

Tropical Rain Forest Information Center II

Presented to the LCLUC Science Team Meeting
21 January 2004

DL Skole, CO Justice, MA Cochrane, J. Qi, WH
Chomentowski, J Samek, T Smith, F. Bohn

Center for Global Change and Earth Observations
Michigan State University

Dept. Geography
University of Maryland

Science Focus

- Science-driven data systems
- LUC as an agent of global change
- Forcing on the carbon cycle
- Key regions of interest in the tropical belt
- Focus on attaining basic measurements of the full suite of land cover changes, from deforestation to degradation
- Providing information system services and data products to the science community

Background

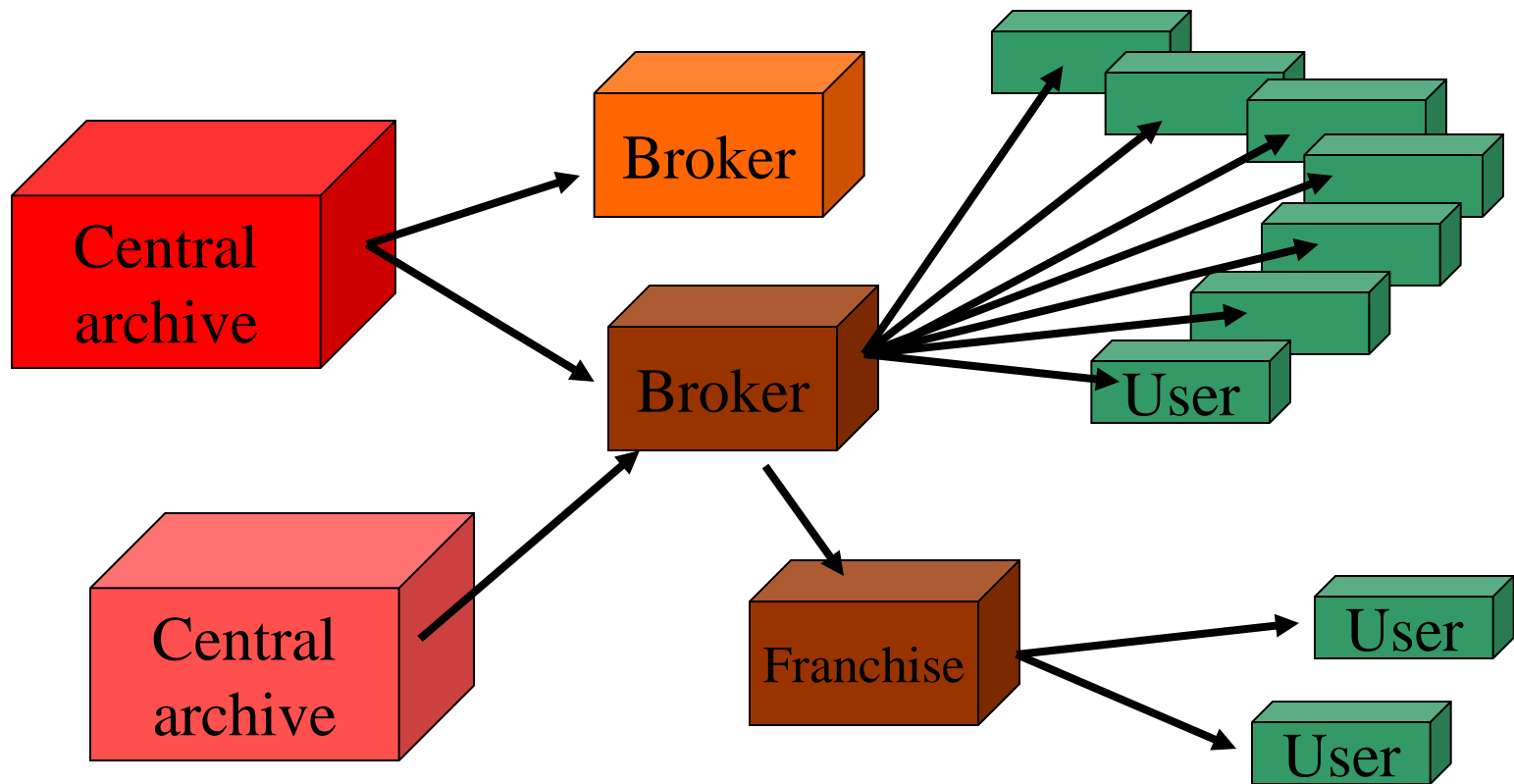
- Early need for large scale information management systems
 - To manage large amounts of raw Landsat data
 - To manage the derived products from a geospatial information analysis approach
- Most use of Landsat data had been on a single scene basis
- Query, browse and ordering of data had been tailored to the single scene user
- Landsat Pathfinder (1993-1997): developed an initial IMS to function in three areas:
 - Browse and query for selecting available data
 - Inventory control to track orders and maintain inventory of thousands of scenes
 - “hyper-GIS” to allow information retrieval and analysis in the laboratory

