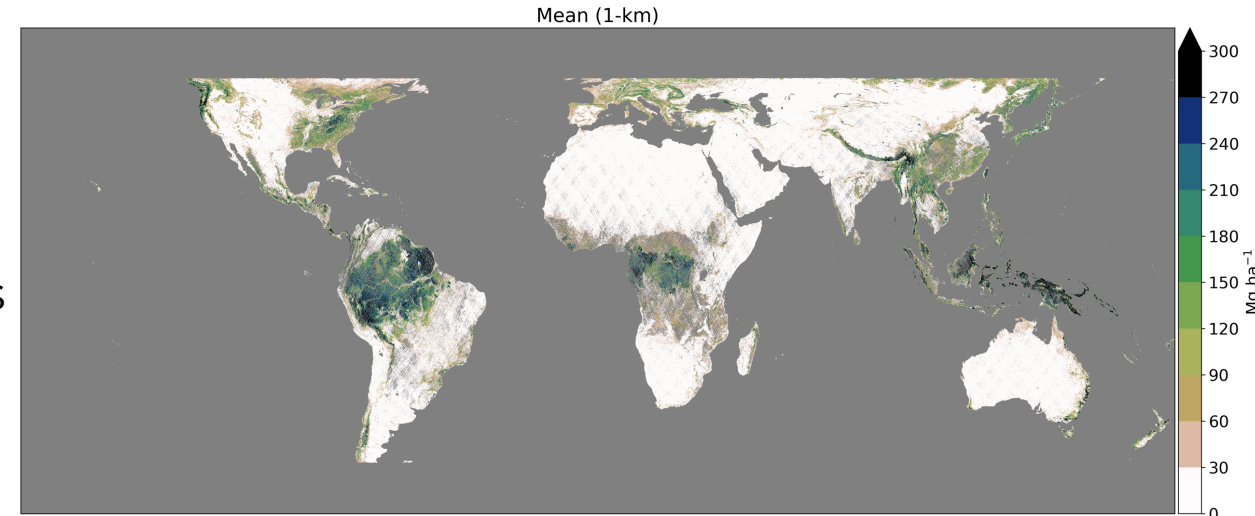
→ <https://climate.esa.int/en/odp/#/project/biomass>



GEDI Biomass Products



- ❖ New GEDI biomass products recently released
- ❖ Complementary boreal biomass product using ICESat-2 released in August, 2023
- ❖ GEDI product includes national biomass estimates
- ❖ GEDI currently in hibernation but should be turned back on in late 2024, overlap with NISAR/BIOMASS!



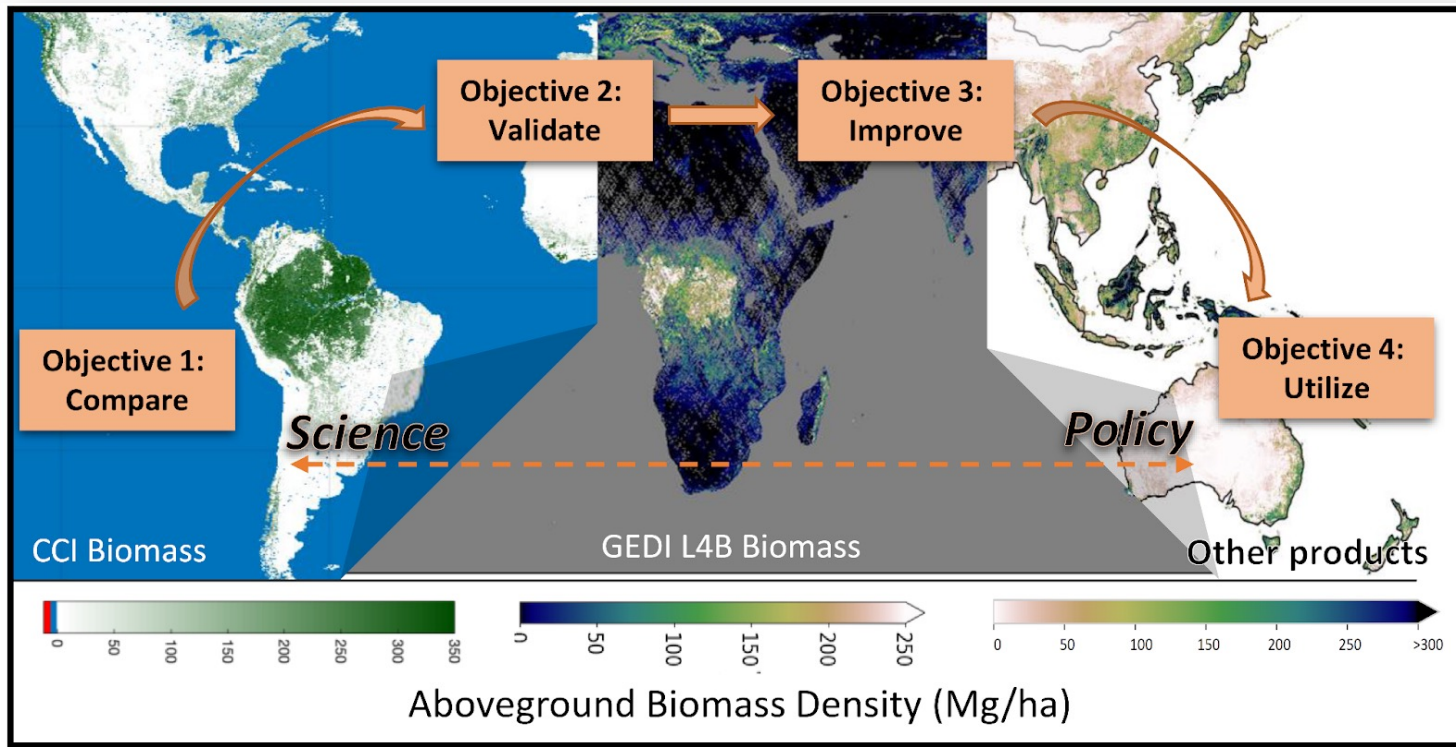
GEDI + ICESat-2 for global biomass mapping with NASA lidars

