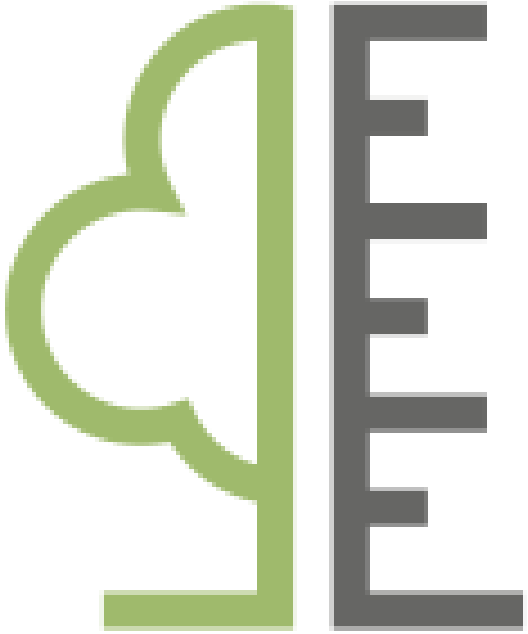


FOREST OBSERVATION SYSTEM

Jerome Chave, Dmitry Shepashenko, Christoph Perger, Oliver L. Phillips, Simon L. Lewis, Stuart J Davies, Klaus Scipal

GlobBiomass meeting, Vienna 2 Feburary 2016

Outline

1. The challenge of training & validation of BIOMASS data

2. Forest Observation System (formerly IFBN)

3. Challenges

BIOMASS wiki

Forest biomass

Above-ground biomass (tons / hectare)

Forest height

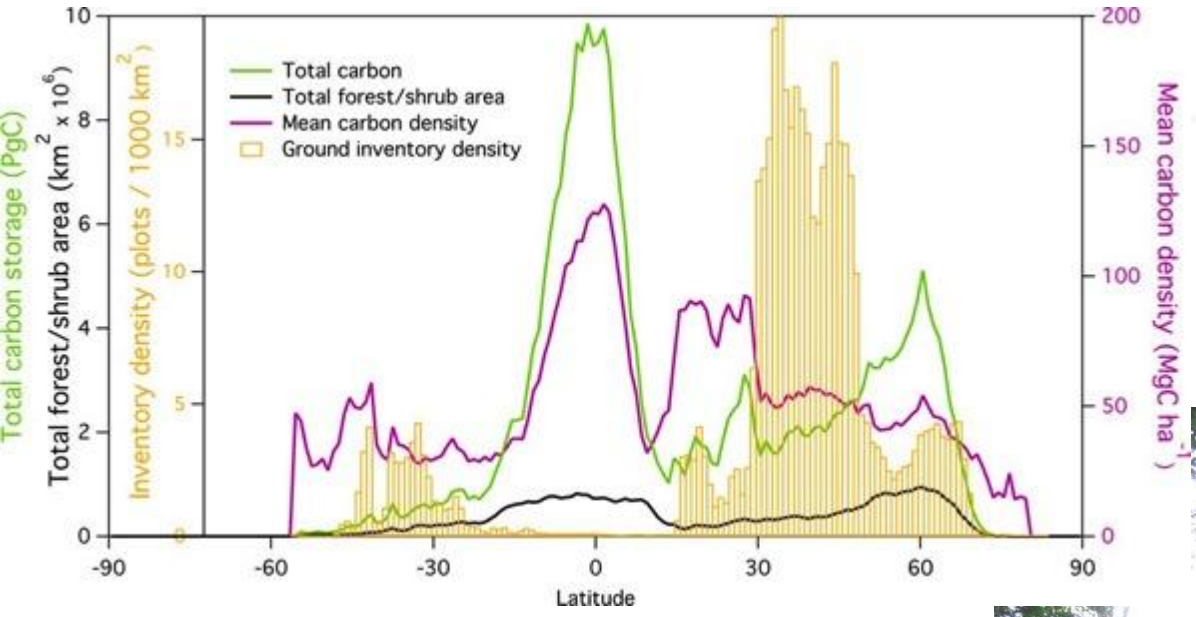
Upper canopy height (meter)

Disturbances

Areas of forest clearing (hectare)

