

GOFC-GOLD

Global Observation of Forest and Land Cover Dynamics



Overview of Fire Related Tasks in GEOSS/GEO

Michael Brady

2nd Workshop on Geostationary Fire Monitoring and Applications
Darmstadt, 4-6 December 2006



GTOS

What is GEO going to do?

- GEOSS will build on and add value to existing Earth-observation systems by coordinating their efforts, addressing critical gaps, supporting their interoperability, sharing information, reaching a common understanding of user requirements, and improving delivery of information to users.



Societal Benefits

1. Reducing loss of life and property from natural and human-induced disasters.
2. Understanding environmental factors affecting human health and well-being.
3. Improving management of energy resources.
4. Understanding, assessing, predicting, mitigating, and adapting to climate variability and change.
5. Improving water resource management through better understanding of the water cycle.
6. Improving weather information, forecasting and warning.
7. Improving the management and protection of terrestrial, coastal and marine ecosystems.
8. Supporting sustainable agriculture and combating desertification.
9. Understanding, monitoring and conserving biodiversity.



GEO – our understanding

- Strong political momentum, internationally and nationally
- May (or perhaps should) change the way we do Earth Observation:
 - Societal benefits (link to observations and products)
 - Future generations of Earth scientists
- Awareness for terrestrial monitoring (one loud voice)
 - GEO 10 year reference plan: “land cover important for all areas of societal benefit”
- Engage user communities previously not or less involved in Earth Observation



GEO – our understanding

- GEO implementation (tasks):
 - Organization of tasks is to some extent learning by doing
 - Built upon existing activities with emphasizing where GEO can make a direct contribution (trigger)
 - Role of GEO Secretariat for task management
 - GEO activities outside of tasks
- GEO is not a funding mechanism (at least not now)
 - European FP 7 program
- GEO will get more focused and has to deliver success stories



GEO & GEOSS Reference Plan

GEOSS Societal Benefit Area	Specific land-related examples
Reducing Loss of Life and Property from Natural and Human Induced Disasters	Early warning systems for fires
Understanding Environmental Factors Affecting Human Health and Well-Being	Impact of fires on air quality; Locust forecasting
Understanding, Assessing, Predicting, Mitigating and Adapting to Climate Variability and Change	Role of forest change on carbon sequestration; monitoring compliance with Kyoto Protocol
Improving Water Resource Management through Better Understanding of the Water Cycle	Improved depiction of topography; impact of vegetation including root zone on hydrological cycle
Improving the Management and Protection of Terrestrial, Coastal and Marine Ecosystems	Monitoring of terrestrial ecosystems using satellite observations
Supporting Sustainable Agriculture and Combating Desertification	Reducing poverty and land degradation for more sustainable uses of agriculture
Understanding, Monitoring and Conserving Biodiversity	Monitoring protected areas and the landscapes within which they are found



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History

- Ministerial Summits
- Reference Document & 10 Year WP
- GEO Secretariat & Director
- 2006 & 2007/09 Work Plans
- Task List Matrix
- 5 Task Committees
- National GEO Secretariats



2006 GEOSS Implementation Plan

- Contribute to 10 tasks (agriculture, disasters, climate, biodiversity, ecosystems)
- Lead 2
 - geostationary satellites for hazards
 - communities of practice
- Could lead 4, with more resources
 - warning system for fire and monitoring for forest conversion
 - Advocate establishing continuity for near real-time, 30-m (or better) resolution, multi-spectral remote-sensing coverage
 - assessment on forests and forest changes utilizing ongoing land cover mapping projects
 - production of a high-resolution global land-cover change dataset



