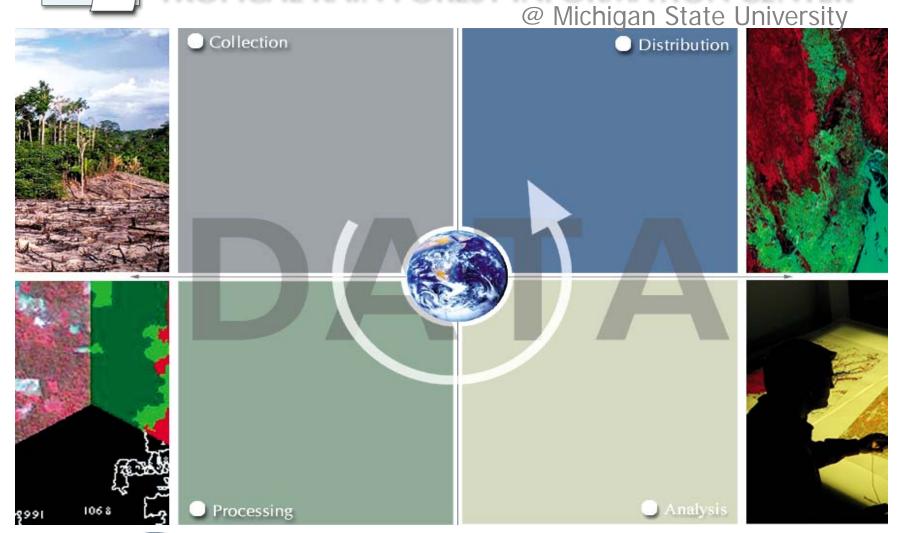


TROPICAL RAIN FOREST INFORMATION CENTER







### 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



#### The data broker model

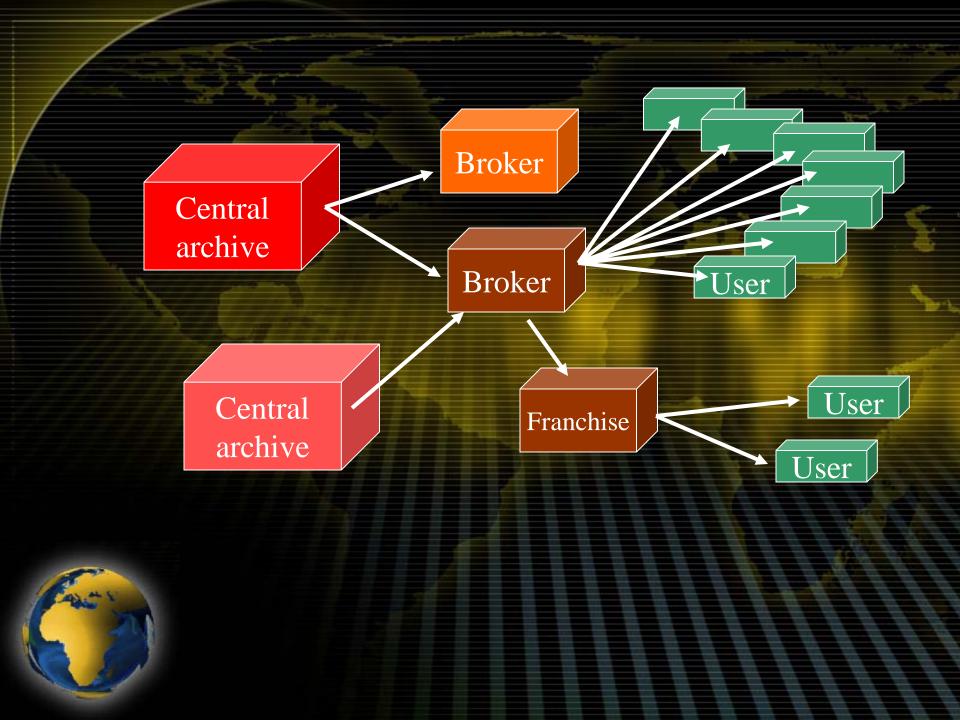
- Consider an older model:
  - Data are received from a sensor or platform and archive at a large facility
  - This facility acts as <u>both</u> the national repository or long term steward and as the access point to user communities interested in obtaining data
  - One system fits all purposes



#### Data broker model (cont.)

- Now consider a new data systems and services 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





## TRFIC Partners

- MSU
- University of Maryland
- USGS Eros Data Center



#### Overview of Landsat data services

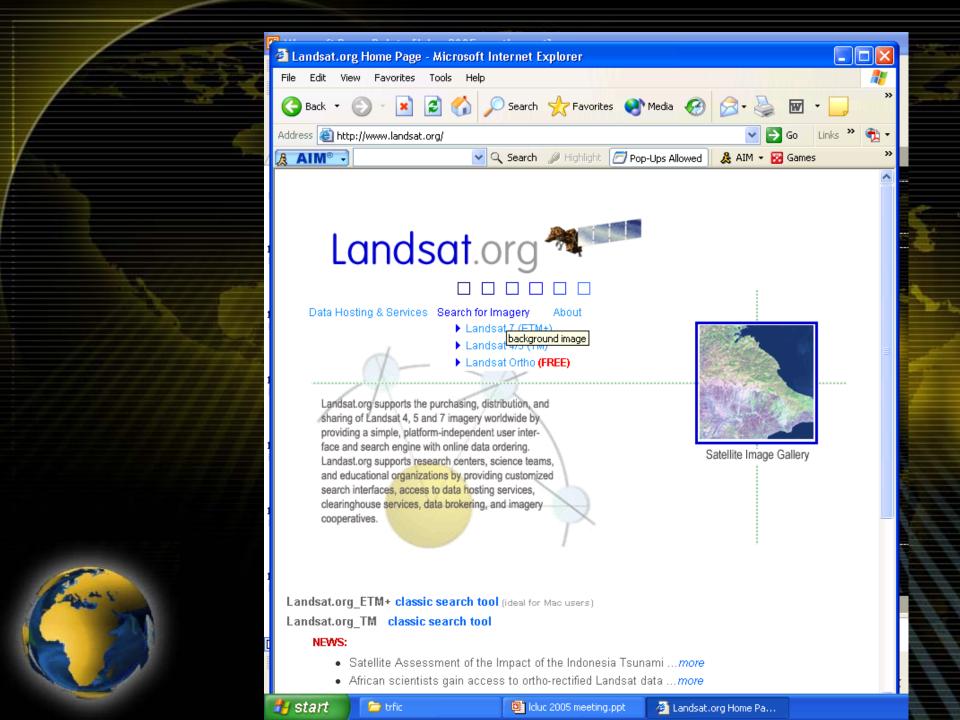
- Access to ortho-rectified MSS, TM and ETM archive
  - Official version as the EDC distribution point (retail end)
- Access to the TRFIC specialized MSS, TM and ETM+ data archive
- Access to the brokered "coop" TRFIC archive
- Brokered access to the complete national archive as well as tropical foreign ground stations.
- Access to the user community holdings through SAXTA.