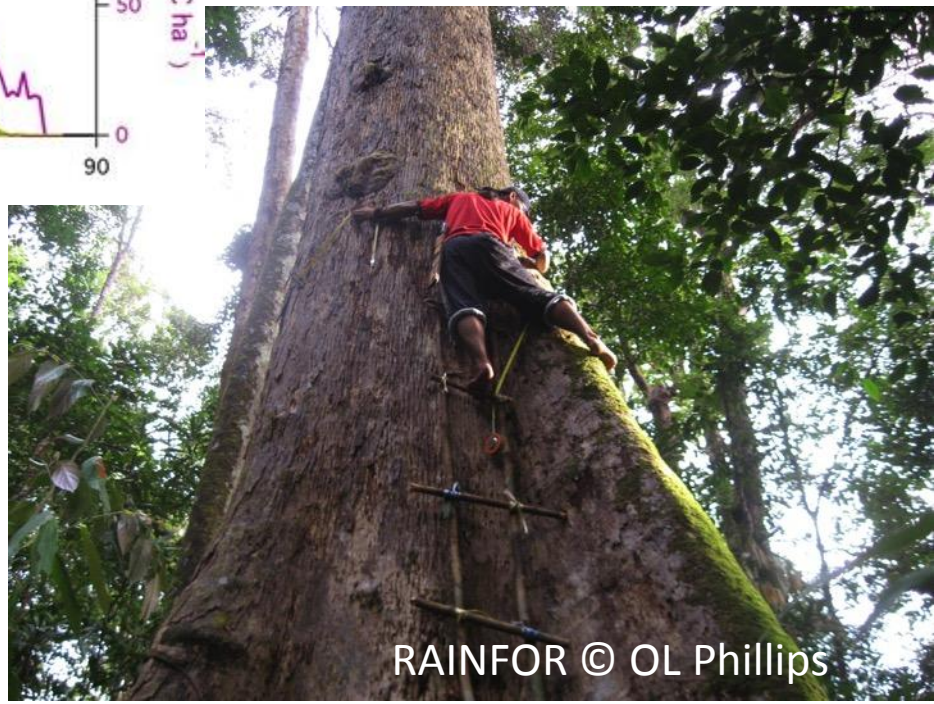
BIOMASS will deliver globally, twice per year, at 200x200m resolution, with 20% uncertainty over a five year period

Forest biomass is **difficult** to measure



Most biomass is in large trees

Native (non-planted) forests represent a large fraction of biomass



Tropical ‘High Carbon Stock’ forests are undersampled

BIOMASS requirements

1. **Timely forest AGB data**. **Extensive new data collection** is essential to calibrate and validate BIOMASS
2. **Wide geographical spread** across the world's high biomass forests**.** Fieldwork should apply global- & continental-scale sampling frameworks across biomes, focussed on the tropics.
3. **High quality data.** Species identity is critical, and measurements of tree diameter and height also require trained technicians **This must apply strict standards to ensure data quality**.

Outline

1. The challenge of training & validation of BIOMASS

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3. Challenges

Engaging large networks

RAINFOR

Established 2000, based on data since 1980. Plots ca 1 ha

CTFS

Established 1982 Plots 25-50 ha

Forest Observation System

1. Prioritize High Carbon Stock forests (mostly the tropics)
2. Use EXISTING plots: RAINFOR/AFRITRON/CTFS
3. Promote two key concepts:
   - **super-sites**
   - **two-scale approach**
4. Make these data available to the EO community

Super-sites

- In the tropics, a key limitation is not *building* but *maintaining* capacity in the tropics
- 50-100 sites around the world
- Strong, long-term monitoring at these super-sites

