Science Focus

- Science-driven data systems
- LUCC 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.
- 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](http://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.
Search and Build

GeoSearch

GeoZoom

GeoSearch Upload

GeoBuild/GeoBundle
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
Comparison - Ikonos x Landsat 7 ETM+

<table>
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<tr>
<th>Year</th>
<th>Total detected (Km²)</th>
<th>Net Increment logging (Km²)</th>
<th>Form-logging (Km²)</th>
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<td>1992</td>
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<td>1996</td>
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<td>11,902.81</td>
<td>14,182.59</td>
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</tbody>
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Participants

• Center for Global Change and Earth Observations at MSU
• EROS Data Center
• SAXTA Team at UMd/SSAI
www.landsat.org

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. Landsat.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.

Landsat.org_ETM+ classic search tool [ideal for Mac users]
Landsat.org_TM classic search tool

NEWS: