

GOFC-GOLD

Global Observation of Forest and Land Cover Dynamics



Observing Essential Climate Variables: Progress and Examples from the Terrestrial Domain

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ESA side event: 6.Dec.2007, 1 pm



UNFCCC and earth observations of land cover

Requirements	UNFCCC	UNFCCC	UNFCCC
	Reporting obligations & sustainable development	Research & systematic observations	Reducing emissions from deforestation in developing countries
Implementation specifications	Kyoto Protocol	GCOS Implementation Plan	Post-Kyoto commitments
Technical guidelines	IPCC GPG LULUCF / AFOLU	Tasks for land cover observations	Technical protocols for measuring and monitoring GHG emissions
Operation and Application	National LULUCF reporting (Annex I) & CDM A/Reforestation	Evolving global programs	National case studies
	DUE Kyoto Inventory GSE Forest Monitor.	DUE GLOBCOVER & GLOBCARBON	GSE Forest Monitor.

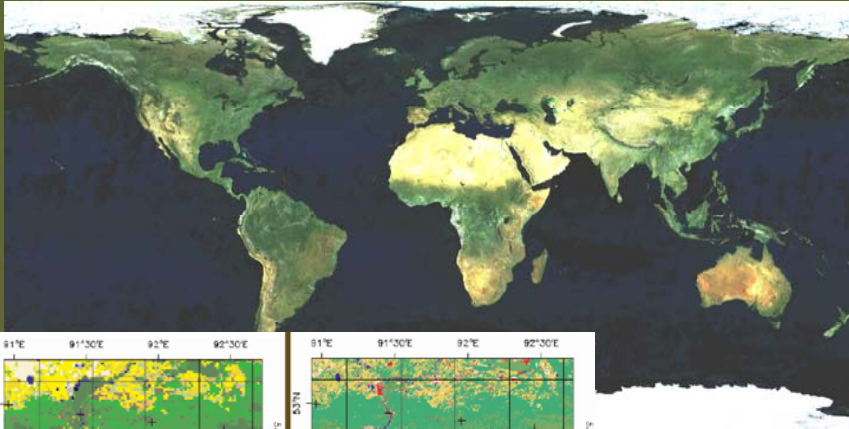
Charge to the Climate Observation Community

1. Implementation Plan of the Global Climate Observing System (*COP 10*)
 - high-quality satellite, ground-based and airborne *in situ* and remote-sensing measurements &
 - dedicated analysis infrastructure, and targeted capacity-building
 - Specific tasks for 13 terrestrial essential climate variables
2. Response of the Committee on Earth Observing Satellites (*COP 12*)
 - Satellite component in the global climate data record
3. *Status of the development of standards for each of the essential climate variables (COP 13)*

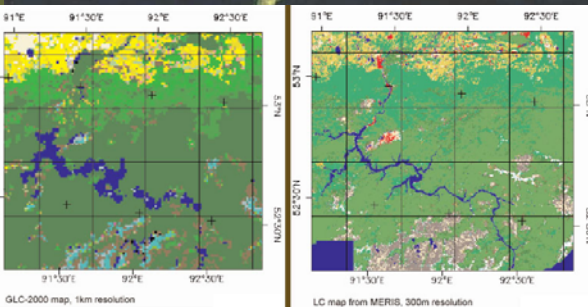
GCOS implementation plan actions for land cover

1. Establish international standards (T22)
 - UN Land Cover Classification System (LCCS) classifiers
2. Methods for map accuracy assessment (T23)
 - CEOS WGCV/GOFC-GOLD best practices report
3. Continuity for fine-scale satellite observations (T24)
 - Commitments to operate Landsat 8 (US) and Sentinel 2 (EU)
4. Develop an *in situ* reference network (T25)
 - Global validation implementation plan and GTOS TEMS
5. Annual global land-cover products (T26)
 - Release (and continuation) of GLOBCOVER
6. High-resolution global land cover change (T27)
 - FAO/FRA 2010 global sampling & GEO definition of specifications

Activities to improve global ECV observations: GLOBCOVER



- Development of an EO system for the production of global land-cover map for year 2005, using ENVISAT MERIS Fine Resolution (300m) data .
- Update and complement other existing global products, such as the 1km global land cover map produced by the Joint Research Center (JRC).
- Classification nomenclature compatible with the FAO-UNEP Land Cover Classification System (LCCS).



