New Tools and Materials to advance the development of REDD+ Reference Levels and Forest Monitoring Systems

Joint FCPF/UN-REDD Knowledge Exchange Day

Arusha, Tanzania

November 4, 2014

FOREST CARBON PARTNERSHIP FACILITY

FAO FIAT PANIS

UN-REDD PROGRAMME

Key UNFCCC Decisions on FREL/FRLs

Decision 4/CP 15	"…**transparently** taking into account **historic data**, and adjust for **national circumstances**…"
Decision 1/CP 16	FREL/FRLs one of the 4 REDD+ elements
Decision 12/CP 17	'**Construction** guidelines'(Modalities for FREL/FRL)
Annex submission)	**Information** guidelines for submission (for FREL/FRL
Decision 13/CP 19 & Annex	Guidelines **technical assessment** **Assessment** procedures

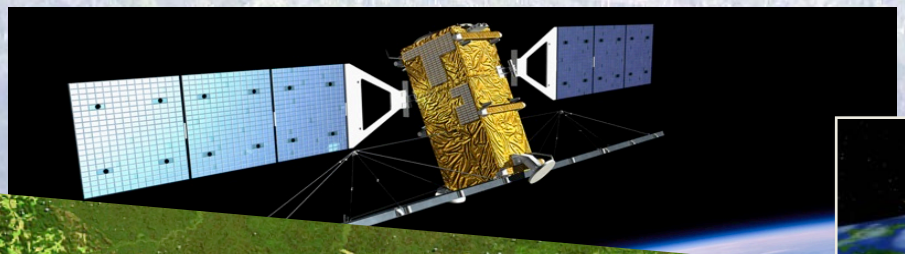
UN-REDD PROGRAMME

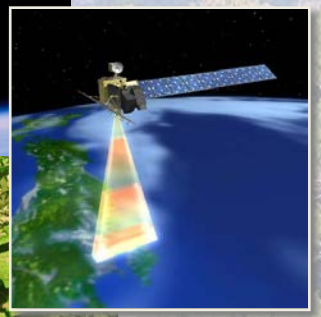
Areas for reflection and discussion

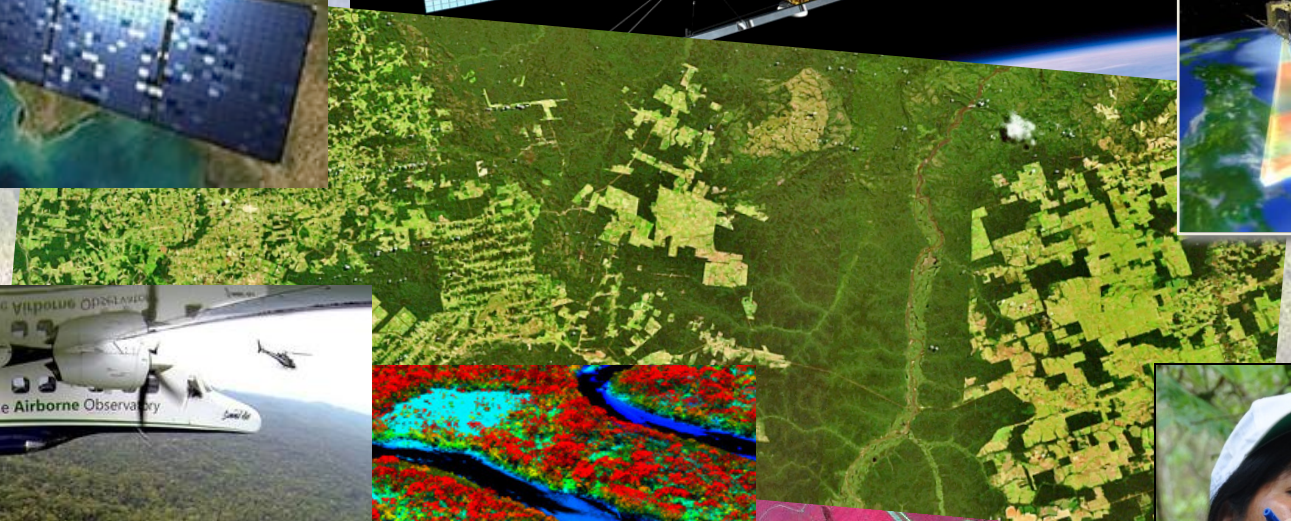
In the context of guidance provided by the UNFCCC process, IPCC Methodologies and guidance….

