



Global Land Survey 2005

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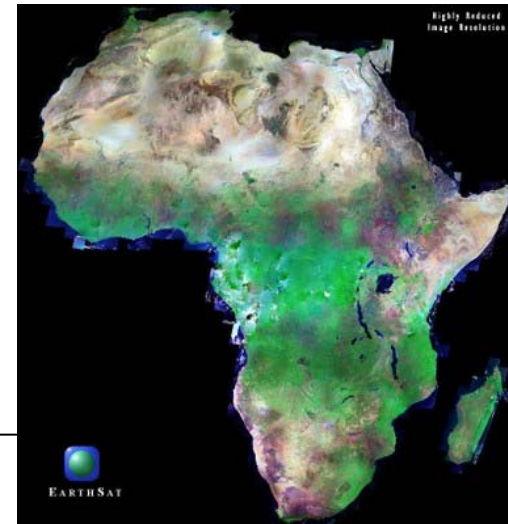
April, 2008



Global Land Survey (GLS 2005)

Follow-on to the GeoCover orthorectified global data sets (1975, 1990, and 2000 epochs) nominally referred to as the middle-of-the-decade dataset (covering 2004-2007)

- ◆ Partnership between USGS and NASA, in support of CCSP
- ◆ Supports global assessments of land-cover, land-cover change, and ecosystem dynamics (disturbance, vegetation health, etc)
- ◆ Pilot project for routine global monitoring in LDCM era
- ◆ Primarily Landsat-7 ETM+ and Landsat-5 TM imagery, with ASTER and EO-1 ALI data as needed



What will GLS2005 look like?

For most of globe:

- *One Landsat-5 image or one gap-filled L7 pair*

Where Landsat-5 is not available and no cloud-free L7 pair is available:

- *Two L7 SLC-off images, distributed without gap filling*

For humid tropics where no cloud free L7 pair is available:

- *3 or 4 L7 SLC-off images, without gap filling*

Islands and reefs / no Landsat data available:

- *EO-1 ALI or ASTER image*

GLS 1975-2000... A New Version

- **Existing GeoCover data sets are currently being reprocessed by MDA Federal to improve geometric accuracy Using SRTM DEM and additional geodetic control**
 - ◆ Reprocessed products referred to as GLS (Global Land Survey) products (e.g. GLS1975, GLS1990, GLS2000, GLS2005)
 - ◆ Two format changes:
 - 15/30/60 Ground/meter pixels from 14.25/28.5/57
 - Remove 10,000,000m false northing in UTM coordinate system (i.e. southern hemisphere has negative values)
 - ◆ Global reprocessing of existing Geocover to be finished May 2008
 - ◆ GLS2000 will serve as the geodetic standard for all Landsat and future LDCM products

GLS 2005 Scene Selection

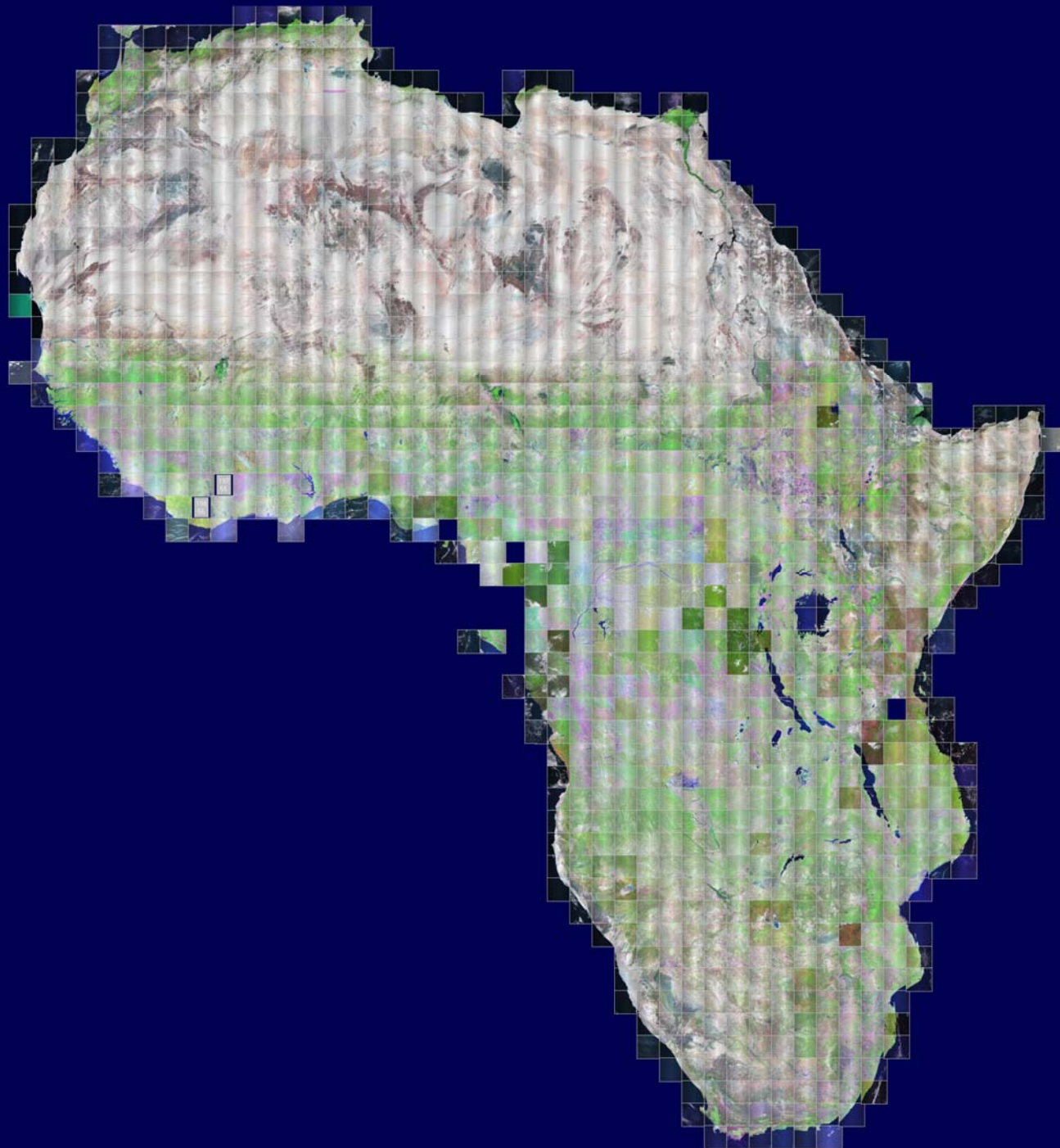
Large Area Scene Selection Interface (LASSI) – automated algorithm used to pick “optimal” collection of 2004-2007 images given constraints:

- minimize cloud cover
- nearest to peak greenness (NDVI)
- maximize area coverage of SLC-off pairs, etc...

