Activities of GEO Forest Carbon Tracking (FCT)

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Overall

- The Group on Earth Observations (GEO) is coordinating international efforts to build a Global Earth Observation System of Systems (GEOSS).
- GEO 2009-2011 Work Plan task CL-09-03b (Forest Carbon Tracking) will demonstrate that coordinated Earth Observations can provide the basis for reliable information services of suitable consistency, accuracy and continuity to support Forest Carbon Tracking.
- Co-Leads of this task are:
  - Australia, Canada, Japan, Norway, CEOS, ESA, GOFC-GOLD and UN-FAO.
- Top Priority for this task are:
  - Milestones of the G-8, COP-15 and GEO-VI (2009), and GEO Ministerial (2010)

Objectives

- To demonstrate the feasibility of forest monitoring information generated from coordinated Earth Observation as input to future national forest and carbon monitoring system.

- (In 2009) To demonstrate to the UNFCCC COP-15 in Copenhagen in December, the value of linking coordinated acquisition of satellite data with standardized processing methods, forest inventory and ecosystem models.

Status of Progress

- CEOS approved "CEOS Communiqué on Forest and Carbon Monitoring"
- An Implementation Plan (IP) of this Task was developed to communicate the contents and schedule of the Task and to facilitate efficient and effective project management.
- A number of "National Demonstrators (ND)" were selected to demonstrate the capability of this Task initially in national scales.
- "2009 Data Requirements For National Demonstrators" was developed and sent to CEOS Chair.

The Role of CEOS

- **The Committee of Earth Observation Satellites (CEOS)** will be critical for this Task, in coordinating the necessary satellite data acquisition.

- CEOS Communiqué on Forest and Carbon Monitoring, (4th March 2009) declares
  - *"CEOS will undertake the necessary coordination of its Member agencies to address the space data requirements of the GEO effort, and to ensure that satellite Earth observations serve an appropriate role in coordination with in-situ observations to support the implementation of this task"*

Japan Aerospace Exploration Agency

Committee on Earth Observation Satellites

Implementation Plan

- 2009-2011 Implementation Plan (IP) of this Task includes several work packages as below.

  WP0000: Task Management & Communication Plan

  WP1000: Define Satellite Data Needs and Secure Continuity

  WP2000: Define and Establish National Demonstrators

  WP3000: Define Data Products and Data Interoperability Methods

  WP4000: Linkage with Ecosystem Models, Validation Procedures and Forest Inventories