New approach to data

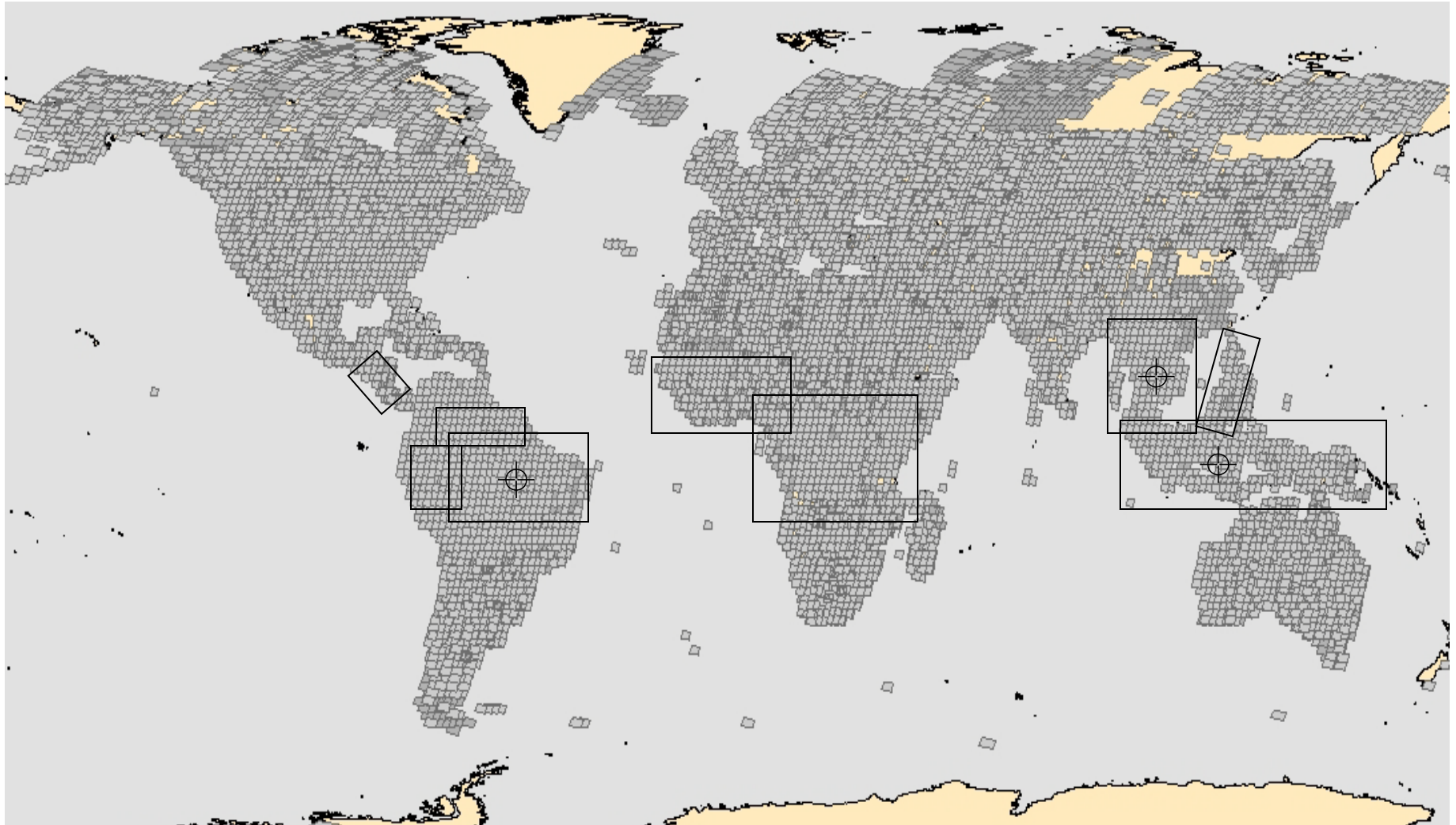
- Large scale datasets should be the norm
 - e.g. Landsat 7 archive is 500,000 scenes
- Bring user to the data, rather than distribute the data to the user
 - i.e. derived product production on-demand
- Data systems at science facilities will be substantial
 - But...need to be more interactive and distributed
- Data search and retrieval should be integrated with multiple information sources
 - cf. image and text based content search

Data broker model

- Imagine a *supply chain management approach* to science data
- The downlink point and long term archive provides a wholesaler function
- Access to data for various communities occurs through data brokers or relatailers
- These data brokers serve thier communities and provide more than just data – domain expertise
- These data brokers form alliances or franchises in an international network of distributed regional providers of data and science information



Data Products Focus



Standard Data Products

- ***Individual Landsat Products.***
- ***Special Selection Landsat ETM+***
- ***Pan-Sharpened ETM+ Products.***
- ***The Orthorectified Global Landsat ETM+ 2000 TM 1992, and MSS 1986 Datasets.***
- ***Forest Cover Change GIS Layers. 5.1.7. Merged Landsat Forest Cover/MODIS Fire Products.***
- ***Forest Fractional Cover Continuous Fields: High and Coarse Resolution.***

GeoBuild Product Suite

- ***GeoBundle* On-line Data Bundle Products.**
- ***GeoAnalyst* Products**
- **Custom Products.**
- **Outreach and Education Products.**

