



Landsat Science Team

Landsat Operations Project Report

12 December 2012

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USGS, Landsat Project Manager

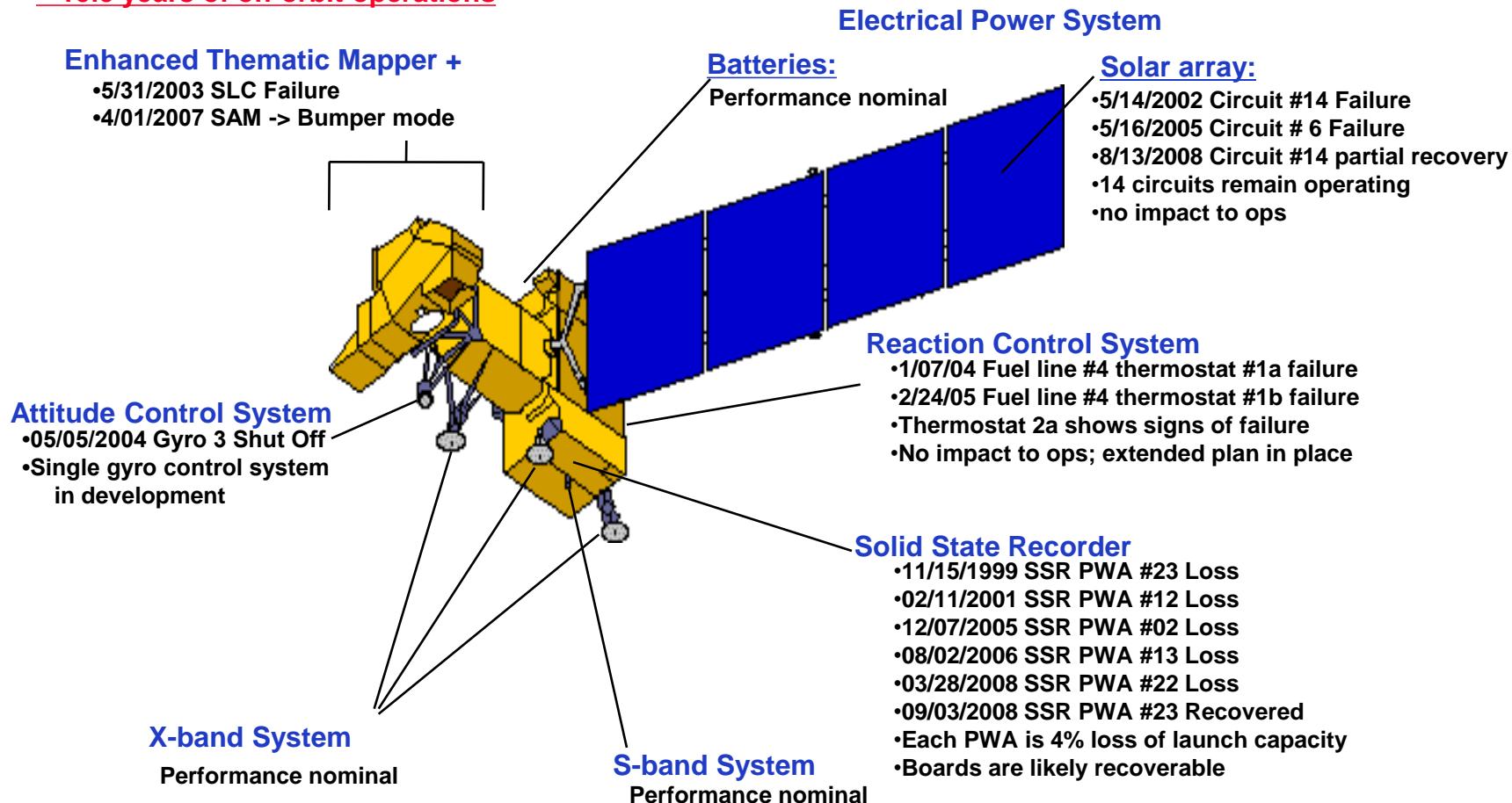
kkline@usgs.gov, (605) 594-2585

Landsat 5 and 7 Status

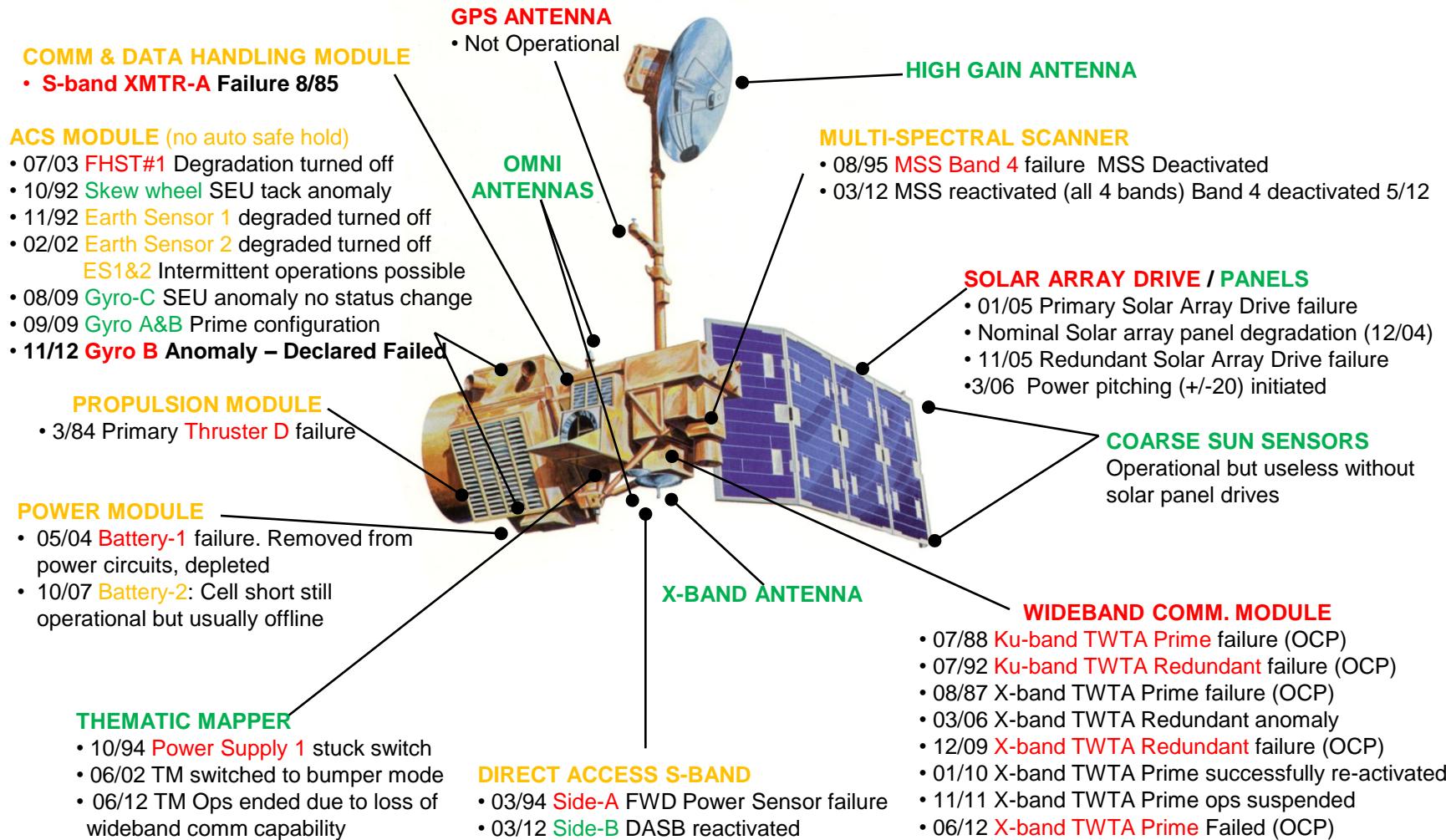


Landsat 7 Spacecraft Status

≈ 13.5 years of on-orbit operations



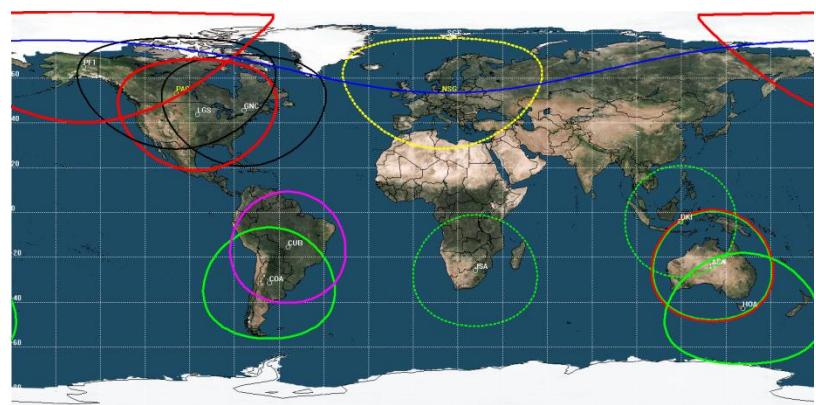