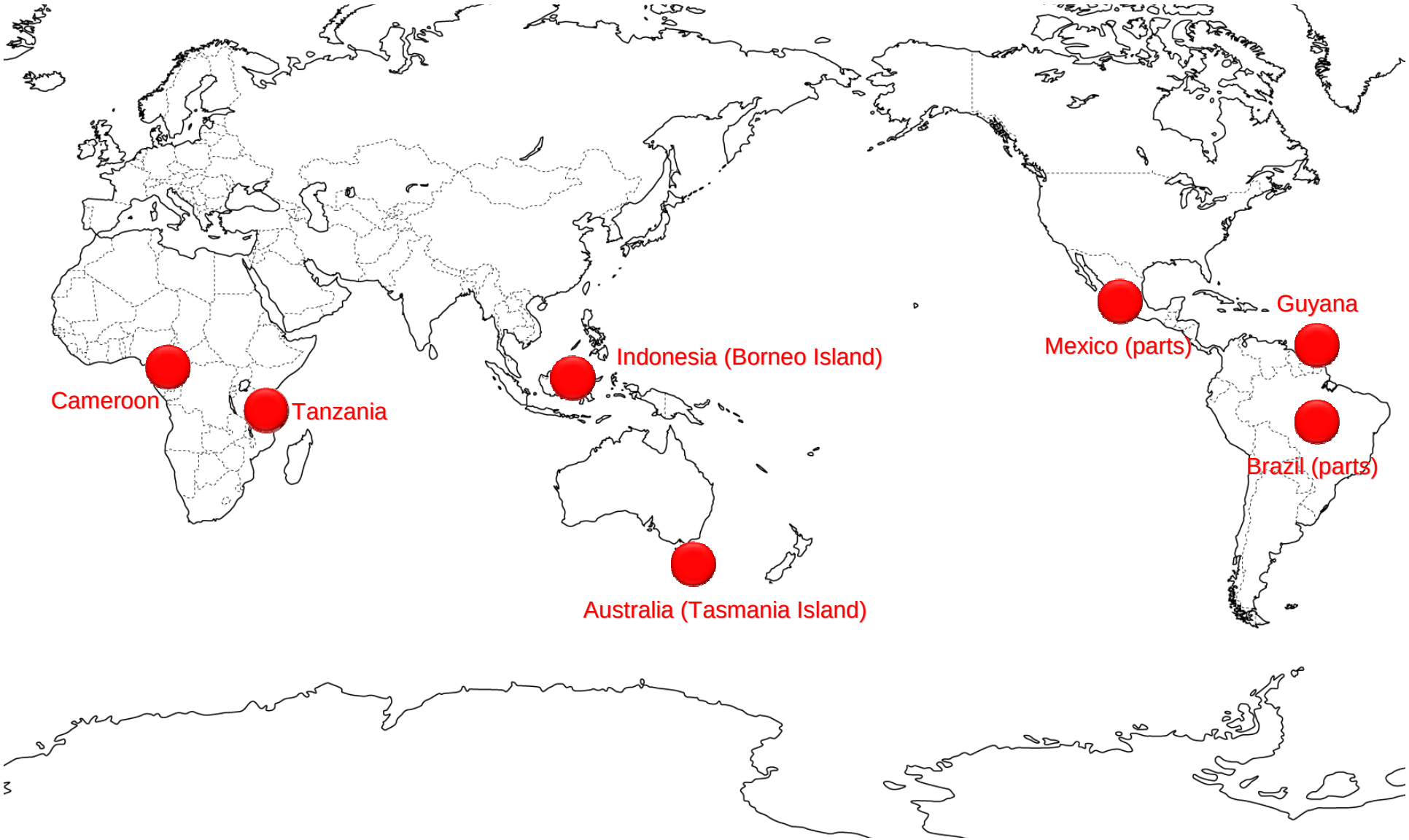
  WP5000: Support Implementation of Prototype Systems on Various Scales to Demonstrate and Disseminate Forest Carbon Tracking Results and Information

  WP6000: GEO-VI and COP-15

National Demonstrators

- To provide proof that global, annual, wall-to-wall coverage of the world's forests is feasible through coordinated satellite data acquisition strategies, the task team seeks to acquire satellite data over key areas of interest, initially at national scales – in a number of selected countries (**National Demonstrators**)
  - Optimal acquisition time window: July through August, 2009
- Further, intensive data acquisitions are requested for certain local validation and intensive observation sites (**Validation Sites**) within National Demonstrators, in support of technical comparison and validation work.

National Demonstrators



2009 Data Requirement

- On 1st June 2009, GEO Secretariat Director requested to CEOS Chair that CEOS space agencies would:
  - Plan and perform coordinated observations over the demonstrator areas
  - Provide relevant archived data; and
  - Support the processing of sample results from these data in order to demonstrate the efficiency and effectiveness of the satellite observations for national reporting obligations.

Specific Data Acquisition Requirements

- The Task asks for CEOS in the coordinated acquisition of the following optical datasets over the NDs.
  - Landsat-5, -7
  - IRS: AWiFS, IRS: LISS-III
  - CBERS 2b: CCD, IRMSS, WFI
  - SPOT
  - Kompsat-2
- 6 SAR systems are invited to contribute to the Task.
  - L-band (23.6cm): ALOS/PALSAR
  - C-band (5.6cm): RADARSAT-1, -2, Envisat/ASAR
  - X-band (3.1cm): TerraSAR-X, COSMO-Skymed

