Improving global data on forest area & change

Global Forest Remote Sensing Survey

work by FAO and partners

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- F. Achard et al. TREES team at **EC Joint Research Centre**
- M. Hansen, P. Potapov et al., **South Dakota State University**,

- Data provided by **USGS** and **NASA**
- PLUS critical input from **over 200 people from 100 countries (with thanks! ☺)**

http://www.fao.org/forestry/fra/remotesensingsurvey/en/
http://www.fao.org/forestry/fra/remotesensing/portal/en/

Overview

1. Why we are doing the Remote Sensing survey?
2. What Key global outputs and benefits
3. How we do it (very briefly!)
4. Potential to scale up and link to national systems
5. Opportunities for other uses of the data
6. Conclusions

Results will be launched Wed 30 Nov 13:00-15:00

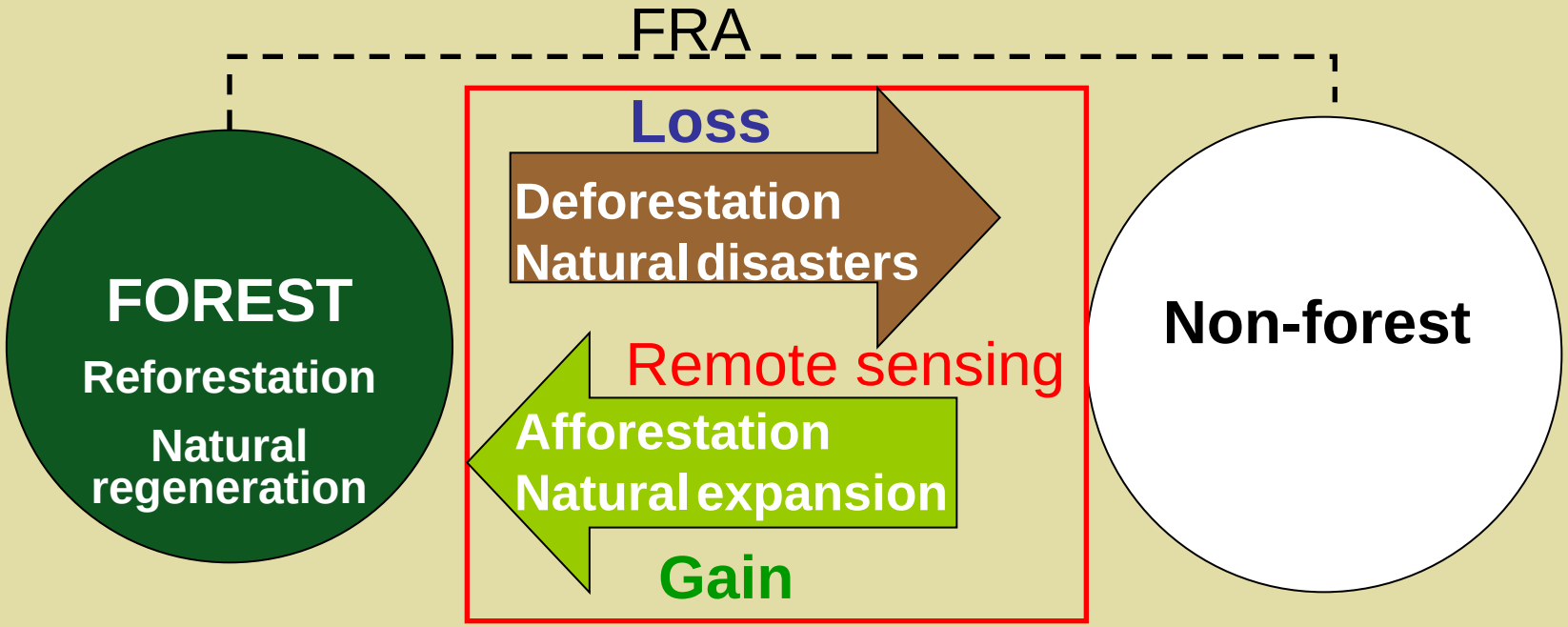
ICC Durban, EU Pavillion, Warsaw room.

Why we are doing a Remote Sensing Survey

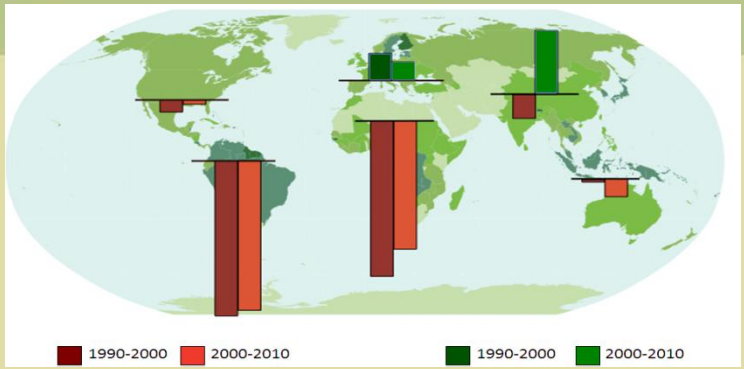
- **Forest CHANGE data is weak in many countries**
- **We need new updated global forest maps**
  - better data on forest area change (e.g. FRA, CBD etc)
- **Strong links between forests and climate change**
  - key data for climate analysis = forest area, type and change (deforestation / afforestation, natural expansion)
- **Remote sensing can:**
  - provide more consistent global forest area data
  - can be done in the same way for different time periods
  - generate better historical data for forest area & change

Why are we doing a Remote Sensing Survey?