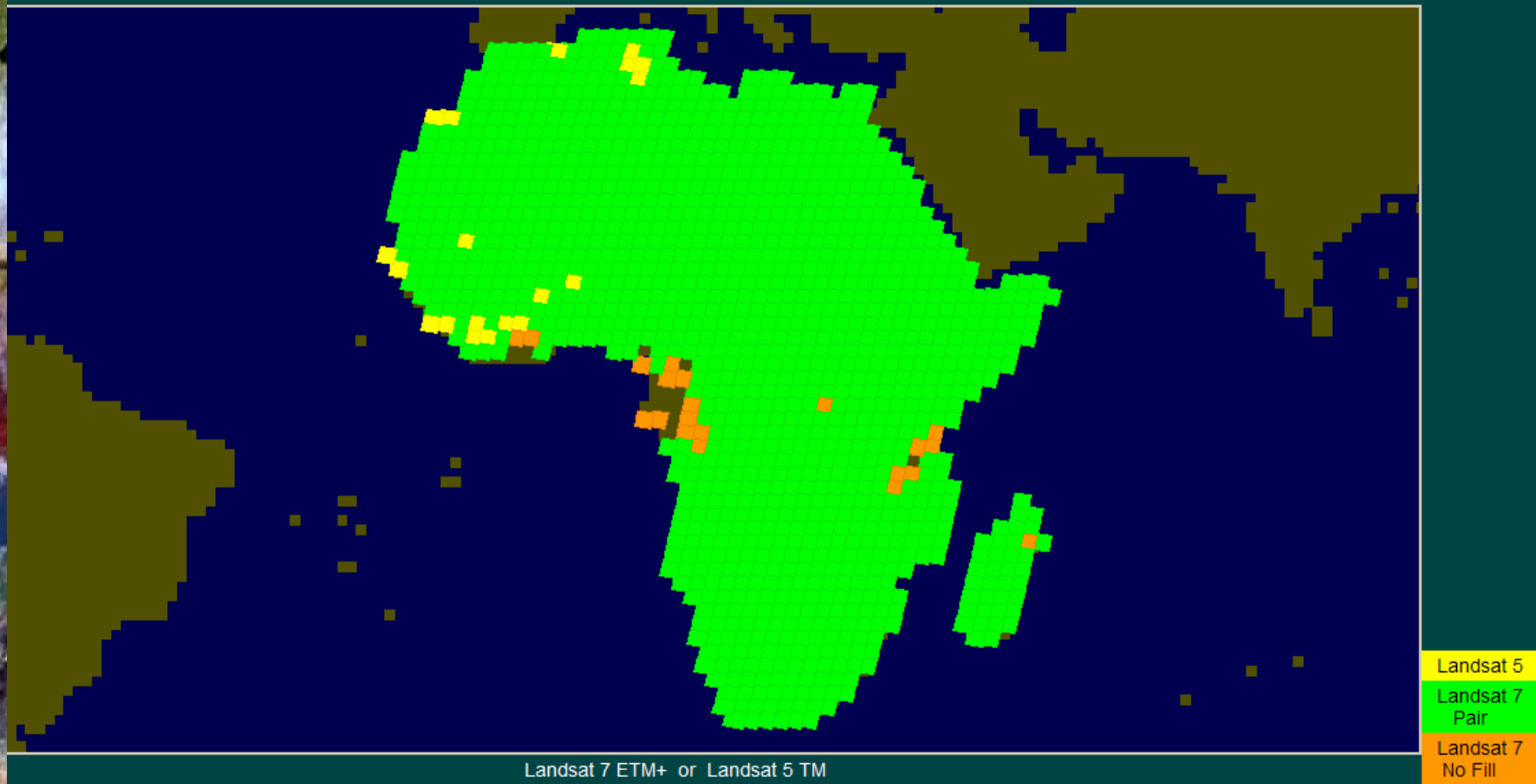
The next slides show examples of scene selections for Africa...

Initial Africa results

W_ndvi_B= 60
W_ndvi_F= 30
W_acca_B= **30**
W_acca_F= **25**
W_difAD_P= **15**
W_ag_P= **0**
W_cover_P= **25**
W_difDY_NS= 4
W_difDY_EW= 4
W_useL5= 0
W_useL7= **5**
W_sensHomg= 5
W_prefDate= 10
W_prefDOY= 15