## Hierarchical approach

• Centralized access to holdings at MSU and EDC through the TRFIC portal at www.landsat.org (Access-7, Access-45)

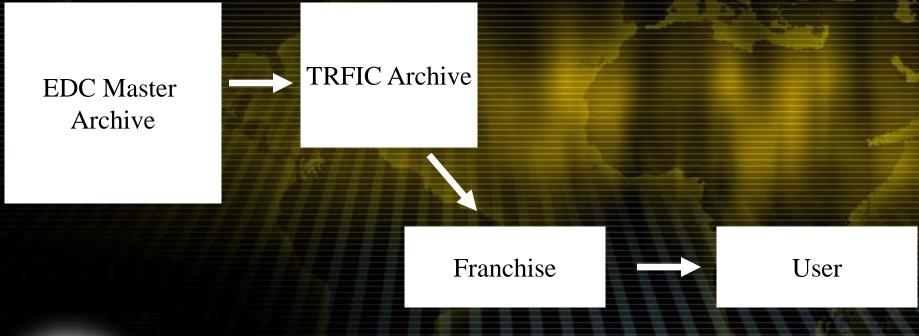




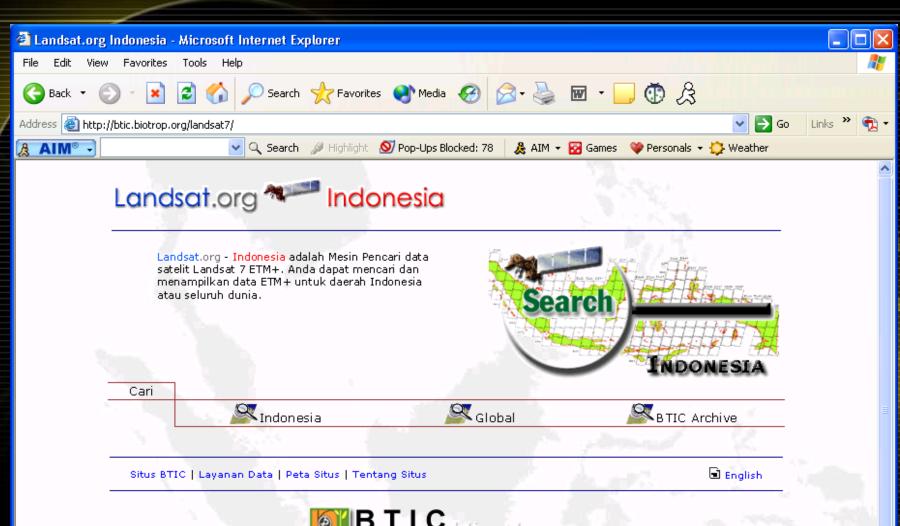


## Hierarchical approach

• Distributed access to regional holdings and foreign ground stations through franchise nodes











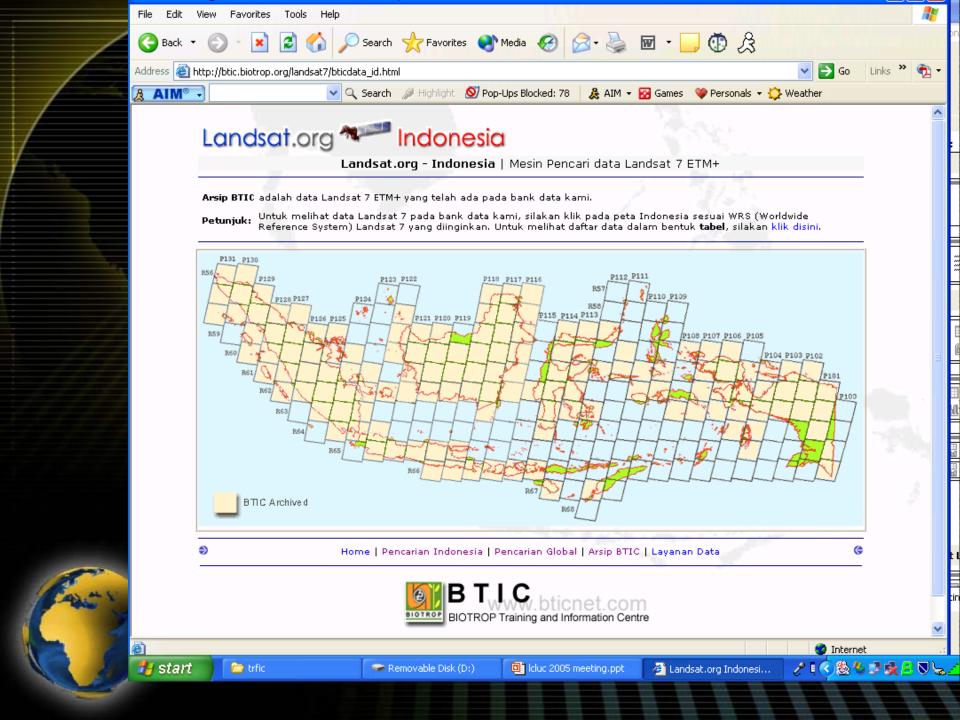




Funding and support provided by:

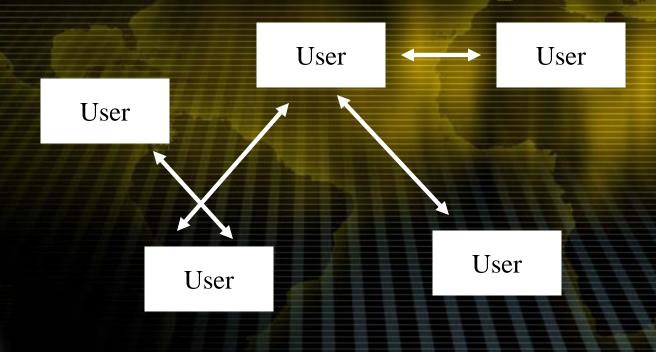




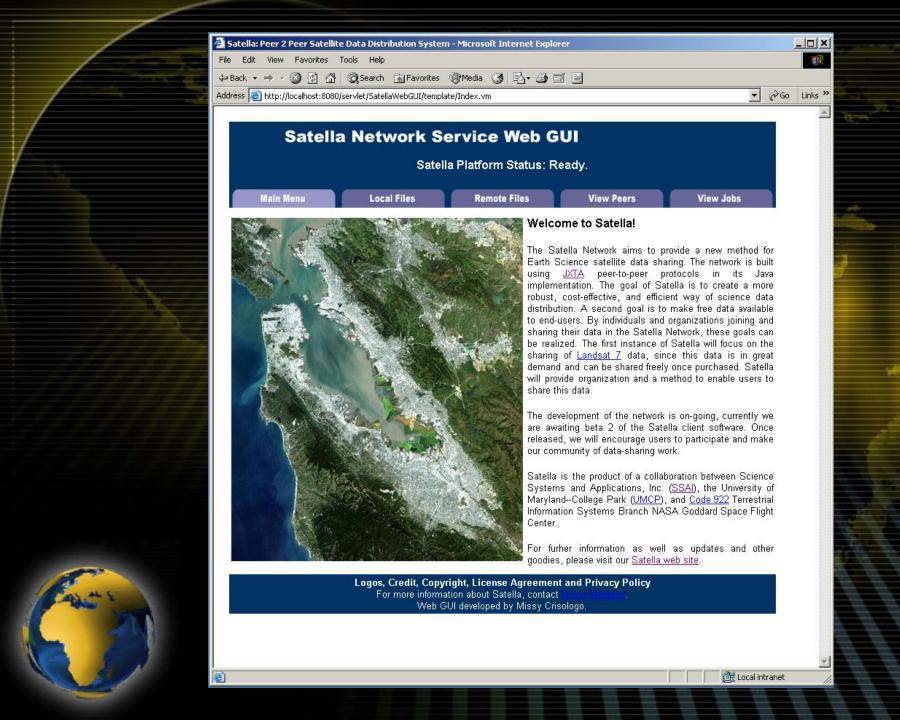


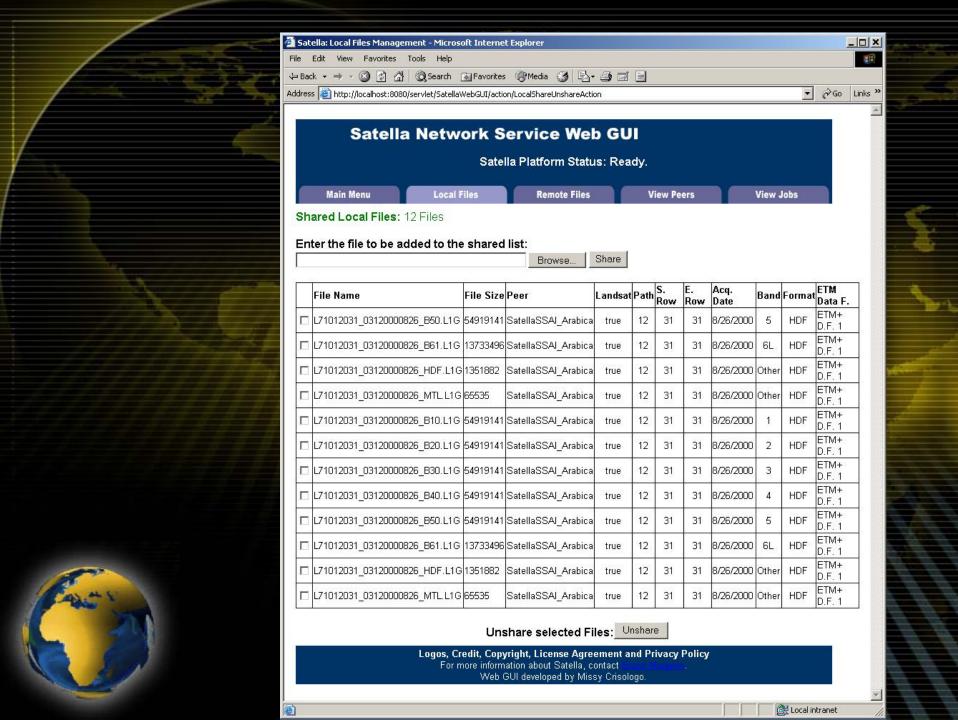
## Hierarchical approach

• Peer-to-Peer access to diffuse community holdings through SAXTA (UMD)









#### Distribution means

- CD/DVD
- FTP
- Fire-wire bulk sets
- Peer-to-peer



#### Other dataset services

- Access to more than 2000 IKONOS images
- Access to the full archive of Aster through www.asterdata.org
- Access to global daily Year 2000 Spot VGT
- Negotiating access services for:
  - Spot 4 global tropical archive
  - IRS global tropical archive
  - And derived products

#### Products

- We offer five levels of services for data and information products:
  - 1) Standard Products, generally individual granules (Landsat scenes),
  - 2) GeoBuild Products which you build for yourself on-line using our web-GIS services,
  - 3) GeoBundle Products which you build and bundle on-line using our web-GIS services,
  - 4) Custom Products, and
  - -5) Special Outreach and Education products, from our Rain Forest Resport Card project.

#### Standard Products

- Individual Landsat Products.
- Special Selection Landsat ETM+ Products.
- Pan-Sharpened ETM+ Products.
- The Orthorectified Global Landsat ETM+ 2000 Dataset.
- The Orthorectified Global Landsat TM 1990s Dataset.
- Forest Cover Change GIS Layers.
- Merged Landsat Forest Cover/MODIS Fire Products.



#### • Web GIS spatial search:

- We provide custom spatialized search using interactive internetbased GIS clients, in which users can digitize on-screen or upload their own specialized multi-polygon GIS layers as search parameters – or using map layers from any registered OGC compliant server on the Internet. Our core service uses our GeoSearch TM technologies. This service uses web-based GIS to search for Landsat data available for large area coverages, and merges results with other images or GIS layers. The service accesses the Landsat archives at EDC, TRFIC-2, and foreign ground stations using open specification (OGC, FGDC, XML, Z39.50) and standard interfaces to portray the results of a query over very large geographic areas. Users can use the client's map interface or upload their own shapefiles or OGC conformant points, lines, or polygons to search the global archive based on user-defined geographical entity.



- Spatial image/map based document retrieval:
  - Map and Image-based document catalog and document content search using our GeoDoc \*\* service which couples the image or GIS map resulting from a data search with their feature names/identities using standard OGC conformant layers and GNIS place names to mount a Z39.50/XML MARC Tagged search of all library catalogs in the Big Ten universities – or your own university library – for relevant papers, books, and other documents. This searching process is enabled by implementing the MARC21 XML schema to specify portions of text to be included in the catalog index. MARC is the acronym for MAchine-Readable Cataloging

#### • Full resolution browse:

 Full-resolution browsing of all Landsat data at EDC, MSU, and foreign ground stations using the MSUdeveloped GeoZoom TM technologies. GeoZoom is a client for rendering browse products on line. It can display, zoom, and pan an image up to full resolution in a standard web browser. It also allows the user to select specific band combinations to display. The GeoZoom browser works by taking the selected bands, compressing them (using a variable wavelet compression algorithm), and sending it over the internet to a web browser. We will expand the capabilities of GeoZoom to include derived product zooming in addition to image zoom capability.

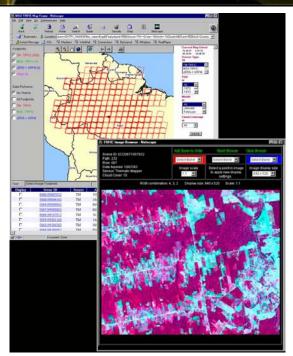
- Analysis and Bundling: toward "lights out systems".
  - We will develop and provide our *GeoAnalyst* service for GISbased on-line analysis capabilities. It is used to analyze and interrogate raw data, sub-setting and re-mapping, bundling of multiple image and digital map products, or on-line linking of our data to users models over the internet. GeoAnalyst will be built on the technology that has been developed at TRFIC in a partnership with the Environmental Systems Research Institute (ESRI). Out of that cooperation, TRFIC acquired specialized capabilities in web-GIS that will allow us to build maps on demand. GeoAnalyst may be used in a standard web browser without any special plug-in or applets. It will use the most recent technology in the area of java Server pages (JSP) and JavaScript. GeoAnalyst uses XML requests, merging requested data from distributed databases using open specification interfaces (OGC, Shapefiles, XML, GML).