- **Most FAO forest data are tables, numbers not maps**
  - most countries only have net forest area change results
  - lack of good data on deforestation
- **What are the dynamics of forest loss and gains?**



RSS outputs and benefits



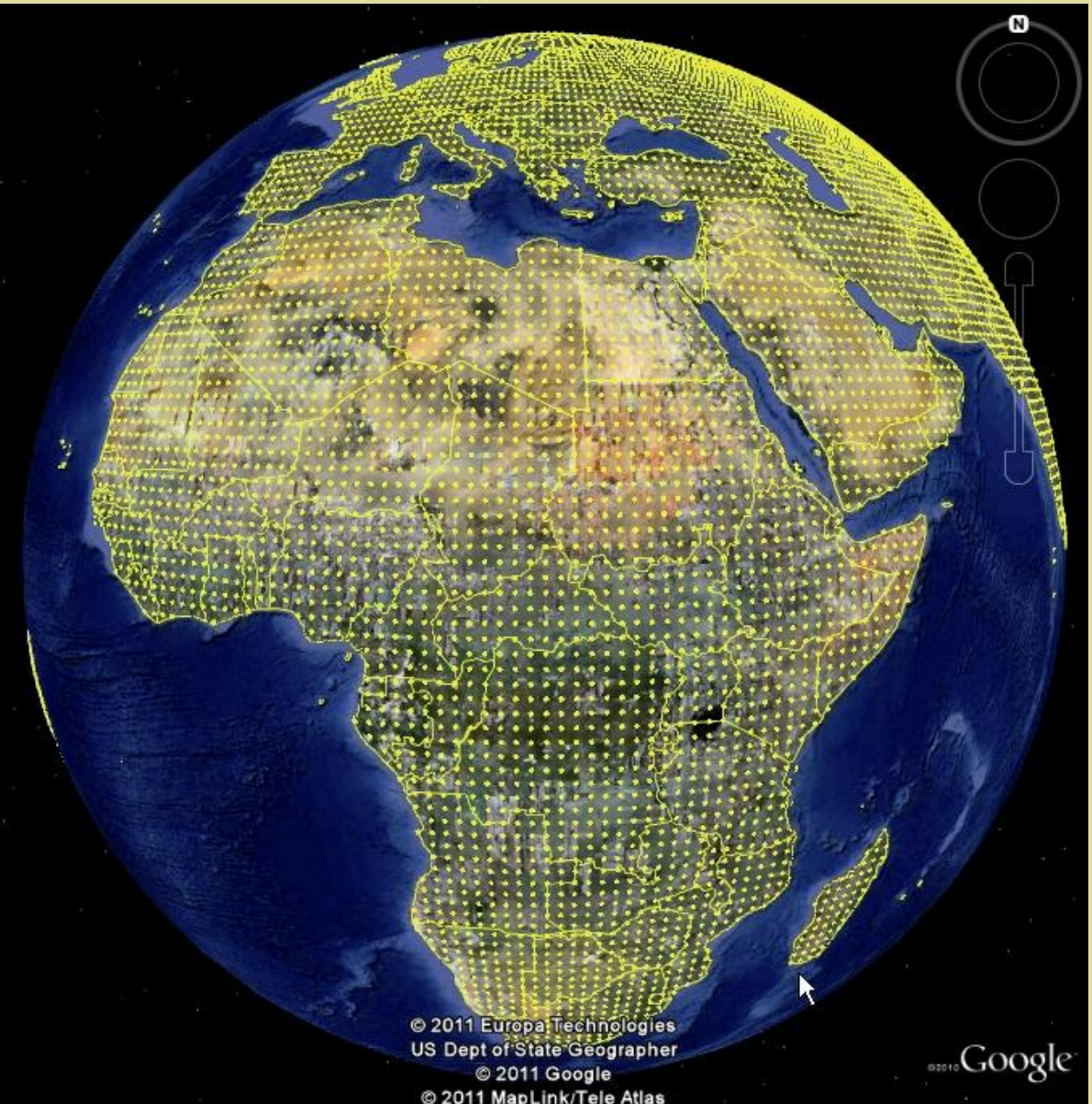
1. **Improved global and regional *change* in forest area (stats)**
   - **weak in many countries**
   - **1990, 2000, 2005 +future?**

2. **New global tree cover maps**
   (250 m resolution SDSU MODIS VCF)

Benefits:

3. **Improve many countries forest reporting capacity**
4. **Long-term monitoring framework for forests AND other variables – e.g. cropping, rangelands**

1 degree by 1 degree systematic sampling grid



- 13,000 sites worldwide
- ~10,000 with tree cover

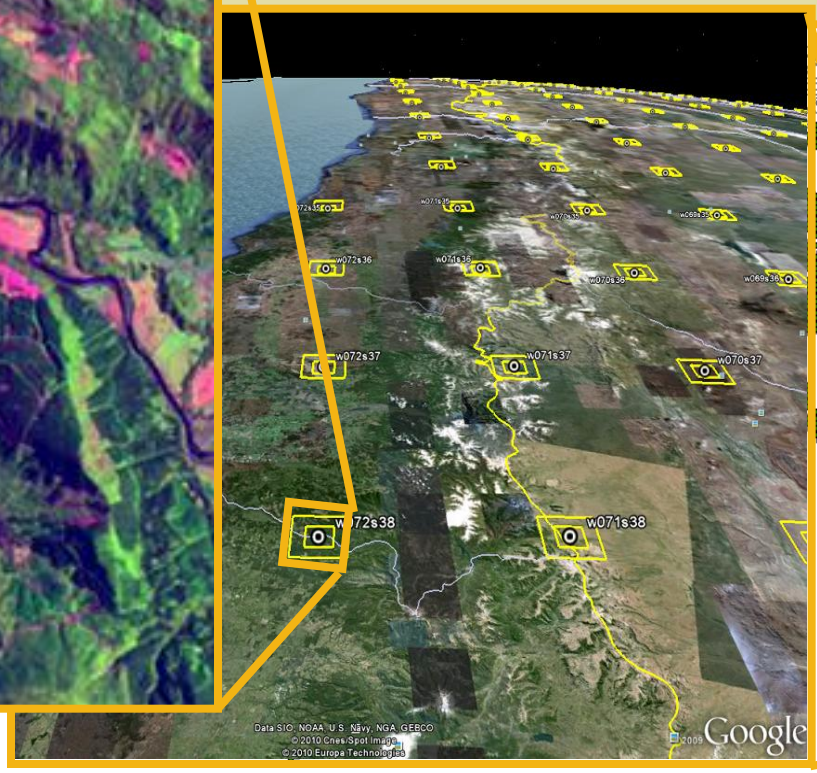
~100 km apart

JRC = Pan-tropics, Europe

FAO = Rest of world

- download shapefile or display in Google Earth

1 degree global sampling grid – 10x10 km sq 30m Landsat scale analysis



Why use sampling?

- Using samples saves time, cost effective
- Robust statistics, with confidence intervals
- easier / faster data acquisition, processing
- can stratify and scale to match complexity
- can get high quality results, people concentrate better on small areas at a time
- developed fairly simple, easy to use tools

Very simple Land-cover and Land-use classes

1. Land Cover

(from RS)

- Tree Cover
- Shrub Cover
- Other Land Cover
- Water
- No Data / Clouds

≠

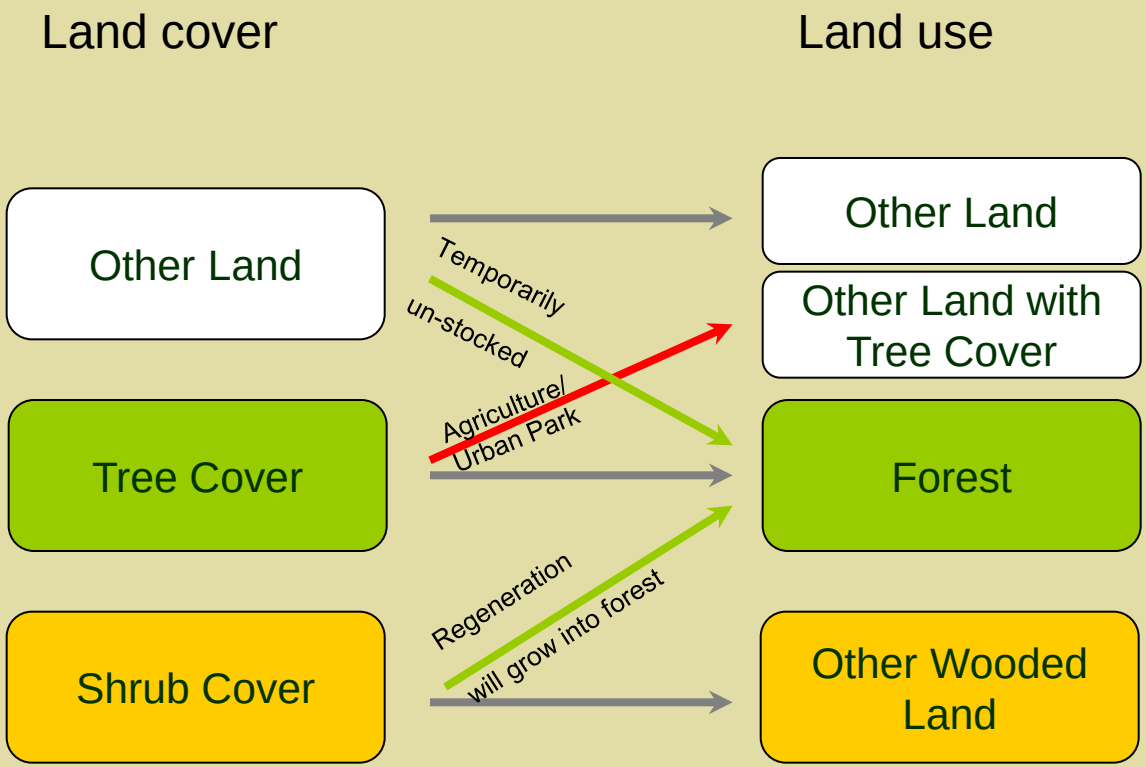
not simple

2. Land Use

(often needs other inputs)

- Forest
- Other Wooded Land
- Other Land Use
- Water
- No Data / Clouds

Phase 2 :
Manual reclassification for the exceptions

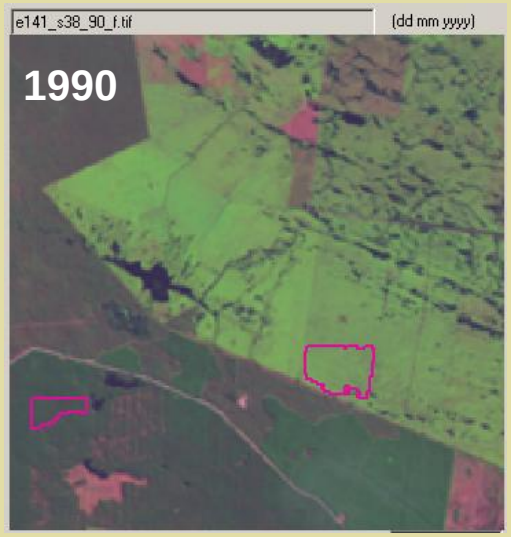


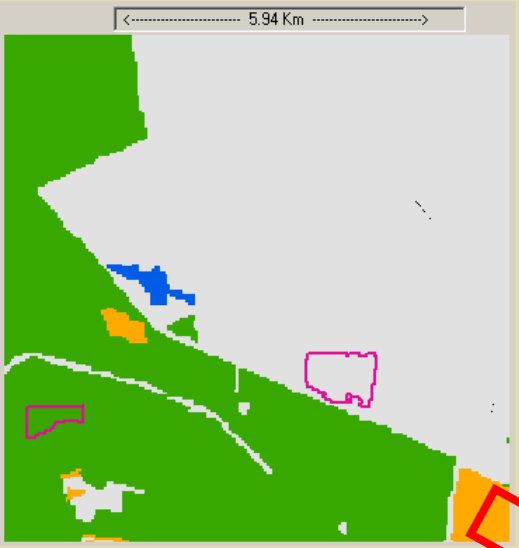
Tree cover change estimation

a) Satellite data

b) Classify and label

c) Validate and check change



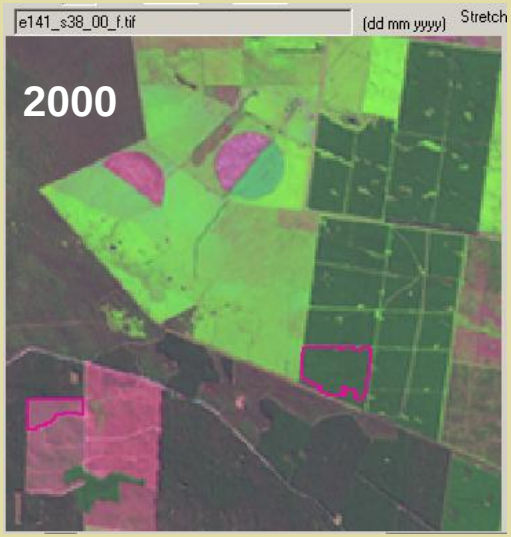


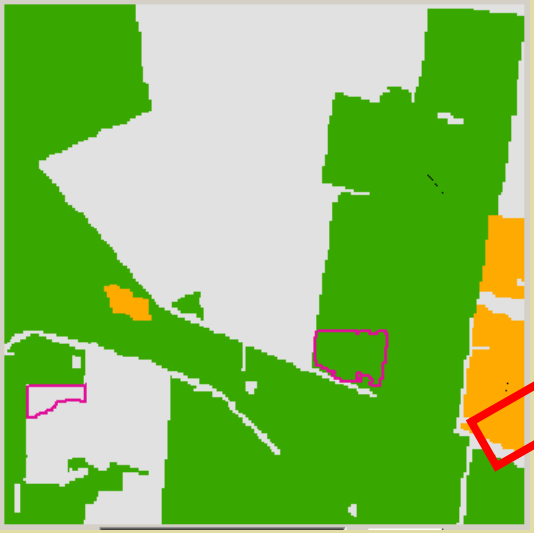
Land cover changes

Gain in trees

Loss

Shrubs
(young trees?)

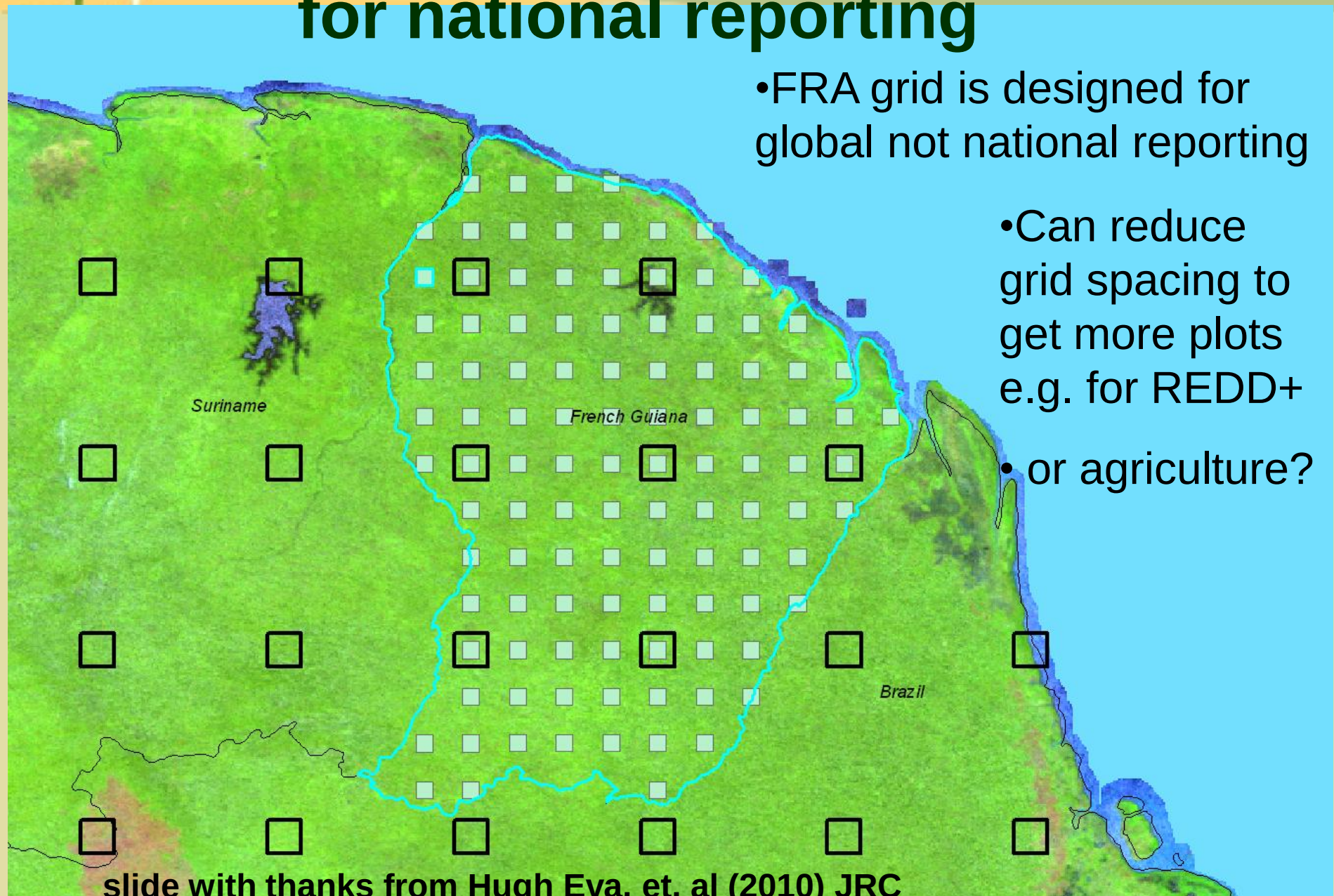




Change

=

Sampling can be intensified for national reporting



- FRA grid is designed for global not national reporting
- Can reduce grid spacing to get more plots e.g. for REDD+
- or agriculture?