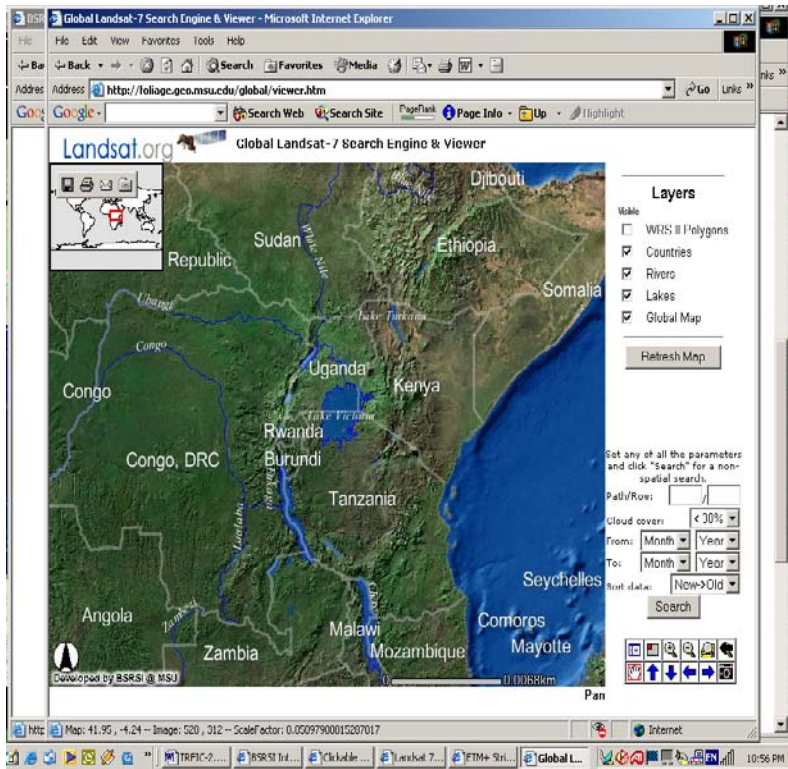
Data Services

- **Discovery:** through www.landsat.org in world wide web search engines and within OGC and other catalog services,
- **Access:** through Access 7 and Access 45 search engines
- **Search:** through internet-based GIS clients using **GeoSearch™** technologies.
- **Search:** through internet based SAXTA peer-to-peer file exchange technologies
- **Search:** through map and Image-based document catalog and document content search using our **GeoDoc™** service
- **Browse:** through full-resolution browsing of all Landsat data at EDC, MSU, and foreign ground stations using the MSU-developed **GeoZoom™** technologies.
- **Order and Distribution:** through secure socket encrypted shopping cart ordering services using credit cards or invoice payment
- **Analysis and Bundling:** through our **GeoAnalyst** service for GIS-based on-line analysis capabilities.

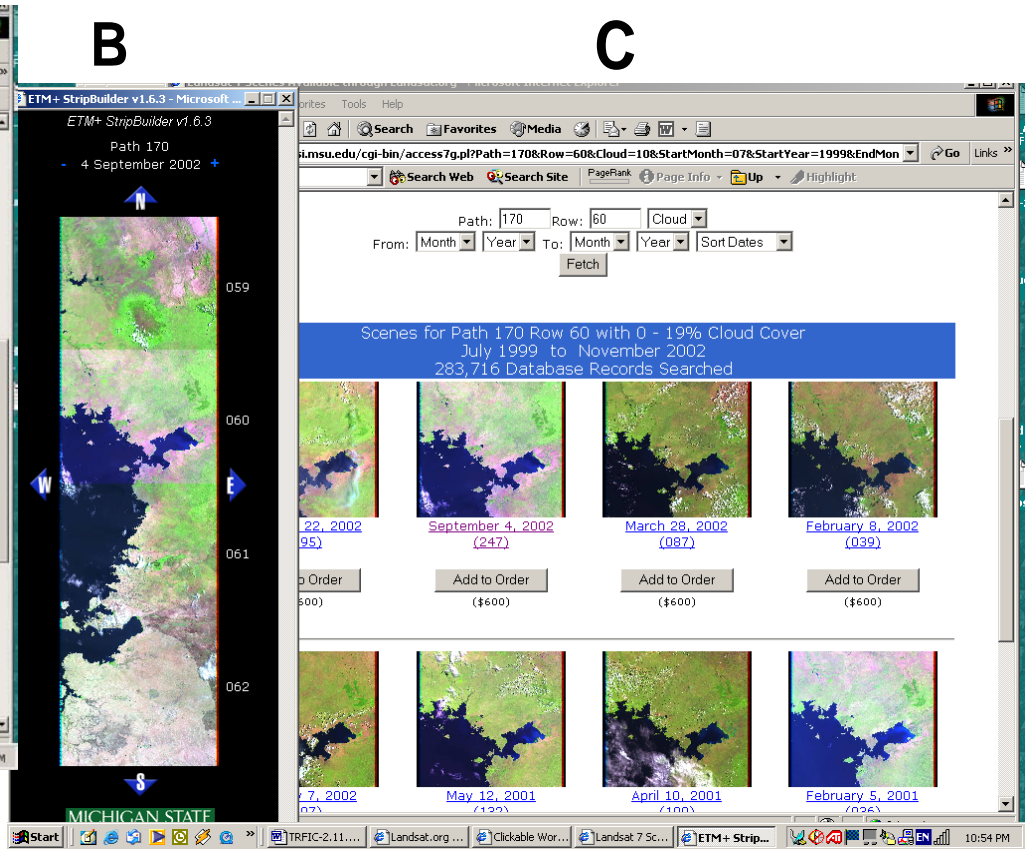
Search and Distribution Model

- Large archive repository connected to the DAAC using Access 7 technologies
- Distributed large science repositories through OGC compliant technologies
- Distributed and diffuse small-to-large cache repositories through SAXTA peer-to-peer technologies.