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Fire Related Tasks

1. Use of Satellites for Risk Management (DI-06-09 Contributing)
 2. Implementation of a Fire Warning System at Global Level (DI-06-13 Lead)
 3. Key Climate Data from Satellite Systems (Contributing CL-06-02)
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4. Pilot Communities of Practice (US-06-02 Contributing)
 5. Regional Networks for Ecosystems (EC-06-07 co-Lead)
 6. Building National and Regional Capacity (CB-07-01d Contributing)
 7. Forest Mapping and Change Monitoring (AG-06-04 Lead)
 8. Virtual Constellations (DA-07-03 Contributing)
 9. Global Land Cover (DA-07-02 Contributing)
 10. Key Terrestrial Observations for Climate (Lead CL-06-03)



DI-06-09 Use of Satellites for Risk Management

- Led by WMO and China
- Expand the use of meteorological geostationary satellites for the management of non-weather related hazards.
- Conduct an assessment of meteorological geostationary-satellite capabilities for the management of non-weather related disasters:
 1. Identify existing applications from geostationary satellites for non-meteorological hazards - Volcanic ash forecasting and forest fire monitoring
 2. Identify required applications based on societal benefit areas
 3. *Referring the planning workshop held in Darmstadt to identify and implement pilot demonstration projects combining US and EU geo-stationary meteorological satellites for fire detection smoke transport, follow-up workshop and initial results.*
 4. Promote results of pilot-projects in particular in developing countries.

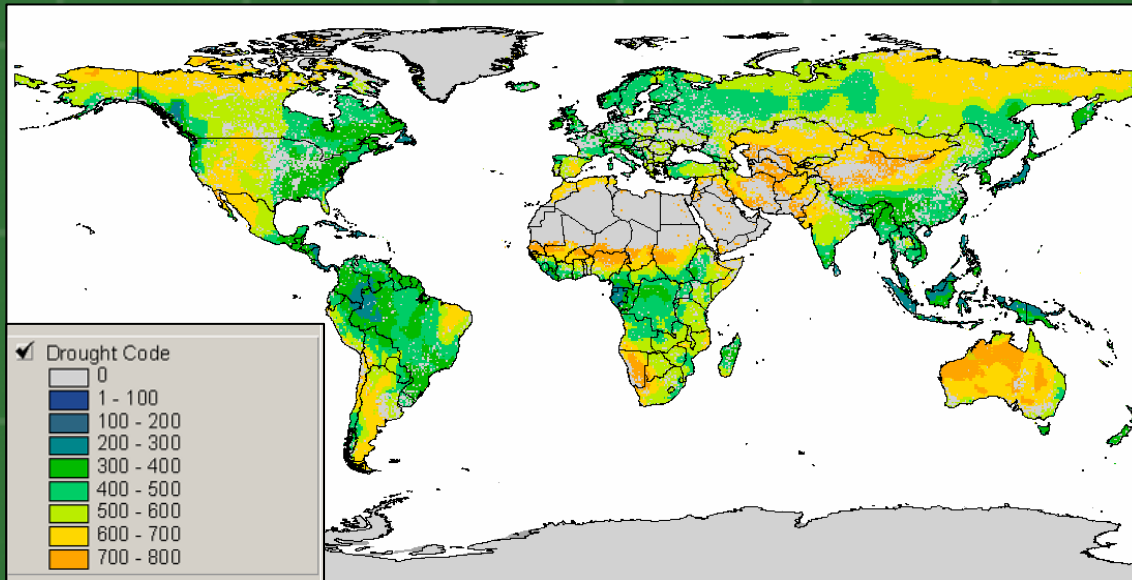


DI-06-09 Use of Satellites for Risk Management

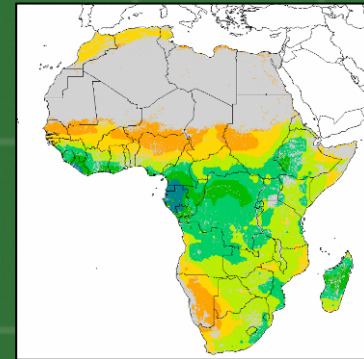
GTOS, through GOFC-GOLD, is leading an ongoing program to expand the use of meteorological geostationary satellites for the management of fire related hazards.

