



Landsat Project Report

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Presented By:

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Landsat 7 Mission Status

- **Spacecraft**

- ◆ Gyro 3 Failure (Shut down May 5, 2004)

- Flight Operations team implemented software gyro
- Working additional improvements for software gyro

- ◆ Other Spacecraft Issues (non-critical)

- Solid State Recorder – 4 memory boards
- Electrical Power Subsystem – shunt #14 and shunt #6
- Fuel Line Thermostat

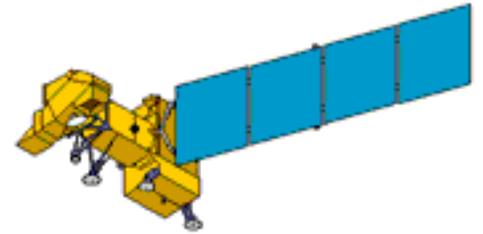
- **ETM+**

- ◆ Scan Line Corrector Failure (May 31, 2003)

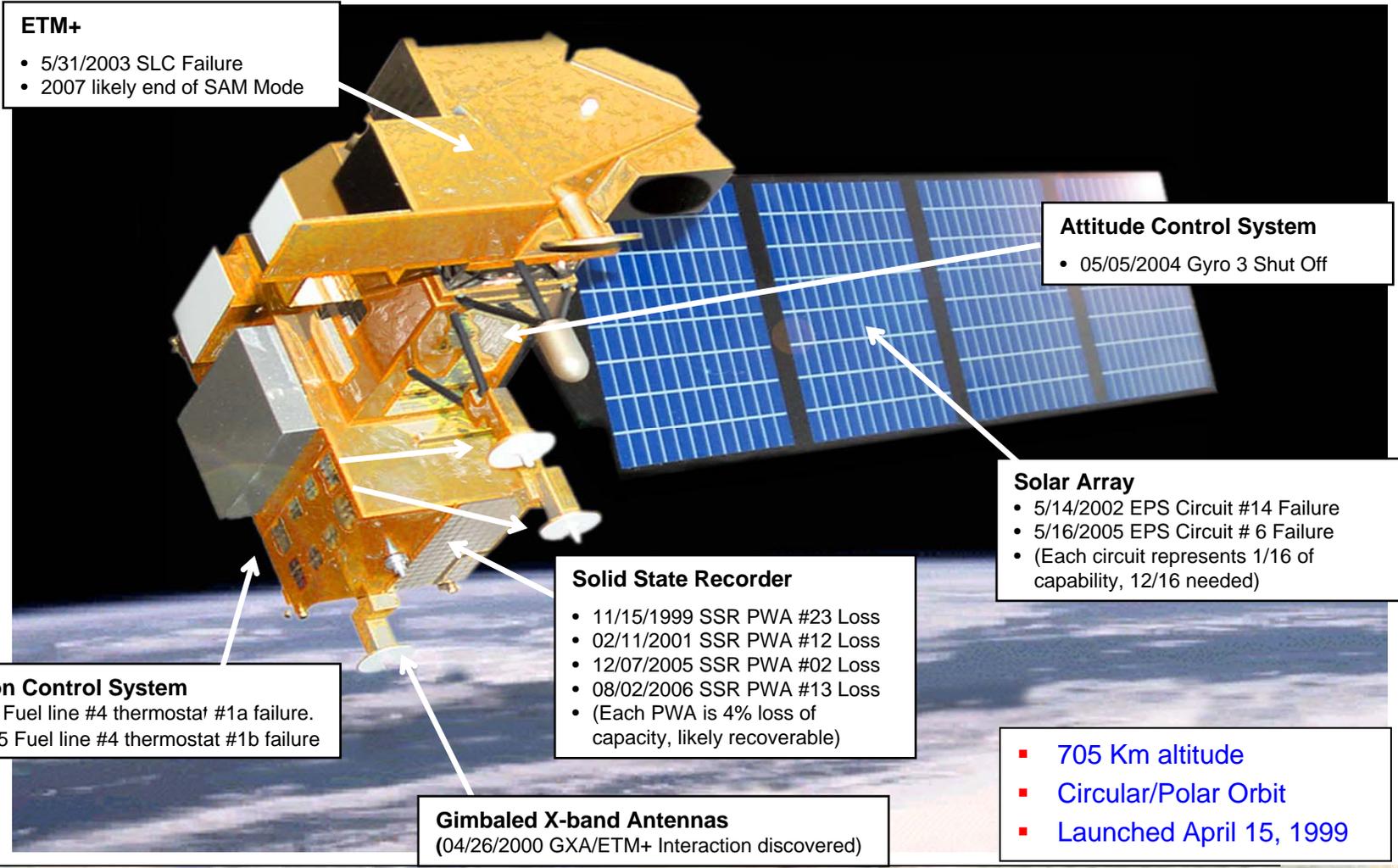
- Continue to operate with SLC off; no impacts to radiometric or geometric performance
- Expect to release Segment-based Fill product in Feb, 2007

- ◆ Bumper Mode operations

- Test data acquired
- Expected to transition between 1/2007 – 10/2007



Landsat 7 Spacecraft Status



Landsat 5 Mission Status

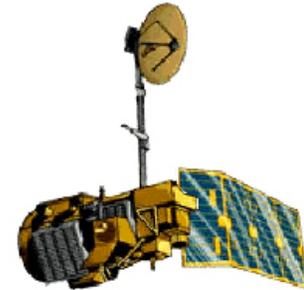
- **Spacecraft**

- ◆ Solar Array Drive Malfunction

- Fixed array operations – Aug 2006

- ◆ X-band Transmission (March 2006)

