

Forest Carbon Tracking

- GEO task to demonstrate support of coordinated Earth Observation forest monitoring

GEO Forest and Carbon Tasks - activities at the validation sites

Øystein Nesje

Ministry of the Environment, Norway

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The future goal for FCT



Within 5 years a global network of national forest monitoring systems with international coordination and acceptance like weather forecasting today

GEO Work Plan task CL-09-03b

Ultimate Goal: Demonstrate to climate negotiators that coordinated Earth Observations can provide the basis for reliable information services of suitable consistency, accuracy and continuity to support Forest Carbon Tracking, leading to eventual establishment of a network of national forest carbon monitoring systems

To support this goal, the task objectives are:

- Establishment of regional demonstration/reference test-sites, using similar input satellite data and agreed methodologies, to demonstrate forest-change monitoring capability, in support of climate policy needs
- Consolidation of observational requirements and associated products, ultimately leading to an annual, mid-resolution global forest-change monitoring program, augmented by frequent near-real time observations in special areas.
- Coordination of observations, including securing their continuity
- Coordinated assessment of tools and methodologies
- Coordination of the production of reference datasets
- Improvement of access to observations, datasets, tools and expertise and associated capacity building activities.

Forest Carbon Tracking

Leads: Australia (Department of Climate Change & CSIRO)
Japan (JAXA)
Norway (NSC)
Canada (CDA)
CEOS (ESA)
FAO
GTOS (GOFC-GOLD)

Sub-task Number: CL-09-03b
Overarching GEO Task: Global Carbon Observation and Analysis System

Related GEO Communities of Practice: Carbon Cycle (former IGCO) and Forest

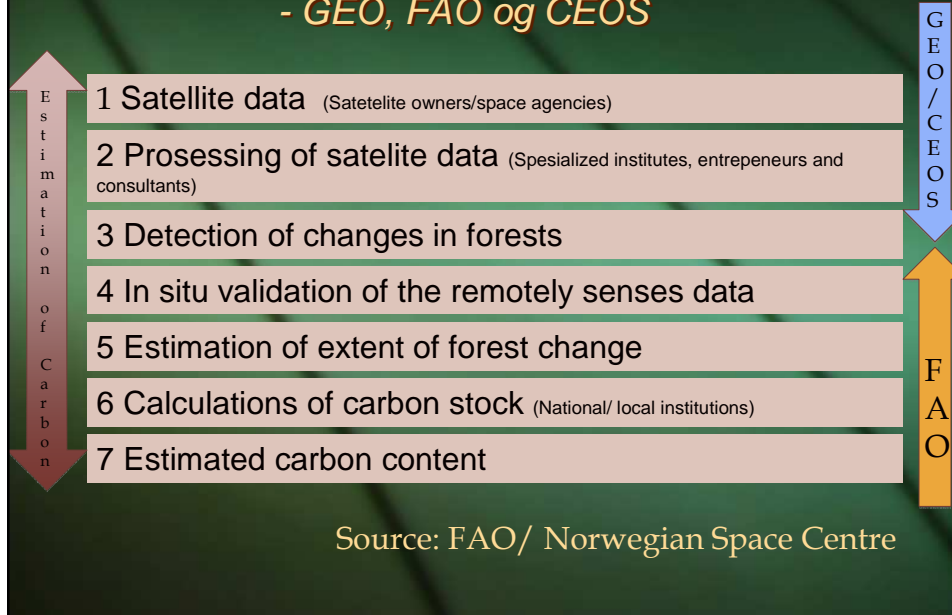
Key Outcomes for 2009 (1)

- 1. Put in place a clear communication plan with key policy-relevant messages and outcomes.**
- 2. Securing a best efforts commitment from the Committee on Earth Observation Satellites (CEOS) to data supply on a continuous basis, as a prerequisite to demonstrating to policy makers that continuity of technical capabilities is guaranteed in support of their policy developments in this domain.**
- 3. Define a list of National Demonstrator sites and secure contacts within these countries. National Demonstrator sites should be drawn from the three major global tropical forest regions: South East Asia, Africa and South America. The number of sites should be limited to 7.**

Key Outcomes for 2009 (2)

- 4. Development of a document to identify the products to be delivered.**
- 5. Development of documented methodologies linking wall-to-wall, time series remote sensing data coverage to both ecosystem models and traditional forest inventories – to consistently estimate carbon stocks at project and national scales, as required in support of policy needs.**
- 6. Specification of agreed validation procedures for remote sensing of forest state and carbon estimates.**
- 7. Compelling visualizations of progress and demonstration results will be developed as inputs to the GEO-VI and COP-15 events, making clear the policy implications of the new technical capabilities.**

Process and global division of labour - GEO, FAO og CEOS



Nominated Initial Test-sites

- > Large regions in Brazil
- > Parts of Mexico
- > Guyana
- > Borneo, with focus on the Indonesian part
- > Cameroon
- > Tanzania
- > Tasmania (Australia)

- > Additional sites to be defined by UN REDD (FAO)

- > Utilise synergy with CEOS LSI Constellation regional areas and FAO FRA 2010 sites

Note: Final area and coverage of each regional test-site is being finalised in conjunction with key countries and governments.

