

# The Role of GOFC/GOLD in Global and Regional Land Cover Monitoring

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Global Observation of Forest Cover





# What is GOFCC?

- An international organization of space agencies and end users working together.
- An ambitious, multifaceted international strategy to bring the Earth's forests/land cover under continuous observation.
- A vision to share data, information and knowledge, leading to informed action.
- A coordinated program of activities to ensure that earth observation and other data are used effectively for global monitoring for natural resource management, policy and global change research.
- A network of participants implementing coordinated demonstrations of the use of geospatial information and technology for sustainable development





# Roles of GOFC/GOLD

- **Facilitate end-to-end international coordination mechanism: from observation to use**
- **Improve technical development and application of new methods of observation, especially remote sensing.**
- **Improve integration of satellite and in situ observations.**
- **Improve understanding of the causes of changes and their impacts**





# GOFC/GOLD Regional Networks

- Provide guidance on regional user needs and capabilities
- utilizing existing science networks
- GOFC interface to national mapping and monitoring activities
- Foster lateral transfer of technology and experience between countries and regions
- Intended to provide transition to operational continuity
- Current network initiatives
  - South East Asia - SEARIN
  - Central Africa - OSFAC
  - Southern Africa – Miombo
  - Boreal (initial meetings – W. Russia/Fennoscandia, Far East)
  - E. Asia (under discussion)
  - South America (under discussion)





# SEARIN

SOUTHEAST ASIA REGIONAL INFORMATION NETWORK

## GOFC Regionalized Network

### Components:

- Regional cal / val sites for detailed studies
- Existing regional forest cover
- Overlaid on single source land cover map
- National forest cover moving to regional harmonized
- Single system for information sharing
- ISS Sites

### Data Acquisition:

- Landsat, Spot VGT, MODIS

### Southeast Asia

### Thailand Sites



1. Mae Chaem, Chiang Mai
2. Lin Thin, Kanchanaburi
3. Phu Sihan, Nakhon Phanom
4. Eastern Forest, Chachoengsao
5. Thung Kha, Chumphon