For accessing performed base payments out of different, sometimes multiple sources (bilateral, multilaterals, private, etc)

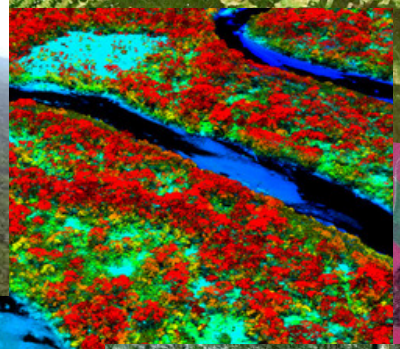
- **SCOPE: Activities, pools, gases**
- **SCALE: Biomes, province, areas subjected to a particular activity, other**
- **FOREST DEFINITION**
- **FOREST MONITORING SYSTEMS IN PLACE: step wise towards national**
- **HISTORIC DATA: Availability, cost efficiency**

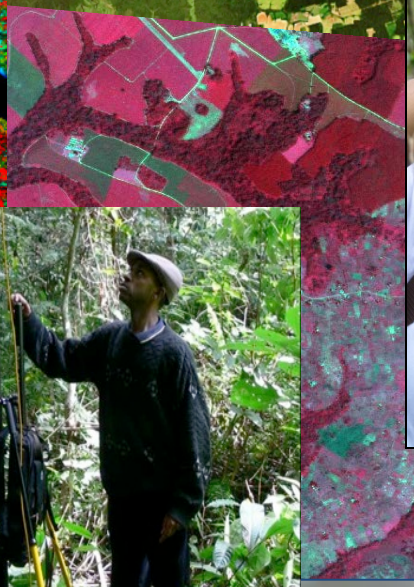







C-GJPY
Carnegie Airborne Observatory





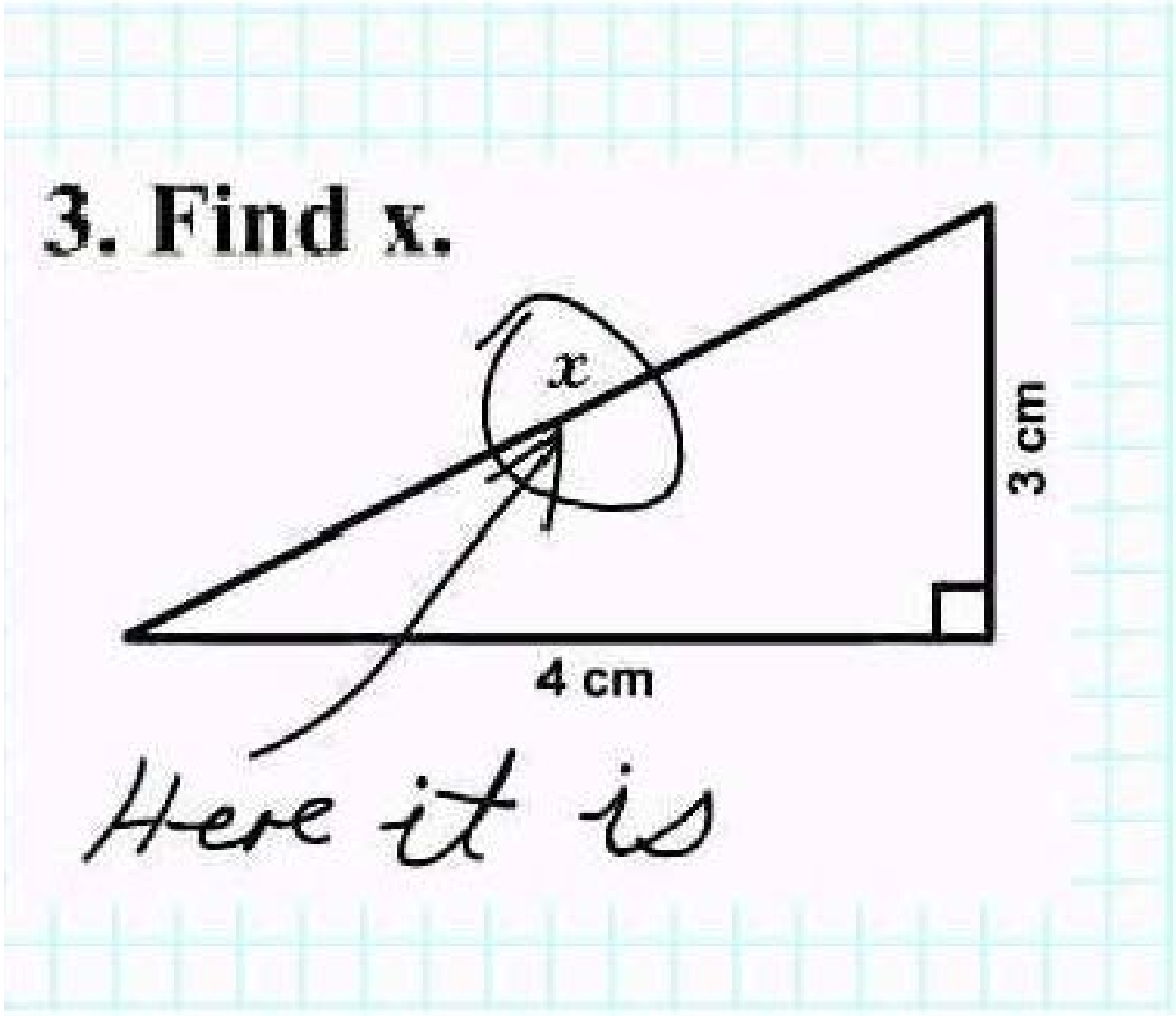

Taller:
Cambio Climático e
Incidencia Nacional

It's simple …

- Develop a Reference Level
- Measure, Report, Verify Results (Emissions Reductions)
- Consistency is important!

$$E_{missions} = A_{ctivity\ Data} \times E_{mission\ Factors}$$

… or is it?



