

GOFC-GOLD

Global Observation of Forest and Land Cover Dynamics



GOFC-GOLD Overview



John Townshend & Michael Brady
NASA Land Cover Land-Use Change
Science Meeting April 11-13th 2005



GTOS

Activities

GLOBAL TERRESTRIAL OBSERVING SYSTEM

Terrestrial Carbon Observations

Terrestrial Networks

Climate Observations (TOPC)

Central and Eastern Europe

Land Dynamics (GOFC/GOLD)

Southern Africa

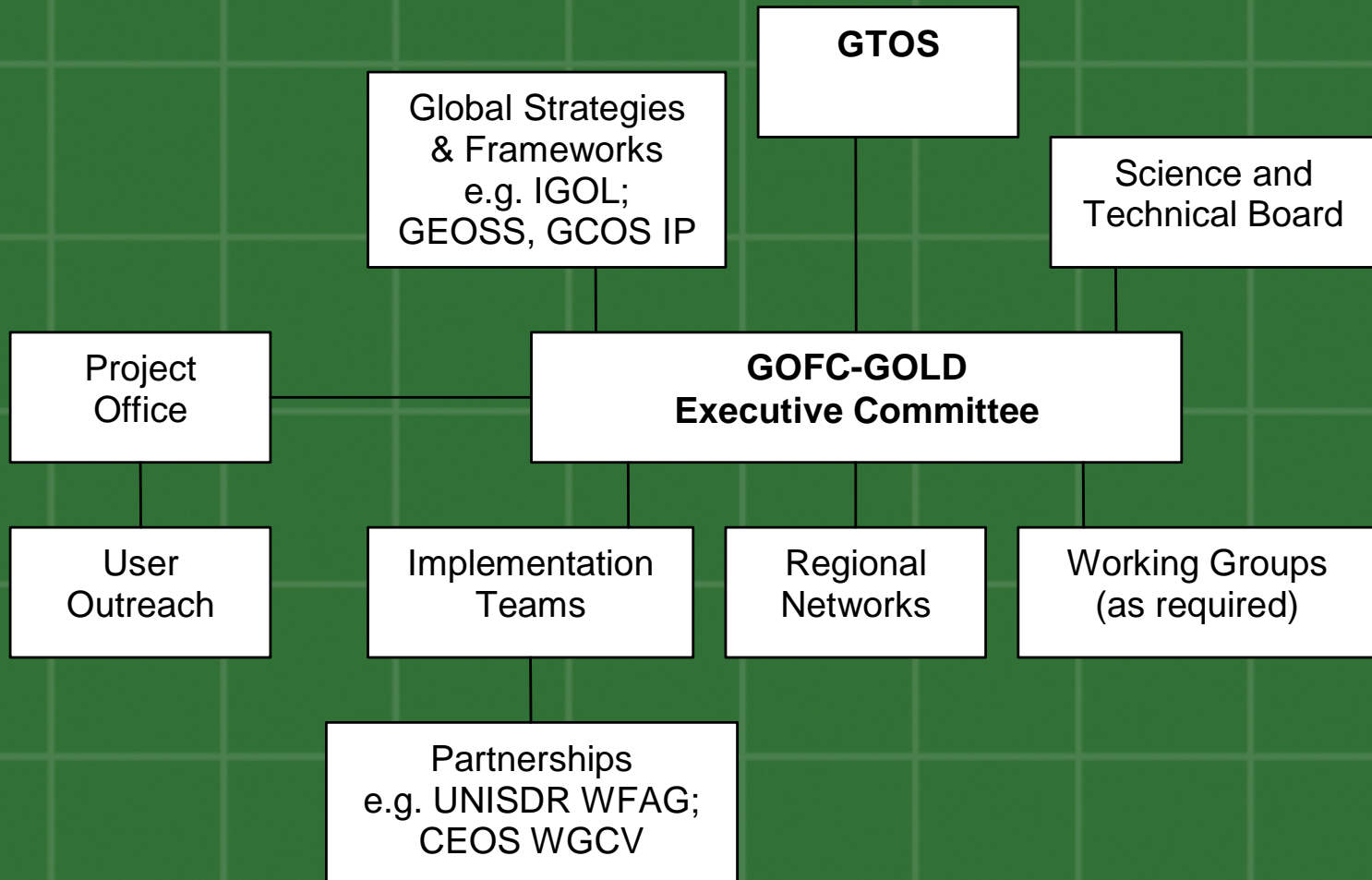
Terrestrial Coastal Environments (C-GTOS)

Net Primary Productivity



GOFC-GOLD

Management Structure



Principal Sponsors

- Canadian Space Agency
- Canadian Forest Service
- NASA
- European Space Agency
- GTOS
- FAO
- European Commission



Functions of GOFC-GOLD

1999 Strategy revisited in 2005 to ensure the global systematic collection of observations of land cover and fire

1. Specifying requirements for products
2. Assessing algorithms and data assimilation procedures
3. Ensuring the availability of observations
4. Harmonization and the development of protocols and standards
5. Ensuring that operational products meet accuracy requirements
6. Capacity building and the role of regional networks

7. Creating GOFC-GOLD products and services
8. Providing information to support international assessments
9. Advocacy role, especially in relation to the continuity of observations and validation



1. Specifying requirements for products

GCOS Implementation Plan

- Establish international standards for land-cover characterization
- Reliable methods for land-cover map accuracy assessment
- Develop an in situ reference network and apply validation protocols
- Generate annual products documenting global land-cover characteristics