Biomass Harmonization Activities



- ❖ Biomass product intercomparison framework and paper
- ❖ Creating policy-relevant (IPCC) tables with EO biomass products instead of default means to increase uptake

Harmonizing maps with policy needs



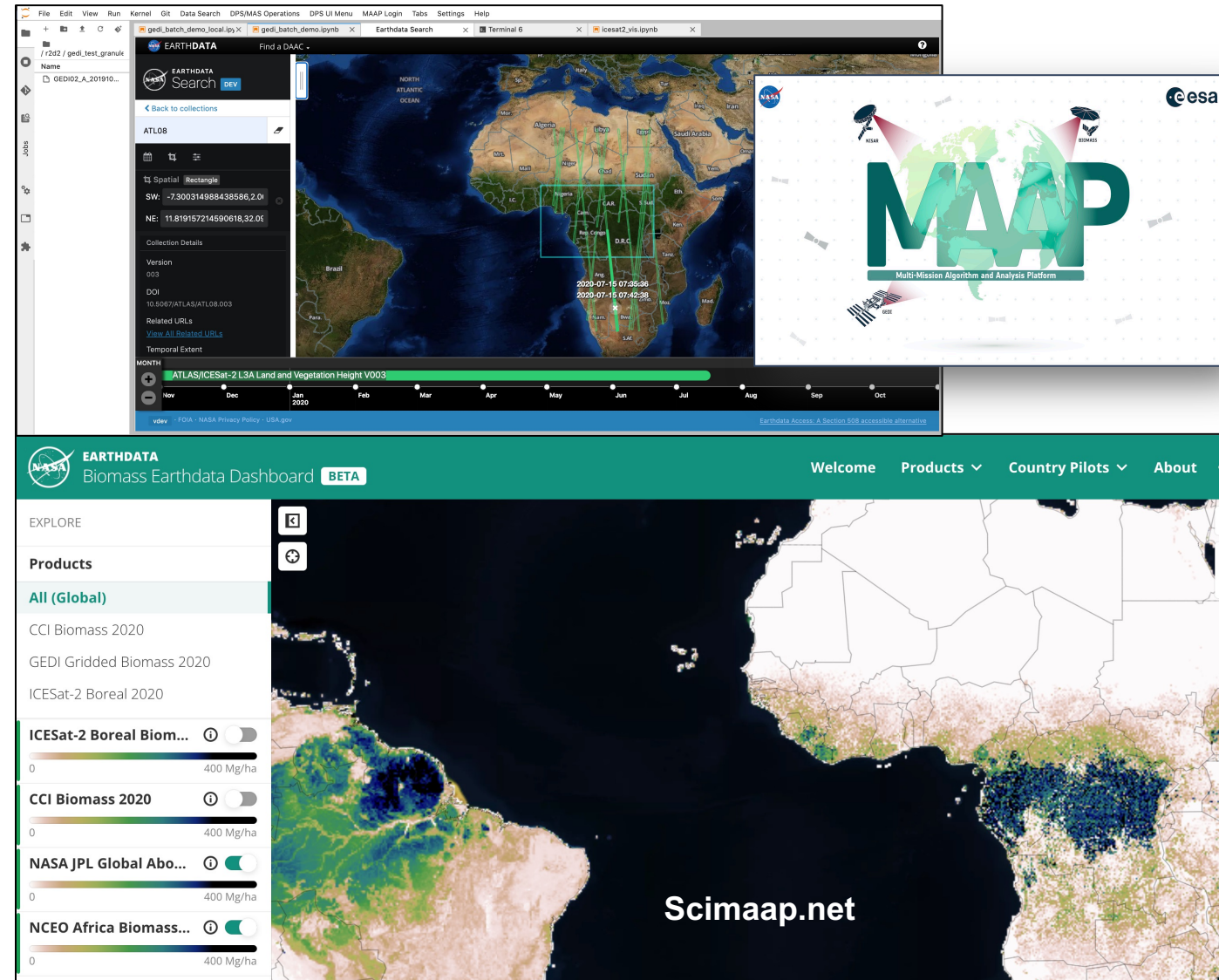
2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Variable	Description	Equation from the IPCC 2006 Guidelines
B_{AFTER}	Biomass stocks on land type i immediately after conversion [t d.m. ha ⁻¹]	Equation 2.16
B_{BEFORE}	Biomass stocks on land type i before conversion [t d.m. ha ⁻¹]	Equation 2.16
ΔC_G	Annual increase in carbon stocks due to growth on land converted to another land-use category or in land remaining in the same land-use category by vegetation type and climatic zone [tC y ⁻¹]	Equation 2.7, 2.9
ΔC_L	Annual decrease in carbon stocks due to losses from harvesting, fuel wood gathering and disturbances on land converted to other land-use category or in land remaining in the same land-use category [tC y ⁻¹]	Equation 2.7 and 2.11
C_{t1}	Carbon stock in the pool at time $t1$ [tC]	Equation 2.5 and 2.8
C_{t2}	Carbon stock in the pool at time $t2$ [tC]	Equation 2.5 and 2.8

