



GEO Forest Carbon activities, from FCT to GFOI (from demonstration to implementation)







The Need for Forest Observations

Latest UNFCCC COP's (15 in Copenhagen, 16 in Cancun and 17 in Durban) have confirmed that comprehensive, continuous and systematic information on forests is a key component of national Measurement, Monitoring, Reporting and Verification (MRV) Systems for REDD+.

The Conference has also invited developing countries to move towards implementing these systems, taking into account the need and the opportunity of using all available observations (from satellite Remote Sensing data to ground measurements).





(FCT) task demonstrate that coordinated Observations from satellites, validated by in situ measurements and properly linked to carbon modeling can provide reliable, accurate, consistent and continuous information to address the monitoring component of national MRVs.

The FCT overall goals are

- 1.to show the feasibility of performing coordinated, large scale satellite observations and
- 2.to test and compare the use of various observations, models, tools and methodologies in order to provide options, advice and guidelines to Countries willing to implement national systems.



FCT logic and activities

GEO FCT has built a cooperating framework, which has progressively involved the scientific and technical community, the space community and countries willing to implement MRV systems for REDD+.

FCT is currently organized along four main lines of support activities:

- •Satellite data coordinated acquisitions and data provision, as needed by the demonstration campaigns
- •Demonstration campaigns, through the involvement of countries, the NDs, the appointment of a dedicated Product Development Team and processing of FCT products over the ND's
- •R&D, definition of R&D topics, R&D plan, development of Guidance Documents, requirements for demonstration planning, with a yearly review cycle to feed back demonstrations results into Guidance Documents
- Associated Capacity Building actions





FCT Task Team



Co-leads

- Norway (NSC)
- Japan (JAXA)
- Australia (Department of Climate Change & CSIRO)
- Canada (CFS-CSA)
- USA (USGS)
- FAO
- CEOS (ESA)

Additional partners contributing space and forest research data and expertise are Brazil, France, the Netherlands, **United Kingdom, European Commission** and GOFC-GOLD. The GEO Secretariat supports activities coordination and

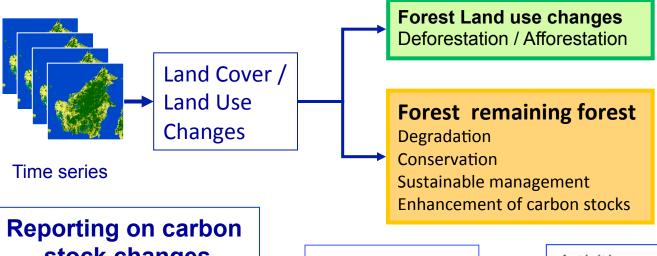
Including the 11 National Demonstrators,
Organizations from more than 30 Countries are contributing to the GEO task.



Support to Countries for REDD+ reporting

Support in the construction of consistent time series of observations and of comparable land use/land use conversion products, as well as in improving the determination of emission factors, will enable Countries to build their baselines and to report yearly on land use and carbon stock changes, so to address all REDD+ current objectives.

Reporting on land use changes



Forest Land is the focus of the yearly reporting on land-use conversions.

stock changes

Assessment of carbon stock changes is based, according to IPCC guidelines, on land use changes ("activities") and emission factors.

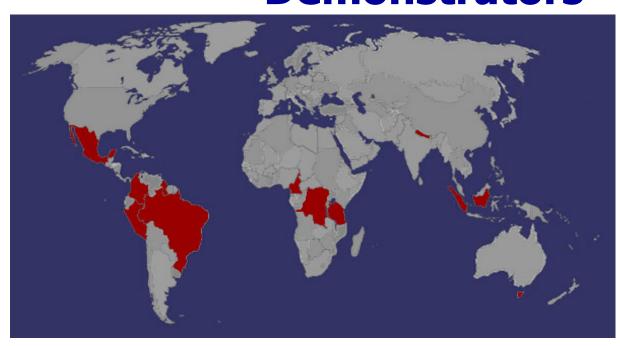
Emissions estimation / Carbon stock change

Activities **Emission Factor** Area Carbon change content

Global Forest Observations Initiative



FCT Network of "National Demonstrators"



From 2009

- Brazil
- Guyana
- Mexico
- Indonesia (Kalimantan)•
- Australia (Tasmania)
- Cameroon
- Tanzania

From June 2010

- Colombia
- DR Congo
- Peru, and

adding Sumatra to Indonesia

11 ND Countries

- Australia (Tasmania)
- Brazil
- Cameroon
- Colombia
- DR Congo
- Guyana
- Indonesia(Sumatra,Kalimantan)
- Mexico
- Nepal
- Peru

From June 2011

Nepal

·Tanzania.





GROUP ON EARTH OBSERVATIONS Data Coordination



GEO-FCT – EO Data Coordination

CEOS

SAR

JAXA (Japan)

- CSA (Canada)
- ESA (Europe)
- ASI (Italy)
- DLR (Germany)

Commercial

(V)HR

- GeoEye
- Ikonos
- Quickbird
- RapidEye
- DMC
- (Spot)
- (CSM e-Geos)
- (TSX Astrium GIS)
- (RS-2 MDA)

OPTICAL

LSI Constellation

- USGS (USA)
- CNES (France)
- INPE (Brazil)
- ISRO (India)
- GISTDA (Thailand)
- JAXA (Japan)



