Measurement, Monitoring and Verification

EPRI Greenhouse Gas Emissions Offset Policy Dialogue
Workshop 5 - REDD

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Conclusions

- **Measuring change in forest area is now tractable at national scale**
  - **We know how to do this**
  - **Must be based on satellite data**
  - **Requires building in-country technical capacity**
  - **Degradation more difficult to quantify**

- **Biomass and emission factors less certain**
  - **Possible at project level with ground and air-borne data**
  - **Foreseeable for future at national level**

- **Markets based on measurable and verifiable quantities can reasonably use default biomass and emission factors**

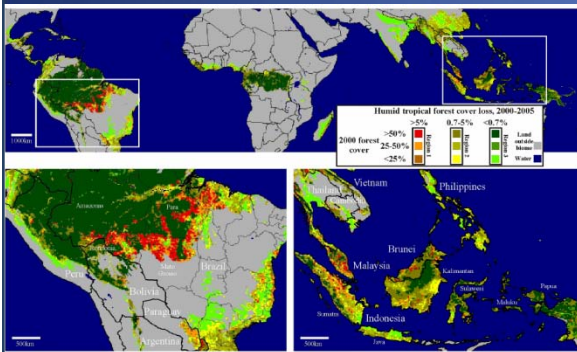- **Simplicity is key for REDD reporting and verification**

Deforestation carbon emissions/yr =

Area cleared/yr x Biomass removed/unit area

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Area cleared/yr x Biomass removed/unit area

PAN-TROPICAL	NATIONAL	PROJECT

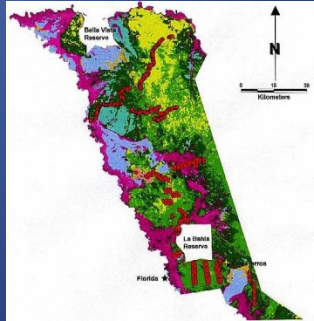**Methods are in-hand to measure changes in forest area at pan-tropical, national, and project levels**

Deforestation carbon emissions/yr =
Area cleared/yr x **Biomass removed/unit area**

initial emissions ✚ **decomposition** ➖ **abandonment/regrowth**

Need to know:
- original biomass
- emission factors for each component
- time scale of interest

Possible at project level but more difficult at national level

	PROJECT LEVEL	NATIONAL LEVEL
Forest area change	✓ satellite and airborne	✓ satellite
Biomass	✓ airborne and ground data	extrapolation only
Emission factor (initial fire, decay, uptake)	modeled; field measurements	modeled

THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE HAS DEVELOPED TIER APPROACH TO ESTIMATE BIOMASS

IPCC Tier	Data needs/examples of appropriate biomass data
Tier 1 (little guidance needed)	Default mean annual increment (MAI for degradation) and/or forest biomass stock (for deforestation) for broad continental forest types—includes 6 classes for each continental area to encompass differences in elevation and general climatic zone; default values given for all vegetation-based pools
Tier 2	MAI and/or forest biomass values from existing forest inventories and/or ecological studies. Default values provided for all non-tree pools Newly-collected forest biomass data.
Tier 3	Repeated measurements of trees from permanent plots and/or calibrated process models. Can use default data for other pools stratified by in-country regions and forest type, or estimates from process models

Degradation is harder

Logging in southern Amazon from satellite
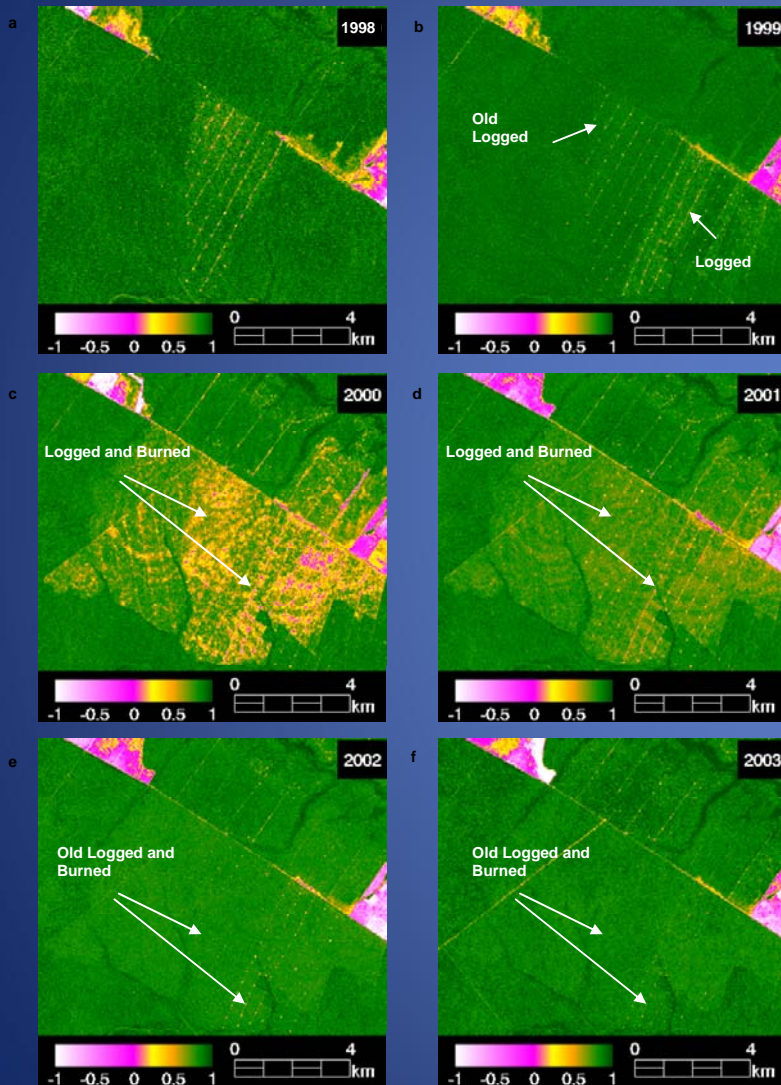
Burned peat in central Kalimantan

Developing and future capabilities

Hardware

- Orbiting Carbon Observatory to measure carbon directly in atmosphere
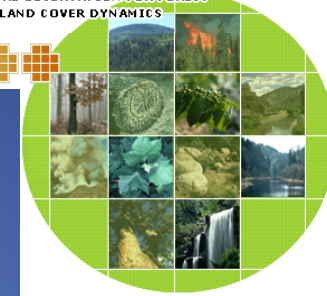
- Radar/LIDAR satellites to improve biomass mapping

Soft capabilities

- In-country technical capacity

- Data access
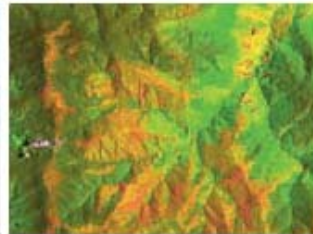
- International attention on forest carbon

www.gofc-gold.uni-jena.de/redd

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