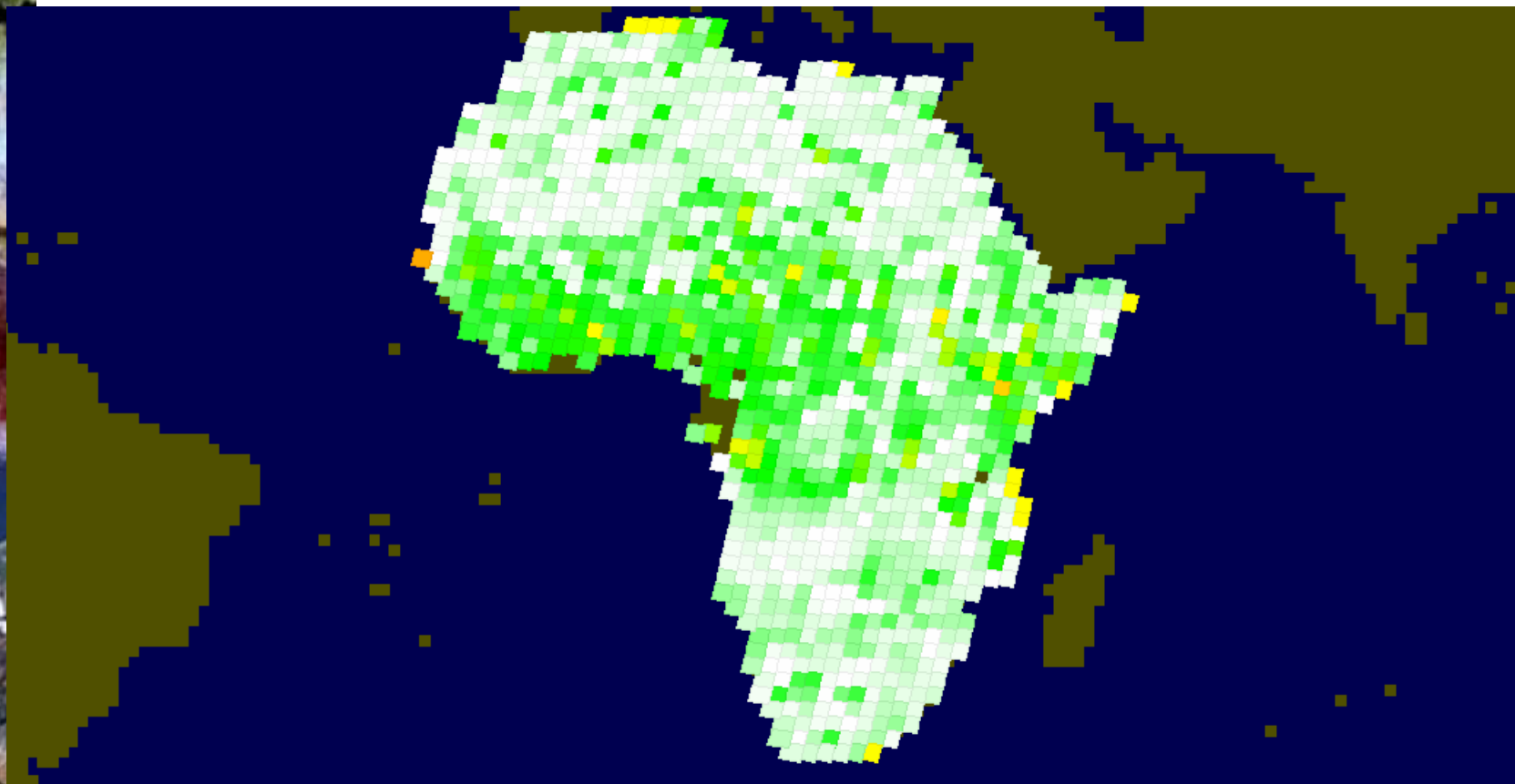


Sensor Visualization



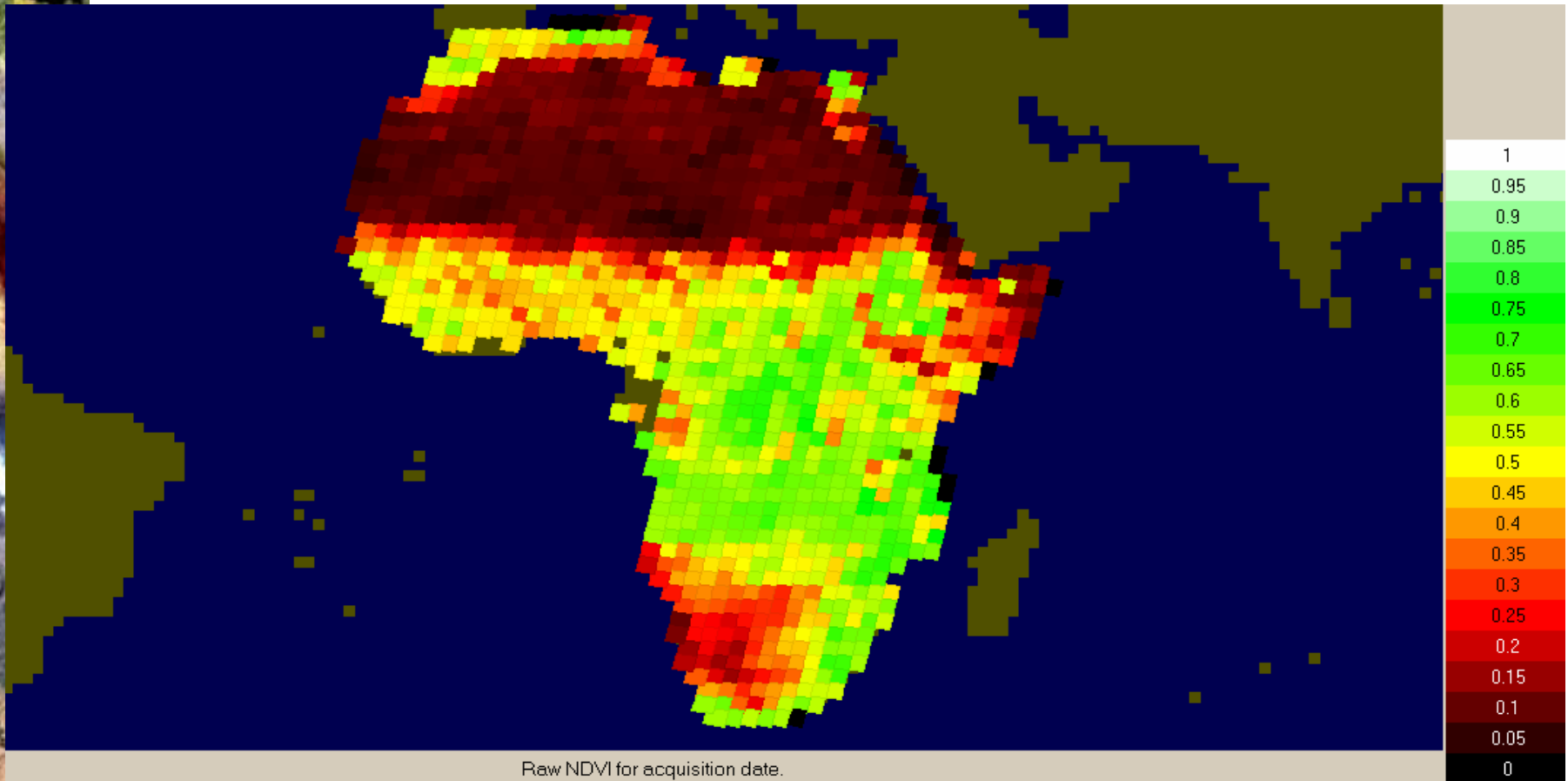
1212 scenes