This includes detecting and monitoring active wildfires and land use fires, and to integrate these observations into a coordinated global observing network.

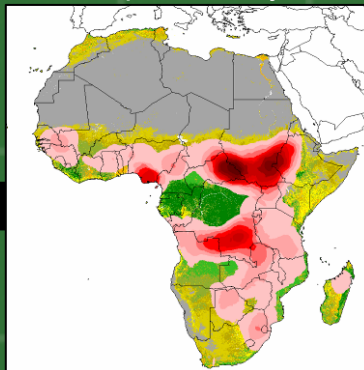
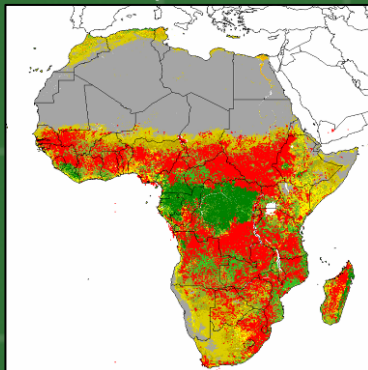
DI-06-13 Implementation of a Fire Warning System at Global Level



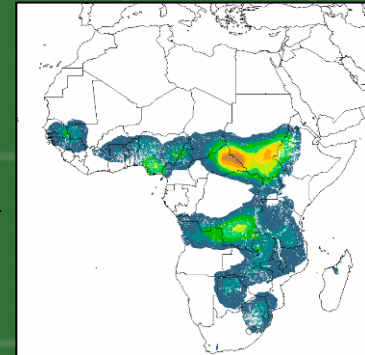
Drought masked by fuel



ATSR Hotpots, 1995-2000



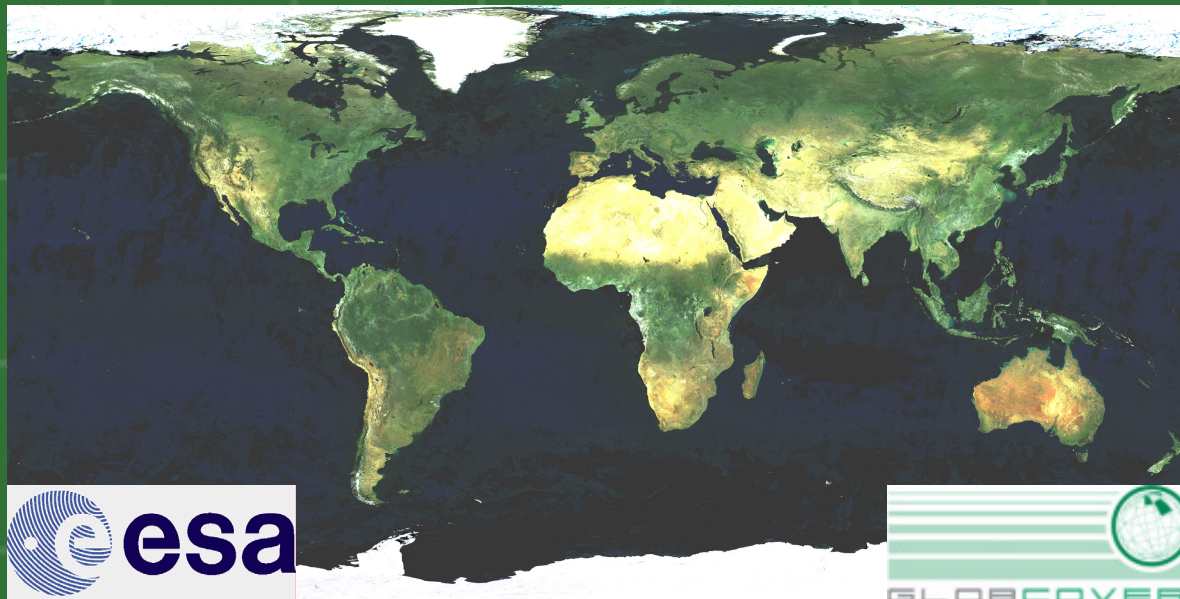
Drought x Fuel x Hotspot Density



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Task AG-06-03 on Global Land Cover