UNFCCC-SBSTA

- CEOS: Detailed specification of variables for climate studies:
 - Land cover and cover change
 - Active fire, radiative power and burnt area
- GTOS: Guidance materials, standards, and reporting guidelines for terrestrial ECVs



GOFC-GOLD Product Specifications for Terrestrial ECVs

Variable	Product
Land cover	<ul style="list-style-type: none">- Land cover 250 m- Land cover change 10 m- Land cover change history
Fire disturbance	<ul style="list-style-type: none">- Active fire- Burnt area- Fire radiative power
<i>Biomass?</i>	<ul style="list-style-type: none">- <i>Biomass/NPP</i>



GOFC-GOLD Symposium on Forest and Land Cover Observations

Jena, Germany

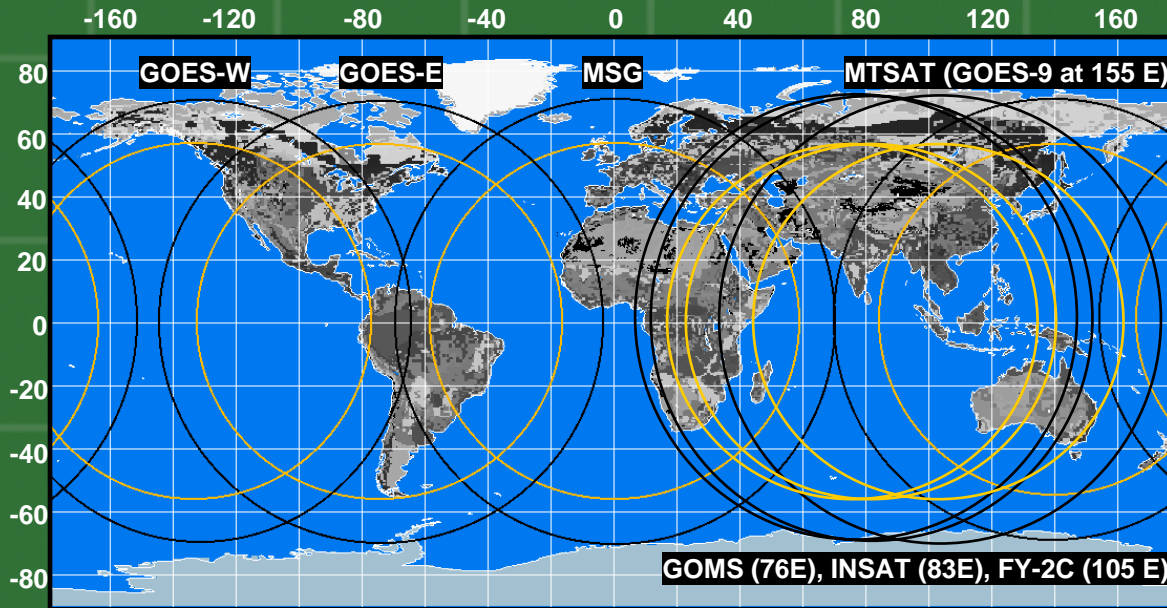
21-25 March 2006

- Workshop on Monitoring Tropical Deforestation for Compensated Reductions
- Workshop on “Monitoring Boreal Forest Ecosystems for International Conventions”