Global land cover map
Version 1 available Febr.'08:
www.esa.int/dua/ionia

Users Organisations:

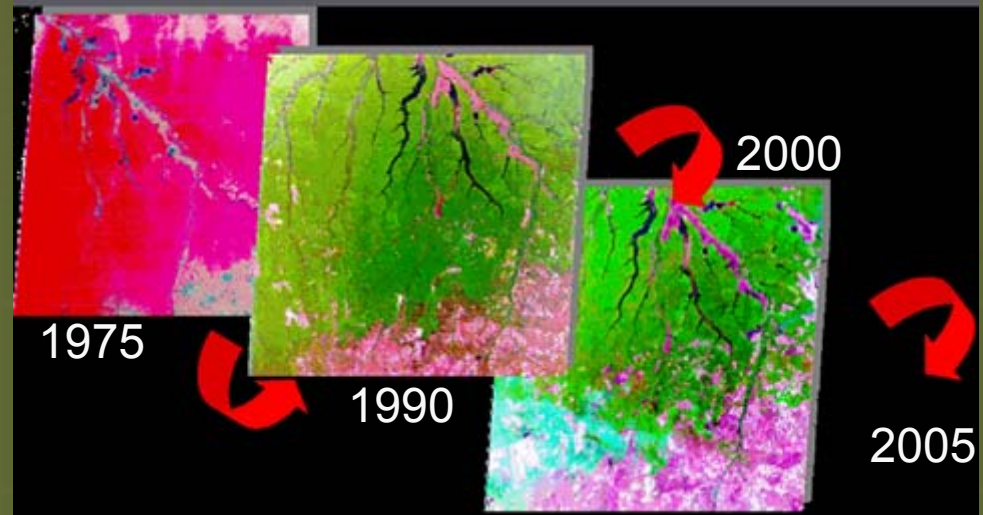
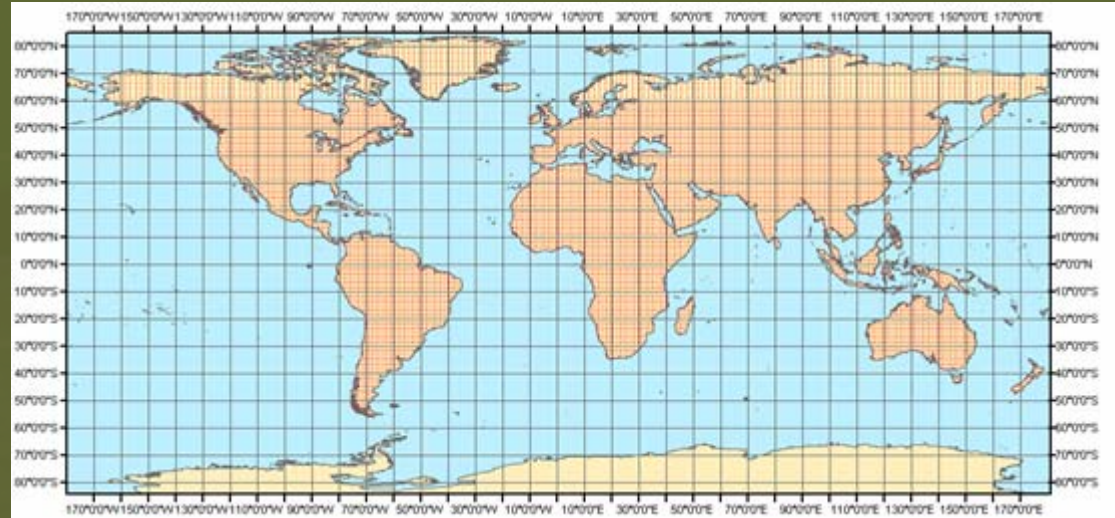
- Food and Agriculture Organization (FAO), Intl
- Global Observation of Forest Cover (GOFC), Intl
- International Geosphere-Biosphere Programme (IGBP), Intl
- Joint Research Center (JRC), Intl
- United Nations Environment Programme (UNEP), Intl