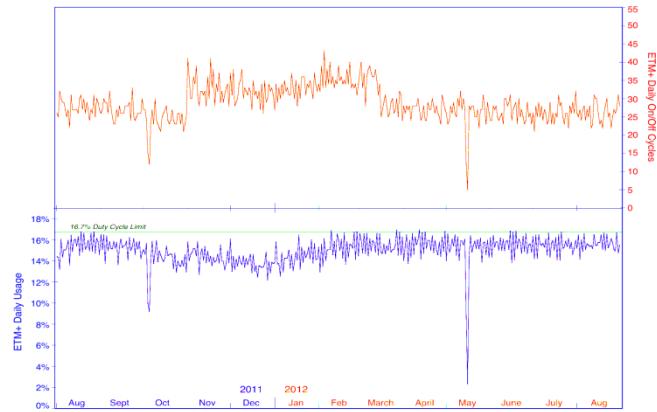
Landsat 5 Spacecraft Status



Spacecraft Activities Summary

- **Landsat 7**

- **Collision avoidance maneuver (4/17/2012)**
 - Out of nominal World Reference System (WRS) orbit for several weeks
 - Returned to orbit following Delta-i maneuver
- **Maximizing data collections**
- **Also collecting in Australia, Argentina, Brazil, Indonesia, Germany*, and South Africa***