GOFC-GOLD

2. Assessing algorithms and data assimilation procedures



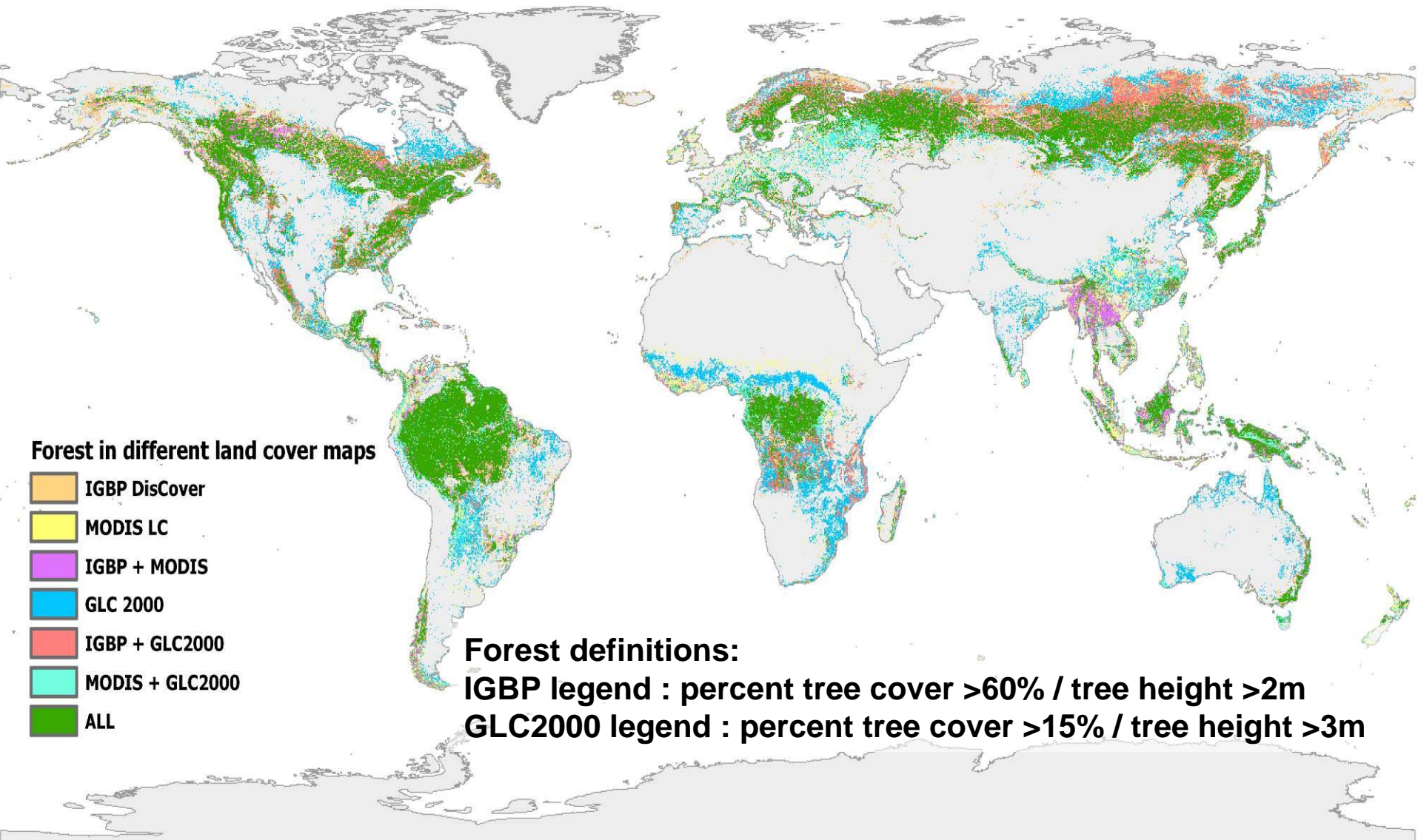
Global Geostationary Active Fire Monitoring Capabilities

Satellite	Active Fire Spectral Bands	Resolution IGFOV (km)	SSR (km)	Full Disk Coverage	3.9 μ m Saturation Temperature (K)	Minimum Fire Size at Equator (at 750 K) (hectares)
GOES-12 Imager	1 visible 3.9 and 10.7 μ m	1.0 4.0 (8.0)	0.57 2.3	3 hours	~335 K	0.15
GOES-9 & GOES-10 Imager	1 visible 3.9 and 10.7 μ m	1.0 4.0 (8.0)	0.57 2.3	1 hour (G-9) 3 hours (G-10)	~324 K (G-9) ~322 K (G-10)	0.15
MSG SEVIRI	1 HRV 2 visible 1.6, 3.9 and 10.8 μ m	1.6 4.8 4.8	1.0 3.0 3.0	15 minutes	~335 K	0.22
FY-2C SVISSR (Fall 2004)	1 visible, 3.75 and 10.8 μ m	1.25 5.0		30 minutes	~330 K (?)	
MTSAT-1R JAMI (2005)	1 visible 3.7 and 10.8 μ m	0.5 2.0		1 hour	~320 K	0.03
INSAT- 3D (2006)	1 vis, 1.6 μ m 3.9 and 10.7 μ m	1.0 4.0	0.57 ? 2.3 ?	30 minutes		
GOMS Electro N2 MSU-G (2006)	3 visible 1.6, 3.75 and 10.7 μ m	1.0 km 4.0 km		30 minutes		