NDVI Visualization Normalized to %max

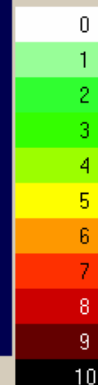
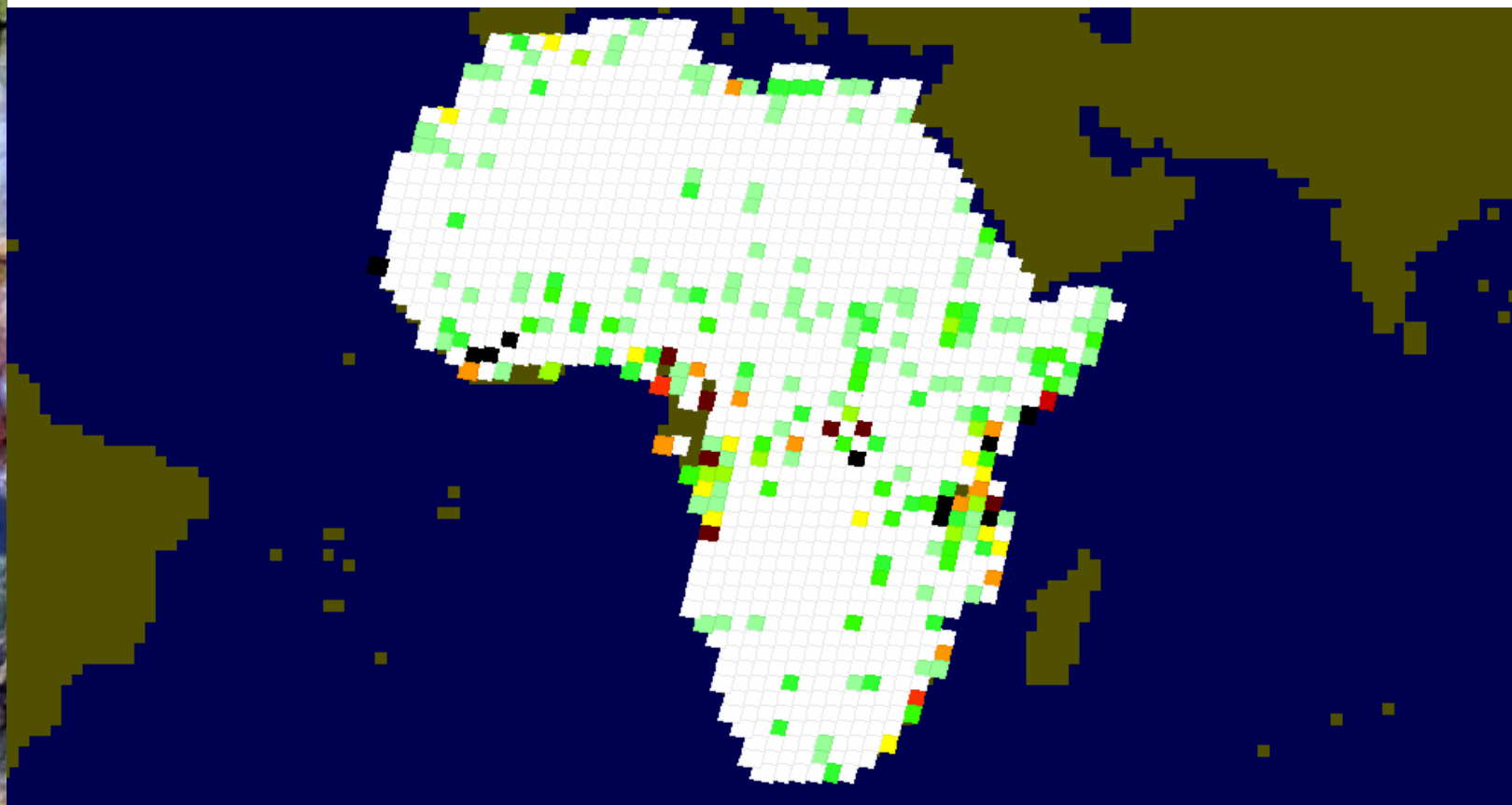