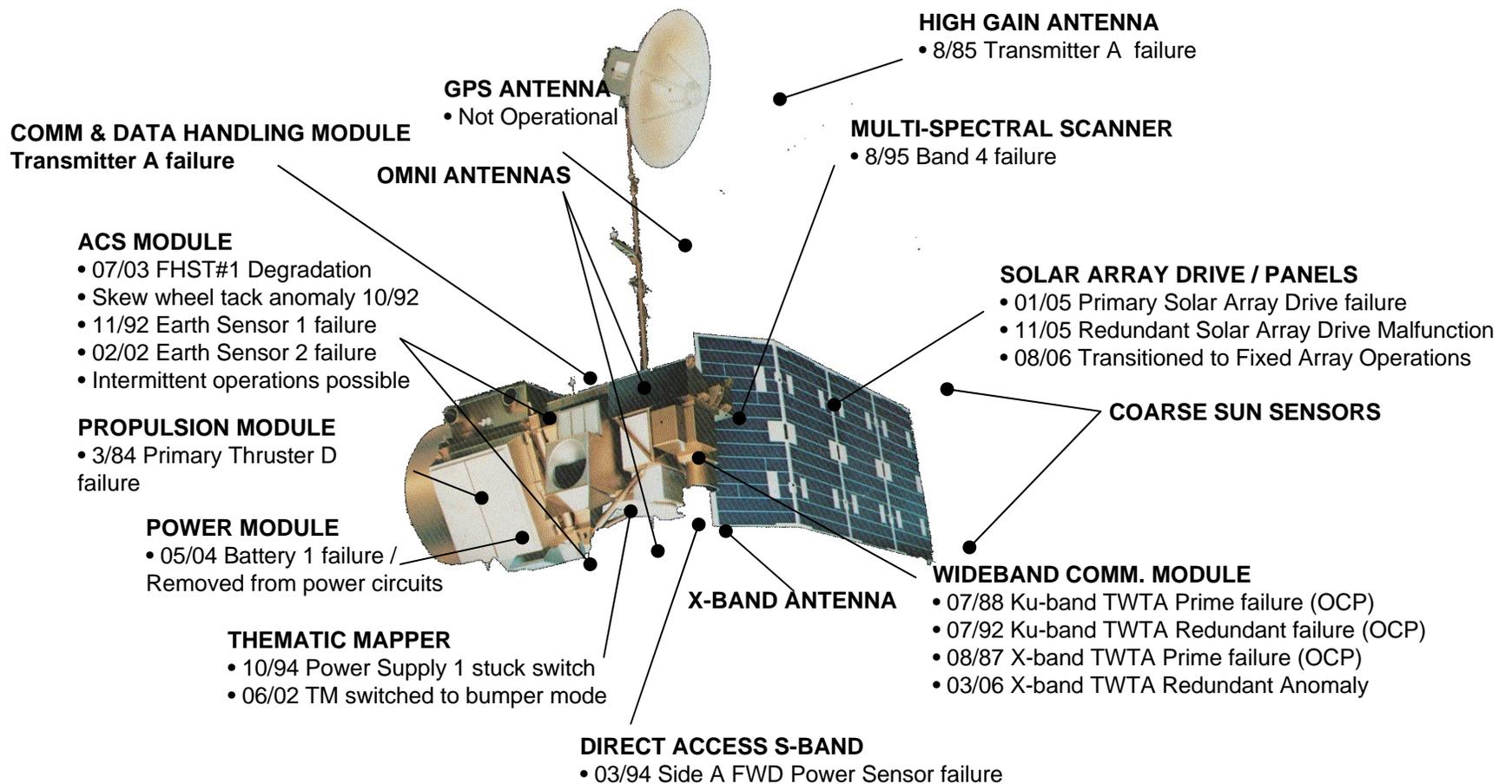
- Power spikes associated with TWTA (Traveling Wave Tube Amplifier)
- New turn on procedure to avoid spikes



- **TM**

- ◆ Functioning normally in bumper-mode

Landsat-5 Flight Segment Overview



Award at the 9th International Conference on Space Operations in Rome

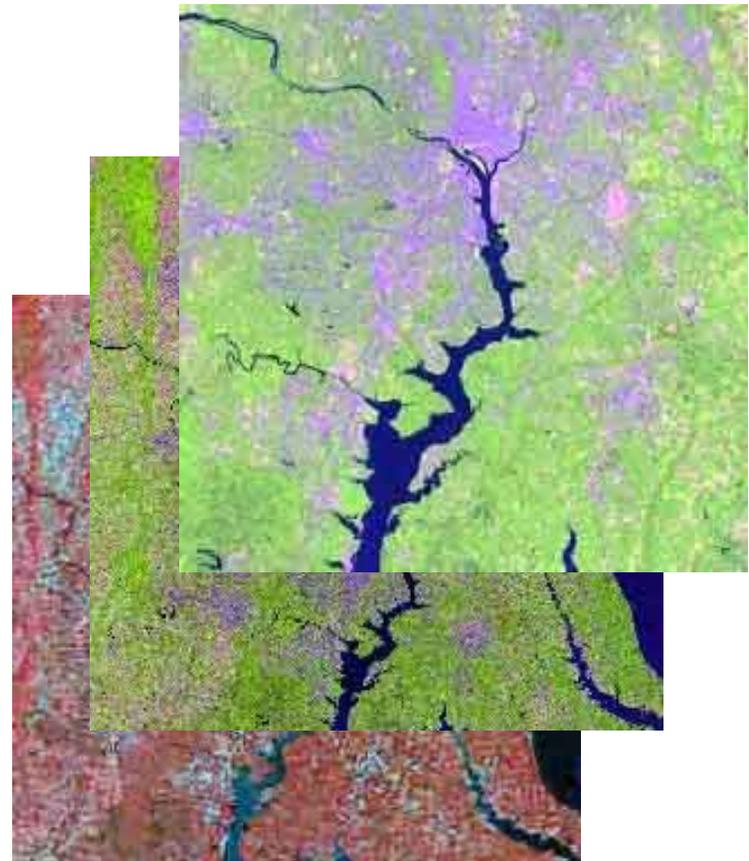


- Quoting the citation, the USGS team will receive the award, “for dedicated efforts in recovering Landsat 5 from two potentially mission-ending hardware anomalies and restoring the mission to full operations.” In November, 2005, the solar array that generates power for Landsat 5 stopped working properly; in March, 2006, the downlink transmitter that sends image data to ground stations tripped a circuit breaker and stopped transmitting data. In each case, the Flight Operations Anomaly Team was able to devise corrective procedures and restore the 22-year-old Landsat 5 spacecraft to full operations. As a result of the team's efforts, image data from Landsat 5 continues to be available to scientists around the globe.