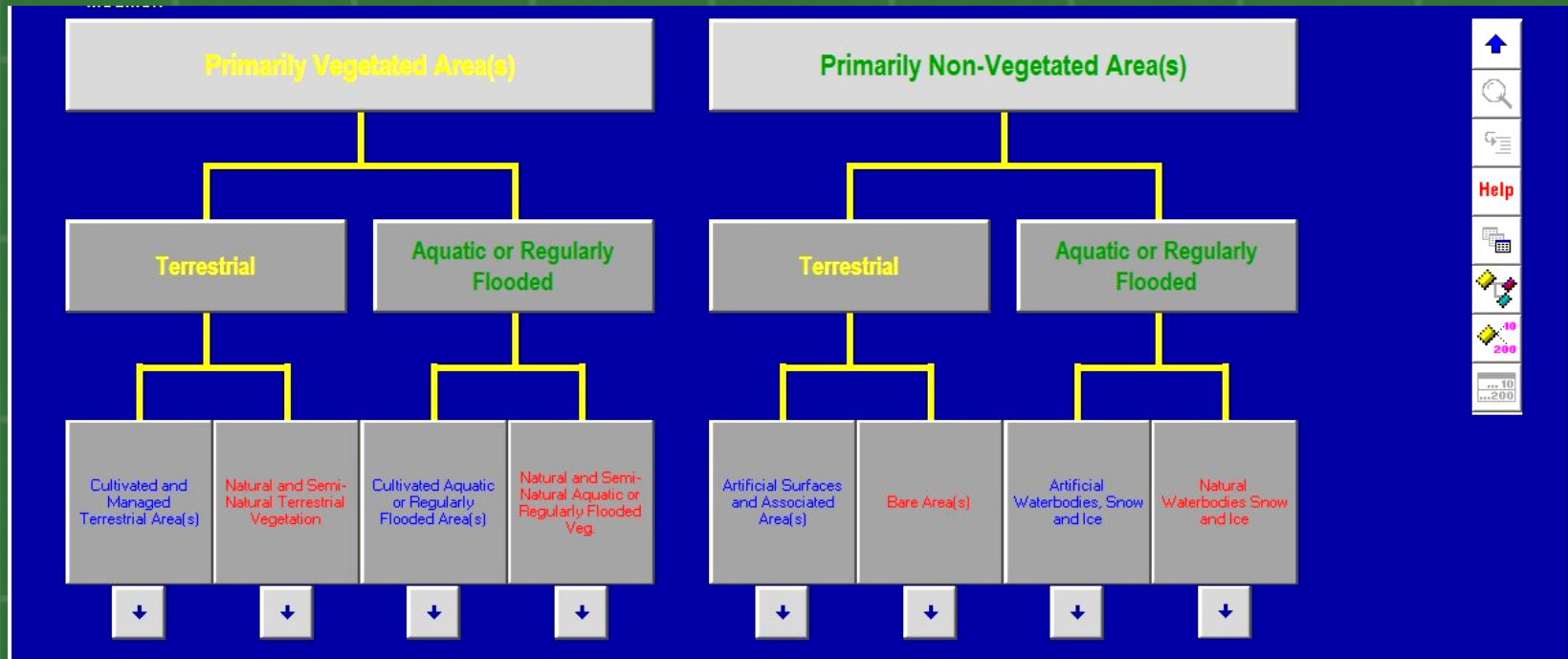


4. Harmonization and the development of protocols and standards

Forest areas in global land cover maps



LCCS-2 user interface at the initial dichotomous classification phase



LCCS is a world-wide reference system for land cover able to combine high flexibility with an absolute level of standardization of class definitions between different users. The system allows a dynamic creation of classes without the user having to relate to a pre-defined list of names by a dynamic combination of land cover diagnostic attributes called classifiers.

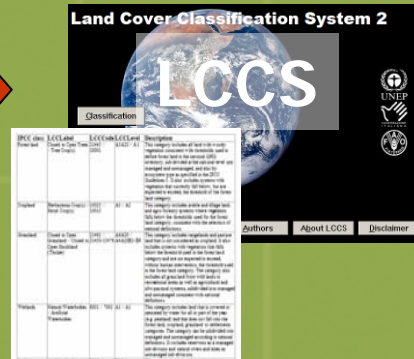
Harmonization mechanisms

Legend

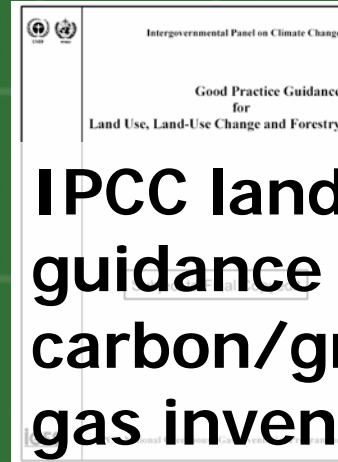


GLC2000

Translator



Land Cover Classification System 2
LCCS

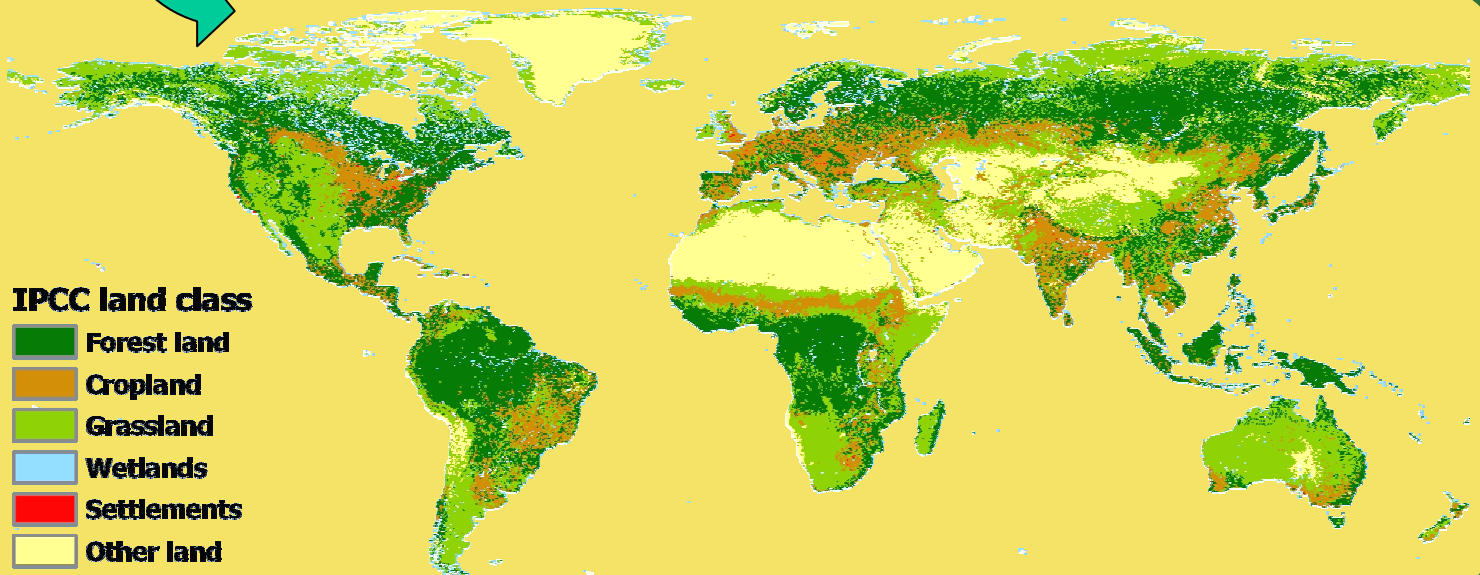


Intergovernmental Panel on Climate Change
Good Practice Guidance
for
Land Use, Land-Use Change and Forestry