### Philippine Sites



1. Magat, Nueva Viscaya
2. Palawan Island

### Malaysian Sites

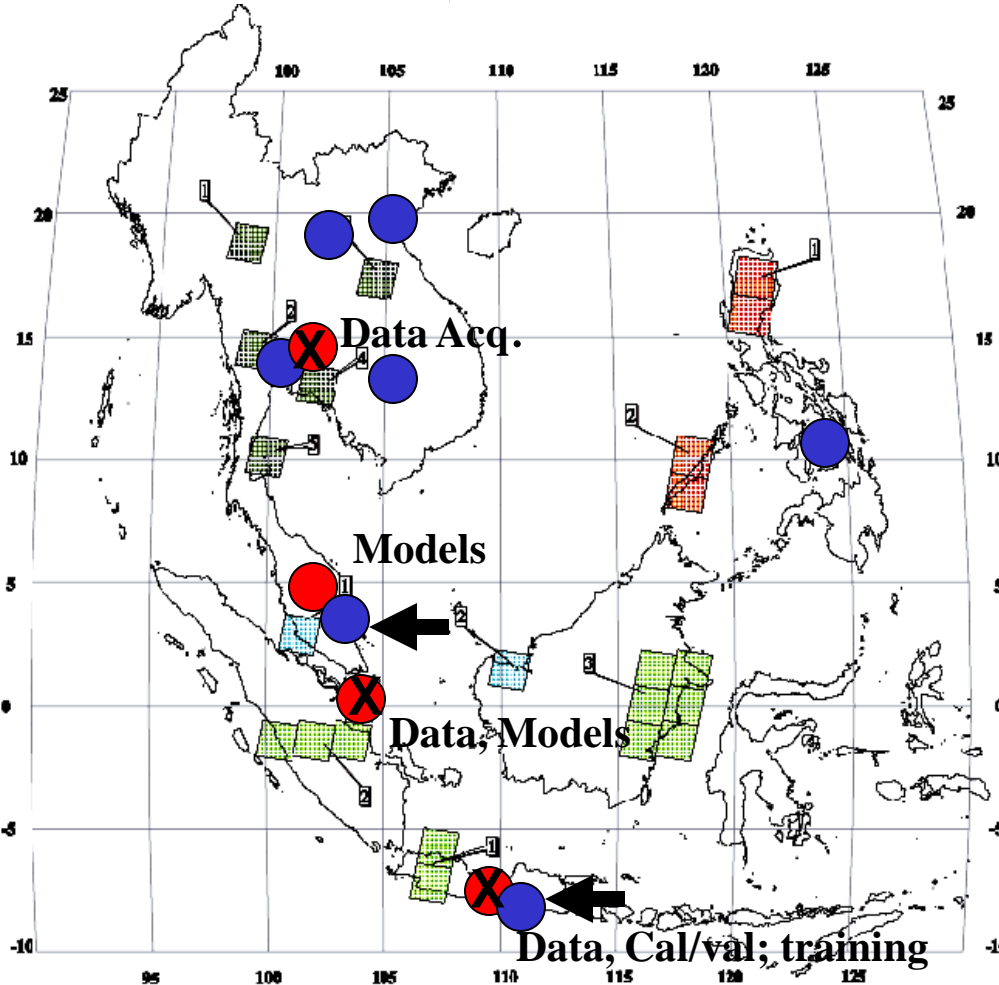


1. Klang Langat, Selangor
2. Sempadi Forest Reserve, Sarawak

### Indonesian Sites



1. Citarum, West Java
2. Betanghari, Jambi, Sumatera
3. Mahakam, East Kalimantan



X Current receiving

● ISS Nodes



In place

● Prod. Ctr



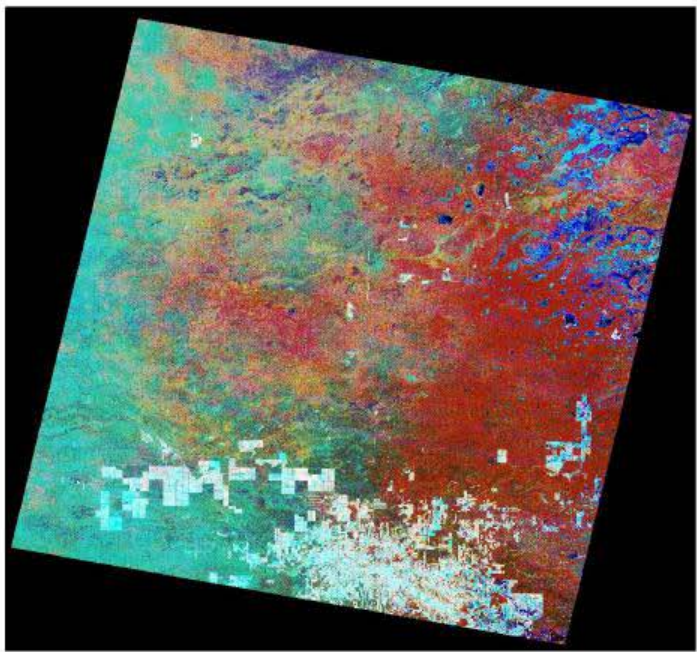
# Uncertainties concerning forest monitoring

- Different definitions and protocols between and within countries.
- Very varying national capabilities to monitor forests and land cover.
- Remote sensing data are often unavailable
  - Costs
  - Satellite acquisition strategies
- Internationally published results yield uncertain results.