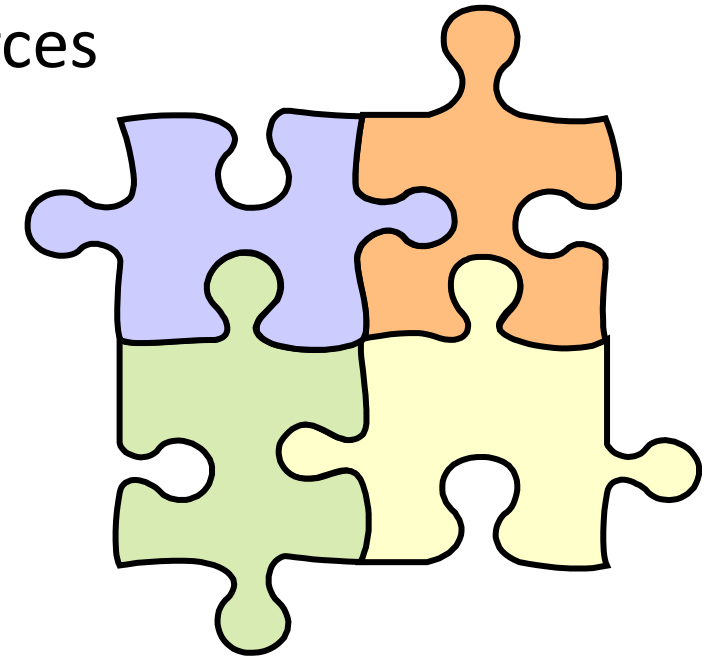
Tools

Technical Guidance

Outline

Why decision support tools and technical guidance?

1. REDD+ Decision Support Toolbox *
2. GOFC-GOLD Technical Guidance (Training Modules) *
3. Other useful and practical resources
4. Emerging Reference Level Approaches (FAO)



* supported by FCPF in FY14/15 budget ('additional activities')

The REDD+ Decision Support Toolbox

Online tool with a simple interface, supported by a comprehensive database, that

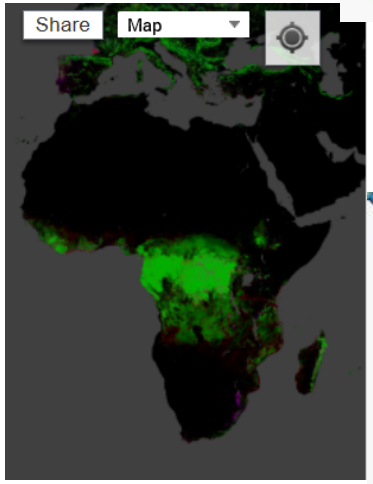
- **Informs** the technical approach for reference levels (RL), forest monitoring, and measurement reporting and verification (MRV)
- **Facilitates** technical and policy decisions related to RL and MRV

The decision support toolbox is data-driven

- Integrates a range of variables required for estimation of emissions
  - Forest cover, forest cover change
  - Fires
  - Logging
  - Biomass and biomass harvesting
  - Soils
  - Population
  - Others
- Prompts users to make informed decisions and explore options

The tool draws on publically available and spatially referenced information

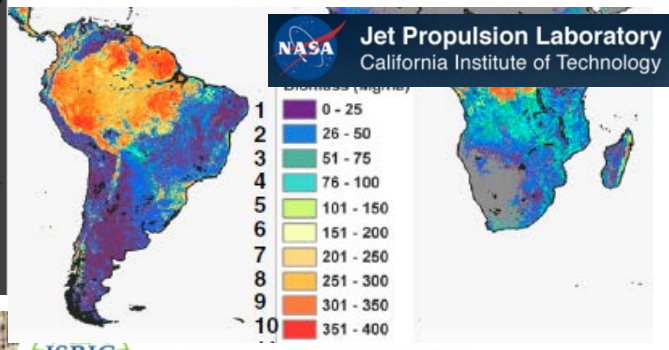
- IPCC
- FAO
- Research and Data Initiatives
- Satellite-based data products
- National Statistics
- Published literature
- Others



REDD+ Decision Support Toolbox

Global Forest Change
Published by Hansen, Potapov, Moore, Hancher et al.

UNIVERSITY OF MARYLAND
DEPARTMENT OF GEOGRAPHICAL SCIENCES



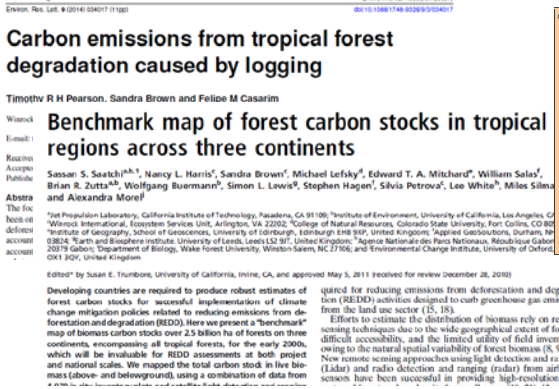
NASA Jet Propulsion Laboratory
California Institute of Technology

ISRIC World Soil Information

WISDOM
Woodfuel Integrated Supply/Demand Overview Mapping

FAO FIAT PANIS

UNFCCC



Carbon emissions from tropical forest degradation caused by logging

Timothy R H Pearson. Sandra Brown and Felipe M Casarim

Benchmark map of forest carbon stocks in tropical regions across three continents

Sassan S. Saatchi[a,b,1], Nancy L. Harris[c], Sandra Brown[c], Michael Lefsky[d], Edward T. A. Mitchard[e], William Salas[f], Brian R. Zutta[a,g], Wolfgang Buermann[h], Simon L. Lewis[g], Stephen Hagen[f], Silvia Petrova[c], Lee White[h], Miles Silma[n] and Alexandra Morel[f]

Developing countries are required to produce robust estimates of forest carbon stocks for successful implementation of climate change mitigation policies related to reducing emissions from deforestation and degradation (REDD). Here we present a "benchmark" map of biomass carbon stocks over 2.5 billion ha of forests on three continents, encompassing all tropical forests, for the early 2000s, which will be invaluable for REDD assessments at both project and national scales. We mapped the total carbon stock in live biomass (above- and belowground), using a combination of data from

quired for reducing emissions from deforestation and degradation (REDD) activities designed to curb greenhouse gas emissions from the land use sector (15, 18).

Efforts to estimate the distribution of biomass rely on remote sensing techniques due to the wide geographical extent of forests, difficult accessibility, and the limited utility of field inventories owing to the natural spatial variability of forest biomass (8, 9, 14). New remote sensing approaches using light detection and ranging (Lidar) and radio detection and ranging (radar) from airborne sensors have been successful in providing high-resolution esti-

The tool informs decisions on

- Scale (national vs. jurisdictional)
- Scope (REDD+ Activities)
- Pools
- Gases
- Reference Period
- Forest Definition
- Emission Factors
- Others

What follows are screenshots of the Decision Support Toolbox

REDD+ Decision Support Toolbox

Apologies for the small font size!

FOREST CARBON PARTNERSHIP

REDD+ Decision Support Toolbox

WINROCK INTERNATIONAL

FCPF

REDD+ Design | Reference Levels | National Forest Monitoring | Reporting and Verification | Summary | Resources

FCP Countries

REDD+ Design

Reference Levels

Forest Monitoring

Reporting & Verification

Summary

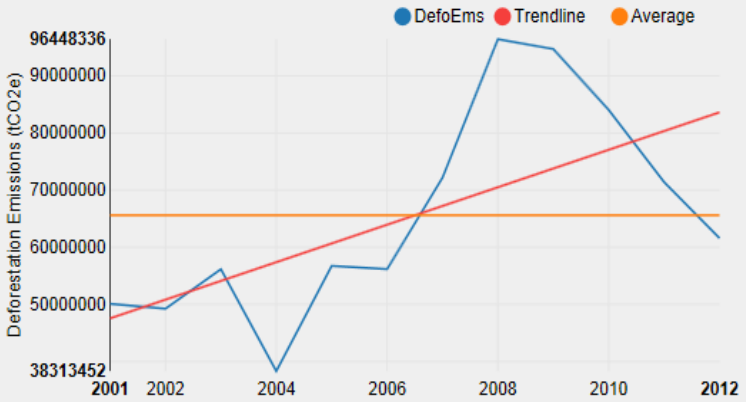
Tanzania

Defining Reference Period

Symbols 'Fire_F' missing in "Fire_F" for year 2012

Deforestation Emissions

Explore the implications of different reference level periods for emissions from deforestation by selecting different start and end periods for the deforestation RL. Save your selection by clicking the 'Next' button at the bottom of the page. The average historical emissions and trendline are presented here for comparison, but the average historical emissions for the selected reference period will be used going forward.



Deforestation start year

2001

required

Deforestation end year

2012

2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

	Average	Trend
Forest Loss (FL) (ha/yr)	139,717	FL = 7,937*YEAR + -15,785,810; R^2 = 0.69, P = 0.01
CO_2 emissions (t CO_2/yr)	65,600,180	Ems = 3,280,889*YEAR + -6,517,504,403; R^2 = 0.64, P = 0.02

First-order estimates

Build my Reference Level

Your default reference level is shown below. This uses default databases and includes the decisions you made about [illegible]ties, carbon pools, and the reference period.