slide with thanks from Hugh Eva, et. al (2010) JRC

FAO – JRC Global Remote Sensing Survey

Systematic sampling grid - Zambia

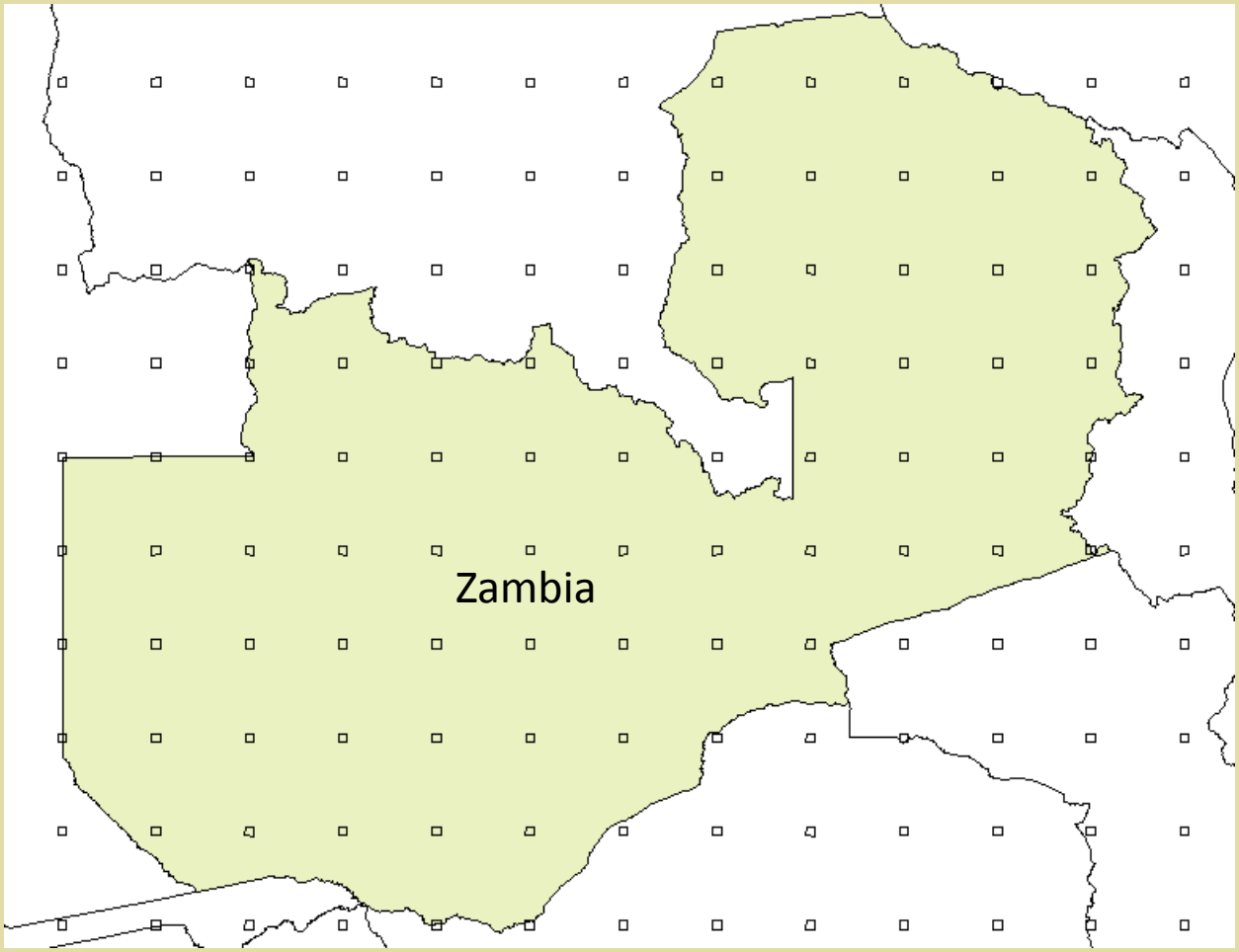
<u>1 degree grid</u>

10 x 10 km squares

~ 100 km apart

< 1 % sample suitable for large region or global statistics

~ 70 sites, not enough for national variation



FAO – JRC Zambia national level systematic sampling grid

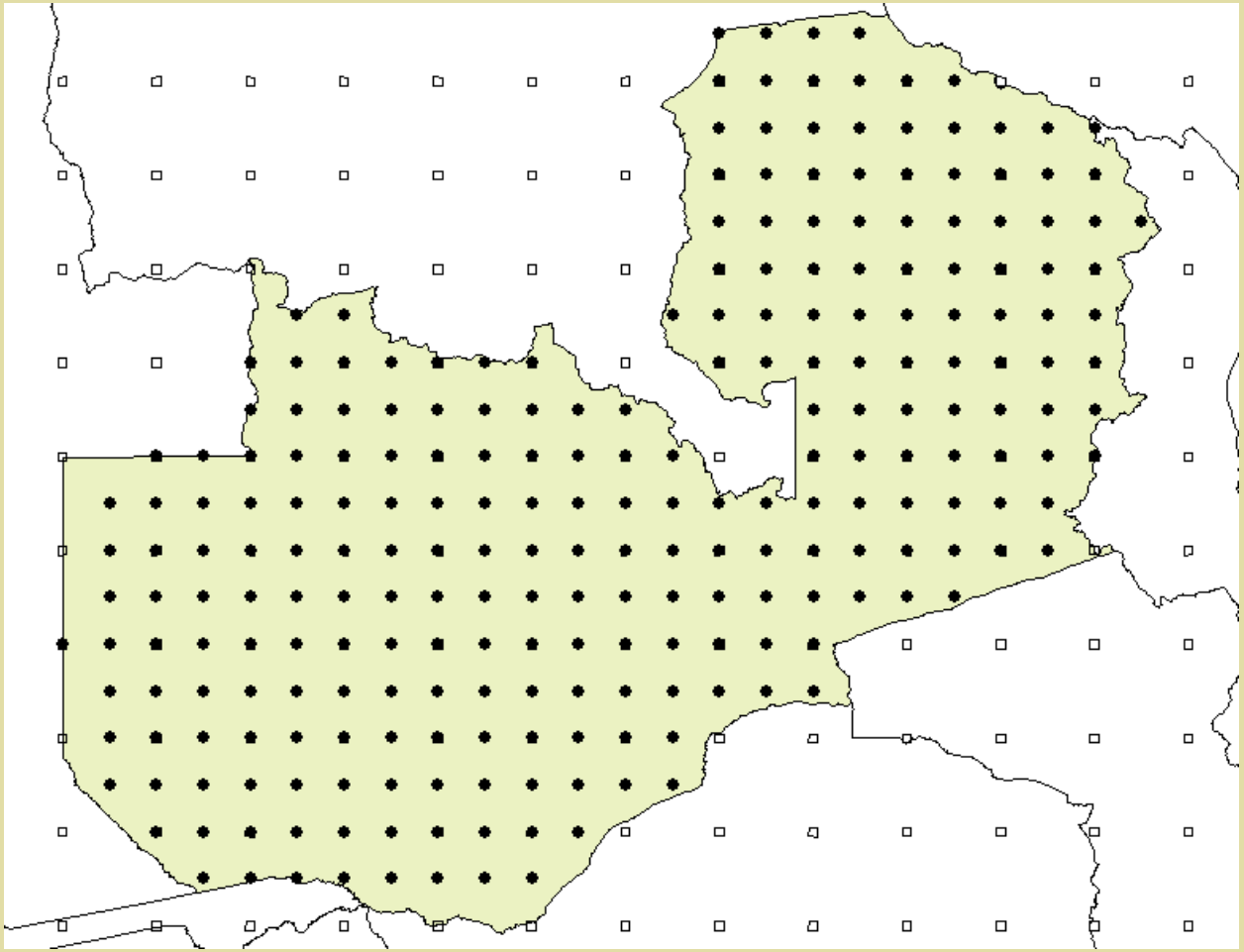
Samples can be intensified

248 sites @0.5°

10 x 10 km

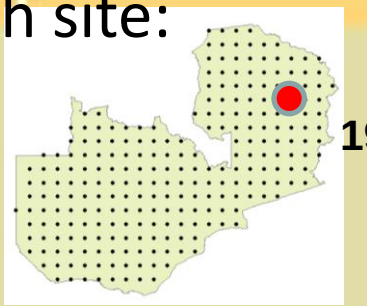
>3 % sample at national scale

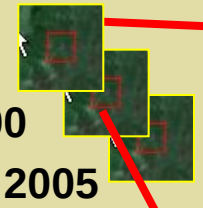
Link to field plot data at each site



FAO – JRC Zambia national level systematic sampling grid

At each site:



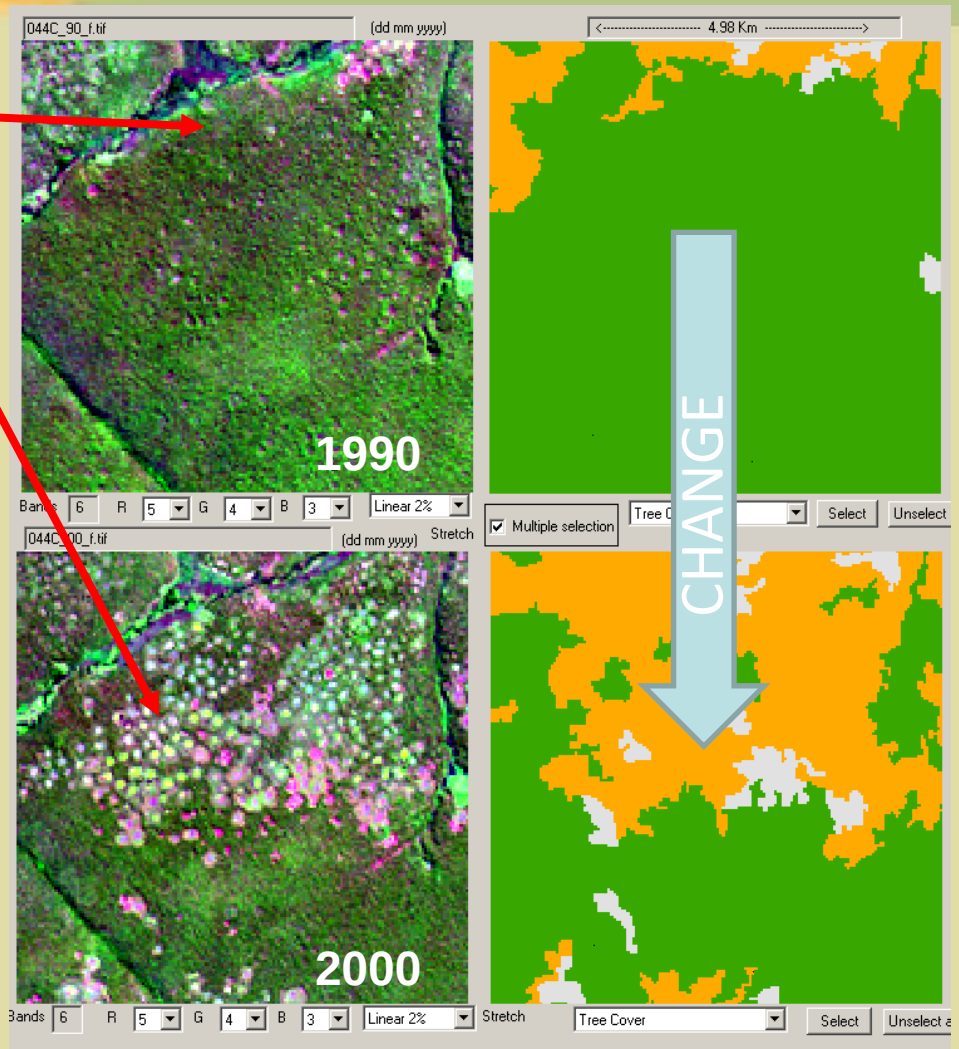


Change to/from tree cover and forest (1990 – 2000 – 05)

Automatic draft classification

Reviewed & corrected by National experts

Building on national capacity



Outcome=Better national estimates of gain/loss (deforestation)

Easier access to data
Landsat samples on internet

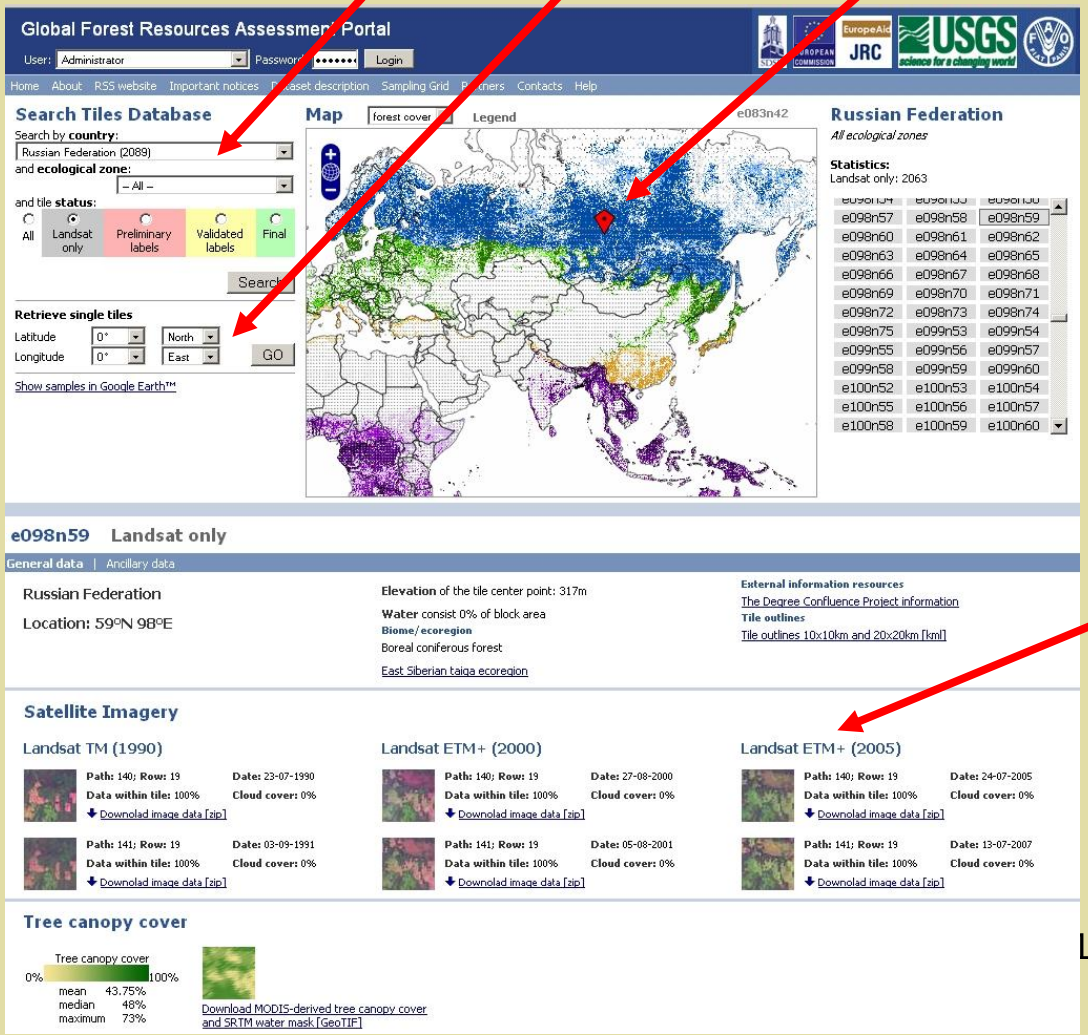
http://www.fao.org/forestry/fra/remotesensing/portal/en/