NDVI for acquisition date, normalized WRT peak annual NDVI for this WRS scene

Absolute NDVI



Cloud Coverage- Base

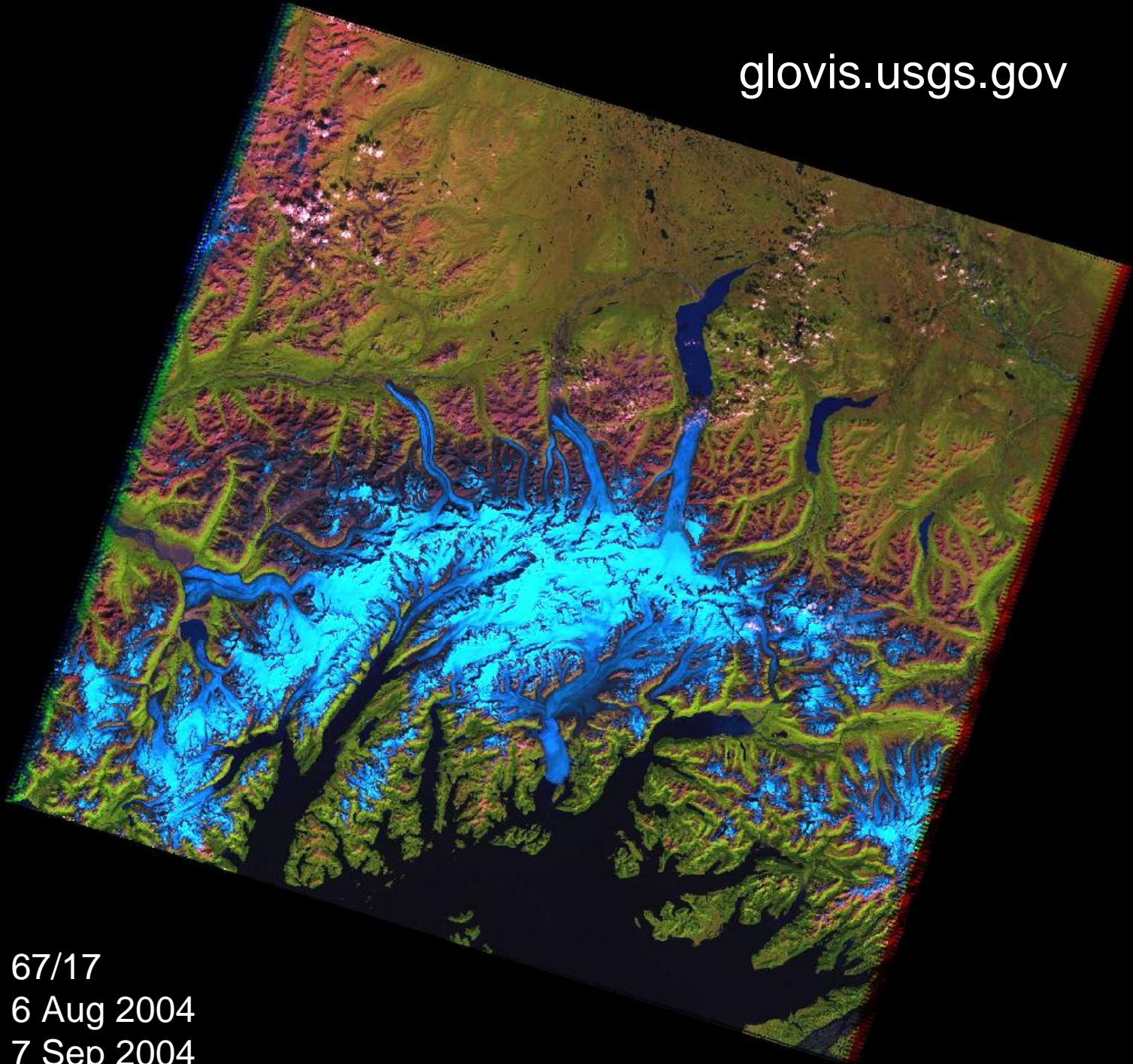