**IPCC land use
guidance for
carbon/greenhouse
gas inventory calc.**

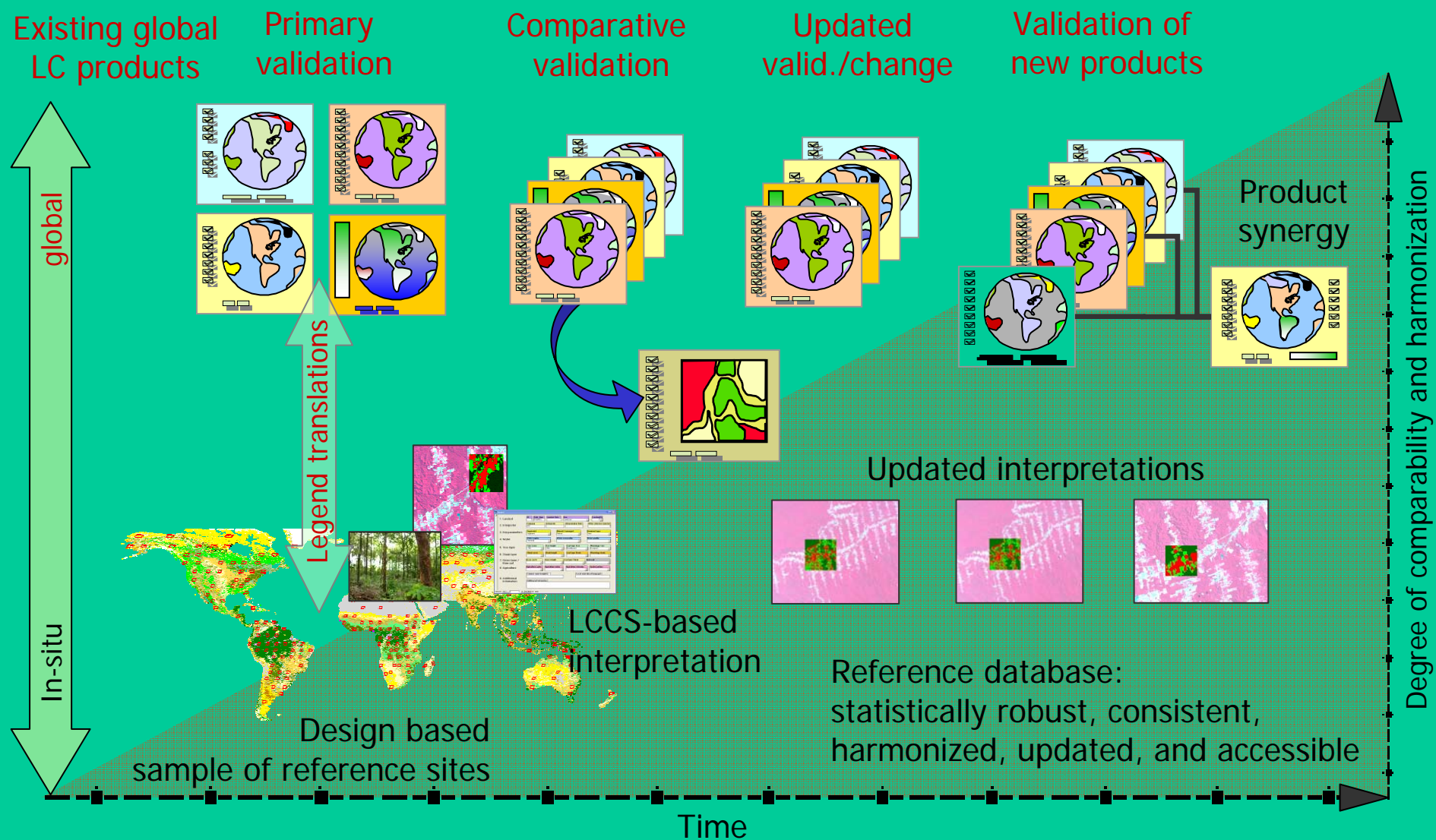
Harmonized map

- IPCC land class**
- Forest land
 - Cropland
 - Grassland
 - Wetlands
 - Settlements
 - Other land



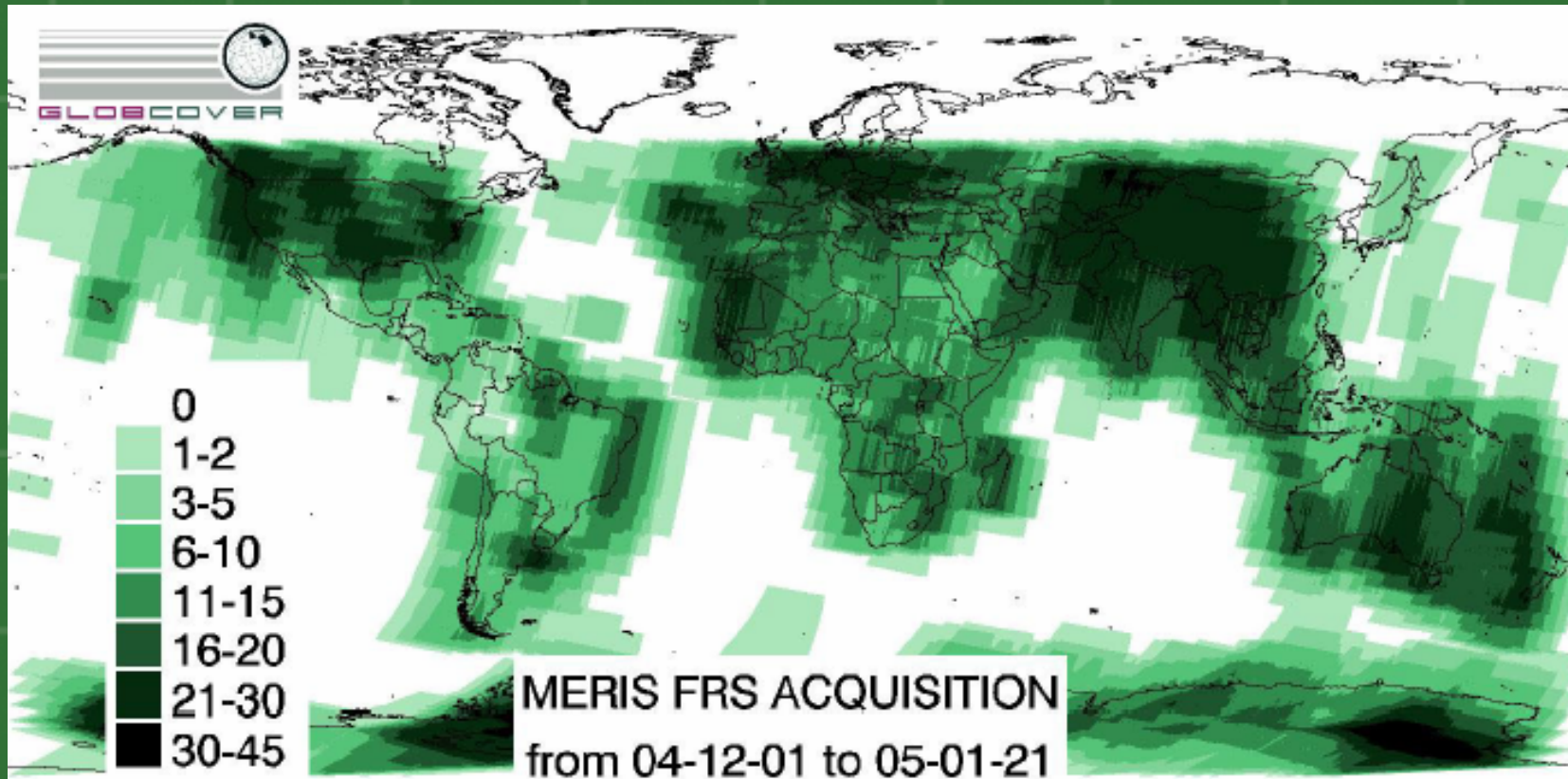
5. Ensuring that operational products meet accuracy requirements

Framework for joint GOFC-GOLD/CEOS Harmonization/Validation initiative



GLOBCOVER

- Kick-off in April 2005
- Validation implemented through harmonization/validation initiative



Top Priorities for Land Cover

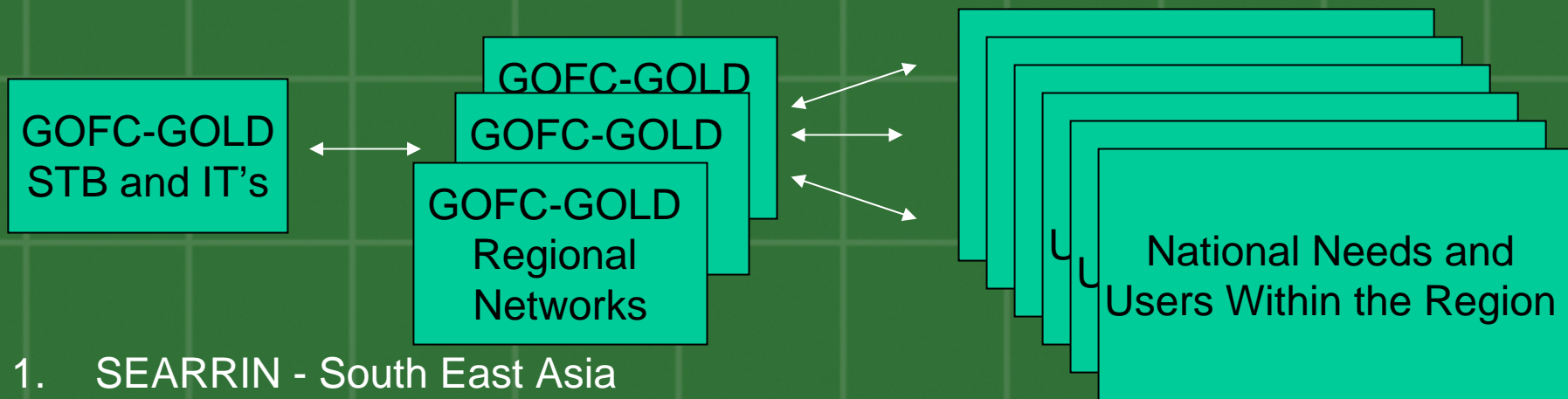
- International harmonization and validation framework (CEOS WGCV)
 - Harmonization for using LCCS – crosswalking classifications to IPCC needs
 - Procedures for global classification validation about to be published (Alan Strahler, BU)
 - Validation procedures for continuous fields starting (Matt Hansen, SDSU)