Not a new idea

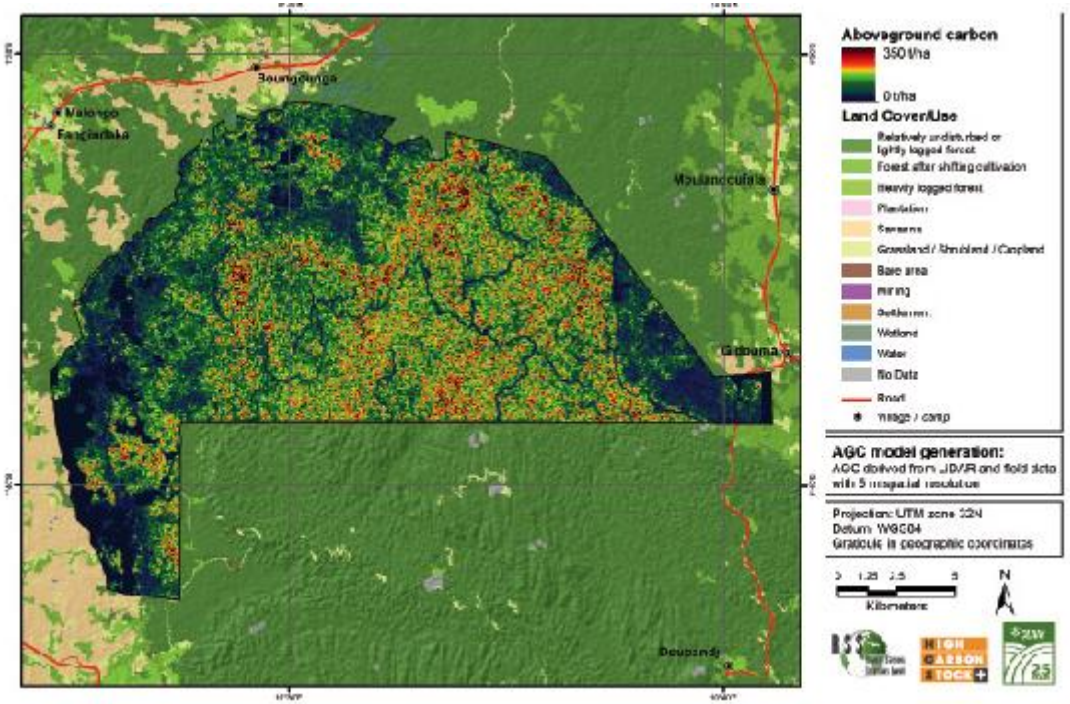
Australian SuperSiteNetwork

Super-sites FOS specifications

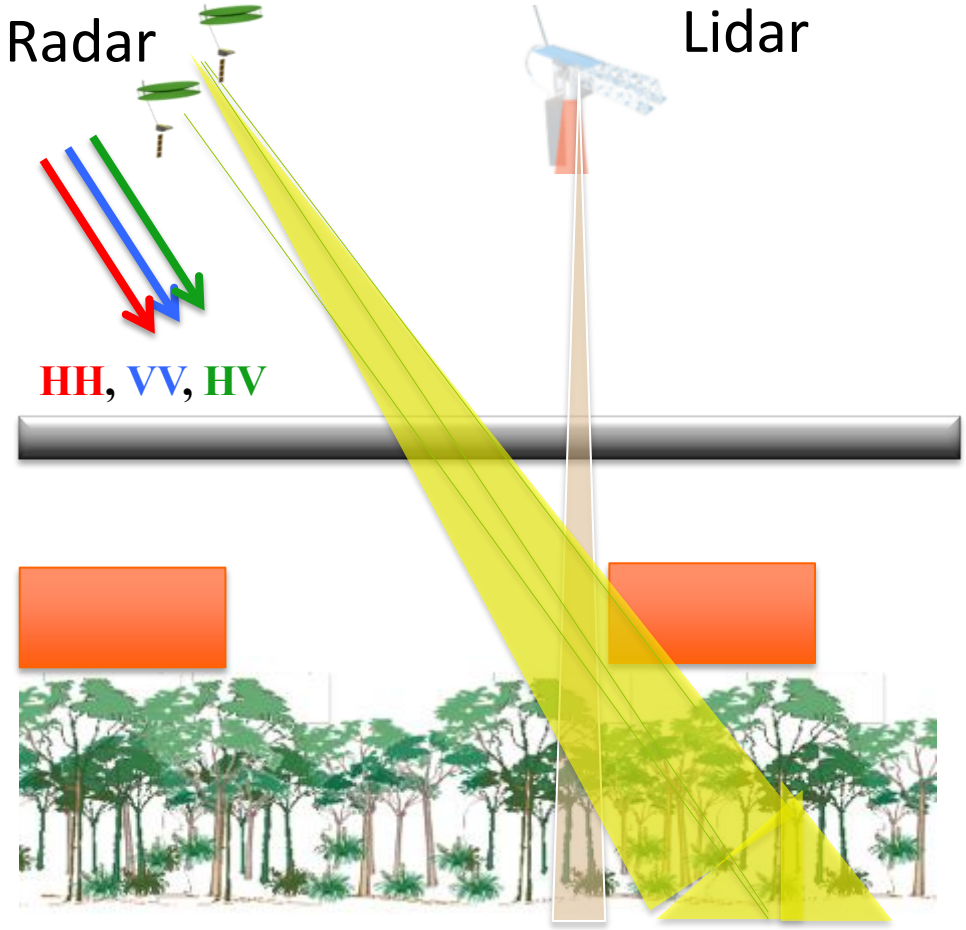
1. At least 10 1-ha already established permanent sampling plots. Plots should be established and monitored according the best tropical forestry standards (Rainfor or CTFS protocols)
2. Aerial LiDAR scanning (ALS) over at least 1000 ha, with minimal quality requirements
3. terrestrial LiDAR scanning (TLS) at (at least) two of the permanent plots, and if possible all 10 plots
4. weather/soil moisture measurements

Two-scale approach

- Establishing 10 1-ha plots is NOT an easy task (it is EXPENSIVE
- Forest plots are often NOT established randomly in space.
- ALS data offers a simple way to SCALE UP AT LANDSCAPE SCALE



Two-scale approach



Global L2
BIOMASS product

TRAINING

Small-footprint LiDAR map
(10-100 km^2 sampled)

TRAINING

Ground-based inventories
(0.1-0.5 km^2 sampled)

Implementation

Outline

1. The challenge of training & validation of BIOMASS

2. Forest Observation System

3. Challenges

FOS challenges

Many partners are from developing countries.

Data contributors work in conditions that are often difficult physically and institutionally, and occasionally dangerous or even impossible.

Consequently the partners of this effort must be adequately trained, equipped, insured, and paid.