# Services

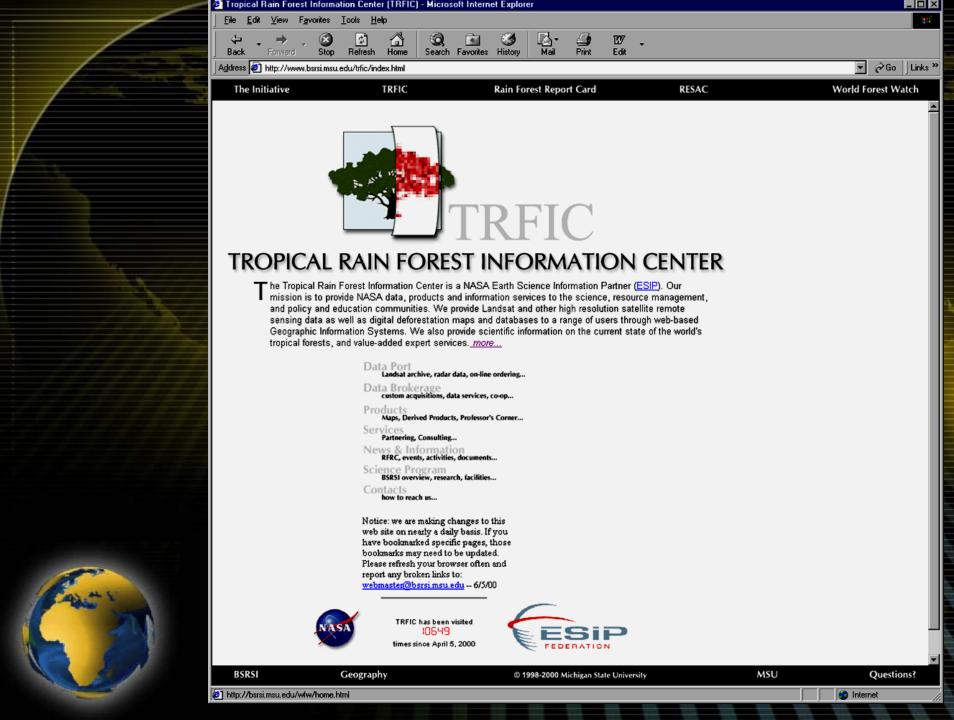
GeoSearch, GeoZoom

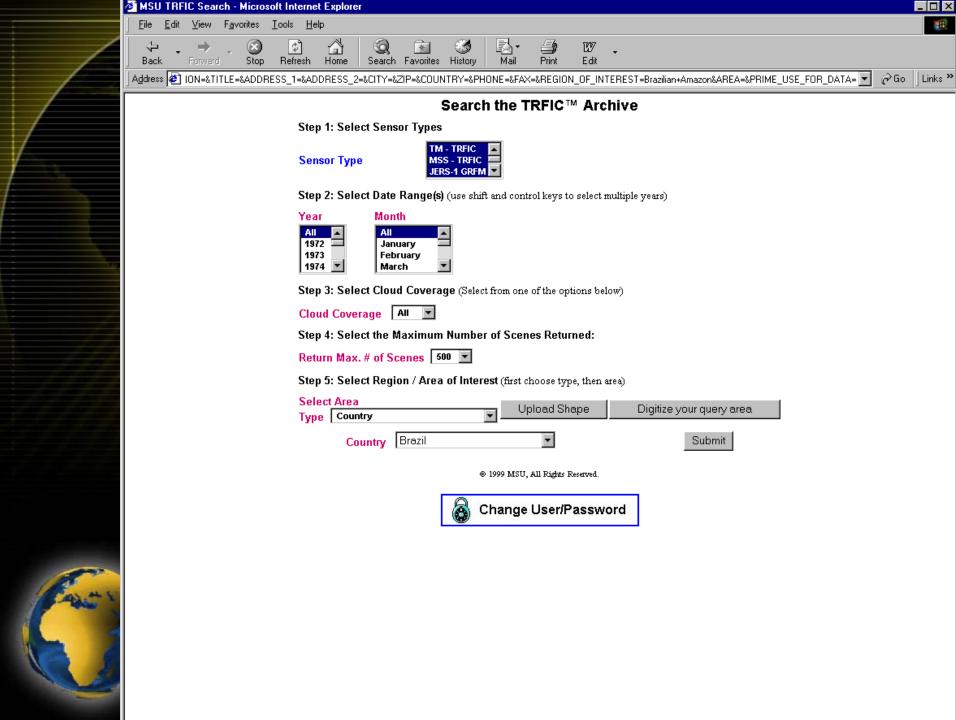
Upload Polygons

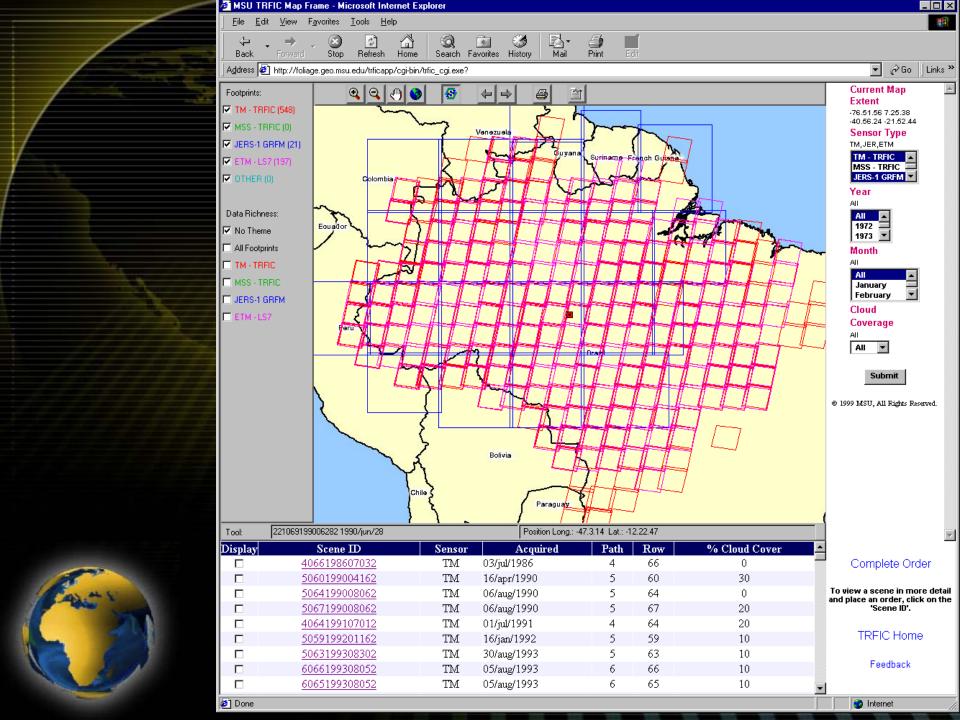
GeoAnalyst, GeoBundle

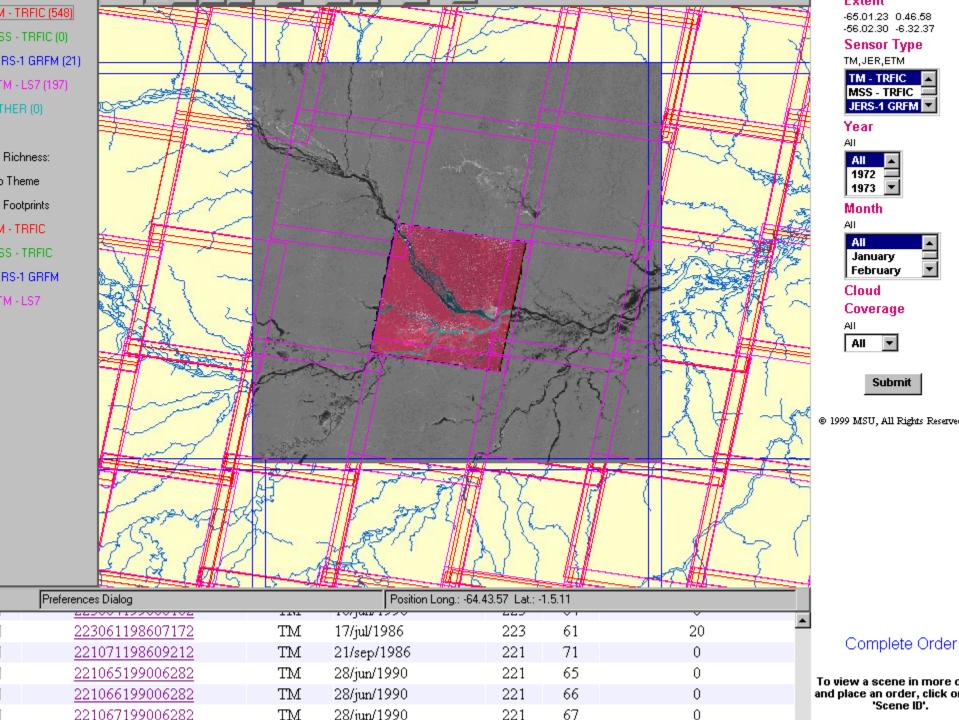


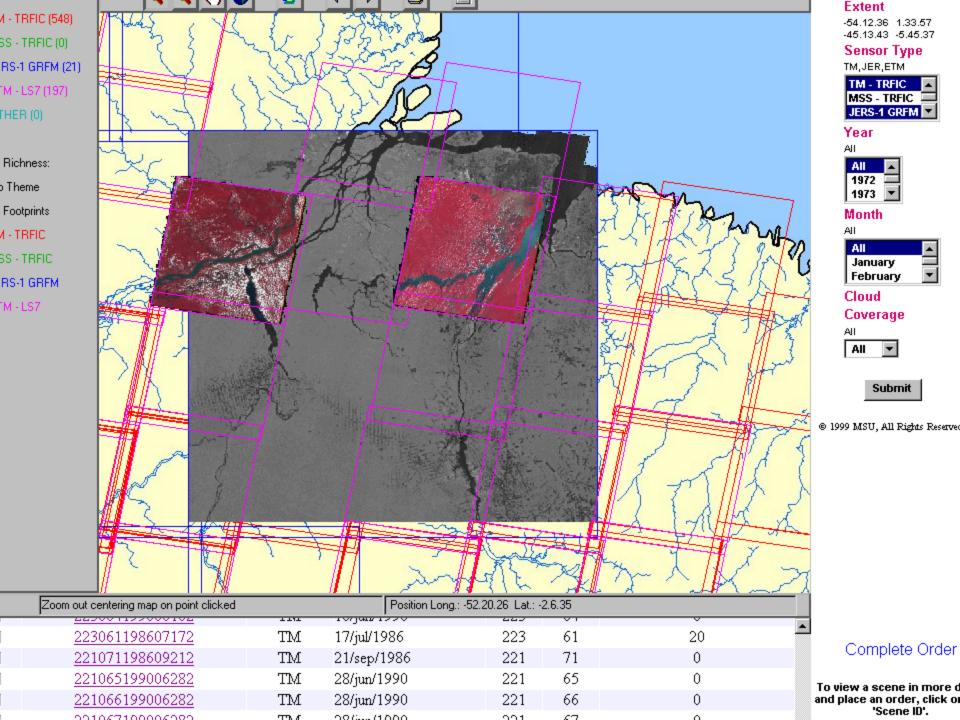














Step 3: Select Cloud Coverage (Select from one of the options below)