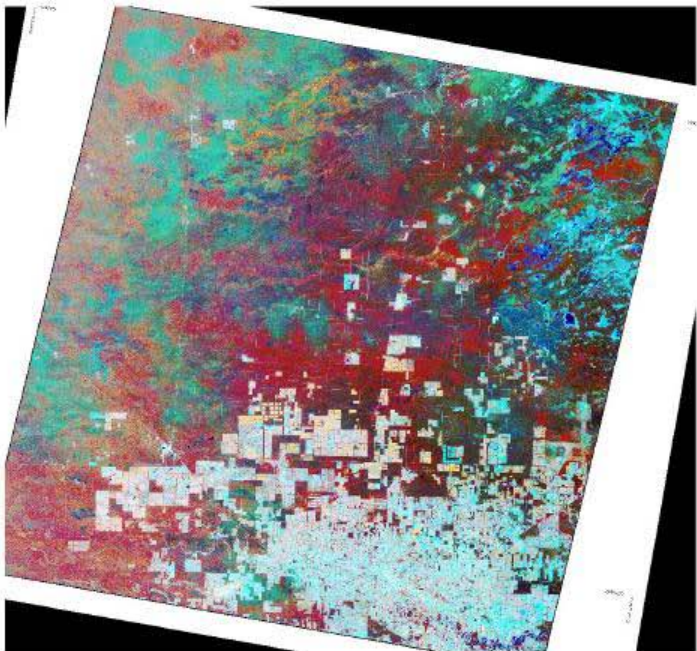




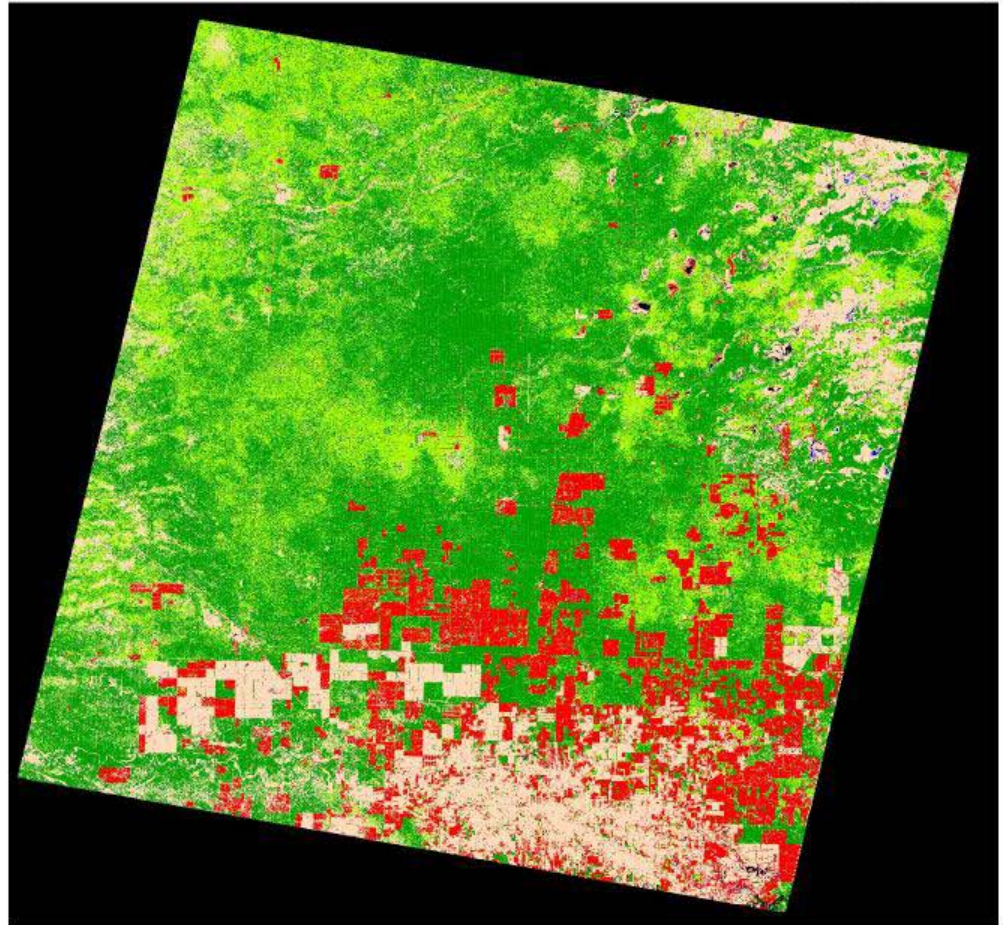
# Northwest of Filadelfia Nueva Asuncion, Paraguay



April 14, 1985



January 23, 1997



The above illustration is a land cover classification of forest (green), non-forest (tan), deforestation (red), and water (blue). Deforestation includes tropical forest and chacoan forest conversion. In total there was 3,799 square kilometers of deforestation detected. In the images on the left, tropical forest is shown through tones of red. The dryer chacoan forest is located in areas that have a textured blue color. Pasture and ranches are located in areas that have a bright cyan color. (Path/Row - 228/075)