U.S. Landsat Archive Overview

(Marketable Scenes through September 25, 2006)

- **ETM+: Landsat 7**
 - ◆ 654,932 scenes
 - ◆ 608TB RCC and L0Ra Data
 - ◆ Archive grows by 260GB Daily
- **TM: Landsat 4 & Landsat 5**
 - ◆ 671,646 scenes
 - ◆ 336TB of RCC and L0Ra Data
 - ◆ Archive Grows by 40GB Daily
- **MSS: Landsat 1 through 5**
 - ◆ 641,555 scenes
 - ◆ 14TB of Data

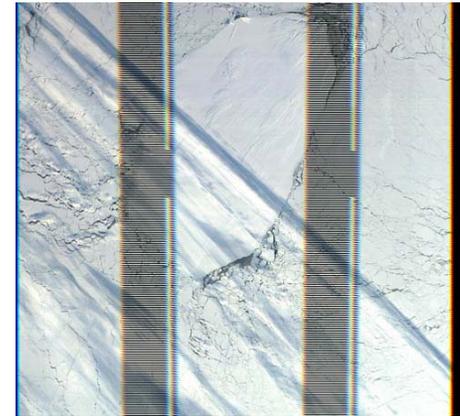


FY06 Key Events and Activities

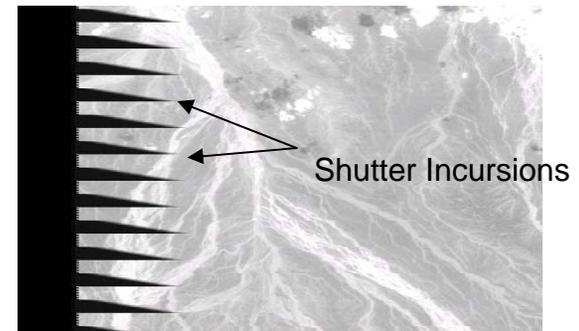
- Landsat 5 backup Mission Operations Center
- Landsat 5 Flight Operations Contract awarded to Honeywell
- Ground system transition to Linux continuing
- Transcription of over 185Tb of Landsat 1-5 data on ~8,600 tapes almost complete

Bumper Mode Operations on L7

- Landsat 5 transition in 2002
- Landsat 7 tested bumper mode in March, 2006
- Software changes in work for LPGS



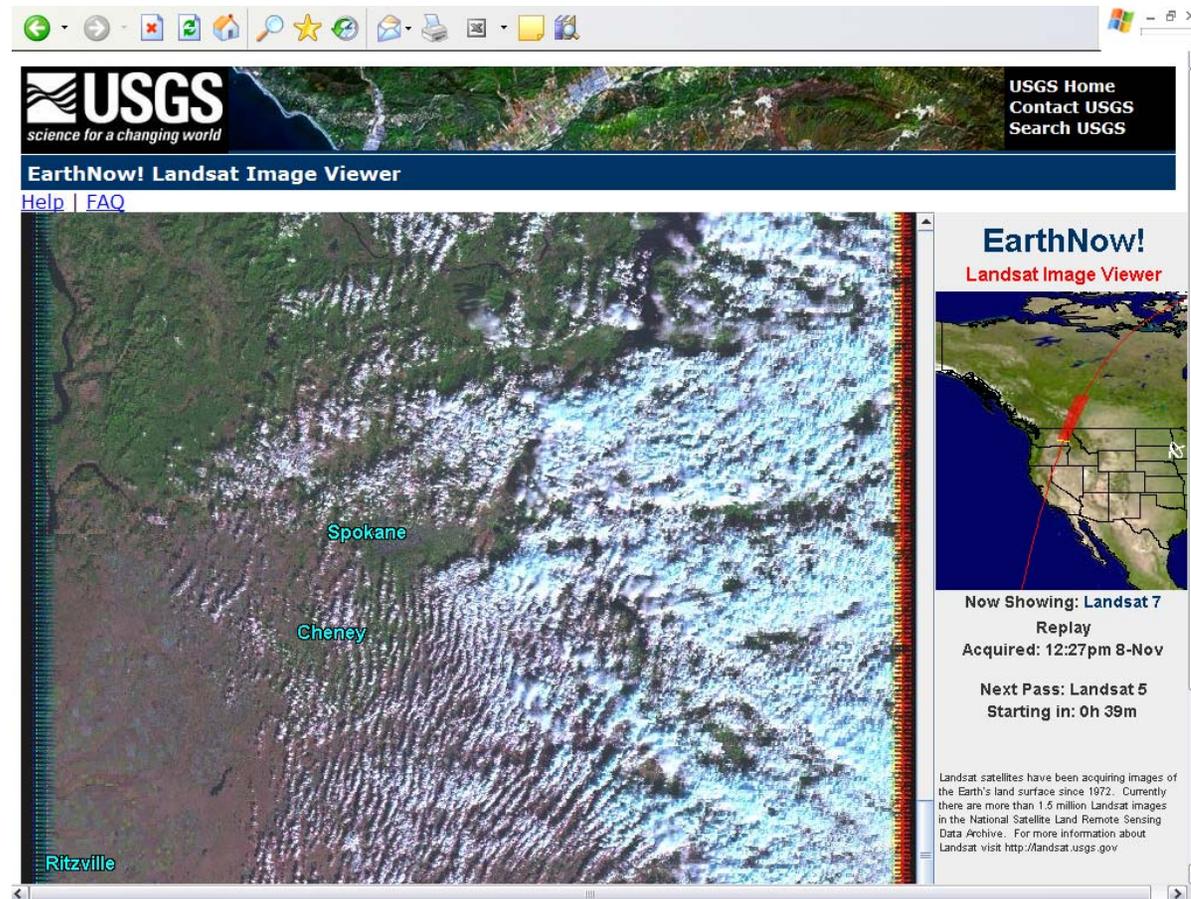
Example of shutter incursions with Landsat 5



Example of recent shutter incursions with Landsat 7

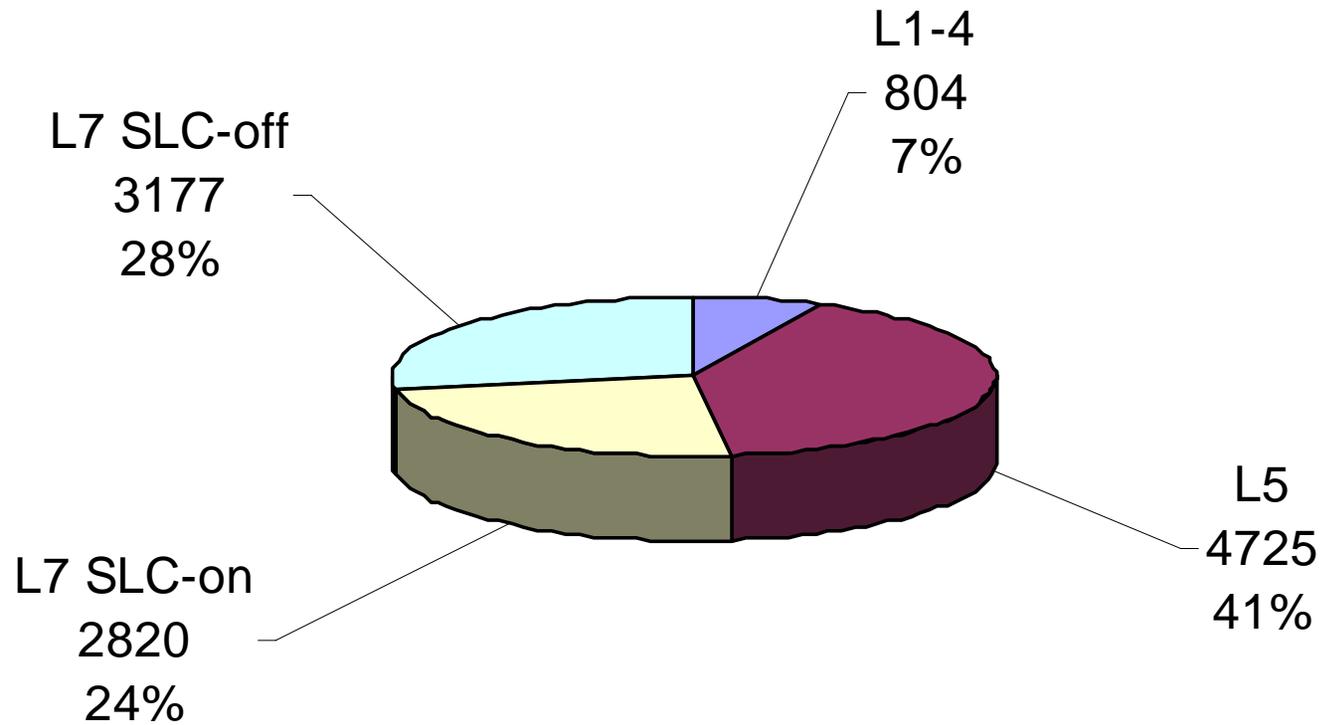
Landsat Image Viewer

- <http://earthnow.usgs.gov>

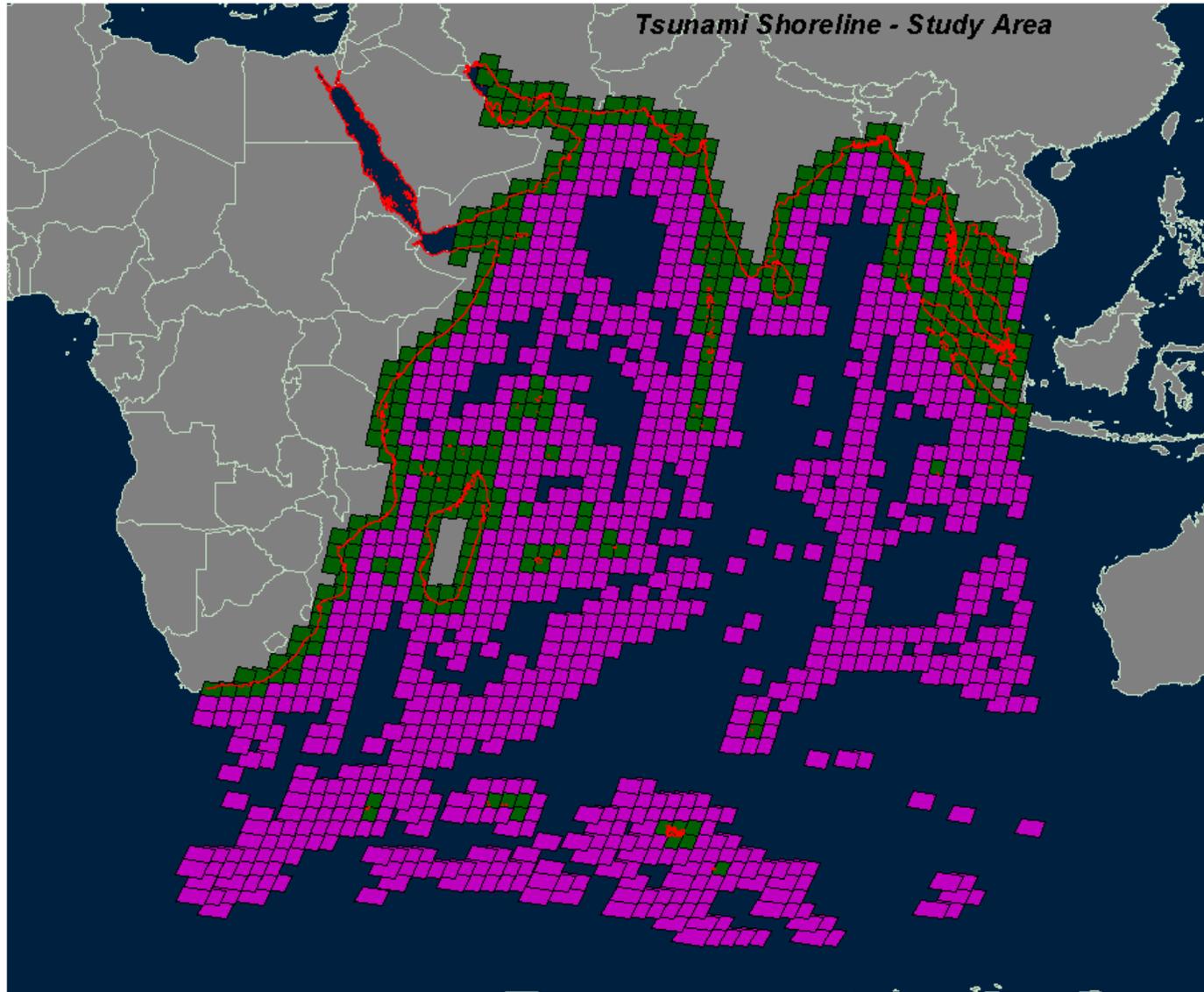


Sales of Landsat

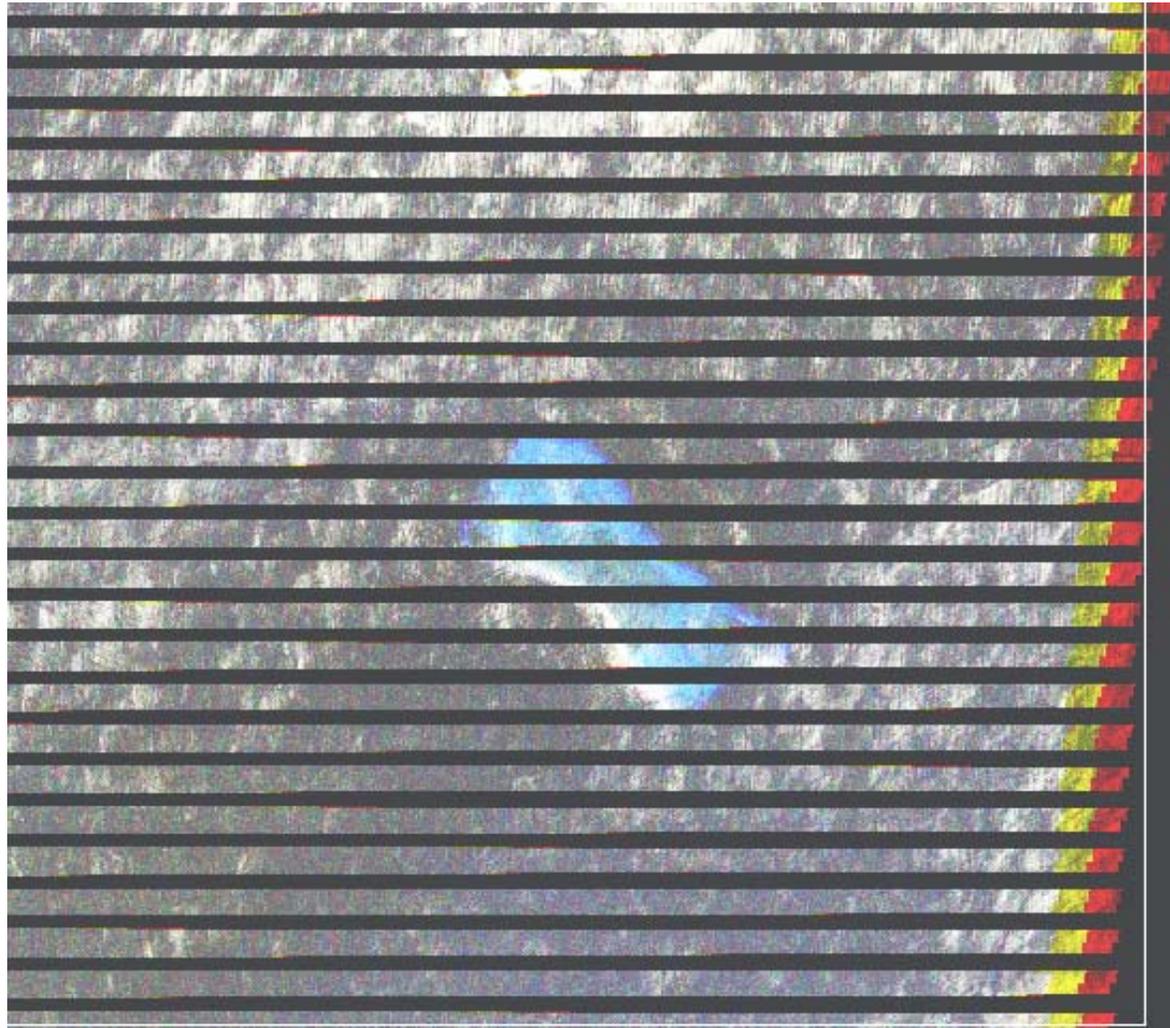
Landsat FY06 Sales



Indian Ocean Campaign

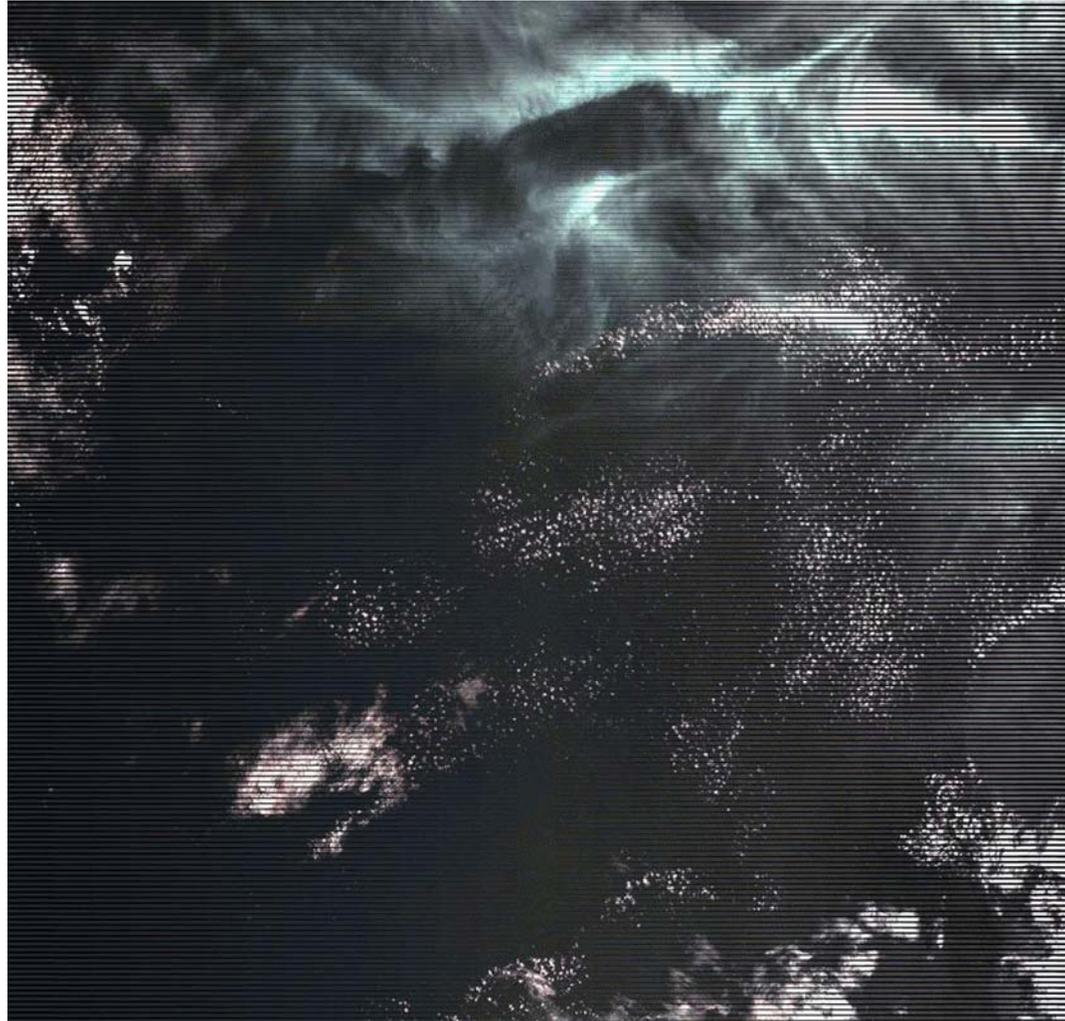


Shallow Water Hazards



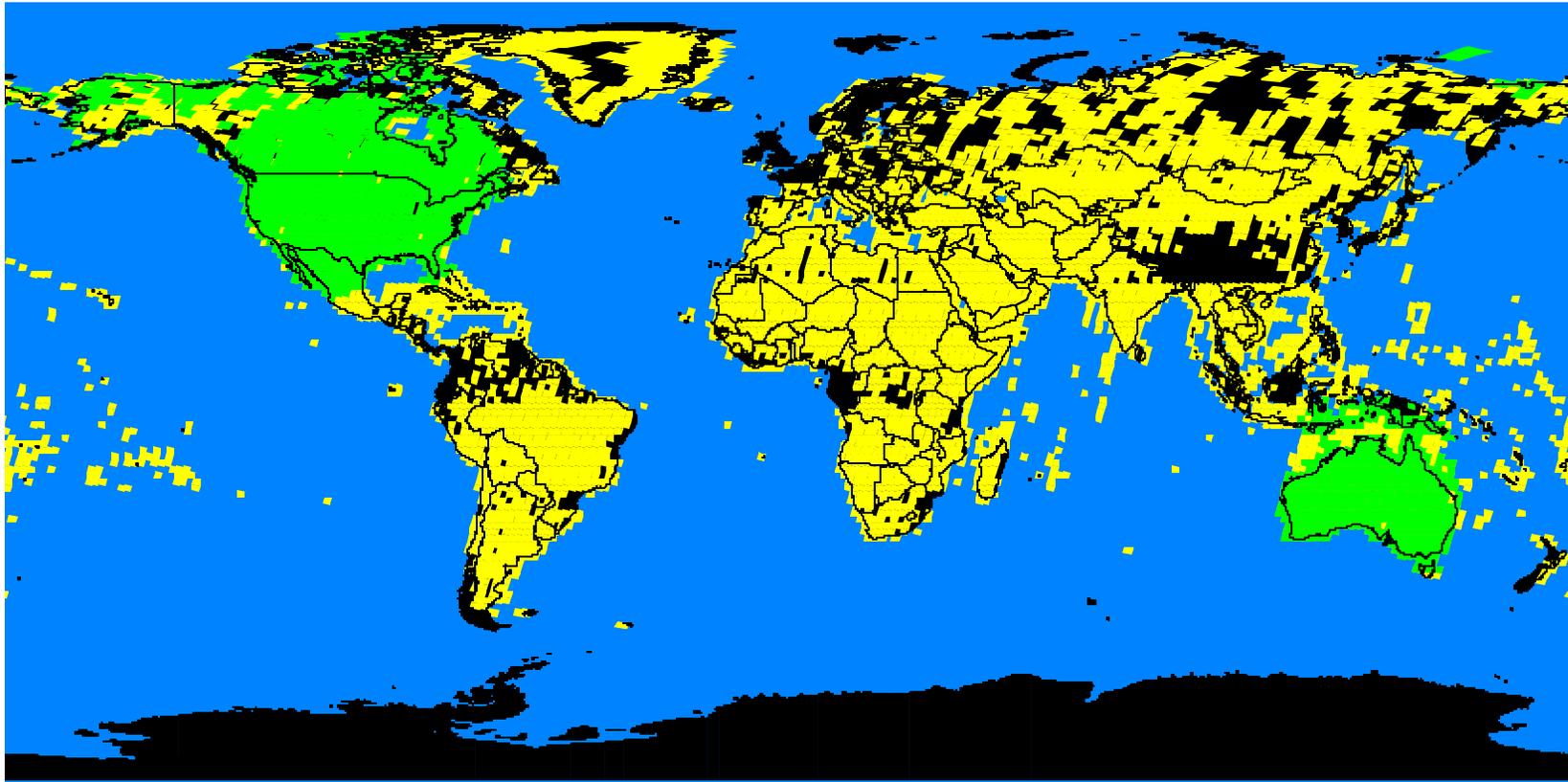
Bands 3,2,1

Automated Cloud Cover Algorithm



“0%” Cloud Cover

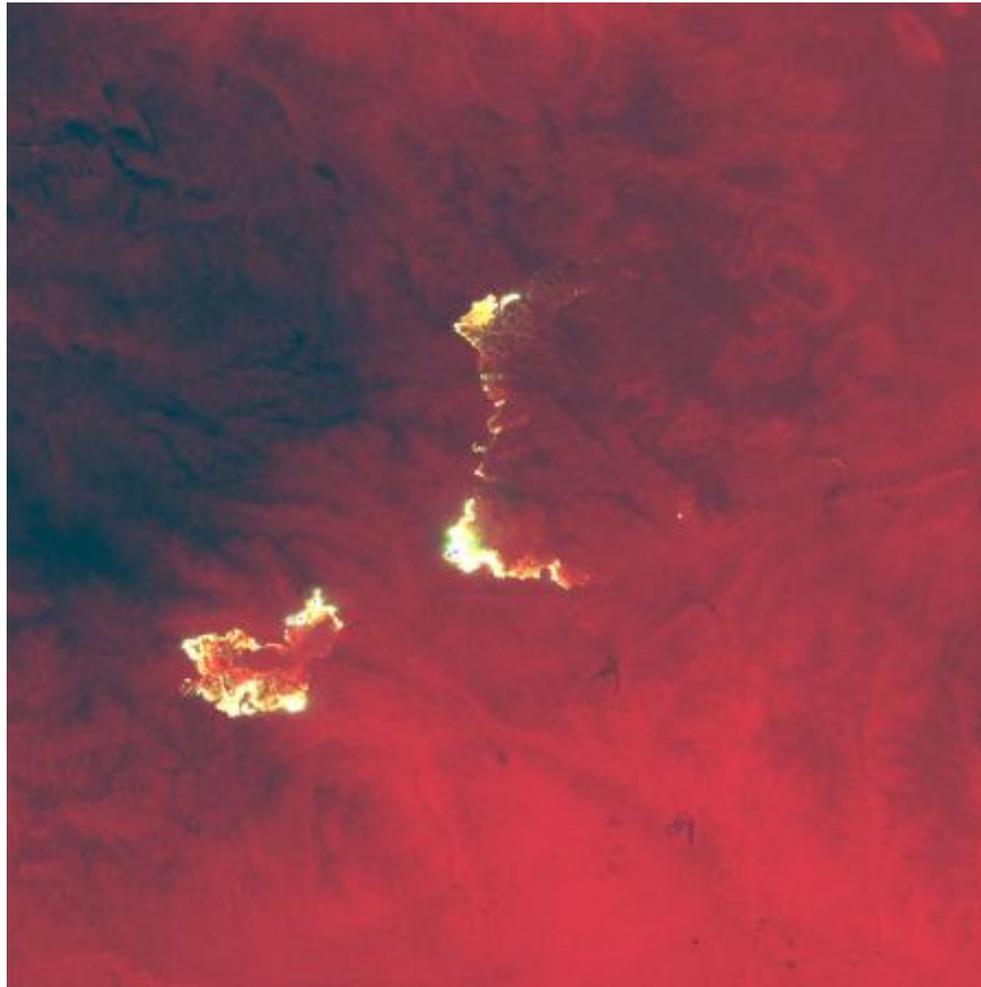