Access-7 @ www.landsat.org



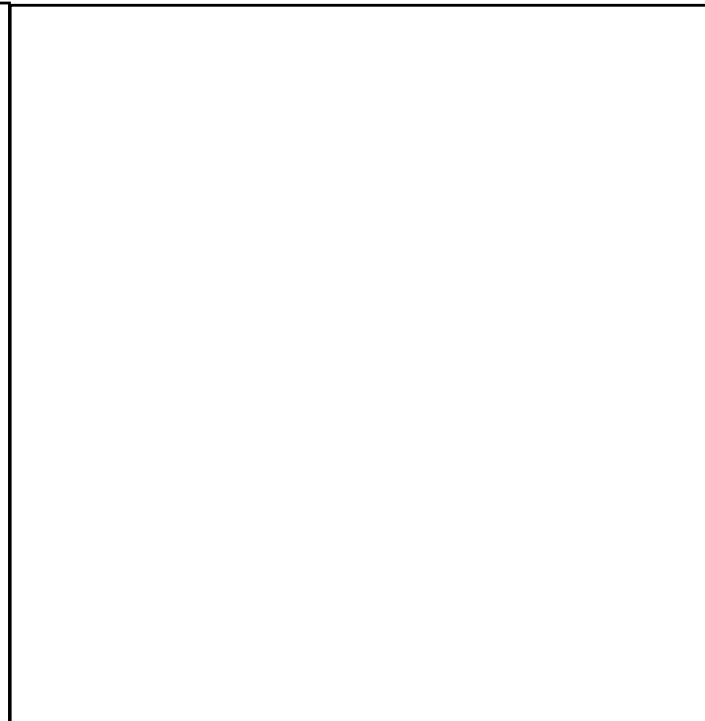
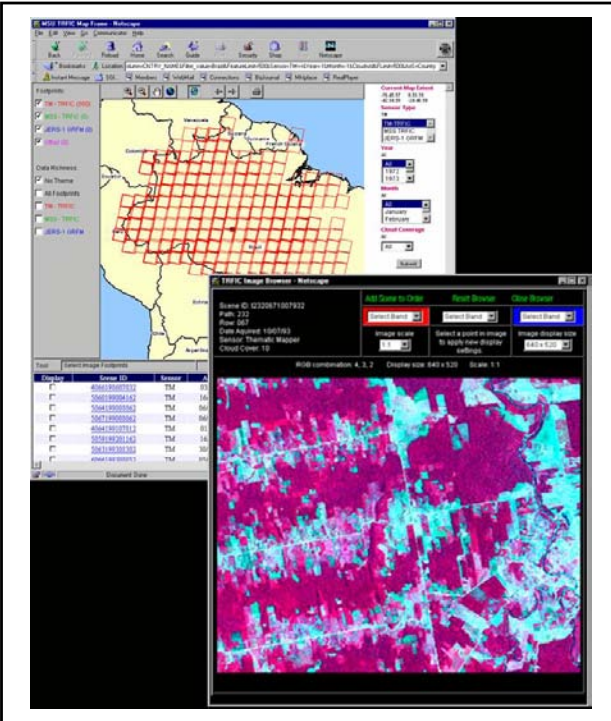
A



B

C

Search and Build



GeoSearch

GeoSearch Upload

GeoBuild/GeoBundle

GeoZoom

User Services

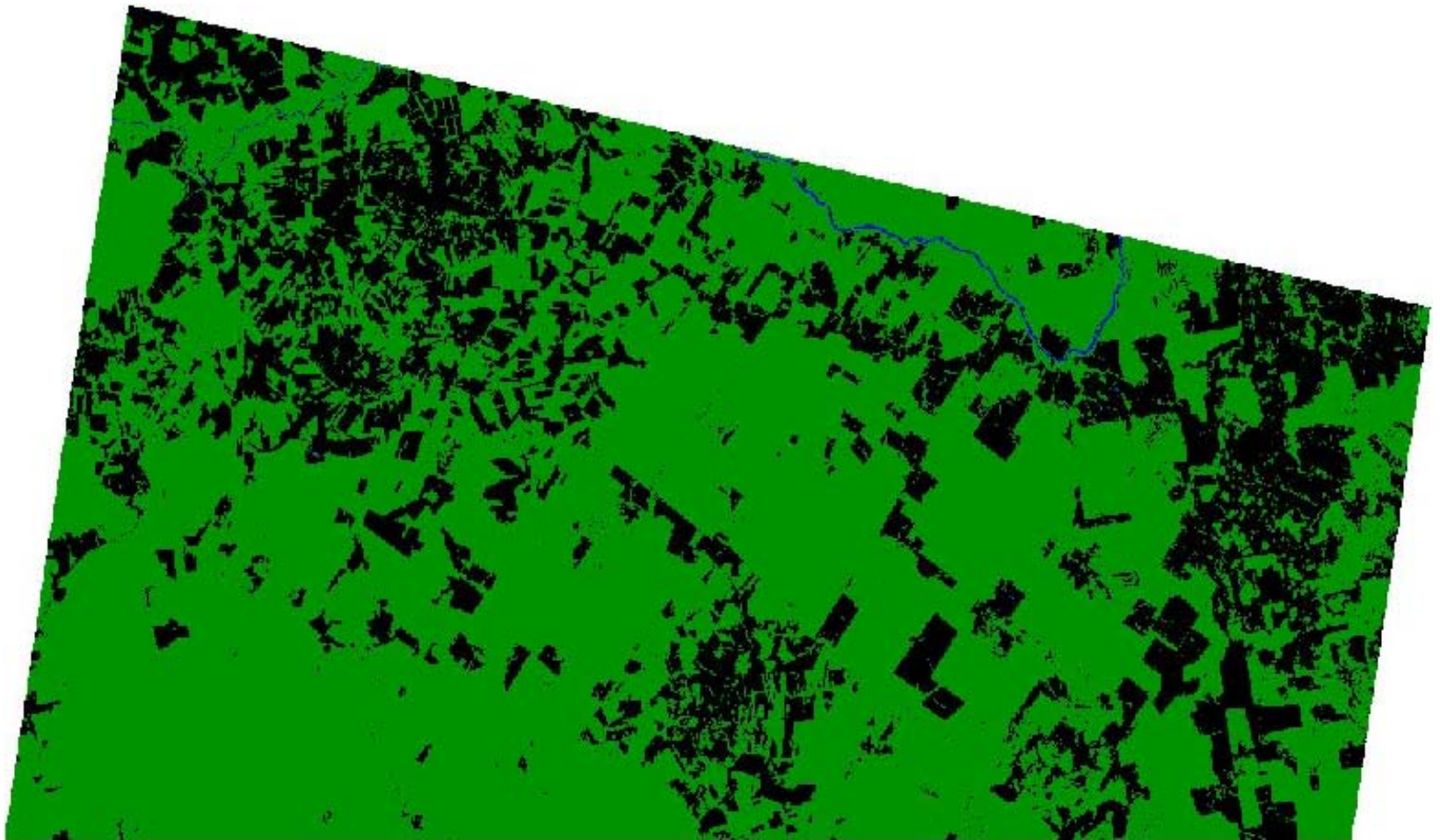
- Data Hosting
 - e.g. LBA, Safari 2000, FAO, UNEP, etc
- Data Distribution Sets
 - e.g. Amazon DVD
- Data Cooperative