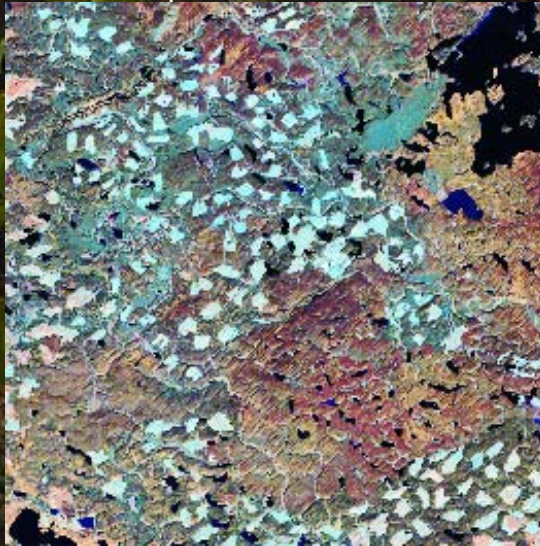
**British Columbia, Canada:** The bright blue patches are areas of mostly bare ground left after logging. While clearcuts in the 1992 image have likely been replanted, the limited red return from these patches in the 1999 image demonstrate how slowly forest regenerates in these environments. **This 1169 Km<sup>2</sup> region lost 92 Km<sup>2</sup> of forest (10%) from 1992-1999.**