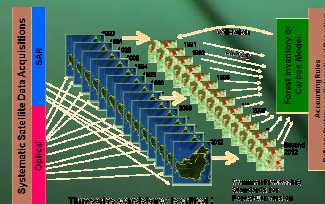


In Situ, Ground, Aerial observations (1)

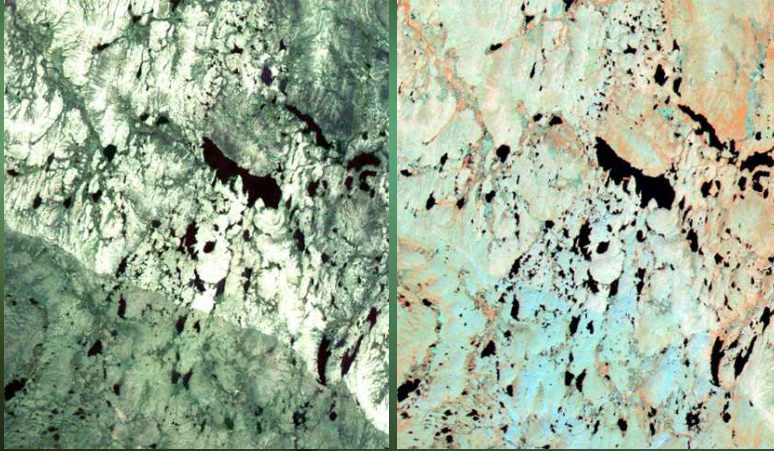
- Many types of observations (normally not satellites)
- Different methods; manual , automated, regular, irregular, simple, advanced, cheap, expensive
- Different user needs; decisions, State of the Environment, biodiversity, land cover, planning, accounting, research etc.
- **Monitoring should be regular, based on accepted methods, timely and at applicable costs (human resources, infrastructure etc.)**

In Situ, Ground, Aerial observations (2)

- In-situ data should meet requirements for validation of satellite data
- Data/methods should meet certain standards (FAO, UNFCCC)
- Long time data series should be available (1990+)



Spectral differences



Landsat TM 1987, ch 321

Landsat TM 1987, ch 457

Border areas – Norway-Finland



Activities at the Validation Sites (1)

- **Suitable validation sites must be agreed upon and established**
- Tier 1 data of forest area can be obtained through national statistics, from forest agencies, conservation agencies, municipalities, survey and mapping agencies
- Tier 2 uses country-defined national data sets, according to different forest types, climate, management systems, and regions
- Tier 3 uses country-specific data on managed Forest Land from different sources, notably national forest inventories, registers of land use and land-use changes, or remote sensing

- **When in situ data are not available the necessary steps to establish in-situ measurements should be established (infrastructure, administration etc.)**

Activities at the Validation Sites (2)

- **Processed satellite data will be made available**

- **Other activities dependent of situation in countries**
 - Capacity
 - Infrastructure
 - Training
 - Other concerns

Establishment of Test Sites (1)

- This GEO Task will establish a number of reference test-sites to demonstrate and develop approaches and methods for using current Earth observation capabilities for long-term, operational forest-cover change and carbon monitoring.
- Test-sites need to have key characteristics to qualify and endorsed in support of this task



Once the initial sites are identified, we will ask CEOS to work with member space agencies to secure the necessary Earth observation datasets and possible additional support from agencies for the data processing.

Proposed Guidelines for Establishment of Test Sites and Recognition by GEO Task (2)

- Sites should be located in countries with own stated intent to develop national forest carbon monitoring systems
- Donor countries and/or donor NGO's clearly identified
- Governmental institutions capable and committed to support ground observations
- Relevant national forest management authorities in host countries being involved
- Clear management and governance arrangements being outlined
- Resources for the acquisition and analysis of the data clearly identified
- Timely and specified reporting on progress and deliverables, including specific data products, for each site

Proposed Guidelines for Establishment of Test Sites and Recognition by GEO Task (3)

- Initial focus will be on cloud-affected areas
- Large areas (to demonstrate repetitive, wall-to-wall, accurate wide-area forest mapping capabilities - e.g. Borneo, Amazon)
- Sites to include representative scientific projects on forest change, with appropriate in-situ observations
- Availability of archived SAR and optical data to demonstrate changes is preferred



Financing

- **UN-REDD**
Appointment with FAO/GEO should be in place
- **World Bank**
Will support up to 30 countries with own stated intent to develop national forest carbon monitoring systems (REDD)
- **Bilateral funding**
- **Other funds**

Satellites are important ...