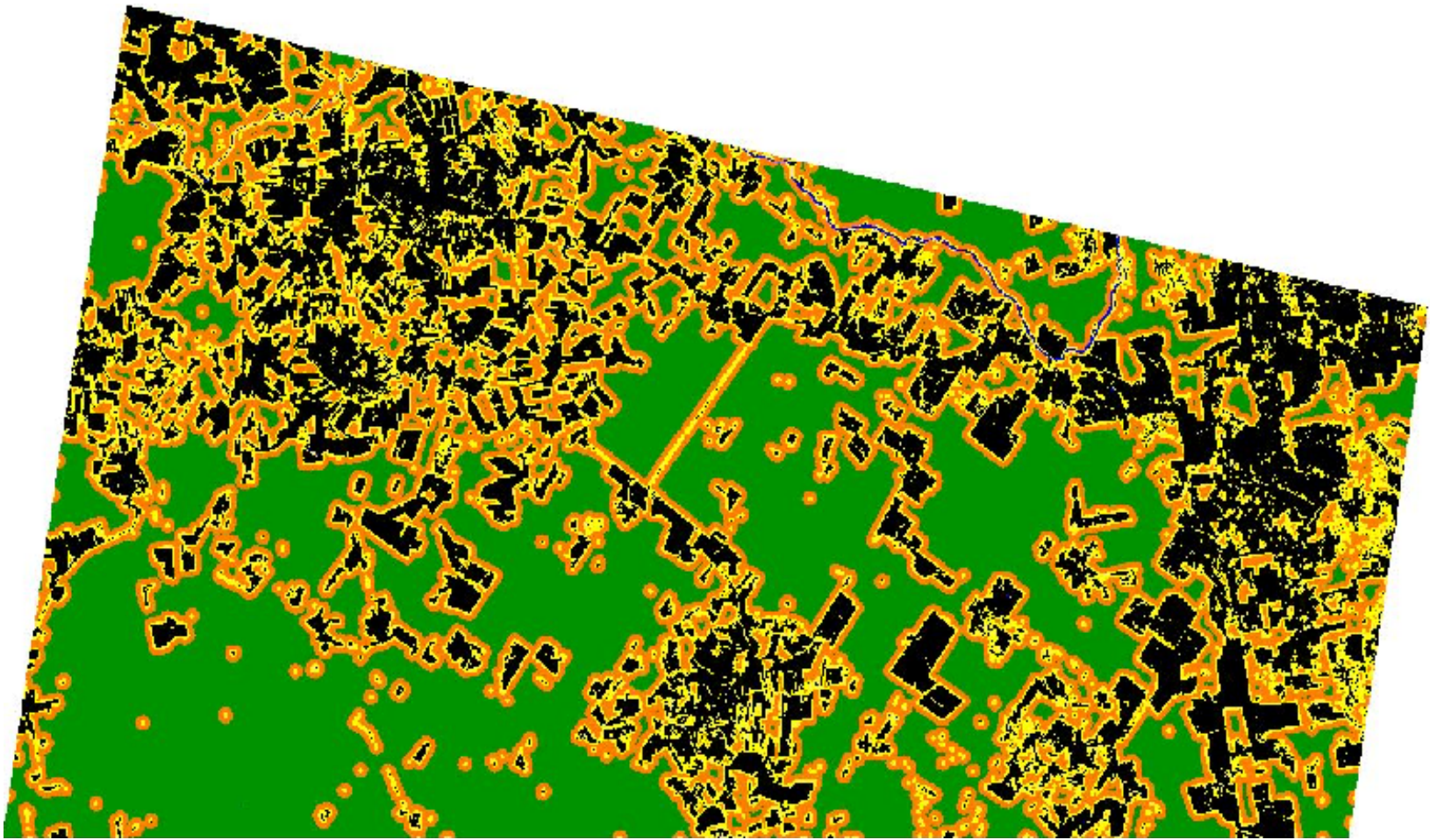
Science Products

- Focus on the full suite of LCLUC
 - Deforestation
 - Fragmentation
 - Regeneration
 - Degradation
 - Logging
 - Fire
 - Edge effects