Your deforestation period has been defined between years 2001 and 2012.

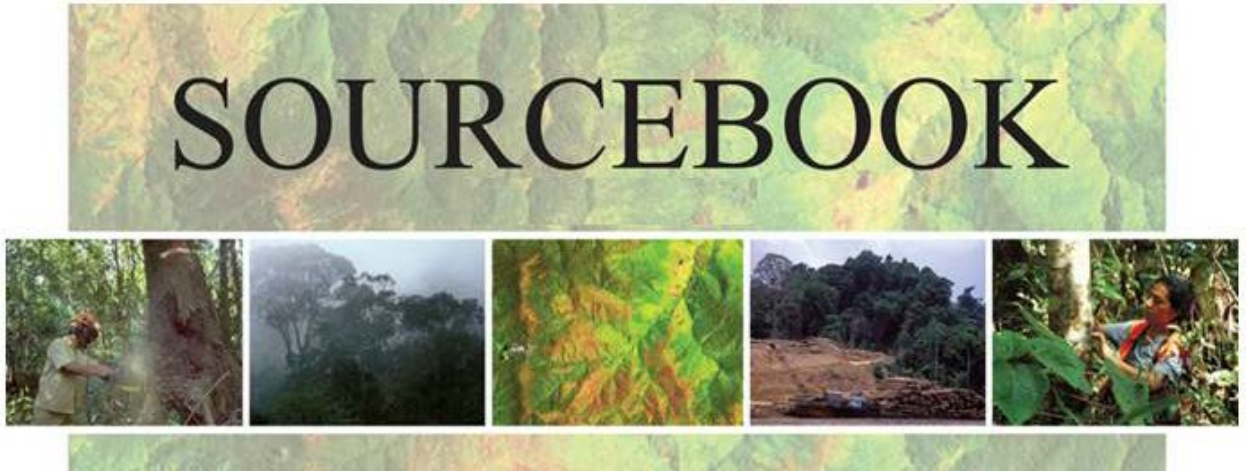
Your fire period has been defined between years 2001 and 2011.

Activity	Metric	First-order estimate	% of Total Emissions
Deforestation	t CO_2e/yr	8,529,864,029	99.72%
Timber Harvesting/Forest Management	t CO_2e/yr	9,959,769	0.12%
Fuelwood/Charcoal Production	t CO_2e/yr	4,789,085	0.06%
Forest Fire	t CO_2e/yr	9,155,002	0.11%
Enhancement of C stocks through forest gains? *	t CO_2e/yr	24,101,216	

* assuming 20% of area eligible for enhancements is afforested or reforested

- Some caveats
  - The tool doesn't make decisions; nor is it meant to 'set' a country's reference level
    - … this requires more technical work.
    - … and a due process in-country.
  - The tool can help facilitate both.
- Next steps
  - Available online in 2015 (via FCPF website)
  - To be used by countries and during country visits and workshops

Training Material based on GOFC-GOLD Sourcebook



FOREST CARBON PARTNERSHIP FACILITY

GOFC-GOLD
Global Observation of Forest and Land Cover Dynamics

WAGENINGEN UR
For quality of life

European Commission

REDD + CIGA-UNAM

WINROCK INTERNATIONAL

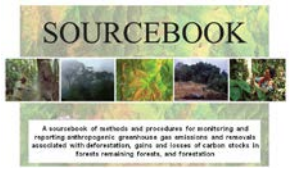
Imazon

University of Idaho
College of Natural Resources

GOFC-GOLD
Global Observation of Forest and Land Cover Dynamics

GOFC-GOLD Sourcebook

- Provides **guidance** from the global community of earth observation and carbon experts on how to obtain **credible estimates** of forest carbon stocks and related changes using satellite remote sensing as an important tool for monitoring changes in forest cover
- Builds on IPCC Guidelines for estimating and reporting GHG emissions and removals from forest lands



The sourcebook is the product of a working group of **Global Observation of Forest and Land Cover Dynamics** (GOFC-GOLD) http://www.gofcgold.wur.nl/

GOFC-GOLD
Global Observation of Forest and Land Cover Dynamics

Objectives of Training Manuals

- Provide a user-friendly set of **modular** training materials that can be **tailored** to country needs and be flexibly used in different settings (workshops, technical support missions etc.)
- Provide technical and practical guidance that is thoroughly **peer-reviewed** by a global network of experts

GOFC-GOLD
Global Observation of Forest and Land Cover Dynamics

Overview of Modules

REDD+ background and design

1 UNFCCC context and requirements & introduction to IPCC guidelines
2 Framework for building national forest monitoring systems for REDD+
3 Assessing and analyzing drivers of deforestation and forest degradation