August 15, 1992



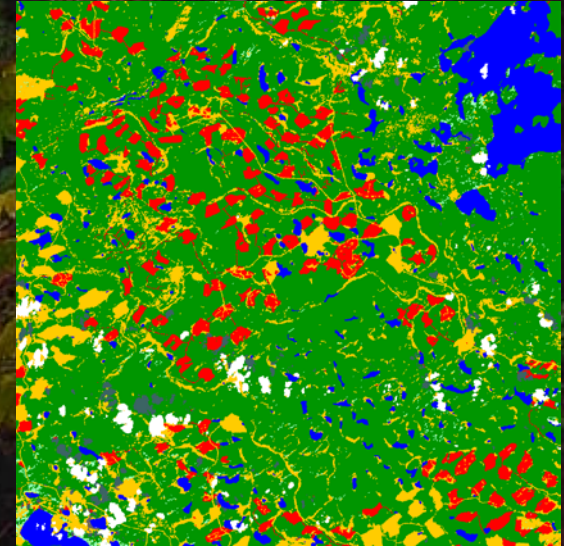
4,5,3 (RGB) 049-022 Landsat TM

September 12, 1999



4,5,3 (RGB) 049-022 Landsat ETM+

Land Cover Classification

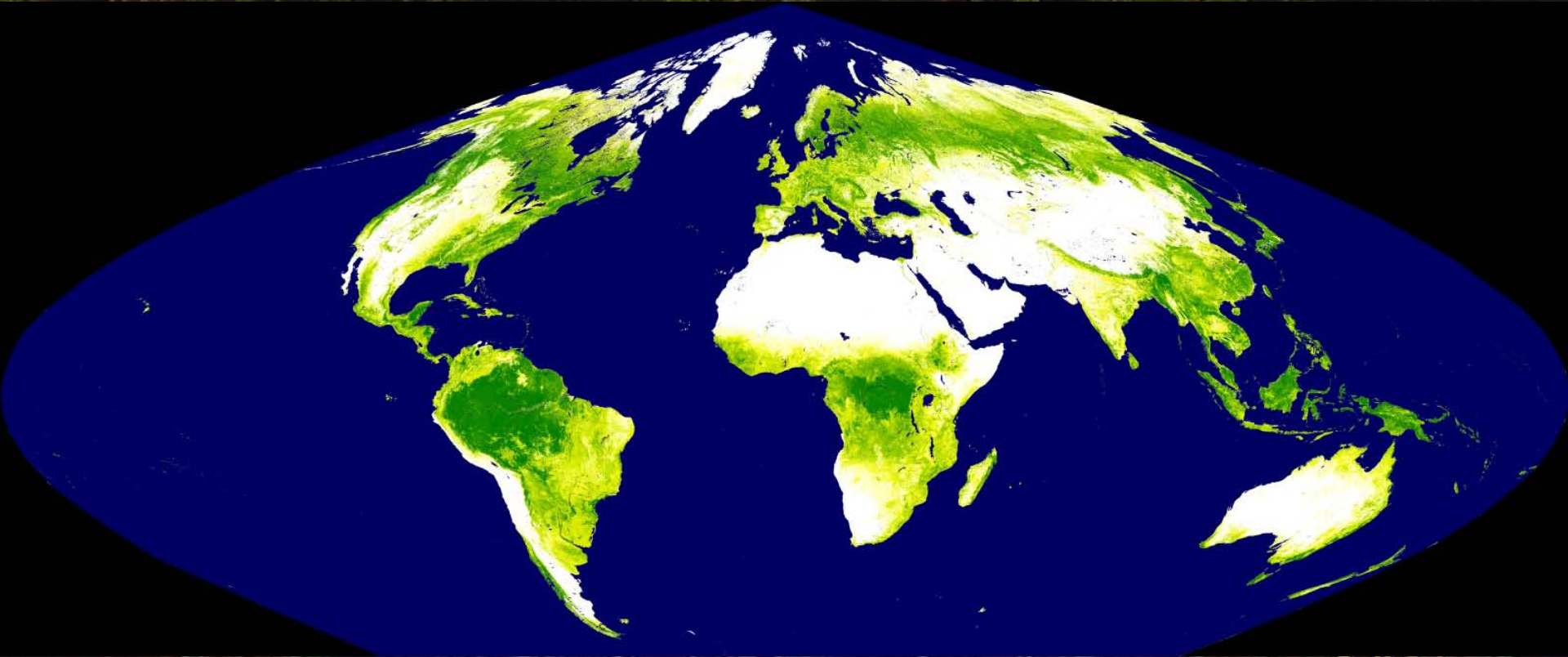


Forest Cover Lost	92 Km <sup>2</sup>
Percent Forest Lost	10%
Forest Lost/Year	13.1 Km <sup>2</sup>





New products:  
Global percent forest cover at 500m for 2000 from MODIS



Hansen and Defries

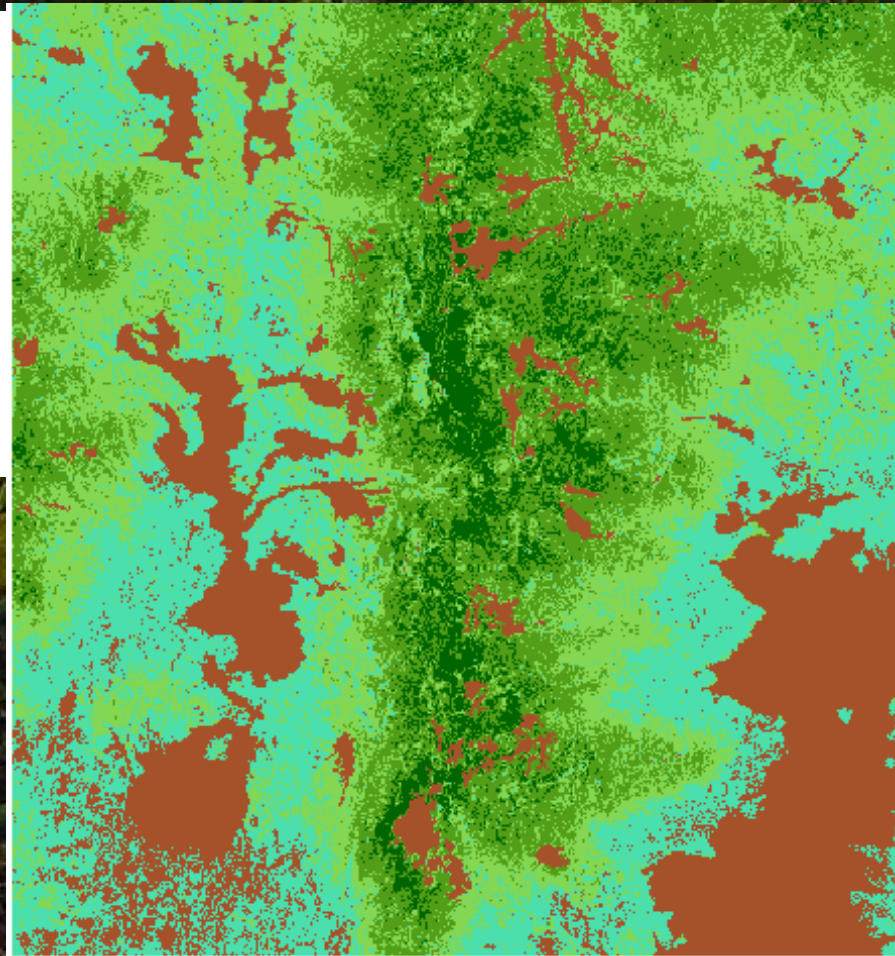
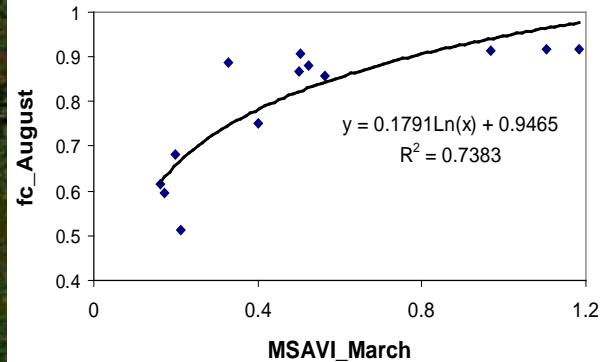
Global Observation of Forest Cover



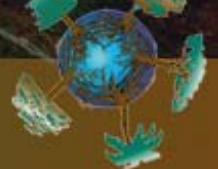
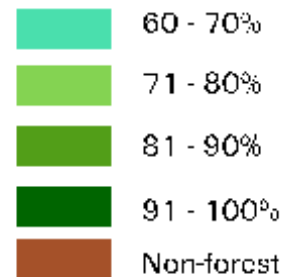


# Fractional Cover (Adjusted)

Fractional Cover Adjustment



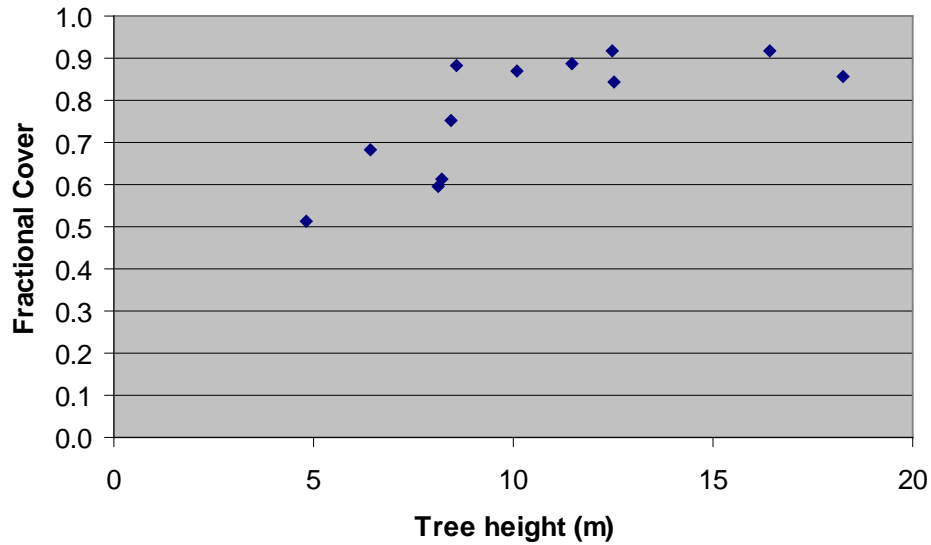
Fractional Cover (Adjusted)