Spacecraft Activities Summary

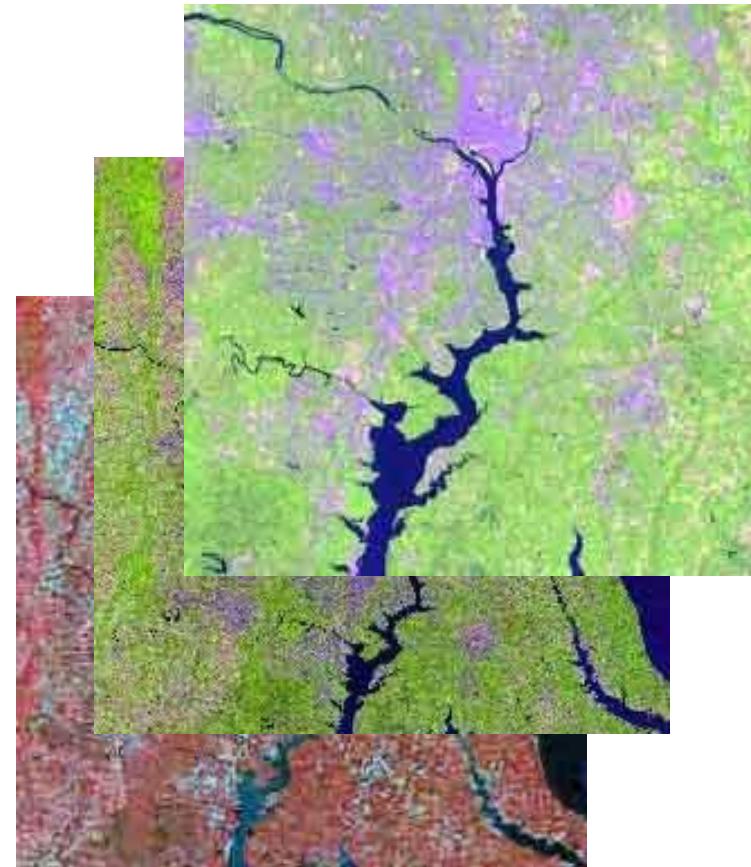
- **Landsat 5**
 - **Gyro B anomaly on Nov 4, 2012**
 - Caused spacecraft tumble
 - Attempted recovery of gyro B without success
 - **Deorbit will begin January 15, 2013 (Pending Approval)**
 - Tentative Decommission Plan:
 - Two deorbit burns to lower out of 705km orbit (about 20km lower)
 - Remainder of burns following LDCM insertion into 705km orbit
 - Remaining burns will depend on fuel/propellant available