Cloud-cover assessment (% of pixels contaminated by clouds)



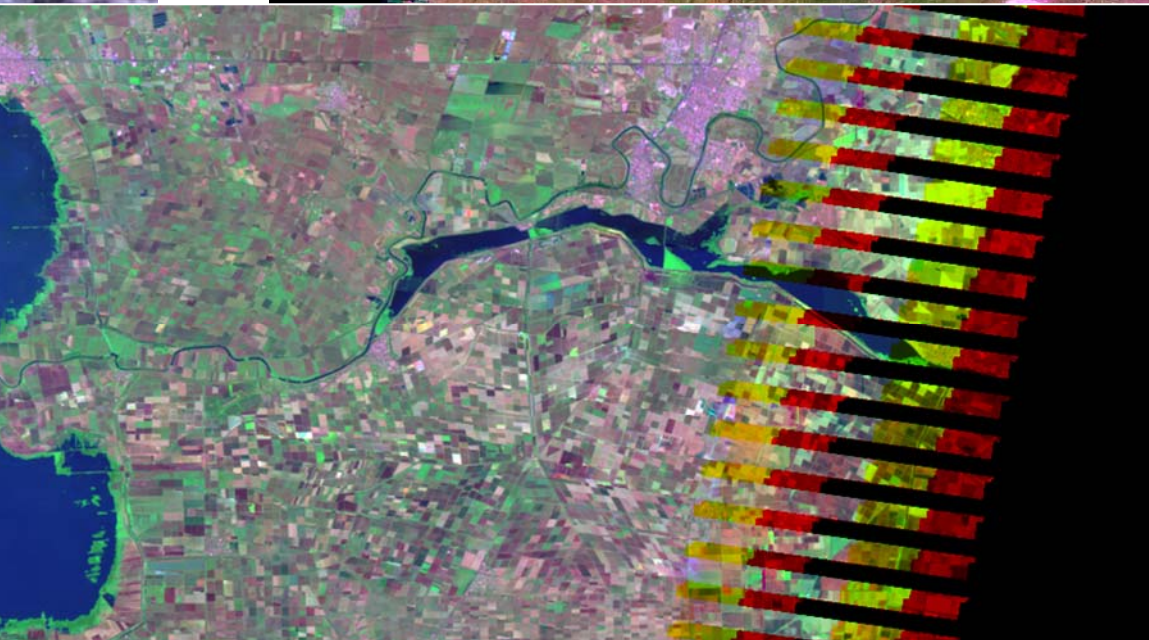
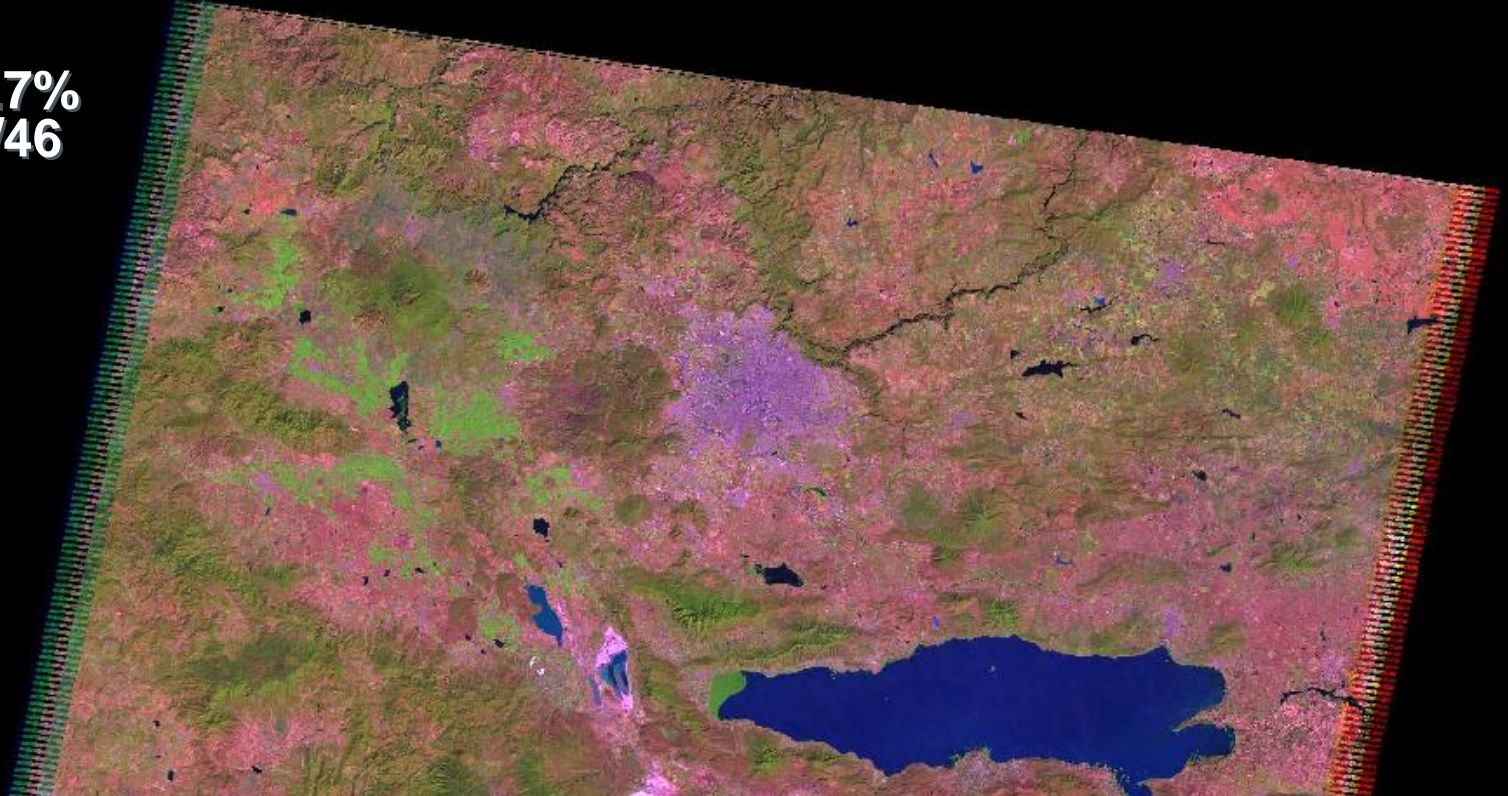
Avg. ACCA- Base: 0.5%