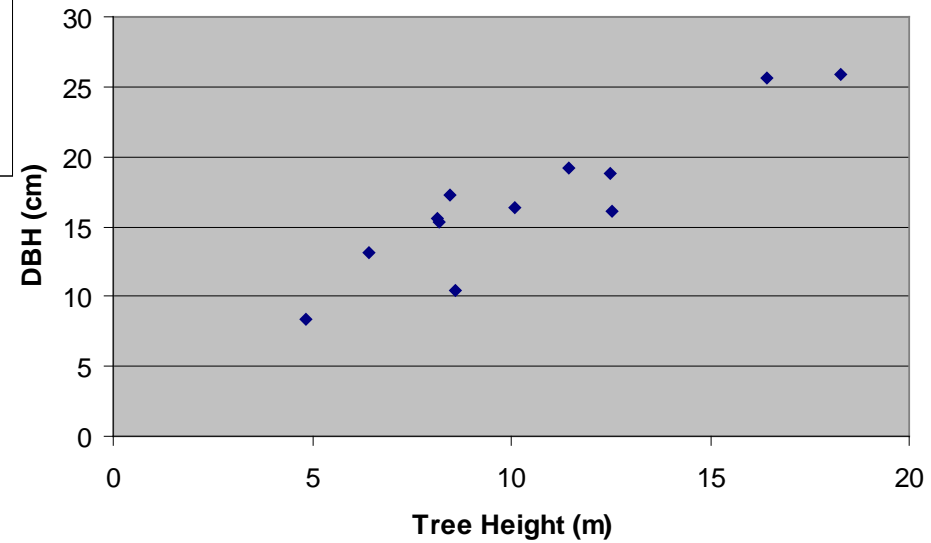


# Relationship between Forest Attributes

### FC vs. Tree Height



### DBH vs. Tree Height





# How can we ensure improved access and use of data.

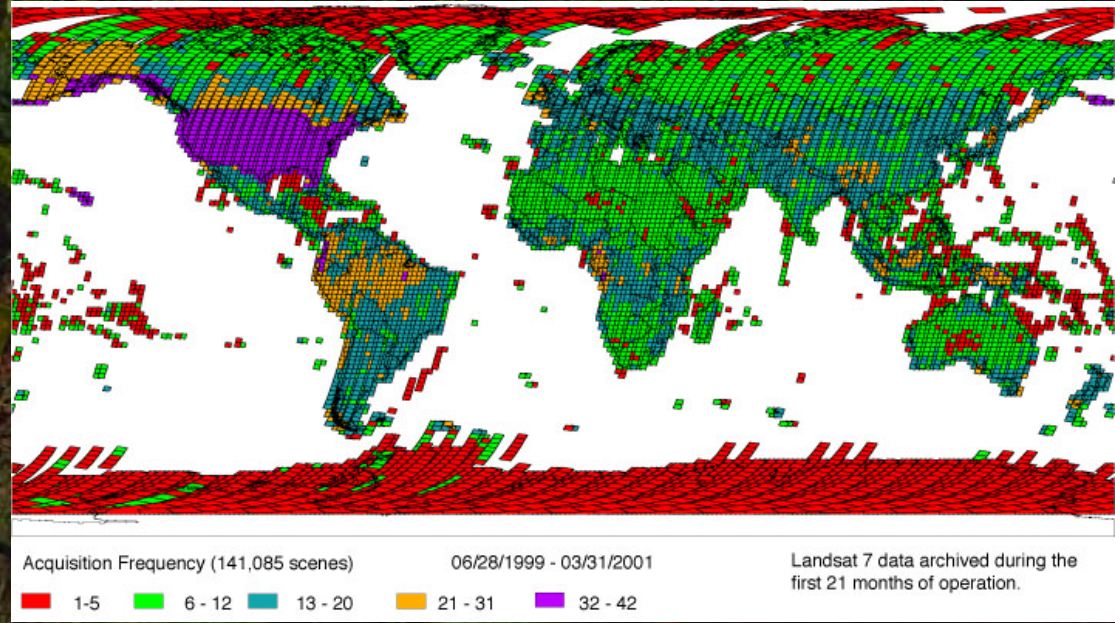
- **Make it easy to obtain data**
  - Integrated directory and catalog capabilities across agencies (even integrated ordering systems).
- **Make data low cost**
  - The world needs earth observations to ensure sustainable development.
- **Advanced products for users needs**