- GLOBCOVER: international consortium (i.e. ESA, JRC, UN, GOFC-GOLD) to ensure application of existing standards
- Global land cover using ENVISAT/MERIS 2005 (300 m resol.)
- Built upon experiences (GLC2000, LCCS)
- Link to international initiatives (i.e. GEO) and regional mapping programs (i.e. CORINE)



Global MERIS mosaic
First GLOBCOVER global
map product available
in January 2007

Global MERIS mosaic



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DI-06-09 Status Reported by Sep 06

- Sep 06: The December 2006 Workshop will further develop the use of geostationary satellite data for fire detection and volcanic ash monitoring.
- Jun 06: GEO satellite data are used for fire detection products and volcanic ash monitoring. CGMS agreed (November 2005) to establish links on WMO website to all real-time fire detection products on satellite operators websites.

GEO III Plenary

28-29 November 2006

- Members (66 nations & EC, 43 orgs)
- Report on GEOSS Progress 2006
- Approve GEO Work Plan 2007/09
- Identify Near Term Successes
- Plan 2007 GEO Ministerial



Progress Reported on 2006 Work Plan: Disasters

The 2006 Work Plan included 14 tasks in the area of “Reducing loss of life and property from natural and human-induced disasters.” Although progress has not been homogenous across all tasks, significant achievements have been made in the following areas:

- Use of satellites and associated technologies in support of disaster reduction - Fairly good progress is reported in this area, if not always directly linked to the activities identified in the tasks.
- In particular, the use of Meteosat Second Generation (MSG) for fire detection and mapping is increasing, in some cases integrating MODIS applications worldwide, and EUMETSAT plans to deliver an operational “fire” product starting from 2007.
- InSAR technology is also becoming more mature as an operational tool for disaster reduction.
- In addition, the GEO Secretariat has continued discussion with the Board of the International Charter on Space and Major Disasters and with the Director of UNOOSA to ensure coordination on the use of remote sensing for this purpose. Although Charter members are not enthusiastic about the enlarging the Charter’s scope and mandate, the COPUOS approved the creation of the SPace based Information for Disaster management and Emergency Response (SPIDER) program, (formerly DMISCO) with an initial arrangement that foresees Offices in Vienna (UNOOSA), Beijing, Bonn, and Geneva.

Progress Reported on 2006 Work Plan: Disasters

- Global Fire Warning - Fairly good progress is reported, even if not always directly linked to the activities identified in the task. Early warning pilot services are being put in place in different countries and regions and a worldwide project has been proposed to UN/ISDR at the 3rd Conference on Early Warning (EWCIII in Bonn, March 2006), and is awaiting approval.
- Capacity building for disaster reduction - There was a general understanding of the contributors to these tasks that the overall objectives would be consolidated within the GEO capacity building strategy articulated for 2007 to 2009. In particular, it shall be noted that the objectives for 2006 for the task DI-06-12 (Initiate a knowledge-transfer on the use of Earth observations for disaster management) were pursued. The task has been closed and the relevant report is available. This task will be followed up within the above-mentioned SPIDER program.

GEO-III - November 2006 General Report on GEOSS Progress - Document 16



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Progress Reported on 2006 Work Plan: Climate

- User requirements refinement. GCOS has developed a document entitled “Systematic Observation Requirements for Satellite-based Products for Climate” and CEOS has prepared a response to these requirements (to be presented at COP-12 UNFCCC in November 2006). In addition, the WCRP Observation and Assimilation Panel (WOAP) has created an informal working group on the “development of improved observational datasets for reanalyses” to provide expertise and support to GEOSS reprocessing and reanalysis activities.
- Terrestrial climate observations framework. Development of a terrestrial framework for the development of standards and guidance material for variables related to climate in support of the UNFCCC has been initiated (see www.fao.org/gtos/doc/2006-GTOS-SC/13-UNFCCCreporting-v4.doc). GTOS has created a web-forum on its website to assist in the exchange of supporting information, data and ideas.



Progress Reported on 2006 Work Plan: Agriculture

- Global forest cover monitoring - The GEO Secretariat, with a number of co-sponsors, is organizing the 1st Global Forest Monitoring Symposium to be held in early 2007. A Symposium Science Steering Committee has been formed and a draft agenda and participant list developed.



2007/09 Use of Satellites for Risk Management

- This Task is led by WMO and China. Elaine Prins as PoC
- With reference to a multi- hazard approach, define and facilitate implementation of a virtual constellation for risk management.
- The Task will include development of dedicated Software tools (based on the basic ones developed within Task AR-07-03) to be used, in the short term, to facilitate the analysis of coverage for critical observations and, in the medium- long term, to implement the user interface with the operators for products ordering and retrieval and to perform data integration and re-processing.
- The Task will also include specific activities concerning Constellation requirements definition and performance assessment, with the full involvement of Users, through participation of “champions” from the relevant community of practice.
- The Secretariat will continue its action towards the Board of the International Charter as well as relevant CEOS members, in order to identify possible strengthening of Charter mechanisms and options for widening its scope.



GEO Near Term Successes

- Ministerial Meeting in November 2007
- Targeted tasks with links to fire detection:
 - Global Fire Warning System
 - The GEOSS Backbone – Registry of Interoperable GEOSS Components
 - World Portal for Earth Observations
 - Global Land Surface Imagery Initiative
 - Global Land Cover Change Dataset
 - GEONETCast



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Thank You Questions?

Main web page <http://www.fao.org/gtos/gofc-gold/>

Land cover IT web page <http://www.gofc-gold.uni-jena.de/>

Fire IT web page <http://gofc-fire.umd.edu>

Fire Related Tasks

1. DI-06-09 Use of Satellites for Risk Management (Contributing) Expand the use of meteorological geostationary satellites for the management of non-weather related hazards.
2. DI-06-13 Implementation of a Fire Warning System at Global Level (Lead) Initiate a globally coordinated warning system for fire and monitoring for forest conversion, including the development of improved information products and risk assessment models.
3. US-06-02 Pilot Communities of Practice (Contributing) GTOS, through GOFC-GOLD, is co-leading with Canada and Sweden a community of practice to identify and further refine users' needs for forest observations.
4. CB-07-01d Building National and Regional Capacity (Contributing) Initiate a knowledge-transfer programme to developing countries to ensure basic capacity to utilize Earth observations for disaster management.
5. DA-07-02 Global Land Cover (Contributing) Production of a high-resolution global land-cover change datasets and report on the mechanisms for regular analysis and reporting on land cover change and the use of these products, especially in developing countries.
6. AG-06-04 Forest Mapping and Change Monitoring (Lead) Initiate an international assessment effort on forests and forest changes utilizing ongoing land cover mapping projects (e.g. GLOBCOVER). Ensure application of standardized classifications and harmonization of existing datasets.
7. DA-07-03 Virtual Constellations (Contributing) Advocate rapid development of the "CEOS Constellations Concept for better temporal, spatial, and spectral resolution and related data management and dissemination. The CEOS Constellation for Land-Surface Imaging, designed to ensure the relevant synergy with High Resolution Multispectral Imager Continuity.
8. EC-06-07: Regional Networks for Ecosystems (co-lead) Build upon existing initiatives (e.g. ANTARES in South America and IOC-sponsored regional networks for oceans; GOFC-GOLD regional networks and ILTER for terrestrial domains) to develop a global network of organization-networks for ecosystems, and coordinate activities to strengthen observing capacity in developing countries.