Regional Networks

a critical component of the
implementation of GOFC-GOLD

Providing the interface between the panel
and national level data users and needs

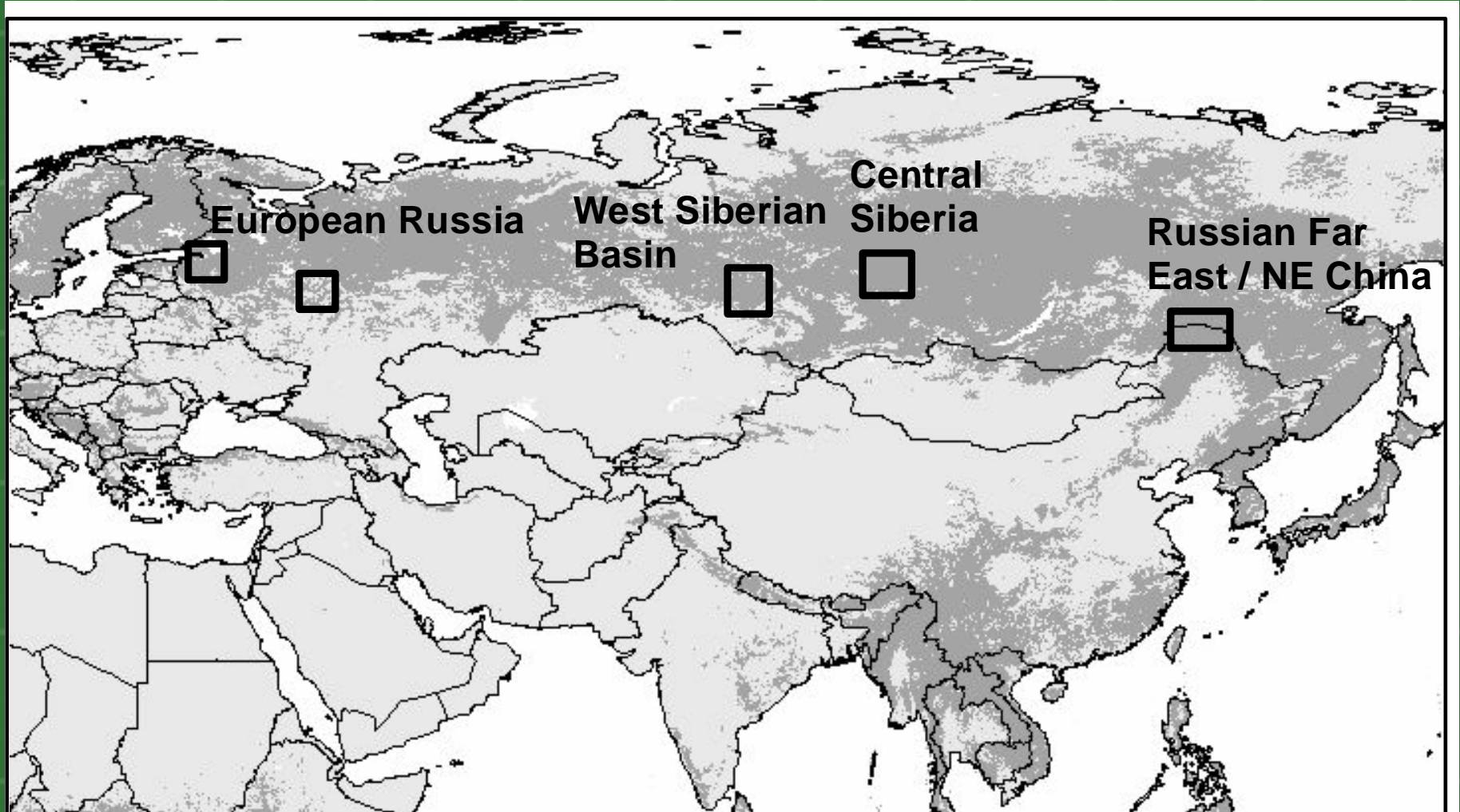


1. SEARRIN - South East Asia
2. OSFAC - Central Africa
3. Miombo - Southern Africa
4. SAFNET – Southern Africa
5. NEARIN – Northern Eurasia
6. East Asia (initiated early 2005)
7. Latin America (under development)



GOFC-GOLD

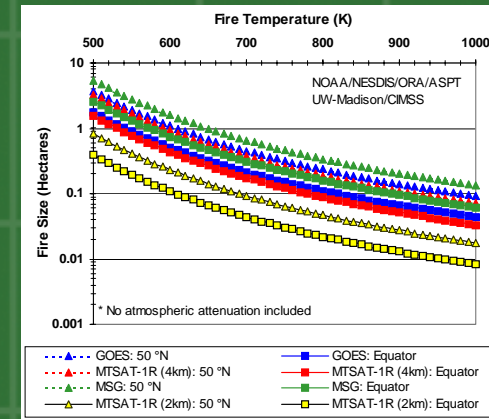
NERIN: NELDA study regions and sites



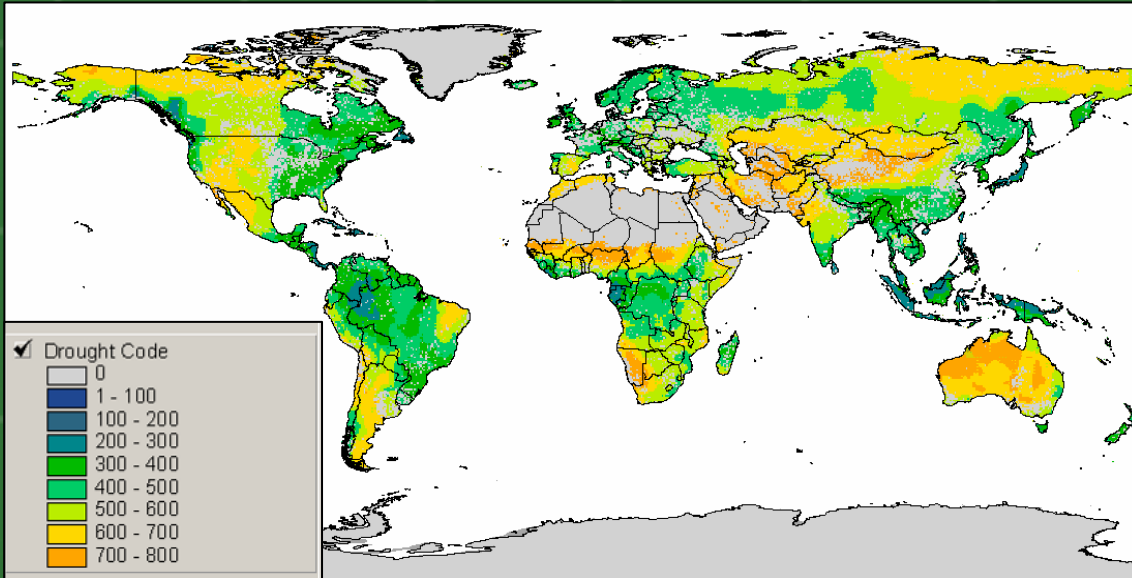
GOFC-GOLD

Fire Monitoring and Mapping Products

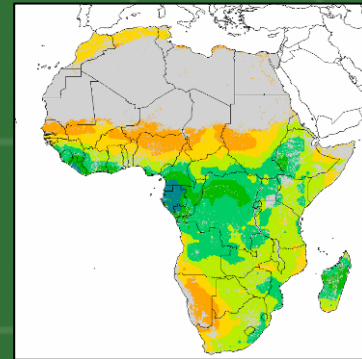
- Emerging Geostationary Global Fire Network
- Near Real Time Global Daily Active Fire Monitoring
- Web based Fire and Imagery Distribution Systems
- Multi-source fire information integration
- Regional / Global Burned Area Monitoring
- Systematic product validation
- Near real-time and Regional fire emissions modeling
- Regional Fire Danger Rating Development
- Sensor Web Demonstration (BIRD technology demonstration for Fire Characterization)
- Planning Fire Monitoring on Next Generation Polar Orbiters



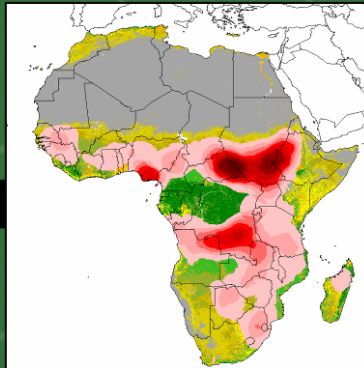
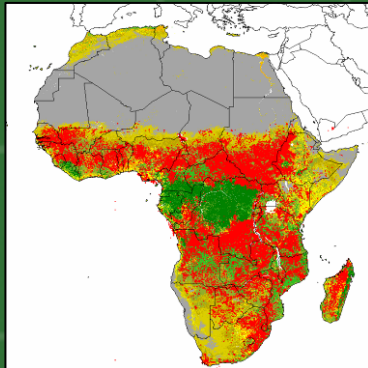
Global Fire Danger Rating System



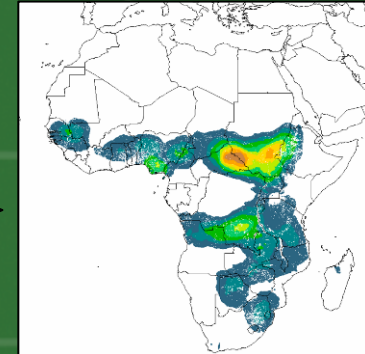
Drought masked by fuel



ATSR Hotspots, 1995-2000 ATSR Hotspot Density, 1995-2000



Drought x Fuel x Hotspot Density



GOFC-GOLD

9. Advocacy role, especially in relation to the continuity of observations and validation



GEO Task (AR-06-09)

- Advocate establishing continuity for near real-time, 30-m (or better) resolution, multi-spectral remote-sensing coverage everywhere on the Earth's surface, including support for the launch of a Landsat-equivalent follow-on mission.
- Led by USA; CEOS (USGS); GTOS (GOFC-GOLD)