REDD+ measuring and monitoring

4 Monitoring activity data for forests using remote sensing
5 Monitoring activity data for forests remaining forests
6 Estimating emission factors for forest cover change
7 Incorporating community based approaches in national monitoring
8 Estimation of carbon emissions from deforestation and forest degr.
9 Estimation of GHG emissions from biomass burning
10 Estimation of uncertainties
11 Overview and status of evolving technologies

REDD+ assessment and reporting

12 National data organization and management
13 Data and guidance on developing REDD+ reference levels
14 Reporting REDD+ performance using IPCC Guidelines and Guidance

GOFC-GOLD
Global Observation of Forest and Land Cover Dynamics

Module Structure

Background lectures (14)

Module 1.2 Framework for building national forest monitoring systems for REDD+

Module developers:

Erika Romijn
Martin Herold
Brice Mora

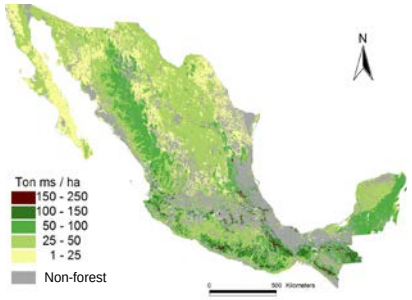

After the course the participants should be able t

- Understand the needs and priorities of a national REDD+ policy and implementation strategy
- Assess and characterize forest monitoring and reporting capacities of developing countries in different national circumstances
- Develop a roadmap for building sustained in-country capacities for REDD+ MRV

GOFC-GOLD training materials for REDD+ monitoring and reporting
Module 1.2 Framework for building national forest monitoring systems for REDD+

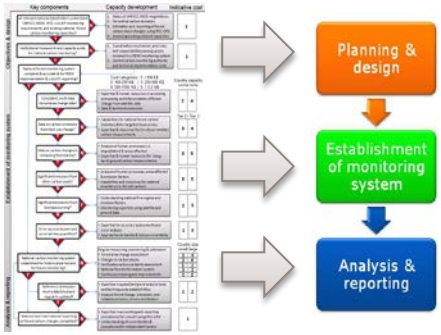
Country examples (28)

Biomass density map (in T dry matter) for 2007 for Mexico, derived from INEGI vegetation map (2007) and INFyS 2004-2008 plot data.



Practical exercises (22)

Process for establishing a NFMS



… and more: support documents, notes, references

GFOI Global Forest Observations Initiative

Global Forest Observation Initiative GFOI

http://gfoi.org/

GEO GROUP ON EARTH OBSERVATIONS

GFOI Global Forest Observations Initiative

Space Data Coordination Group (SDCG)

Baseline Global Data Acquisition Strategy

- Provide consistent time-series of satellite data over global forest cover.
- Annual national cloud-free optical coverage over each country.