glovis.usgs.gov

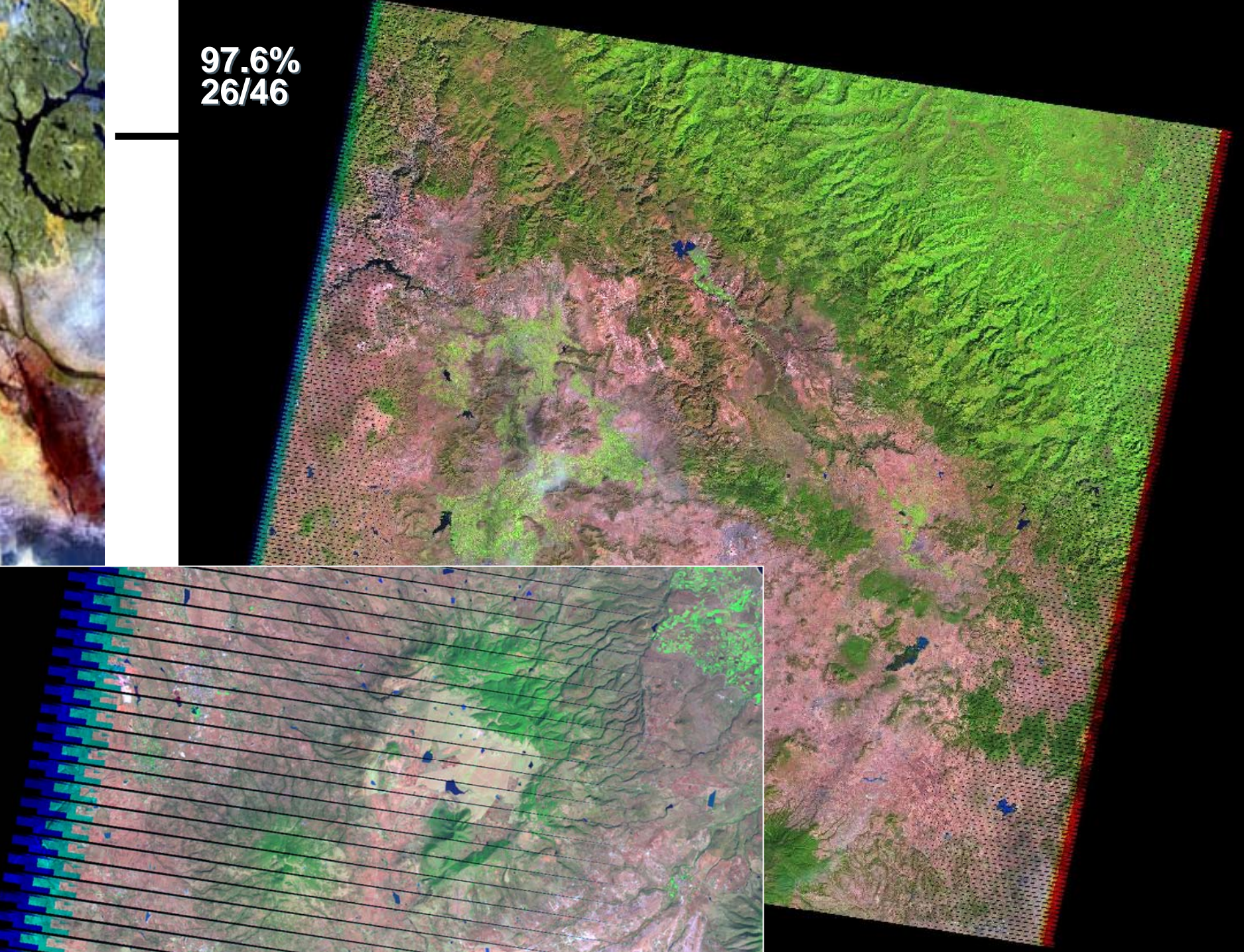


67/17
6 Aug 2004
7 Sep 2004

99.7%
29/46



97.6%
26/46

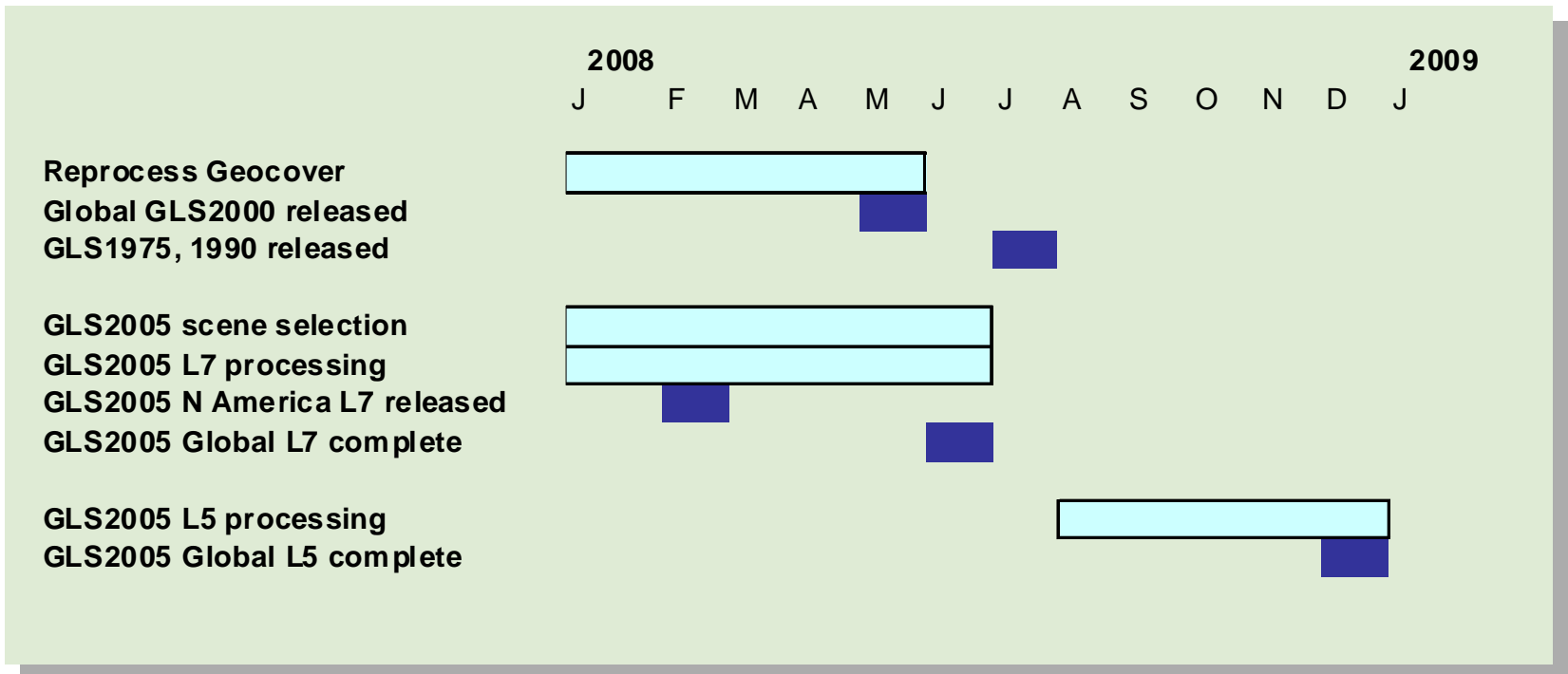


Distribution Policy

- **Contributors to the GLS 2005 dataset will receive a complete copy once production is complete**
 - ◆ Likely to be distributed on a firewire drive
- **The products will all be made available online at no cost through USGS GLOVIS interface**
 - ◆ Products become available soon after production
 - ◆ <http://glovis.usgs.gov>

GLS Schedule

- All Reprocessed GLS data (1975-2000) released by July 31, 2008
- All GLS2005 ETM+ imagery released by June 30, 2008
- All GLS2005 Landsat imagery (including L5) released by Dec 31, 2008



Phase III: Land Cover Analysis

The GLS2005 effort is focusing on both data products and long-term land cover analysis

NASA Land Cover & Land Use Change (LCLUC) and Earth Science Information Systems programs are funding analyses of GLS (1975-2005) record:

- Giri, C. (USGS EROS) – Monitoring Tropical Mangrove Forests
- Hansen, M. (SDSU) – Forest Cover in Humid Tropics
- Skole, D. (MSU) – Tropical Forest Cover Change
- Townshend, J. (UMD) – Global Forest Cover Change Data Record
- Townshend, J. (UMD) – Forest Cover Change in Americas
- Xiao, X. (UNH) – Land Cover Products for Monsoon Asia

The Road to GLS2010

- **Landsat Sensors may or may not be operational during 2010-2011 (LDCM launches July 2011) – need contingency plans to assure basis for assessing changes in global land cover**
- **International sources of Landsat-like data are proliferating**
 - ◆ IRS AWIFS, CBERS, Theos, etc
 - ◆ Observation frequency, data quality improving
- **Work out contingency plans for Landsat-less conditions**
 - ◆ International consortium can generate “best available” 2010 global coverage from all available satellite sources
 - ◆ Distribute to all users as a “global good”
 - ◆ Work together to assure common data/metadata formats, distribution policies, etc
 - ◆ Start now to assure 2009-2011 acquisitions