GEO GROUP ON FCT Acquisition Summary



Campaign	Summer 2009	Spring 2010	Summer 2010	Spring 2011	Summer 2011	Total
ALOS PALSAR	6189	7531	13746	15079	mission lost	42545
RADARSAT-2	595	1278	875	1160	1093	5001
ENVISAT ASAR	684	1419	2785	1547	3318	9753
COSMO - Skymed	not planned	183	N/A	N/A	91	274
TerraSAR-X	not planned	16 243 n	139,0	007SC	enes	756
Landsat 5 &	nore	7180	11362	11691	10149	44770
SPOT	TPM by ESA, but restrictions related to repatriation		2252	2810	6192	11254
CBERS-2B	3580	N/A	mission lost	mission lost	mission lost	3580
IRS	not planned	100	13674	6015	1187	20976

Forest Carbon Tracking







Sub 30m core satellite data streams for continuous, annual, global coverage

Sep 2011

2010 2011 2012 2013 20	014 2015 2016 2017	2018 2019 2020 2021 202	2 2023 2024 2025				
ENVISAT (ESA)							
Sentinel-1A/B/C (ESA)							
RADARSAT CONSTELLATION 1/2/3 (CSA)							
SAOCOM-1A/B -2A/B(CONAE)							
			Data policy to be confirmed				
LANDSAT 5/7 8.1 DCM (LISGS)							
		OCM					
2B concluded operations in May 2010							
Sentinel-2A/B/C (ESA)							
	ENVISAT (ESA) Sentinel-1A/ LANDSAT-5/7 & LDCM (USGS) CBERS-2B/3/4 (INPE/China)	Sentinel-1A/B/C (ESA) RADARSAT CONSTELLAT SAOCOM-1A/B -2A/B(CO	ENVISAT (ESA) Sentinel-1A/B/C (ESA) RADARSAT CONSTELLATION 1/2/3 (CSA) SAOCOM-1A/B-2A/B(CONAE) LANDSAT-5/7 & LDCM (USGS) CBERS-2B/3/4 (INPE/China) 2B concluded operations in May 2010				



Additional Data

Further data streams of interest



Sep 2011 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 Radar sensors C-band RADARSAT 2 (CSA) Commercial system L-band **ALOS & ALOS-2 (JAXA)** Data policy to be confirmed. Access to PALSAR W2W archive of interest. Also future access to full-resolution ALOS-2 PALSAR data for ND verification sites X-band TERRASAR-X & TANDEM-X & TERRASAR-X-2 (DLR) Commercial system, German Govt considering bulk purchase COSMO-SkyMed Constellation & 2nd generation (ASI) Commercial system There are also numerous one-off C- and X-band missions in planning by several countries SPOT-4/5 (CNES) Commercial system, but Congo Basin coverage offered by French Govt (via AFD) for FCT purposes until 2015. SPOT-6/7 (SpotImage/Infoterra) **DMC-2 Constellation (UK)** Commercial system Ingenio (Spain) Deimos-1 (Spain) Commercial system Data policy to be determined RapidEye (Germany) Commercial system, German Govt considering bulk purchase IRS-1c/d & RESOURCESAT series (India) Commercial system

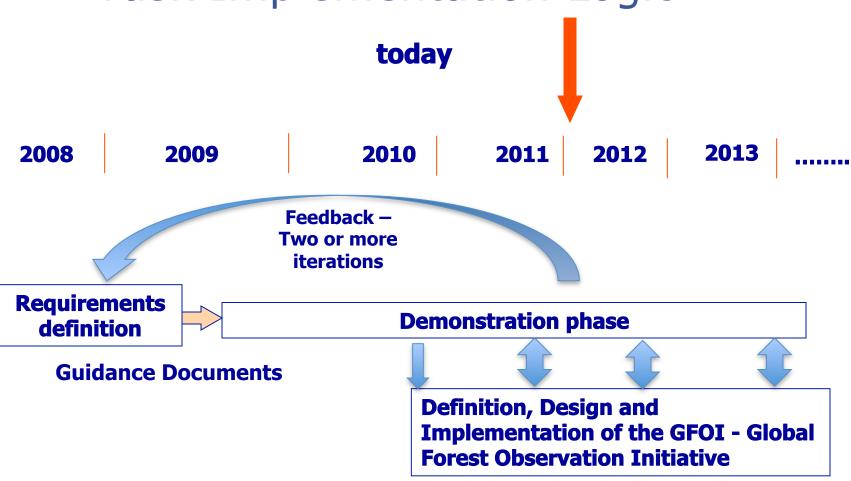
There are also numerous missions in planning by several countries that may be of value - including many high resolution missions of interest for validation. Few datastreams will have the capacity to provide routine global coverage. But many more will be able to contribute to national and regional coverages.







Task Implementation Logic







The Global Forest Observation Initiative (GFOI) builds on the accomplishments of the FCT

The GFOI Implementation Plan was approved at the November 2011 GEO Plenary

GFOI aims:

- fostering the sustained availability of observations in support of national forest information systems
- supporting countries in the use of observations in national forest information systems and reporting commitments – respecting national choices of data and tools

First GFOI Task Force meeting in Geneva January 2012
Third Science Data Summit in Tanzania February 2012
First meeting of the Space Data Coordination Group in Montreal March 2012







Approach of the GFOI

Chain of countries' support

Assessment of Support Needs

Consultation with the suppliers and donors

Preparation of the national supporting plan Support of the countries including CB

GFOI will not be prescriptive.

- GFOI can help outline the options that are available to national governments.
- The country will decide the data requirements based on its national circumstances and heritage and experience.

GFOI will not provide one-stop support

Support the country to build its own capacity





Climate R³ (Regional Readiness Review)

- Australia leading APRSAF initiative to improve space data coordination aspects of climate policies in the region
- Interested in supporting stronger regional data coordination activities and processes in support of key GEO activities – such as GFOI and GEO-GLAM
- Ideally including participation of main data providers –
 Japan, China, India, Korea
- Climate R3 workshop in Perth on 24-25 May will aim to promote a resolution on regional data coordination for APRSAF to consider

Global Forest Observations Initiative