Activities to improve global ECV observations: FRA 2010

FRA 2010 global remote sensing survey:

- Specifically designed to cover the forest-related information needs for monitoring progress towards the 2010 Biodiversity Target, the Global Objectives on Forests of the UNFF and the Millennium Development Goals.
- A systematic sampling design (grid of blocks at 1x1 deg intersect) will be used.
- The area covered at each sample site is 10 km x 10 km (with a 5-km buffer zone)
- Landsat images—dating from around 1975, 1990, 2000 and 2005—will be interpreted and classified



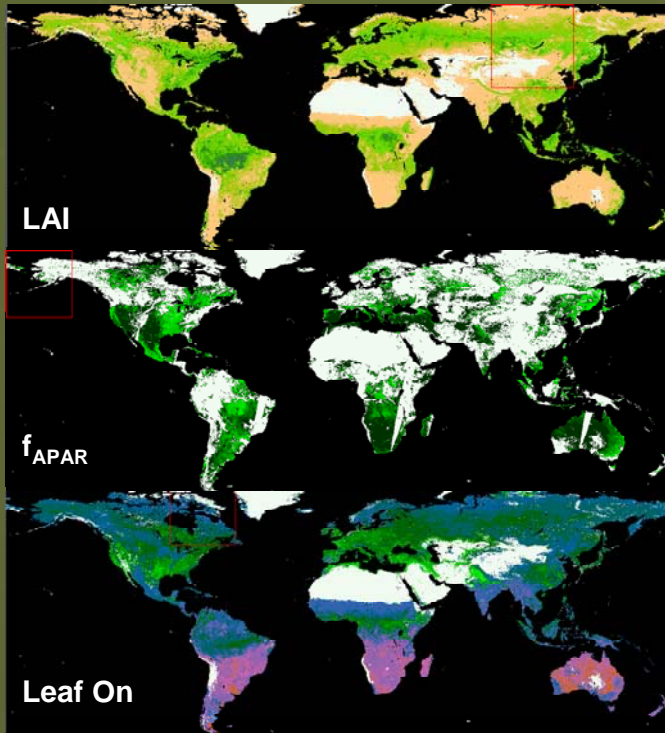
Charging the Climate Observation Community

Essential Climate Variable	ESA global observation commitments
Snow Cover	GLOBSNOW*
Soil Moisture	SMOS**
Glaciers	GLOBGLACIER
Lake Levels	<i>(regional activities)</i>
Albedo	GLOBALBEDO*
fAPAR	GLOBCARBON
Leaf Area Index	GLOBCARBON
Fire disturbance	GLOBCARBON
Land Cover	GLOBCOVER
Biomass	<i>(regional activities, e.g. Siberia)</i>

* in preparation (start 2008)

** future dedicated satellite mission (launch 2008)

Activities to improve global ECV observations: GLOBCARBON



- Development of a processing system, to generate multi-annual (1998-2007) estimates of land surface products globally from the VEGETATION, ATSR-2, AATSR, MERIS sensors.
- Demonstration and qualification of the GLOBCARBON processor by production of global estimates of Leaf Area Index, Fraction of Absorbed Photosynthetic Radiation, Vegetation Growth and Burned Area from 1998-2007.

- ✓ Global, multi-annual, multi-sensor
- ✓ Links with major land surface, atmospheric transport and terrestrial carbon modelling community

User Organisations:

- IGBP, **Intl**
- ESSP Global Carbon Project (GCP), **Intl**
- Potsdam Institute for Climate (PIK), **D**
- Max Planck Institute for Meteorology (MPI), **D**
- Laboratoire des Sciences du Climat et Environnement (LSCE), **FR**
- CTCD **UK**
- Geoland EU GMES Project, **EU**