Cloud Coverage All

Step 4: Select the Maximum Number of Scenes Returned:

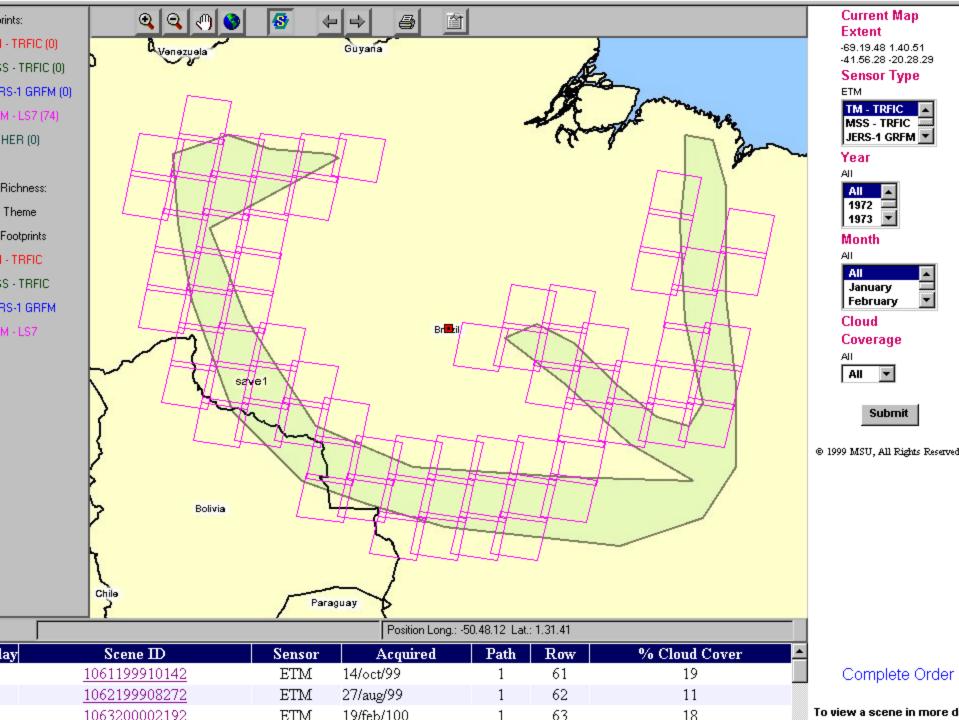
Return Max. # of Scenes 1500 🔽

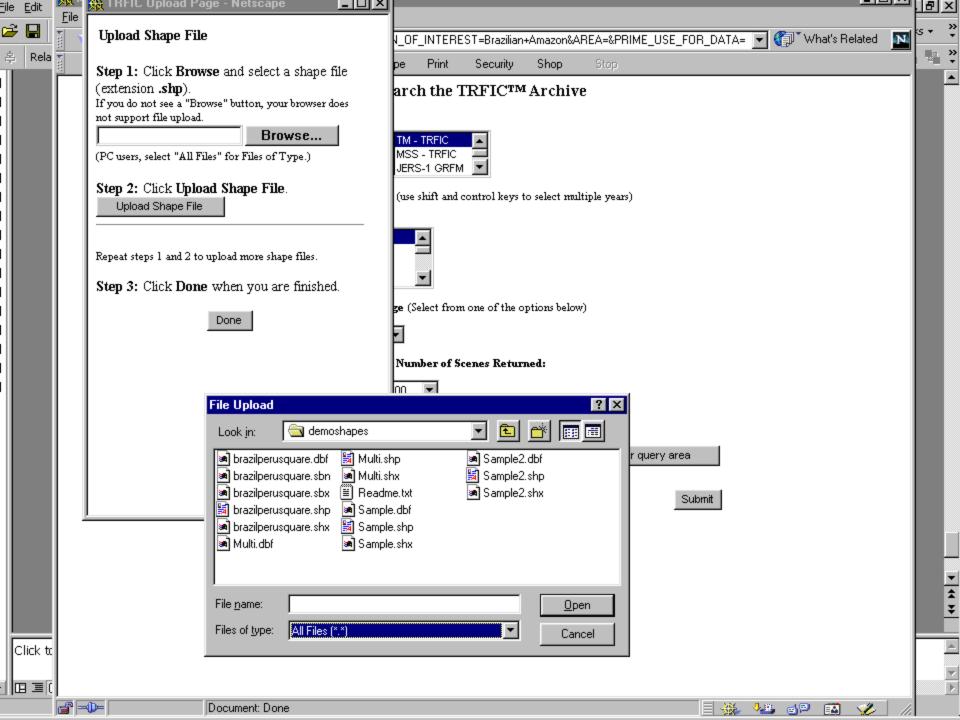
Step 5: Select Region / Area of Interest (first choose type, then area)