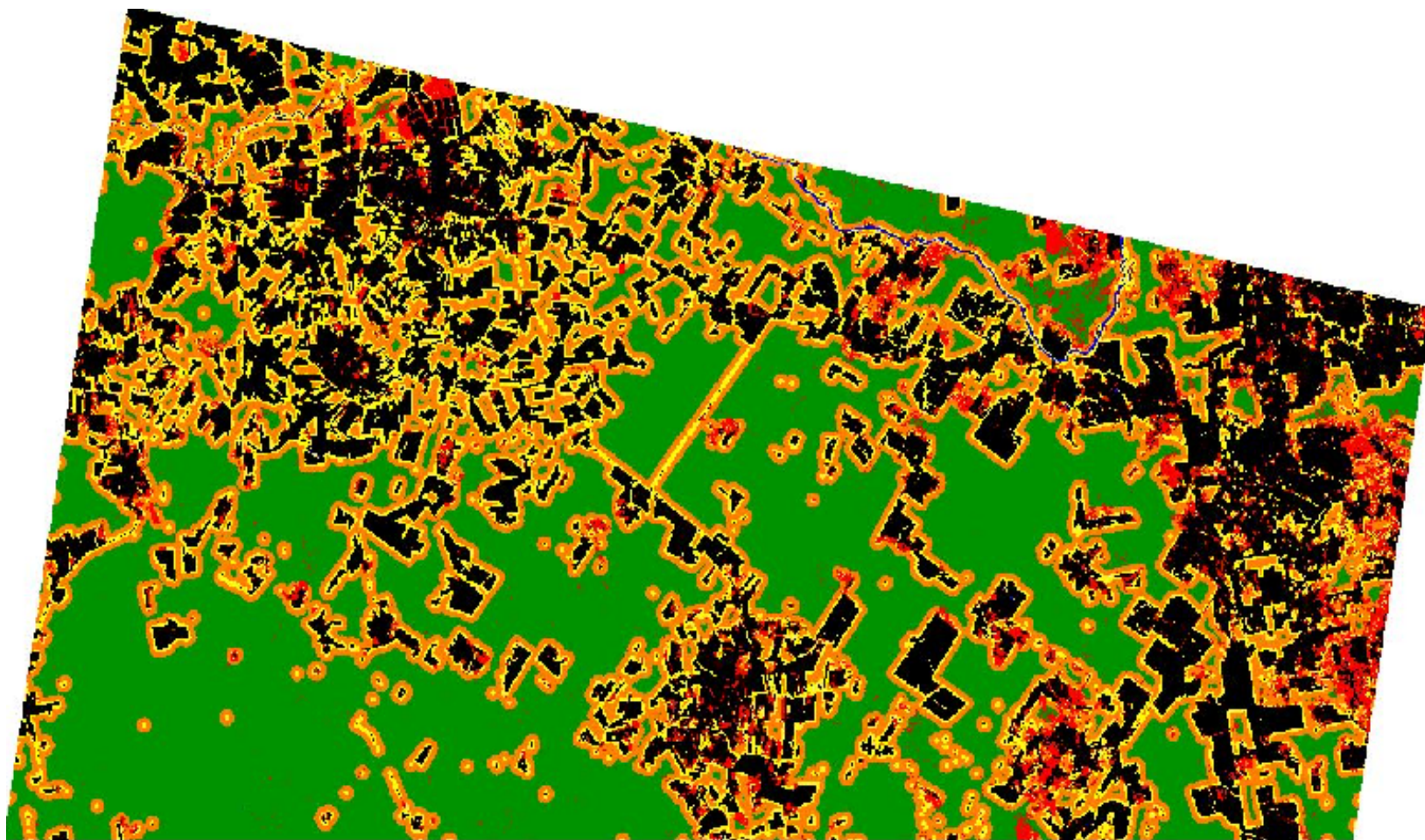
Deforestation by 1999



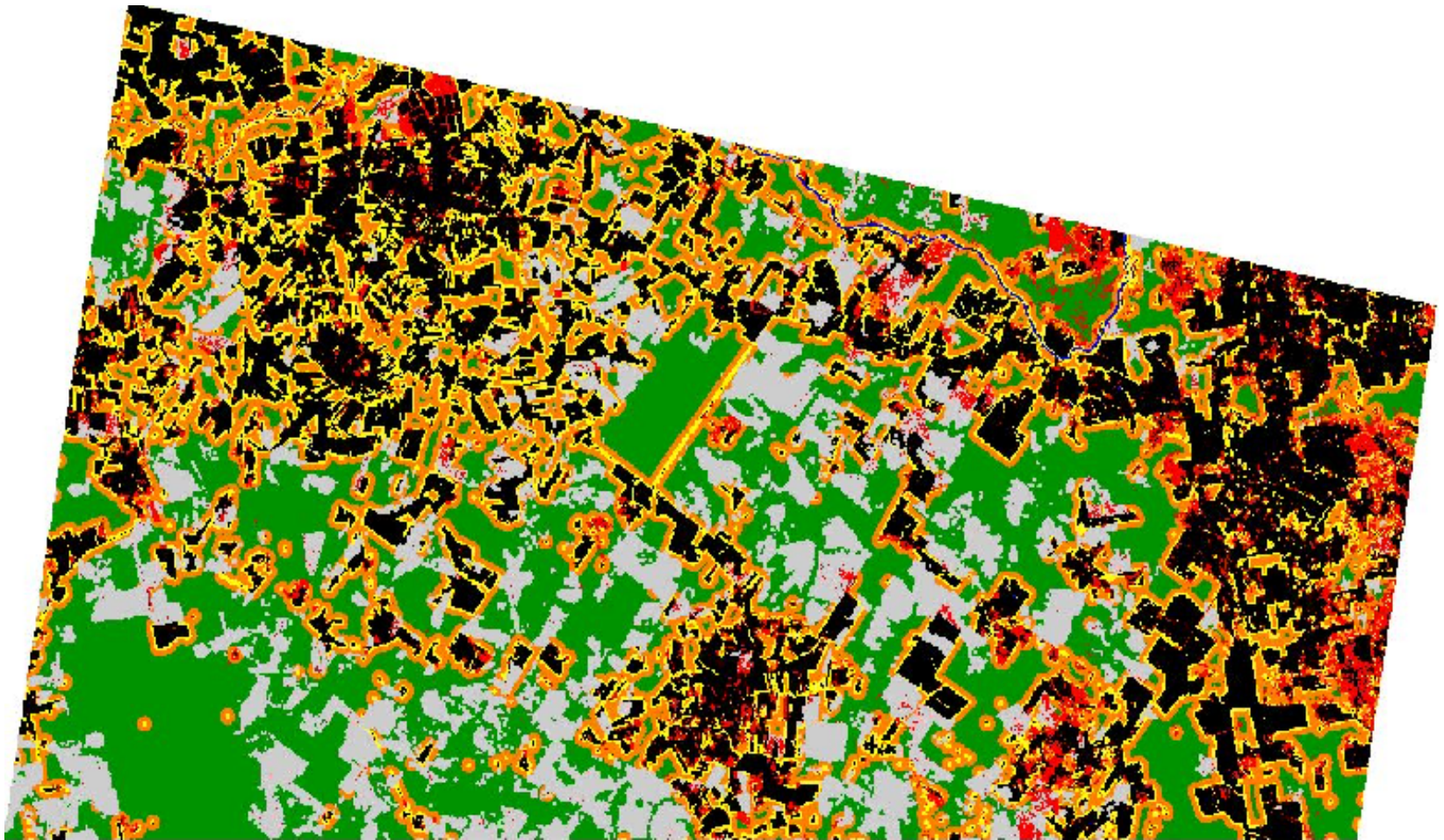
Fragmentation and Edge Effects



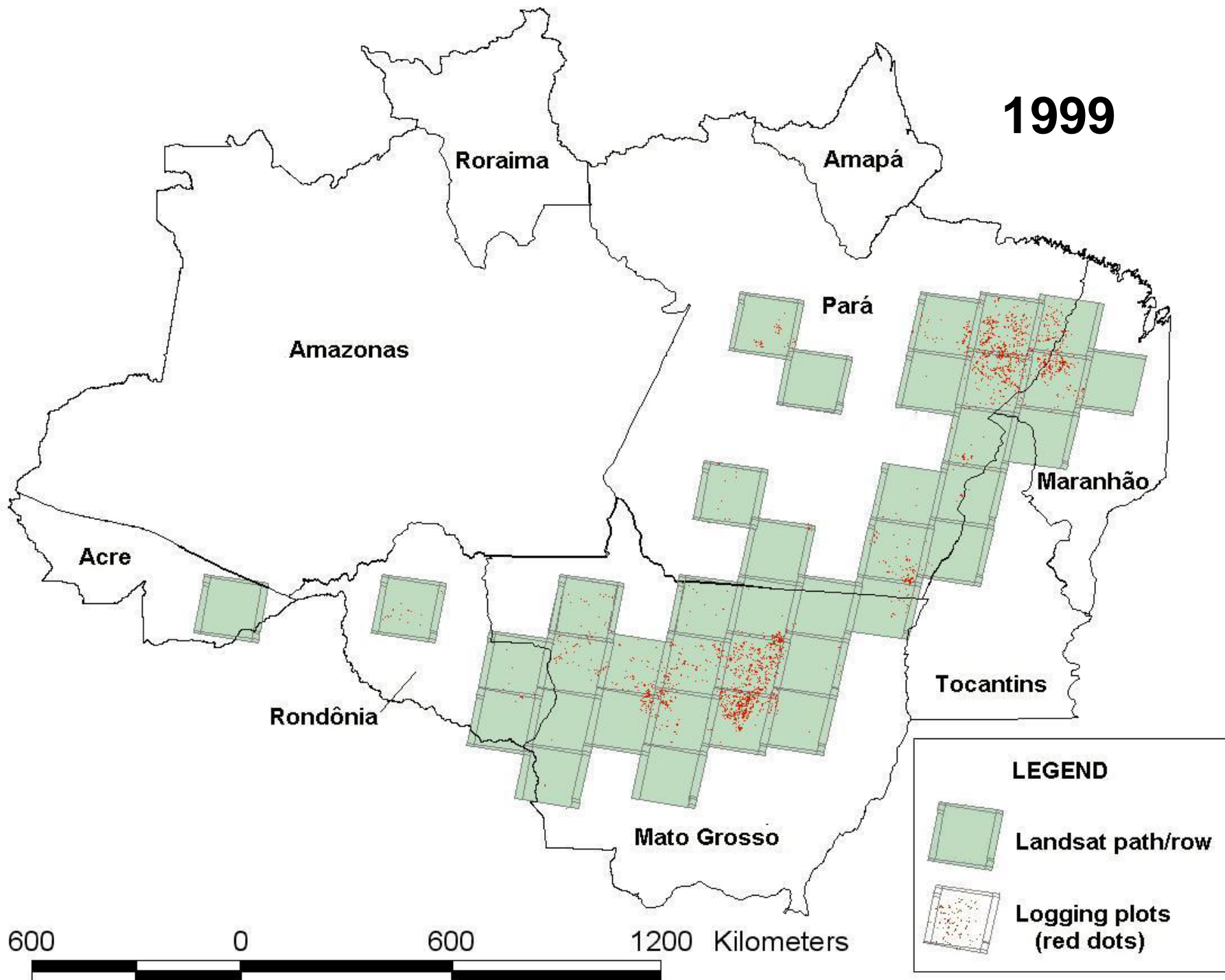
Fires in 1999



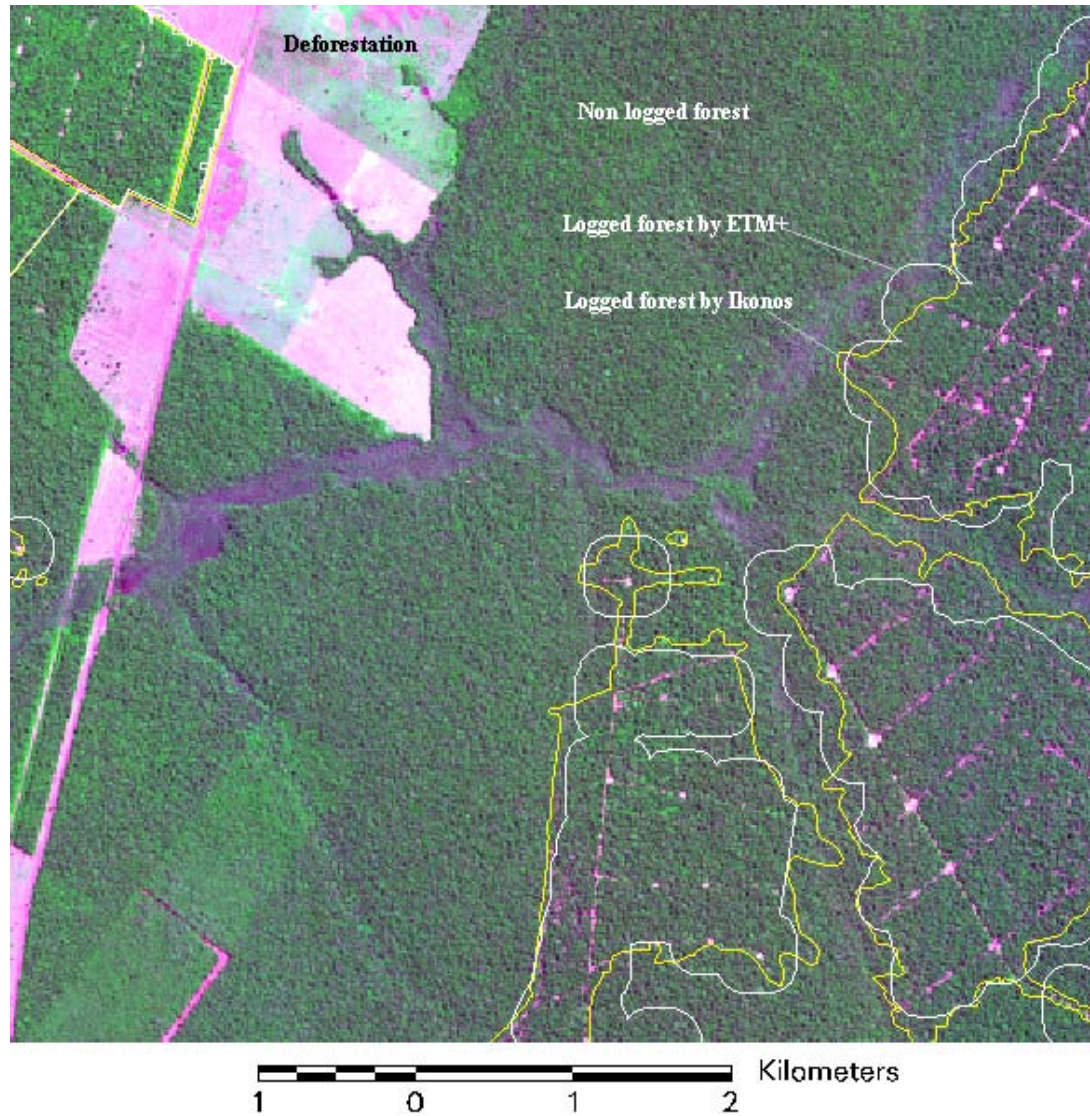
Logging 1992-1999



1999



Comparison - Ikonos x Landsat 7 ETM+



Areas of logged forests mapped on Ikonos and Landsat ETM+ images, displayed on Ikonos image RGB 3/4/2, 2000.

Year	Total detected (Km²)	Net Increment logging (Km²)	Form-logging (Km²)
1992	5,969.48	3,774.55	2,194.92
1996	10,035.57	4,986.13	5,049.44
1999	26,085.40	11,902.81	14,182.59

Participants

- Center for Global Change and Earth Observations at MSU
- EROS Data Center
- SAXTA Team at UMd/SSAI

www.landsat.org

The image shows a screenshot of a Microsoft Internet Explorer browser window displaying the website http://www.globalchange.msu.edu/frame/frameset_landsat.html. The