Region/Condition	Above-ground biomass [tonnes d.m. ha ⁻¹]	Uncertainty	Uncertainty type	References
Asia/condition ²	404.2	120.4	SD	1-12
Primary >20 years	212.9	143.1	SD	5-7, 11, 13-16
Primary ≤20 years	52.8	35.6	SD	9-11, 14, 15, 17
Secondary >20 years	307.1	104.9	SD	3, 4, 9, 10, 18-21
Secondary ≤20 years	206.4	80.4	SD	9, 10, 22-28
Tropical >20 years	75.7	34.5	SD	9, 10, 14, 22, 23, 28-32
Tropical ≤20 years	413.1	128.5	SD	3, 4, 9, 10, 33-35
Temperate >20 years	131.6	20.7	SD	9, 10, 36, 37
Temperate ≤20 years	45.6	20.6	SD	9, 10, 37-39
Boreal >20 years	236.6	104.7	SD	1, 2, 16
Boreal ≤20 years	72.8	36.4	SD	9, 10, 16, 40-47
Subtropical >20 years	187.3	94.0	SD	3, 4, 9, 10, 18-21
Subtropical ≤20 years	131.0	54.2	SD	9, 10, 22-26
Alpine >20 years	55.7	28.7	SD	9, 10, 22, 23, 25, 26
Alpine ≤20 years	55.7	28.7	SD	9, 10, 22, 23, 25, 26
Asia	67.7	93.4	SD	9, 10, 35, 48-50
Tropical				

Hunka et al. (in review)

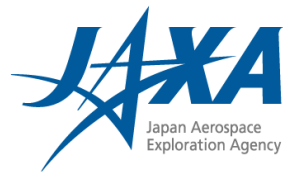
- ❖ The activity is supported by the joint NASA-ESA MAAP platform:
 - Open-science activity, transparent, up-to-date, public release of scripts – no black boxes
 - Powered for rapid algorithm development and global-scale analysis
 - Enables collaboration with partner countries
 - Supports Biomass Dashboard



The image displays two screenshots of the MAAP platform. The top screenshot shows the EarthData Search interface with a map of Africa and a sidebar containing collection details for 'ATL08'. The bottom screenshot shows the Biomass Earthdata Dashboard with a map of Africa and a sidebar listing various biomass products like 'CCI Biomass 2020' and 'ICESat-2 Boreal Biomass'.

We recommend continued support of CEOS member agency representatives to participate in the biomass harmonization activity

- Growing set of country partners, led by USGS Silvacarbon; JAXA as the new SIT Chair will increase efforts to collaborate with SE Asian countries
- NASA is supporting a new 3-year grant Carbon Monitoring System grant focused on bridging the science-policy gap (Mexico, Ecuador, Senegal, Ghana, others...)
- Expanding CEOS biomass protocol to change validation highly desirable



Food and Agriculture
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United Nations