Landsat Archive and Processing Topics

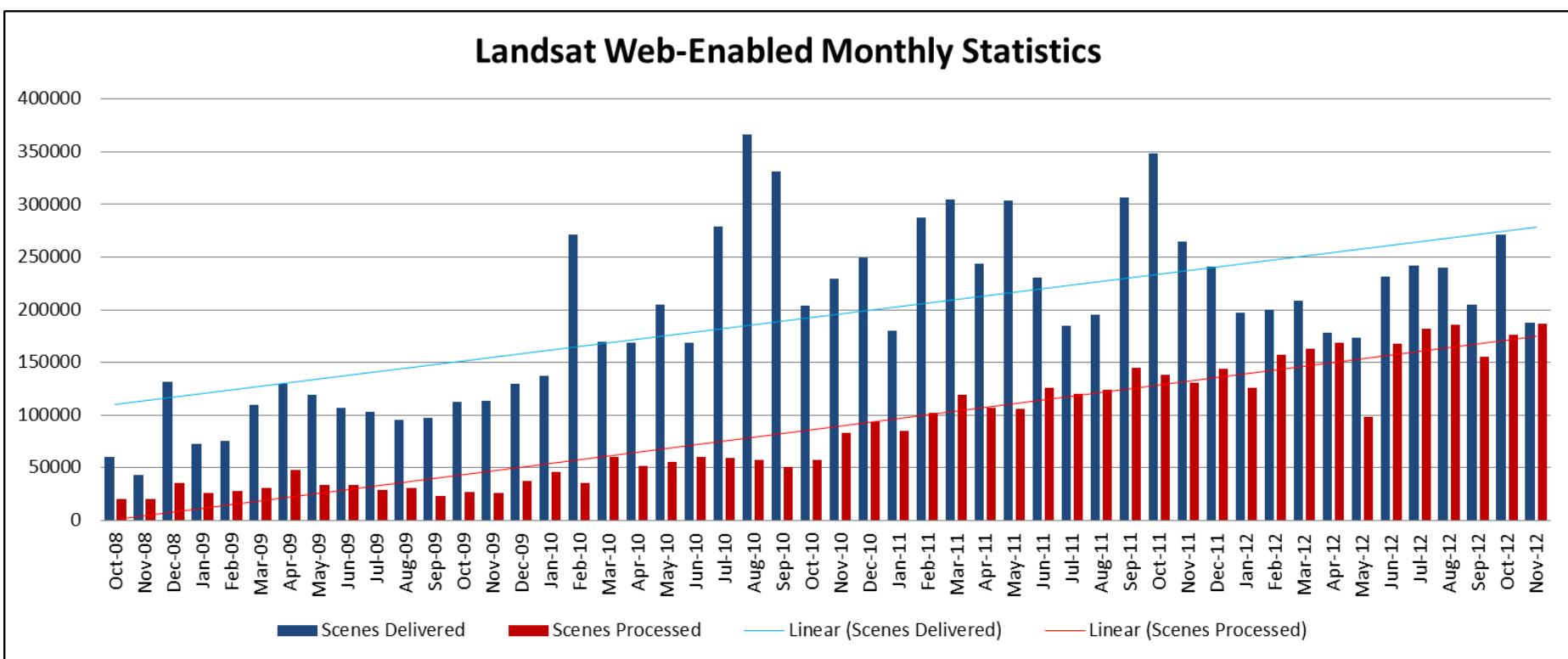


U.S. Landsat Archive Overview (December 3, 2012)

- **ETM+: Landsat 7**
 - 1,486,129 scenes
 - ~1,380 TB Raw and L0Ra Data
 - average scene size 487 MB
- **TM: Landsat 4 & Landsat 5**
 - 1,477,779 scenes
 - ~741 TB Raw and L0Ra Data
 - average scene size 263 MB
- **MSS: Landsat 1 through 5**
 - 626,405 scenes
 - ~38 TB Raw and L0Ra Data
 - average scene size 32 MB