1. Search options

search by country, lat – long or using map

2. Global coverage over 13,000 samples

3. Encourage YOU to use the data too!

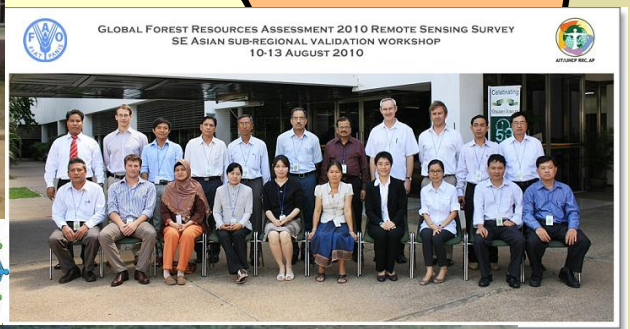


Download Landsat samples

RSS partnerships

Technical expertise +

connect to country knowledge for validation



Validation by countries national experts

Opportunities for partnerships

- FAO-JRC RSS has existing strong partnerships between technical agencies and countries
- Many opportunities for using data and methods for other purposes: crop monitoring, land degradation, *your work?*
- Can form a framework for national monitoring system (land-cover and land-use)
- The RSS dataset could have a role as a validation or training dataset or use as a known benchmark
- Encourage YOU to contact your RSS National Focal Point (http://www.fao.org/forestry/fra/remotesensing/country-info/en/)
- Ask for access to the RSS data and use it yourself – especially improve the forest layer or fill in the white spaces for Agricultural Land!

We can all benefit from collaborating, sharing data and knowledge better

- We need to build partnerships & networks
- Consistent classifications or translation good
- Need to link Global systems to National data
- Need to link remote sensing with ground data
- Need to share knowledge with other agencies & disciplines
  - for efficiency of cost and effort, reduce duplication
  - for consistency of results (less time debating data, more on decisions)
  - for improved capacity and sharing techniques

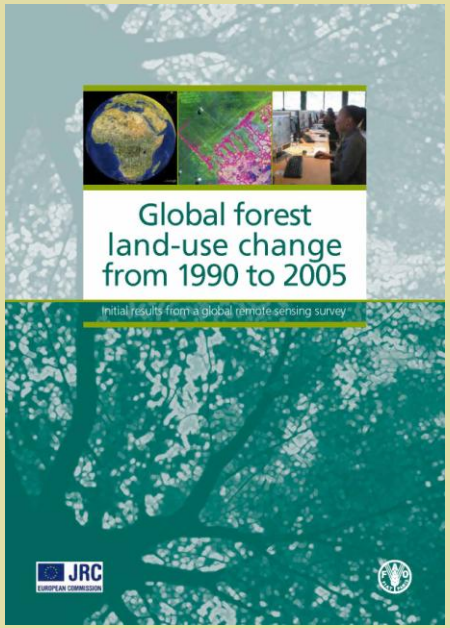
RSS conclusions

1. **Global framework, robust statistical design, scalable** that can be linked to national systems
2. **Easy access to data and tools** will help countries improve future forest area and change estimates
3. **Strong partnerships** with countries & technical support will create the best global statistics we have so far for forest change
4. Opportunities for collaboration with others, sharing data and techniques
5. RSS is helping monitor the world's forests, **How can we use it in climate-smart agriculture?**

Thank you

Launch of results
13:00-15:00 Wed 30 Nov
EC Pavillion

More information is available from
8 page summary on website after 30 Nov



JRC EUROPEAN COMMISSION

17th Conference of Parties of the UN Framework Convention on Climate Change

The JRC and FAO have the pleasure to announce:

A **side-event** to be held on **November 30th 2011**
Time 13:00 – 15:00
In pavilion of the European Union *(Warsaw Room)*

Global forest land-use change from 1990 to 2005
Initial results from the Remote Sensing Survey of the
FAO Global Forest Resources Assessment

Agenda and Speakers

13:00 – 13:10 *Welcome address*
M. Bucki, *European Commission, DG CLIMA*

13:10 – 13:40 *Monitoring forest cover changes in the tropics*
Dr. Frédéric Achard, *Joint Research Centre of the European Commission*

13:40 – 14:10 *The FAO FRA 2010 Remote Sensing Survey: New global forest area and land use change results*
Adam Gerrand, *Food and Agriculture Organization of the United Nations*

14:10 – 14:25 *Experience from Papua New Guinea in participating to the global remote sensing survey and lessons in a national context*
Dr. Joe Pokana, *Office of Climate Change, Papua New Guinea*

14:25 – 14:40 *Experience from Angola in participating to the global remote sensing survey and link to national assessment)*
André Mateus Simão, Head of Forestry Department, Angola

14:40 – 15:00 *Conclusions and discussion*

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