For More Information

GLS2005 Web Site:
<http://mdgls.umd.edu>

January 2008
*Photogrammetric
Engineering &
Remote Sensing*

Mid-Decadal Global Land Survey

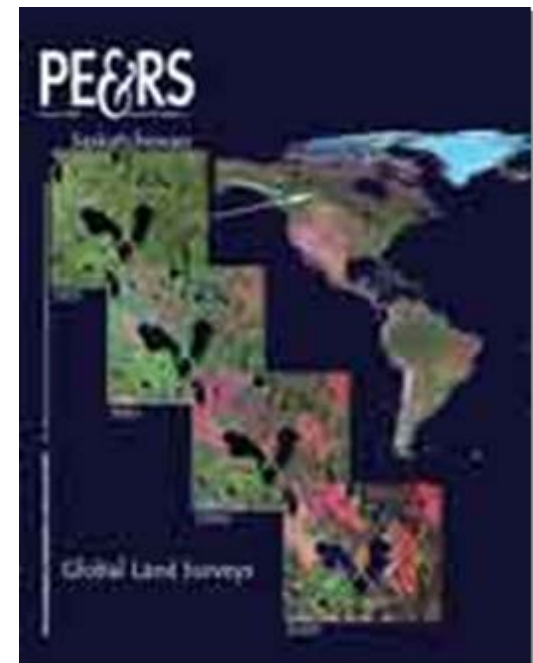
Home Background Status Documents Links

The Mid-Decadal Global Land Survey (MDGLS) is a partnership between the U.S. Geological Survey (USGS) and the National Aeronautics and Space Administration (NASA), in support of the U.S. Climate Change Science Program (CCSP) and the NASA Land-cover Land-use Change (LCLUC) Program.

Characterizing trends in land cover and land use remains a key goal for Earth science. The MDGLS is assembling a global dataset of 30-meter resolution satellite imagery to support measurement of Earth's land cover and rates of land cover change during the first decade of the 21st century.

The MDGLS builds on the existing Geocover data sets developed for the 1970's, 1990, and 2000. Some 9000 Landsat images from the period 2004-2007 will be acquired, processed, and made available to the public via FTP download. Given the failure of the Landsat-7 ETM+ Scan Line Corrector in 2003, a combination of Landsat-7 gap-filled data and Landsat-5 data from U.S. and international ground stations will be used in the project. Additional imagery from ASTER and EO-1 ALI imagers will be included to augment the Landsat coverage. Processing will begin in early 2007 and orthorectified products will be made available for download throughout the project. The complete dataset is expected to be completed in late 2008.

We are interested in your feedback. Questions or comments may be directed to: mdglsinfo@xxxxxx



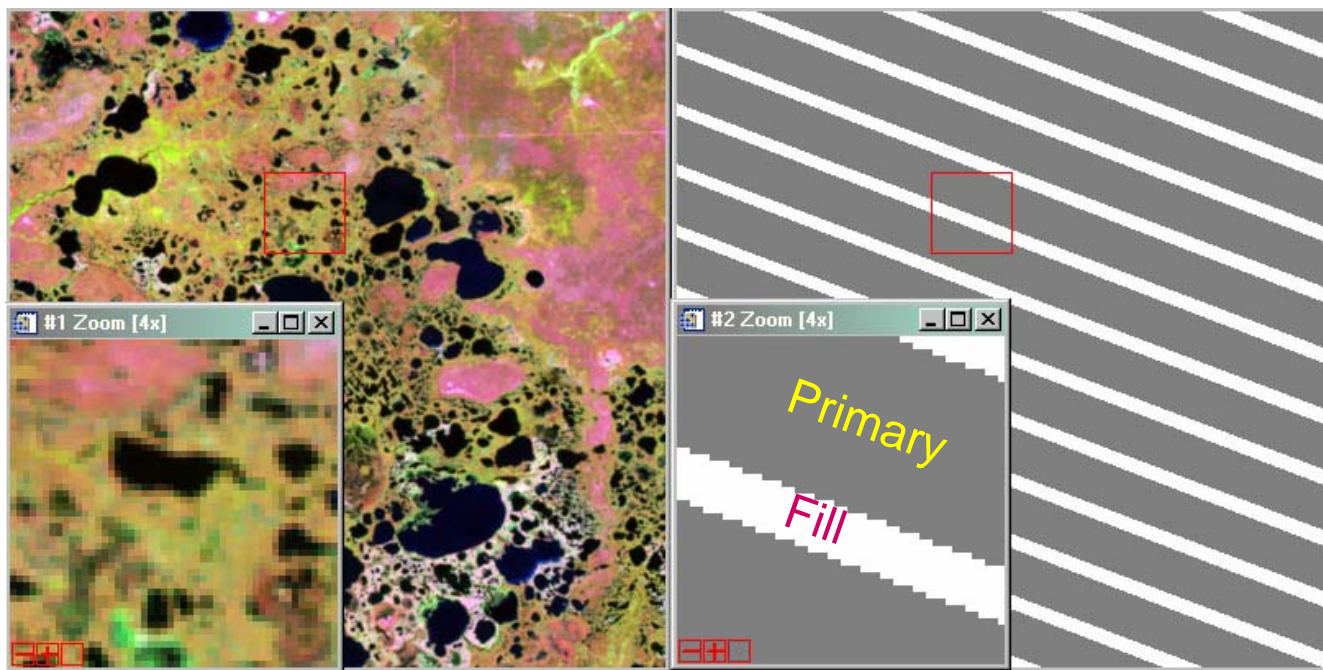


Backup

Landsat-7 ETM+ SLC-off Data

- GLS2005 has elected to use both Landsat-5 and Landsat-7 Data
- Landsat-7 ETM+ data affected by Scan Line Corrector (SLC) failure: 24% of each image is missing
- USGS EROS gap-filling/radiometric matching algorithm works well for cloud-free scenes
- Gap-filling will not be performed for cloudy images

Northern
Siberia
(p159r15)



Sources of GLS 2005 Data

Landsat-7 ETM+ :

available globally from USGS, superior radiometry
Scan Line Corrector failure in 2003 requires image gap-filling

Landsat-5 TM:

available regionally, not globally
dense archives via ground station network

Terra ASTER:

smaller footprint (60x60km)
similar cloud contamination as Landsat
potentially useful for filling gaps in coverage

EO-1 ALI:

very small footprint (30 km swath width)
used for islands/reefs