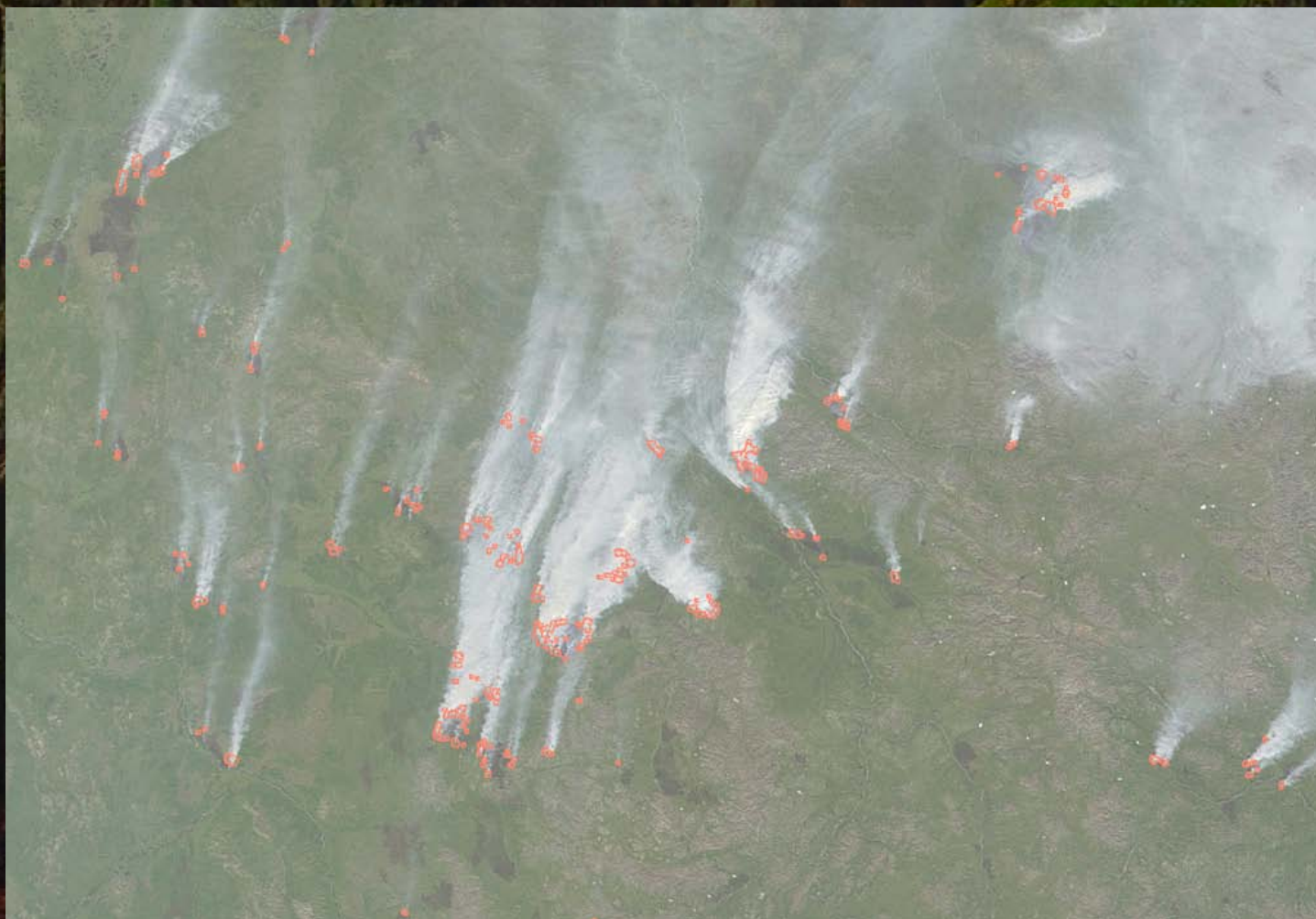
# Landsat 2000 Data Set

- NASA has committed to produce a global orthorectified data set of the globe for 2000.
- Complementary to early 1990s data set.
  - Almost complete
- Discussion on GOFC/GOLD role in dissemination





**MODIS Rapid Response System**  
**Example of Active Fire / Corrected Reflectance Product – Siberia (05/22/01)**



**Global Observation of Forest Cover**





# Emerging Fire Networks

- **Northern Eurasian Network**
  - There has been bi-lateral collaboration with Russian partners: formally funded projects (LCLUC, IDS etc.) and initial demonstrations/joint efforts to secure funding for collaboration
  - Monitoring and information dissemination under way with new datasets, training and capacity building
- **Latin America**
  - Several participating countries and “operational” agencies, in Mexico, Brazil, Peru, Bolivia
  - MODIS fire products being delivered
  - Regional GOFC/GOLD fire workshop planned for April 5-8 2003 in conjunction with the 9<sup>th</sup> Brazilian Remote Sensing Symposium
- **Southeast Asia**
  - Focus of effort on several fronts: ASEAN, APN, SEARRIN
  - Key countries: Thailand, Indonesia, Malaysia
  - MODIS fire product, NOAA fire products





# Global Land Cover Network

- **Supporting observational basis for new UNEP-FAO Global Land Cover Network**
  - Support to **Global Environmental Outlook**
  - Support to various environmental reports and assessments across UNEP and FAO
  - Supports needs of UN follow-on from WSSD
  - Support to the **Forest Resource Assessment** (e.g. FRA 2000, 2010)
  - Support to regional initiatives, e.g. Africover, Asiacover