Space Data Services

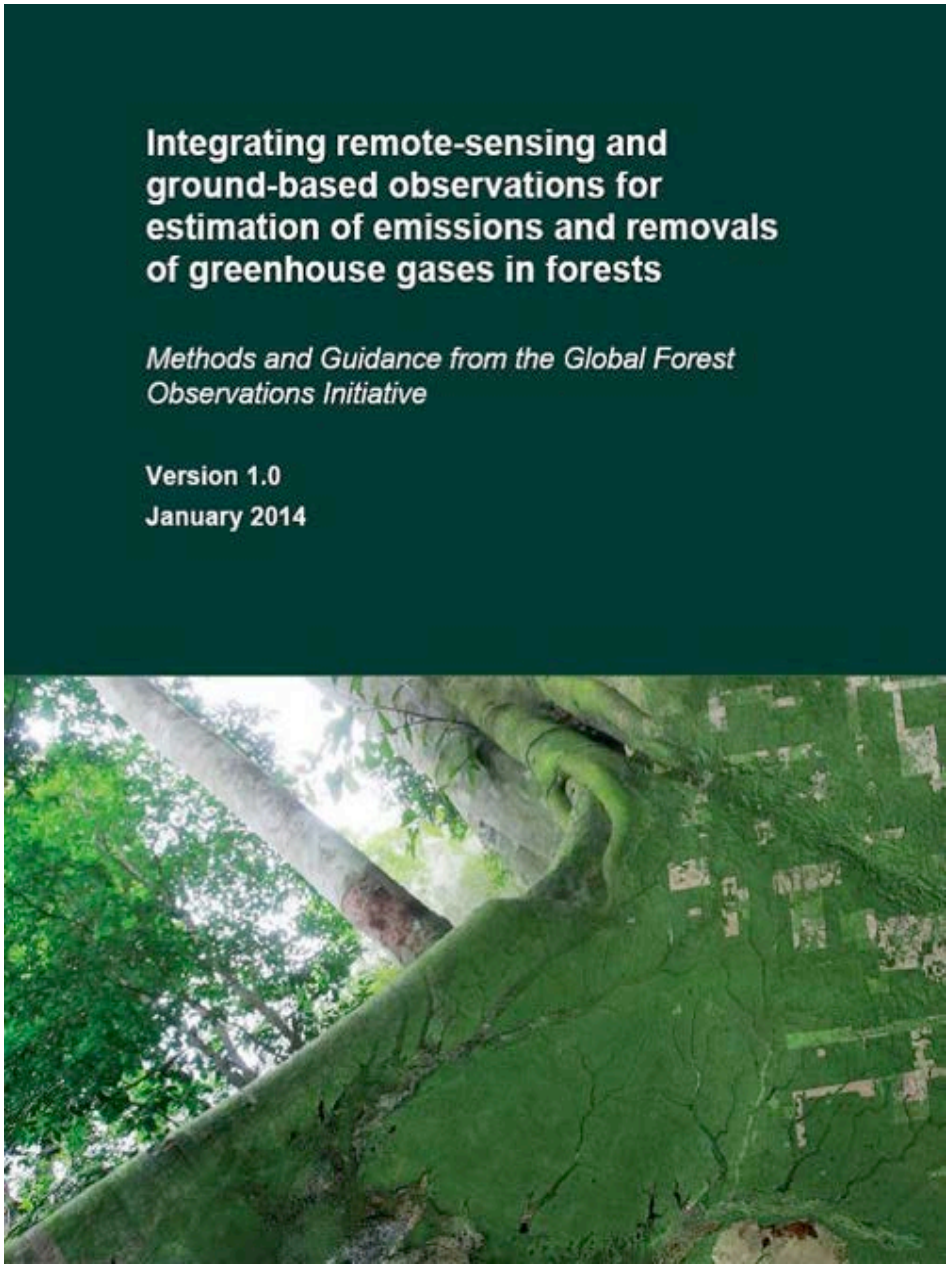
- A coordinated strategy for national data acquisitions accommodating countries' specific technical **requirements, heritage, or experience.**
- Covers a wider range of satellite data sources, including **commercial.**

Data Supply in Support of GFOI R&D Activities

- Includes support for science studies assisting the development and evolution of the MGD for GFOI.

GFOI Global Forest Observations Initiative

Methodological Guidance from GFOI



GEO GROUP ON EARTH OBSERVATIONS

http://www.gfoi.org/methods-guidance-documentation

GLOBAL FOREST WATCH

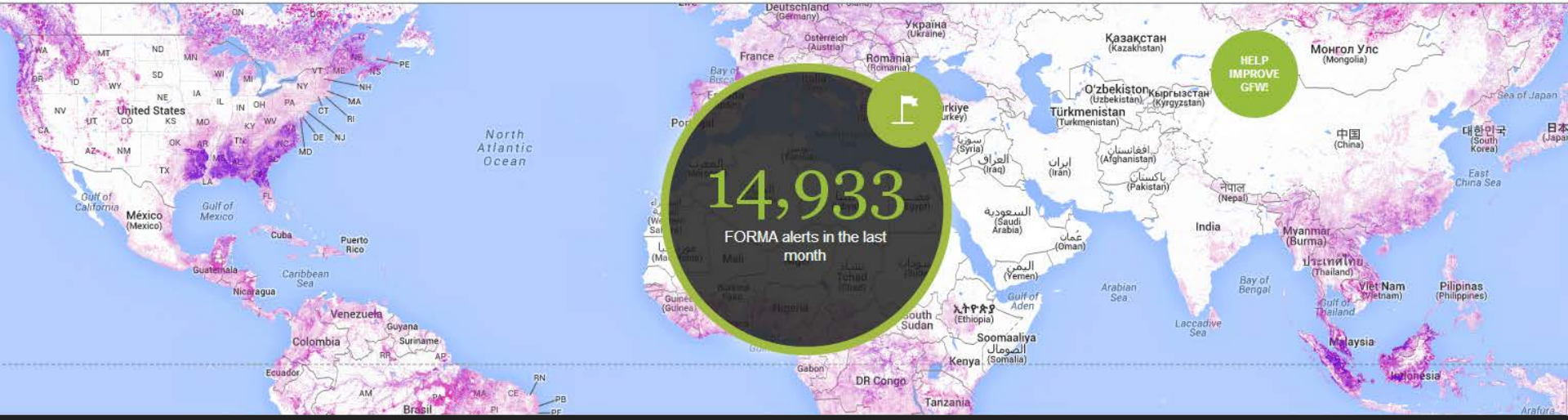
BETA VERSION

HOME | MAP | COUNTRIES | STORIES | BLOG | DATA | HOW TO | ABOUT | Select Language

Find out what is happening in forests right now

CHECK OUT GFW FIRES

CHECK OUT GFW COMMODITIES



Join the community

Subscribe to the Global Forest Watch discussion forum to learn more about data and interact with fellow users and researchers.