Country (Region)	Partnership Countries / Agencies (Demo lead in bold)	Processing Facility Hub	Funds	Size sqkm	Forest Description	Validation sites
AMERICAS						
Brazil	**INPE**, Norway, Woods Hole Research Center, Brazilian National Forest Service, Ministry of Environment,	INPE, Woods Hole Research Center, KSAT+ Research institutions in Norway	INPE and NSC cooperating to seek support from the Amazon Fund	4100000 (to be confirmed)	Largest tropical forest area in the world, five major climatic subtypes: equatorial, tropical, semiarid, highland tropical, and temperate; ranging from equatorial rainforests in the north and semiarid deserts in the northeast, to temperate coniferous forests in the south and tropical savannas in central Brazil	Xingu Watershed, Amazon (Woods Hole RC) FAO FRA has 725 sample tiles (10x10km) with Landsat imagery for 1990, 2000, 2005. FRA-SAR and Others (Wageningen Univ, NSC, INPE)
Guyana	**Norway**, Guyana Min of Environment, The Netherlands	Univ. Wageningen + ?	TBC	215,000	dense tropical rainforest in the centre, cloud or fog forest in the Pakaraima Mountains in the Southwest, selective logging, degradation test site	FAO FRA has 18 sample tiles. TBC (Univ. Jena & Waningen)
Mexico	**Canada** (Canadian Forest Service) CONAFOR	Mexico (optical)	Canada	500,000	Mexico has 170,000 square kilometres are "Protected Natural Areas" with large biodiversity, 568,000 sqkm forest area of which 266,960 sqkm is tropical. Variation of dry tropical forest in the South to short and tall tropical rain forest are the predominant vegetation on the peninsula Yucatan. The latter is suffering high deforestation rate.	FAO FRA has 184 sample tiles. CONAFOR Mexico has 22,000 NFI field plots at 5, 10 and 20km spacing.
AFRICA						
Tanzania	**Norway**, FAO, Tanzanian Min of Environment (nat UNFCCC nego.), Dept Forests and Beekeeping.	Europe? + FAO?	Norwegian Govt	945,200	The largest part of Tanzania is covered by miombo woodlands, a dry tropical forest: Recent reports indicates (Ref. Skutsch 2009) that the carbon loss from degradation in this vegetation type is extremely underestimated in Africa. The mountanious forest (<2% of the country) are a global biodiversity hotspot.	FAO FRA has 79 sample tiles. UMB-Norway
Cameroon	**ESA**, Germany (GTZ), German Development Bank KfW, Cameroon Min. of Environment	ESA	ESA: within GSE Forest Monitoring, baseline mapping full DMC coverage, further activities under discussion	475,440	Cameroon has 60 percent of it covered by forest and almost half the forest are tropical rain forest. Biological diversity is high, especially wildlife, but there are high numbers of endangered species. Deforestation has been significant in parts of the country.	FAO FRA has 41 sample tiles.
ASIA						
Indonesia (Borneo)	Indonesian MoF, **Australia**, Japan, The Netherlands	Australia	Australian Government	743,330	Borneo has a high biodiversity with about 3,000 species of trees (267 species are dipterocarps). The Borneo lowland rain forests cover most of the island. Other lowland biomes are peat swamp forests, the heath forests, freshwater swamp forests in the Southwest, and mangroves. Mountain rain forests lie in the central highlands of the island.	FAO FRA has 180 sample tiles. Several others(Univ. Jena & Waningen)
OCEANIA						
Tasmania (Australia)	**Australia**	Australia	Australian Government	68,400	temperate rainforest, cool temperate climate with four distinct seasons	Key Optical / SAR methodology development site (Forestry Tasmania). FAO FRA has 10 sample tiles.

ONS

Way Forward

- To show the progress to
  - SAR Coordination meeting in ESRIN (X-, C- bands, June 22nd)
  - GEO Forest Symposium in ChangRai, Thailand (July 1-3)
  - SAR Coordination meeting in JAXA (incl. L- band, last week of August)
  - CEOS/SIT-24 (Sept 2009 in Darmstadt)
  - GEO-VI (November 2009 in Washington D.C.),
  - COP-15 (December 2009 in Copenhagen) and
  - GEO ministerial (2010)

- The second step, aimed for implementation in mid-2010, comprises the subsequent full global-scale systematic acquisition so that wall-to-wall forest information products can be regularly(yearly) produced.

Way Forward

- The Task team will then follow-up with the CEOS agencies to organize a series of coordination discussions in order to further consolidate data requirements and define and advance the collective response.
- Discussions between GEO and CEOS should also be initiated to address issues such as management of data and results, arrangements for access and data policy.
- The arrangements for data processing, management and access will be finalized by the task team. The GEOSS Data Sharing Principles hopefully can be applied to all the data and results generated through this international collaboration.
- Any contributions from science community such as K&C to this Task are very much appreciated!!