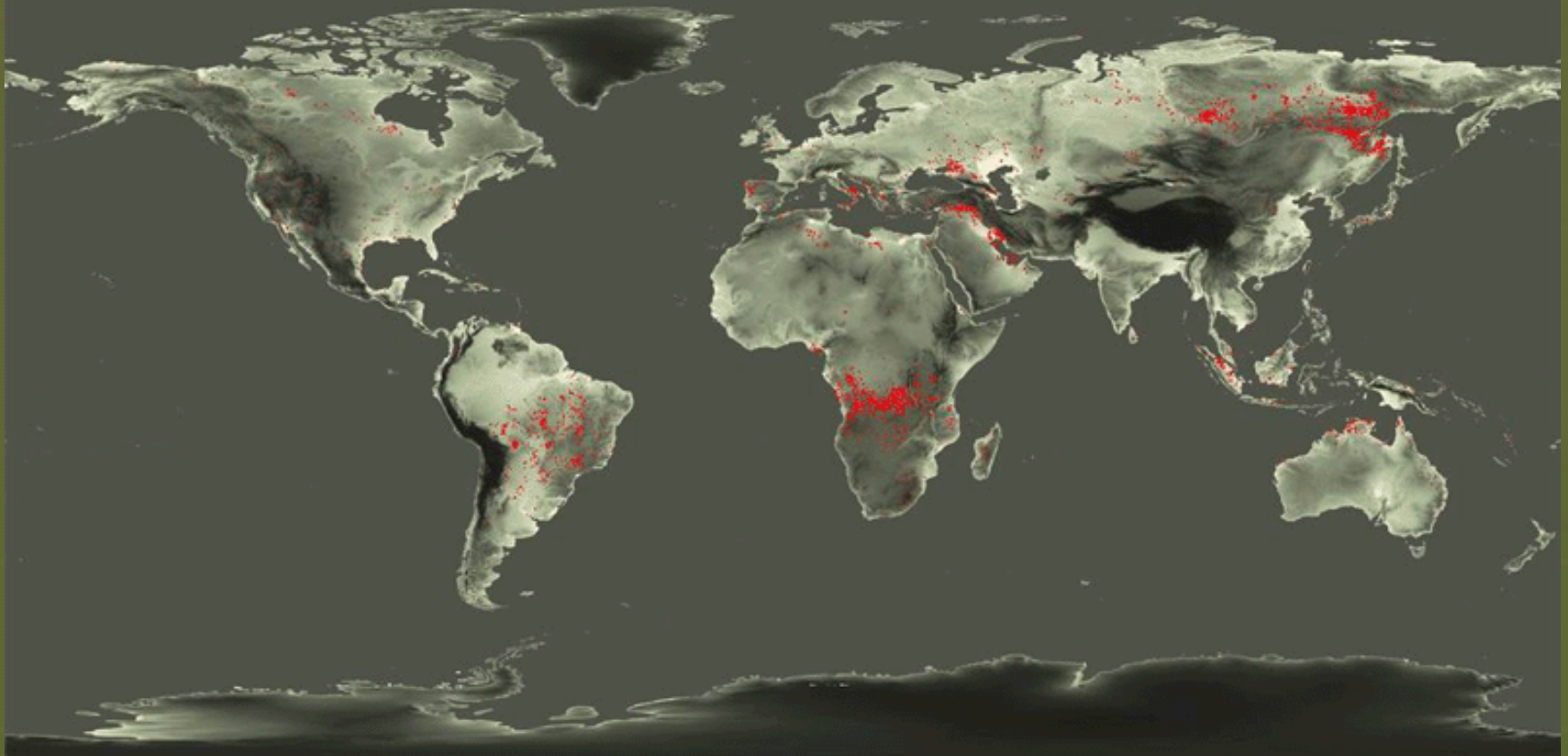


Activities to improve global ECV observations

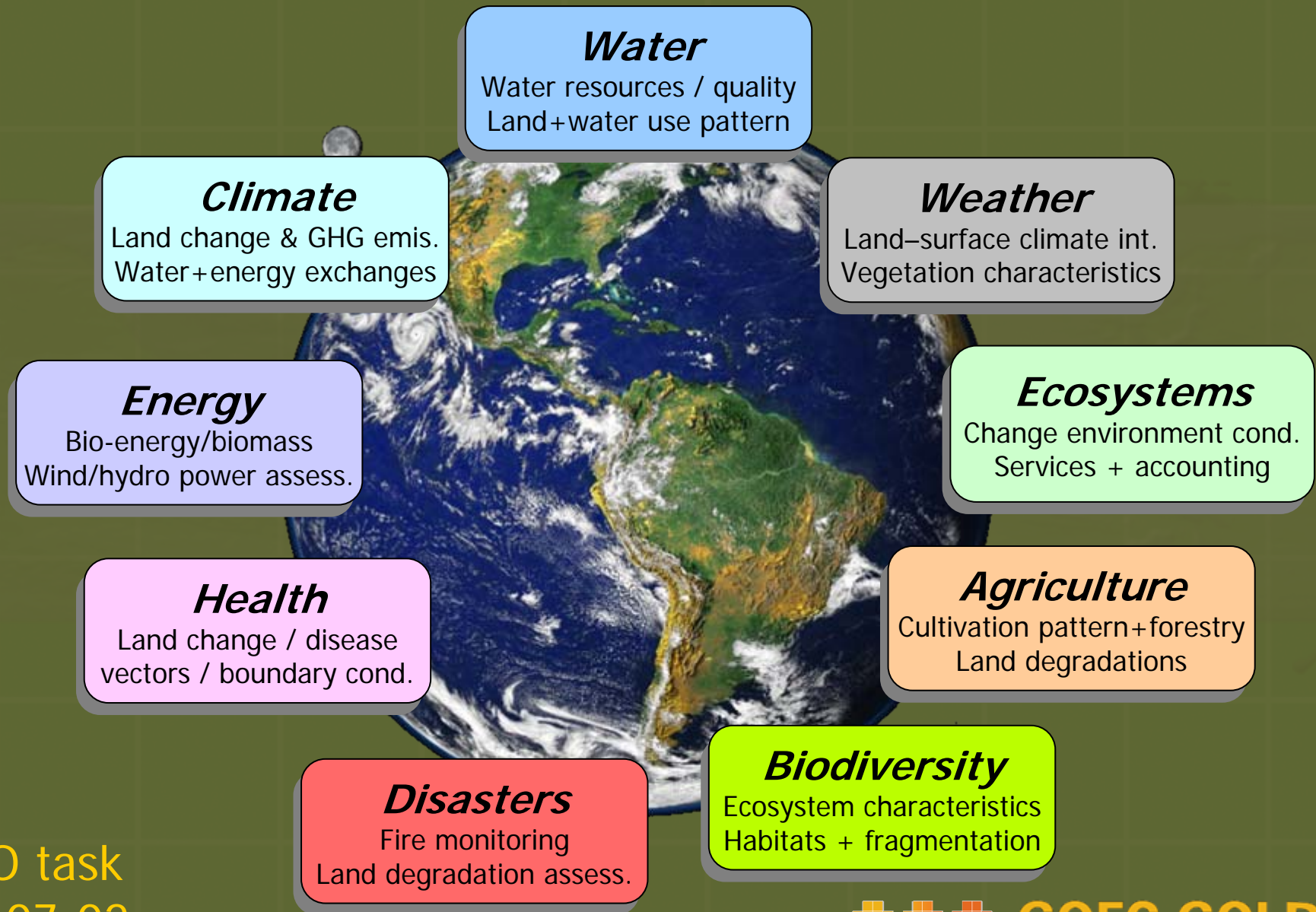


ATSR World Fire Atlas

07 - 1996



GEO societal benefits and land cover observations



Summary

1. Community for observing terrestrial ECV's has taken on the charge from SBSTA on research and systematic observation
2. Ongoing observation activities to improve regional and global estimates of land change:
 - Global efforts on moderate resolutions (GLOBCOVER)
 - Sample-based approach on fine scales (FRA 2010)
 - National level key to achieve societal benefits
3. Operation requires compatibility and comparability for observation data and products:
 - Move from research to operations & establish a truly global climate data record
 - International community experiences to be extended to more detailed scales

Web resources

- **GOFC-GOLD:**
 - <http://www.fao.org/gtos/gofc-gold/>
- **GOFC-GOLD land cover team:**
 - <http://www.gofc-gold.uni-jena.de/>
- **GCOS implementation plan to the UNFCCC:**
 - <http://www.wmo.ch/web/gcos/>
- **EO and reducing emissions from deforestation:**
 - <http://www.gofc-gold.uni-jena.de/redd>