browser title is "Untitled Document - Microsoft Internet Explorer". The website header includes "Center for Global Change and Earth Observations" and a button that says "CLICK HERE TO RETURN TO GLOBAL CHANGE". The main content area features the "Landsat.org" logo, navigation links for "Data Hosting & Services", "Search for Imagery", and "About", and a "Satellite Image Gallery" with a satellite image. A text block describes the site's services: "Landsat.org supports the purchasing, distribution, and sharing of Landsat 4, 5 and 7 imagery worldwide by providing a simple, platform-independent user interface and search engine with online data ordering. Landast.org supports research centers, science teams, and educational organizations by providing customized search interfaces, access to data hosting services, clearinghouse services, data brokering, and imagery cooperatives." At the bottom, there are links for "Landsat.org_ETM+ classic search tool" and "Landsat.org_TM classic search tool", followed by a "NEWS:" section.

On the right side of the image, a presentation software interface is visible, showing a "Slide Layout" panel with various layout options under "Text Layouts", "Content Layouts", and "Text and Content Layouts". The "Text Layouts" section has one layout selected. The "Content Layouts" section has several options, including one with a grid and a person icon. The "Text and Content Layouts" section has two options. A checkbox at the bottom of the panel is checked and labeled "Show when inserting new slides".

The Windows taskbar at the bottom shows the "start" button, several open applications including "Microsoft PowerPoint", and the system clock displaying "10:30 AM".