JOIN THE GROUP

Analysis & alerts

Perform forest cover change analyses on the fly and get answers in real time. Subscribe to receive automated alerts to forest cover change in your area of interest.

START ANALYZING

Submit your story

Have a story to share about forest change? Help improve our forest monitoring by submitting your stories and photos for display on the GFW map.

SUBMIT YOUR STORY

GLOBAL FOREST WATCH

BETA VERSION

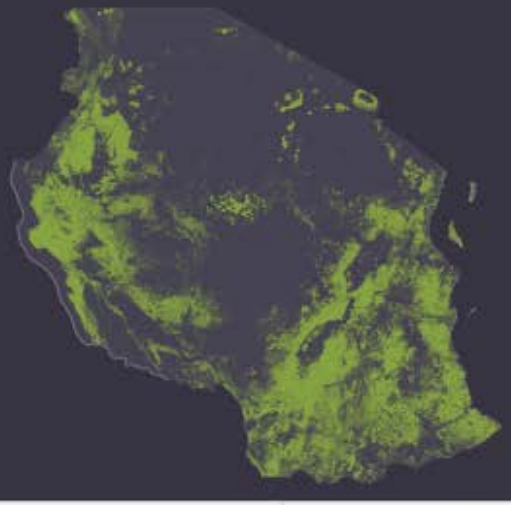
HOME MAP COUNTRIES STORIES BLOG DATA HOW TO ABOUT

Select Language

Tanzania

SELECT AREA

SHARE



TREE COVER (2000)

25 MHa

PERCENT TREE COVER (2000)

28 %

LOSS AND GAIN (2001 - 2012)

100,481

Hectares lost in 2012

INFO

DOWNLOAD DATA

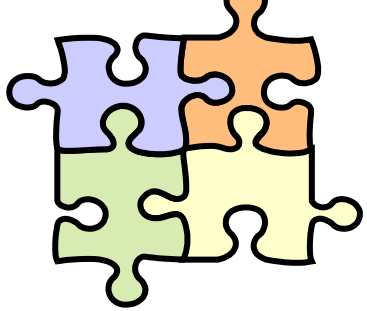
COUNTRY STATS

ANALYZE

SETTINGS

FORMA CLEARING ALERTS | FOREST TYPE | PEOPLE & ECONOMY | TENURE & LAWS | CLIMATE CHANGE | INTERNATIONAL AGREEMENTS

How does it all fit together?



Explore

- Use decision support tool (including embedded data) to develop preliminary estimates and design

Decide

- Use decision support and country-specific data (e.g., GFW) to facilitate a technical and policy decision process

Implement

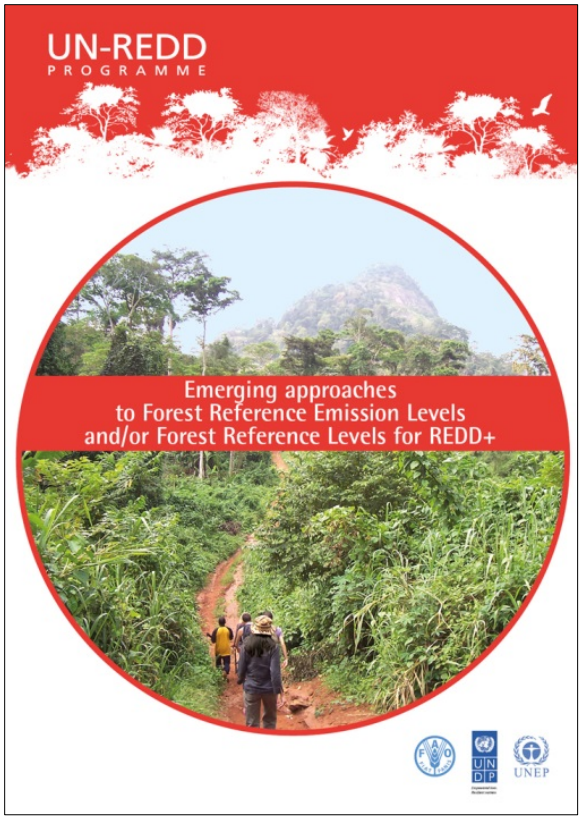
- Use training material to build capacity and technical guidance to implement decisions (GOFC-GOLD, GFOI); get data (e.g., via GFOI)

Overview of new UN-REDD publication:

"Emerging approaches to Forest Reference Emission Levels and/or Forest Reference Levels for REDD+"

Outline of the publication

1. What are FREL/FRLs and what purpose may they serve
2. Country examples: Brazil, Chile, Costa Rica, Democratic Republic of Congo, Ghana, Guyana, Mexico, Nepal, Republic of Congo, Vietnam
3. Examples and Analysis of:
   - Construction methodology
   - Scale
   - Scope
   - Datasets used
4. Emerging Trends and Common challenges




Thank You!