Mid-Decadal Global Land Survey



■ Landsat 7

■ Landsat 5

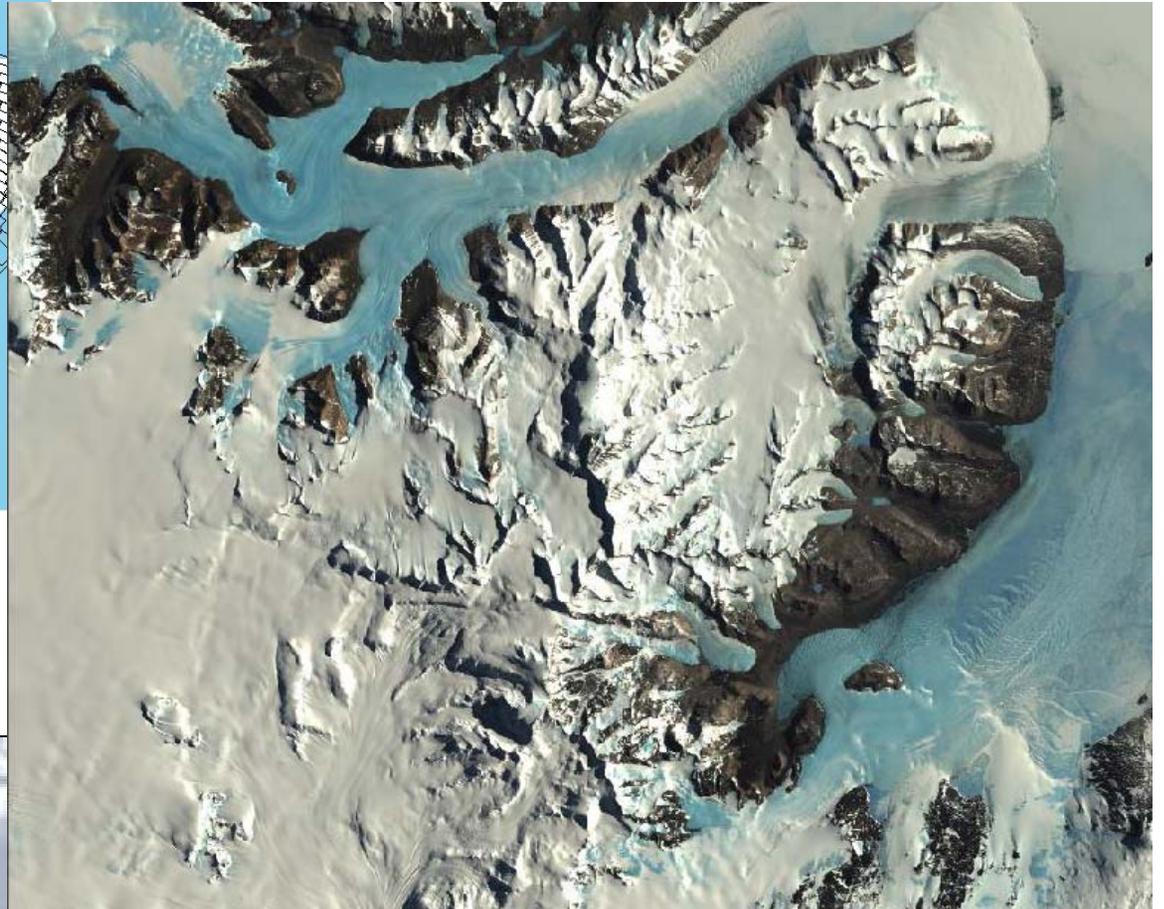
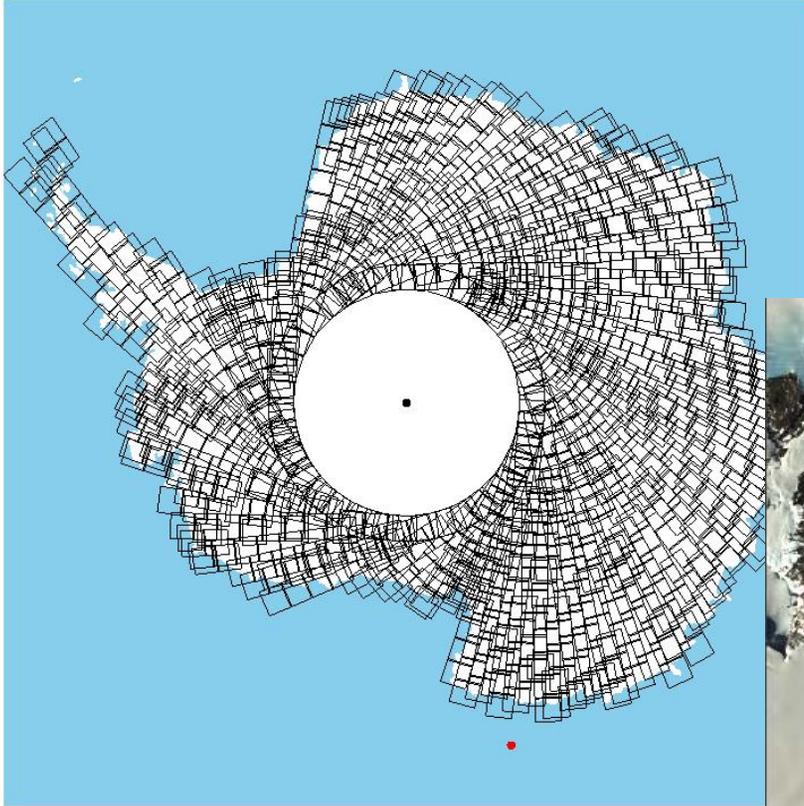
Burn Severity Atlas support



**Sawtooth and Millard
Fires, CA**

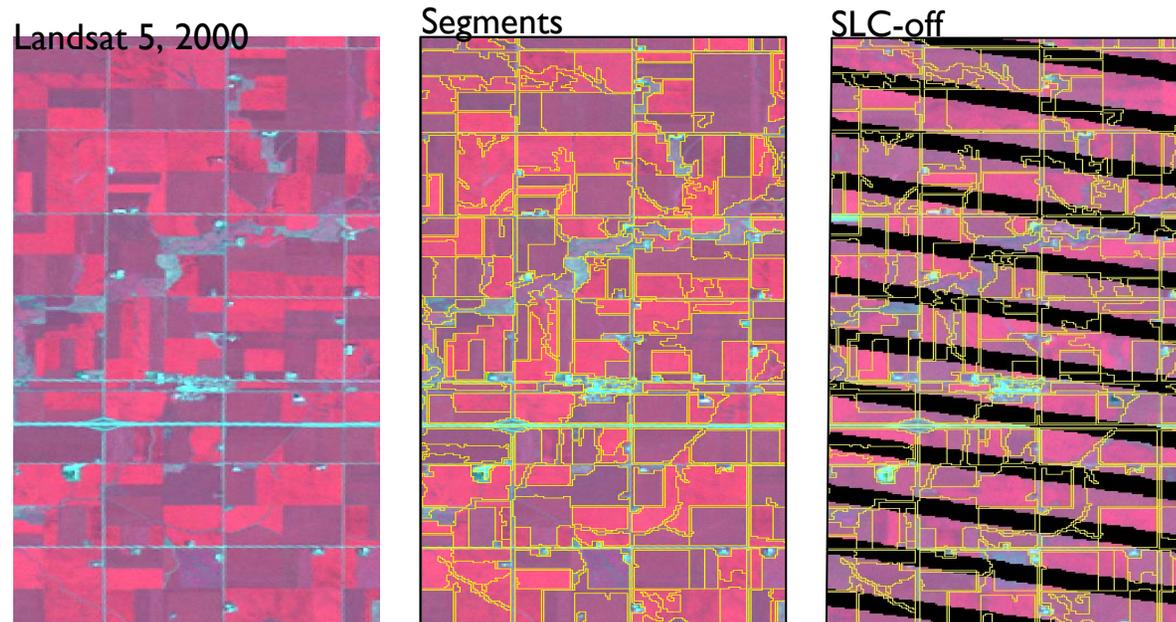
13 July 2006
Night image: 6,7,5

Landsat Image Mosaic of Antarctica



Segment-Based Gap Fill

- **Product in Development – expected release in Feb, 2007**
 - ◆ Interpolates pixels in gap using landscape structure
 - ◆ Ideal for broad area studies where temporal consistency is required



FY07 Plans

- **Start off-site archive of all raw data**
- **Landsat 5 calibration system completed (TMIAS)**
- **Landsat 5 algorithms in LPGS**
- **Begin work on MSS Calibration**
- **Landsat 7 web-enabled data**