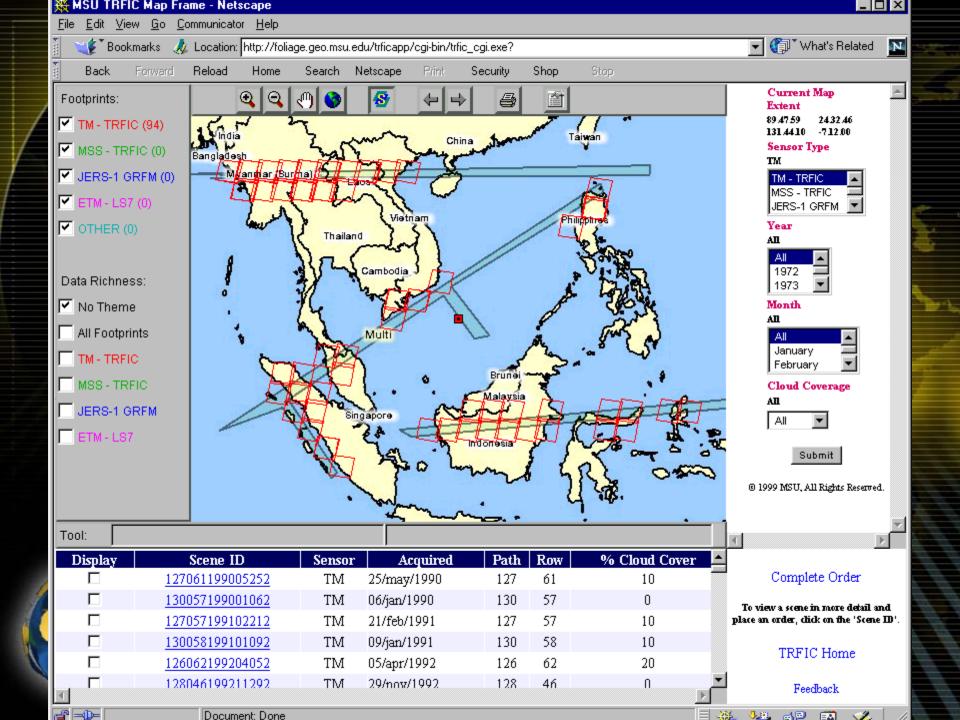


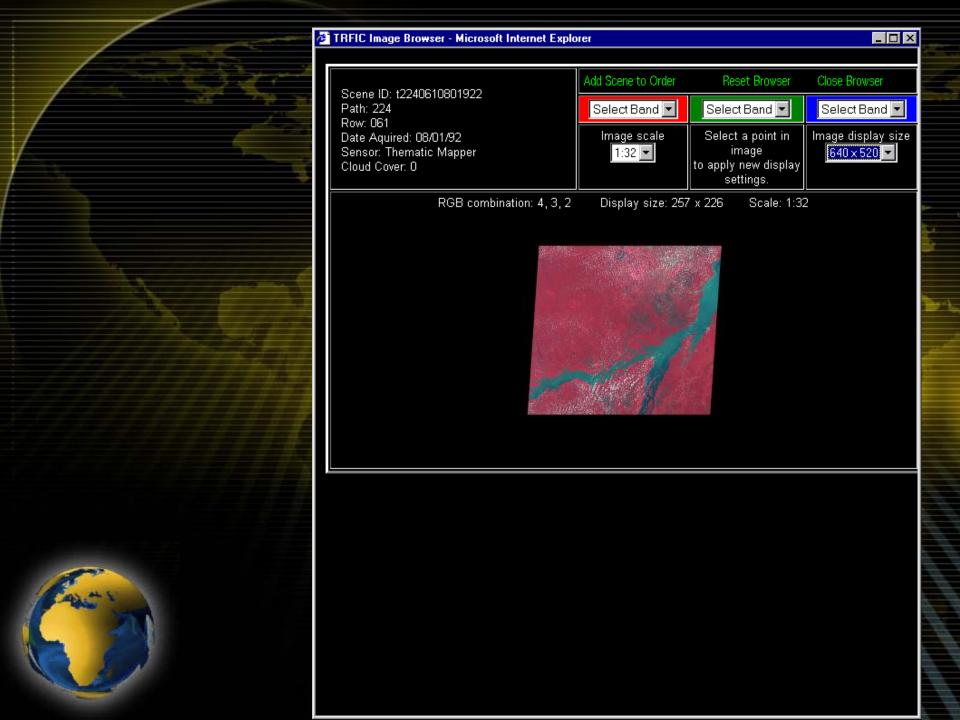


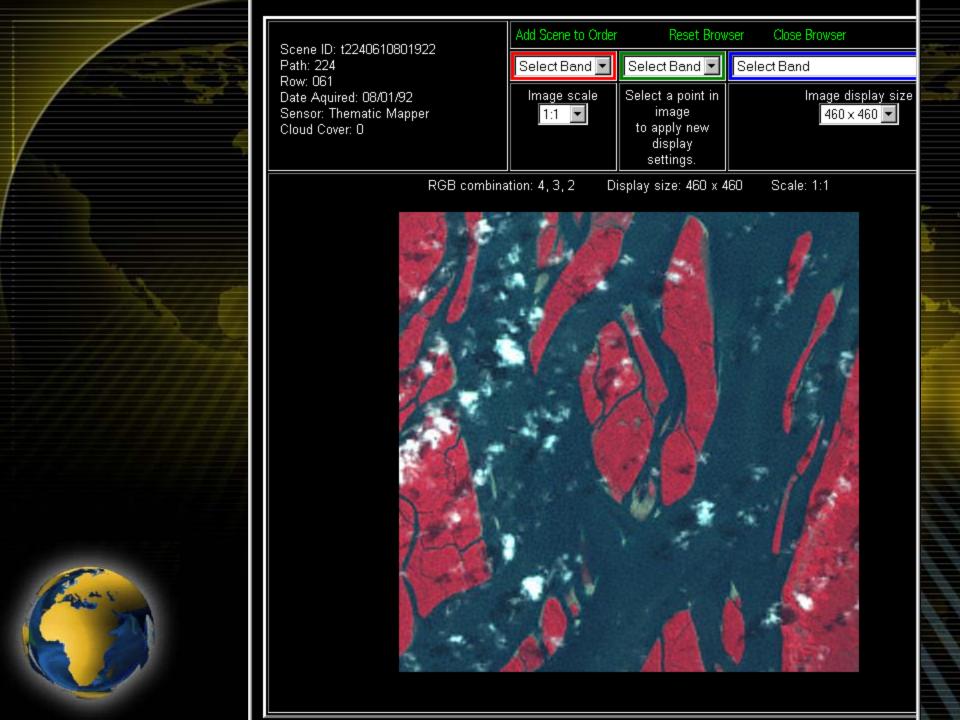


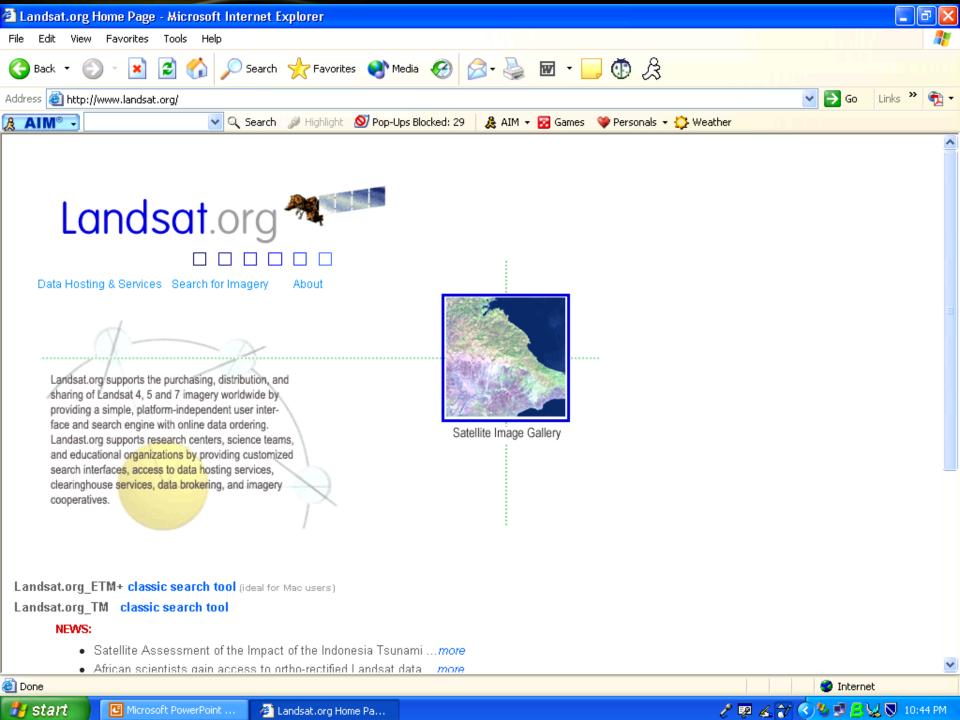


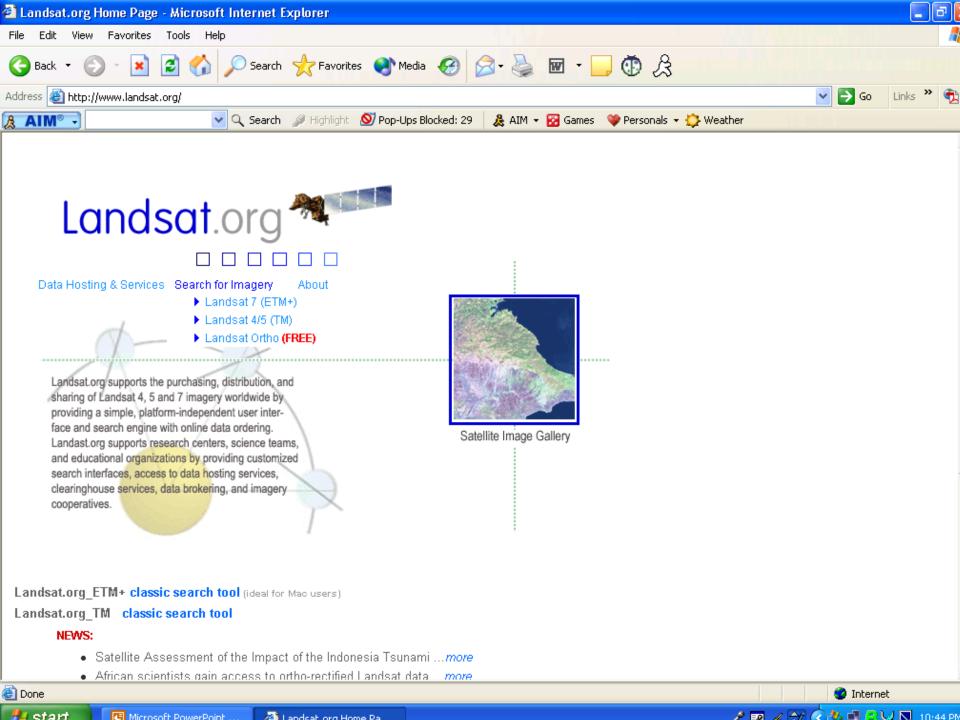


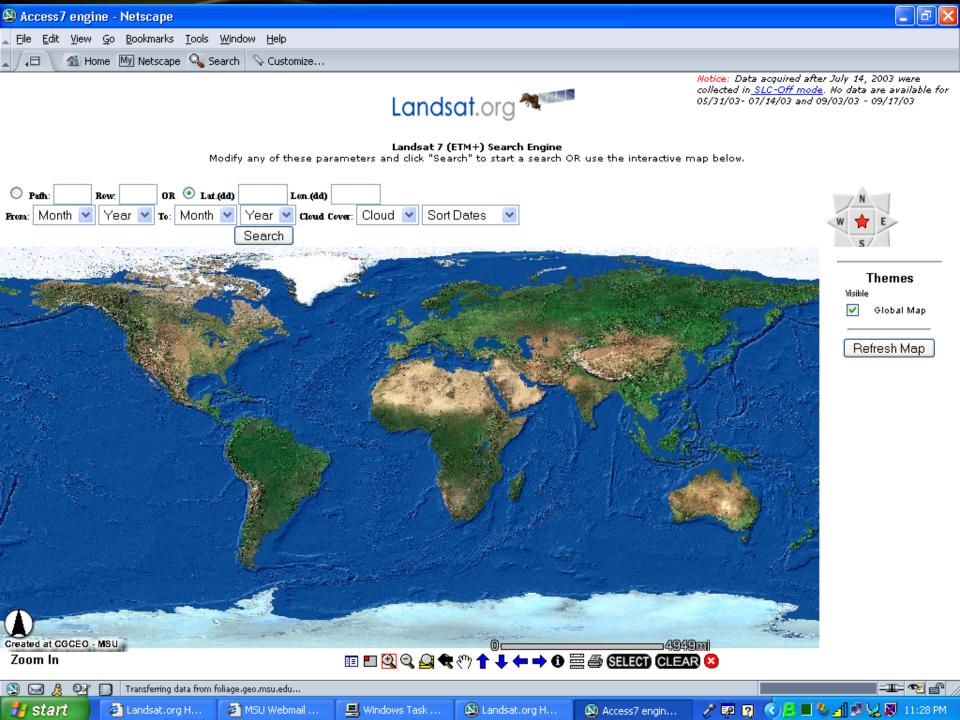




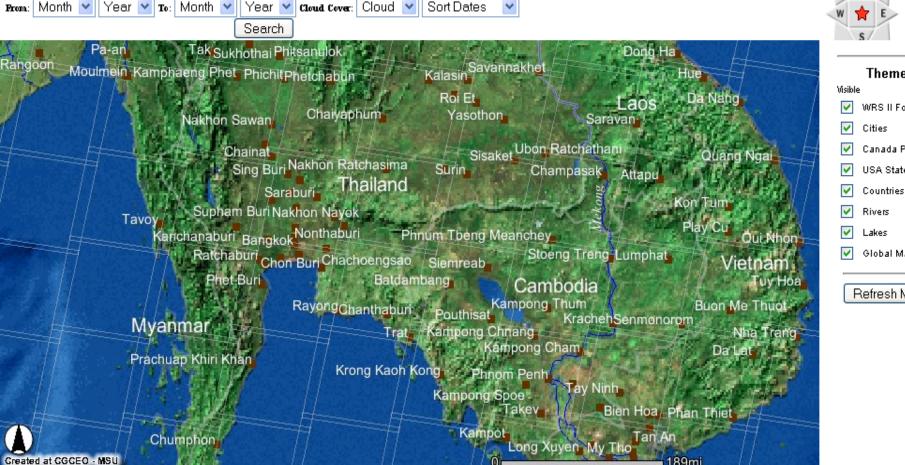












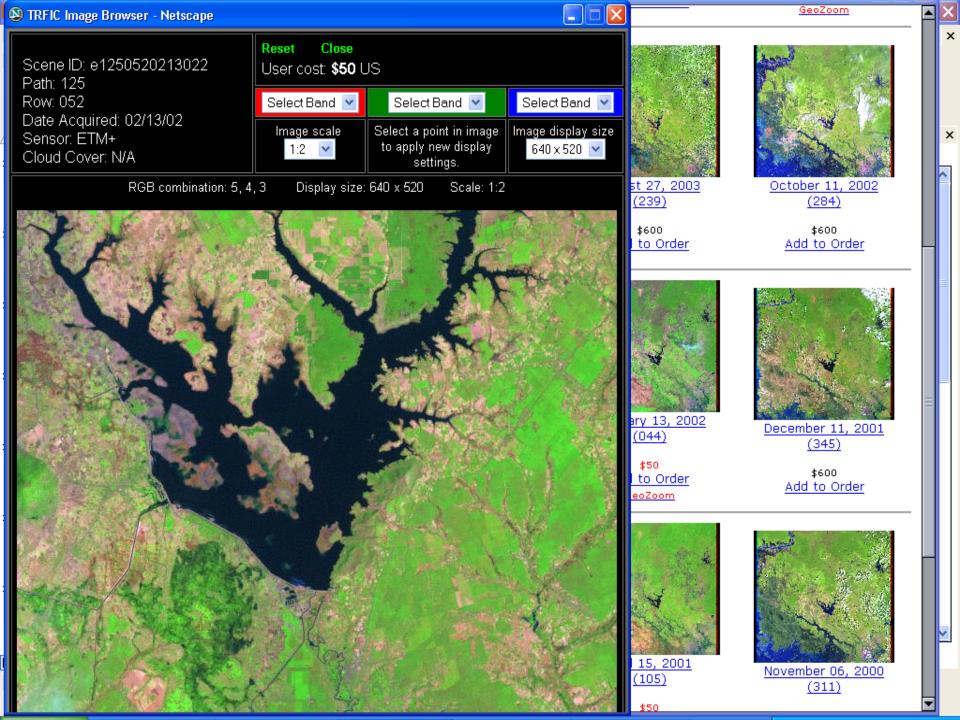






Refresh Map













#### FREE Global Orthorectified Landsat Data via FTP

Landsat.org, an affiliate of the Tropical Rain Forest Information Center (TRFIC), now hosts the Global Orthorectified Landsat Datasets for three epochs: 1970's MSS, 1990's TM, and 2000's ETM+. We provide access to these data for the global community of users for FREE.

You can also order large sets of data and we will deliver them to you. See details here



#### STEP 1:Use the Path-Row Finder to identify your Path / Row area of interest (application help)

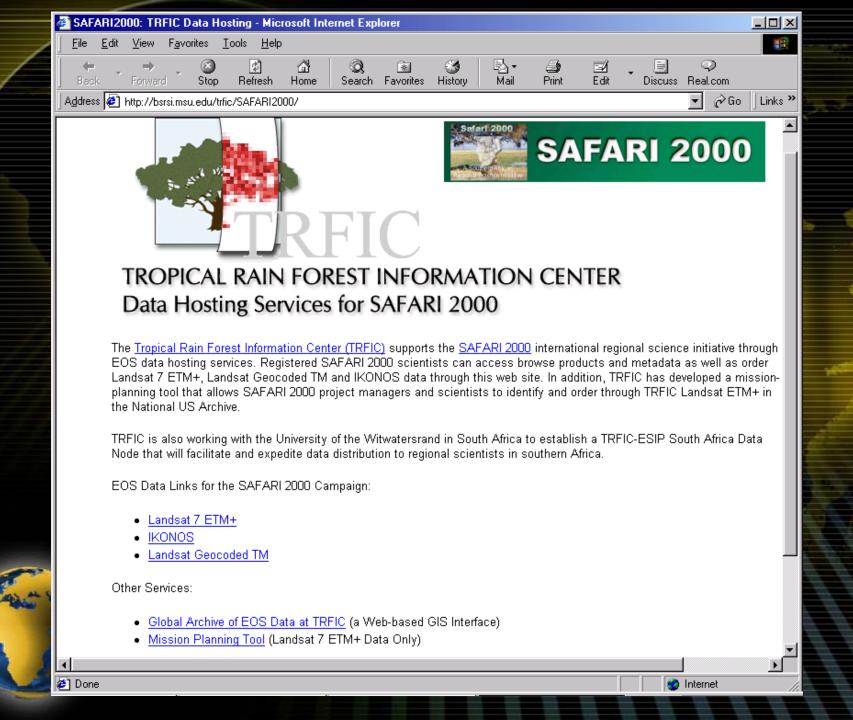
STEP 2: Access data through the links below. The links open up an ftp site showing a list of folders with "Path" lables. Click to open a "Path" folder and again to open a "Row" folder. Within each row folder will be one or two "Scene" folders containg data. Download files in the "Scene" folders to your local computer using the mouse "right click" and "save as" function or by selecting (highlighting) files and using the "copy" and "paste" functions.

Landsat ETM+ Data (2000's)	Landsat TM Data (1990's)	Landsat MSS Data (1970's)	
WRS 2	WRS 2	WRS 1	
• Paths 001 - 015	• Paths 001 - 034	• Paths 001 - 251	
<ul> <li>Paths 016 - 029</li> </ul>	<ul> <li>Paths 035 - 109</li> </ul>		
<ul> <li>Paths 030 - 048</li> </ul>	<ul> <li>Paths 110 - 136</li> </ul>		
<ul> <li>Paths 049 - 088</li> </ul>	<ul> <li>Paths 137 - 167</li> </ul>		
<ul> <li>Paths 089 - 106</li> </ul>	<ul> <li>Paths 168 - 188</li> </ul>		
<ul> <li>Paths 107 - 119</li> </ul>	<ul> <li>Paths 189 - 233</li> </ul>		



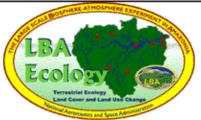
Paths 120 - 131











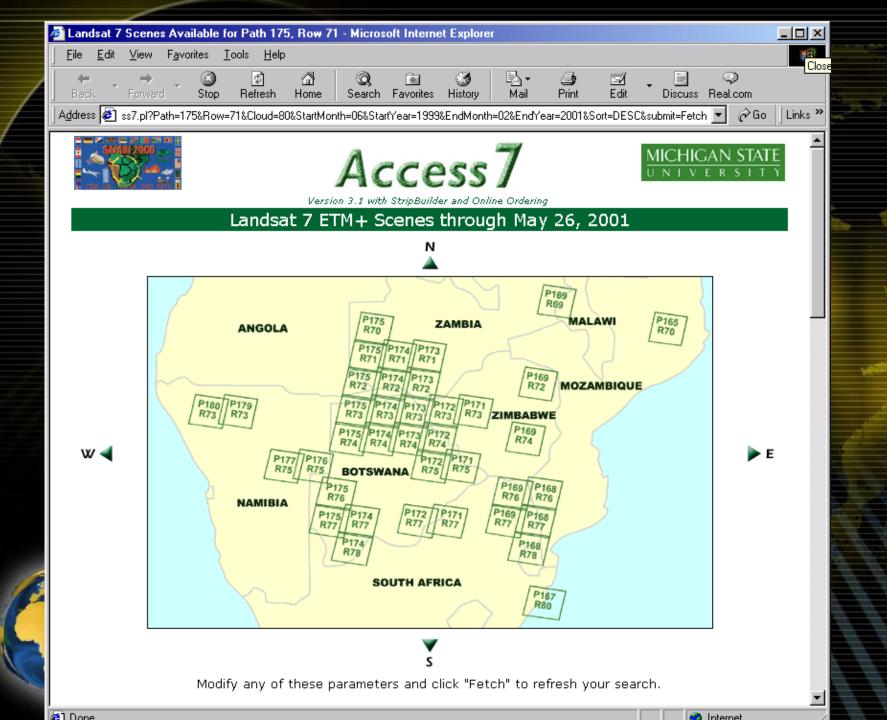
# TROPICAL RAIN FOREST INFORMATION CENTER HOSTING FOR LBA-E PROGRAM

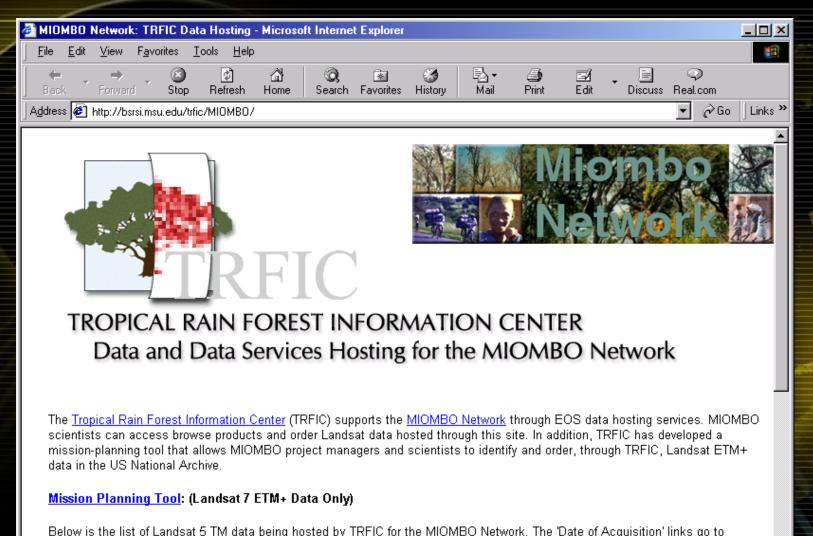
The <u>Tropical Rain Forest Information Center</u> (TRFIC) supports NASA's <u>Large Scale Biosphere-Atmosphere</u> <u>Ecology Project</u> through access to a variety of data products.

#### EOS Data Access for the Brazilian Amazon:

- Order Historic MSS, TM, ETM+, JERS (Option 1) Web-GIS Interface permits on-screen
  polygon digitizing, shapefile upload, and other geographic searches as part of a spatially
  enabled Oracle database of the TRFIC data archive with online, full-resolution browse
  products and online ordering at dramatically reduced cost.
- Order Historic MSS, TM and ETM+ (Option 2) Simple HTML interface with WRS maps
  provide alternative access to imagery archived at the TRFIC also with online, full-resolution
  browse products and online ordering at dramatically reduced cost.
- Order Any Available ETM+ Scene (Option 3) Simple HTML interface to searchable database (dynamically updated daily) of browse products by scene. Use this interface to purchase scenes outside the TRFIC archive thorough the TRFIC brokering service. Images already in the TRFIC archive are noted and reflect the reduced co-op price. Powered by Access7<sup>TM</sup>

LBA-E project scientists can access Landsat data archived at the TRFIC through three data portals: 1) a webbased GIS interface with granule and map layer overlay functions, and 2) a simple HTML interface with hot linked maps of the Brazilian Amazon states and WRS tiles. These two data portals provide access to





Below is the list of Landsat 5 TM data being hosted by TRFIC for the MIOMBO Network. The 'Date of Acquisition' links go to browse products of the data.

Please order the data using this order form.

WRS2 Path	WRS2 Row	Date of Acquisition	Bands
167	70	02/29/88	7
167	71	<u>11/27/88</u>	7
167	71	02/08/92	7
407	74	00/40/05	7