- **Total:**
 - 3,590,313 scenes
 - ~2,159 TB Raw and L0Ra Data



Monthly Downloads / Processed



FY09 (Oct '08–Sep '09)

Delivered: 1.14M
Processed: 358K

FY10 (Oct '09–Sep '10)

Delivered: 2.45M
Processed: 567K

FY11 (Oct '10–Sep '11)

Delivered: 2.92M
Processed: 1.27M

FY12 (Oct '11–Sep '12)

Delivered: 2.73M
Processed: 1.82M

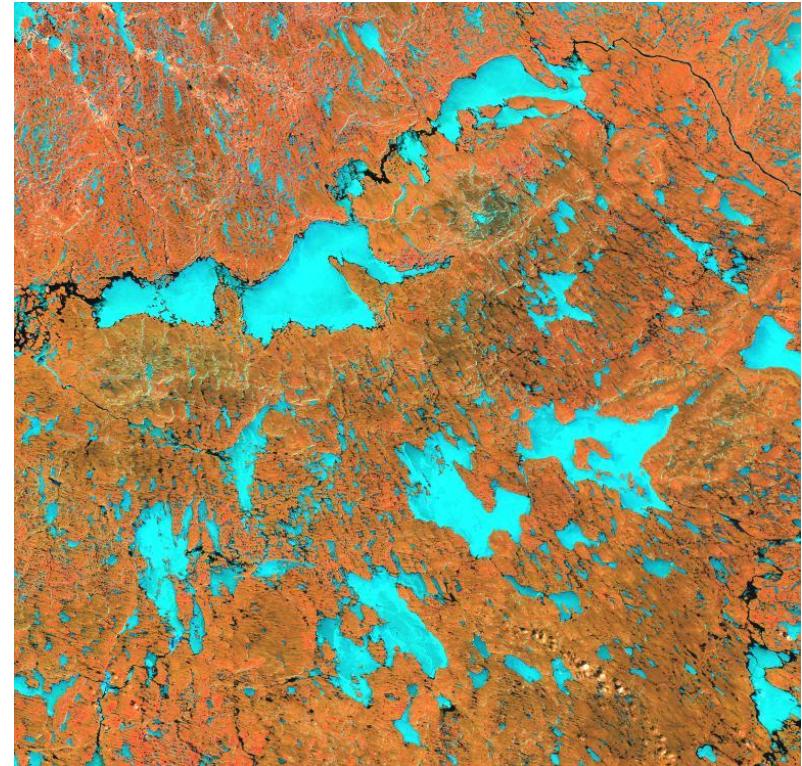
FY13 (Oct '12–Nov '12)

Delivered: 459K
Processed: 363K



Landsat Global Archive Consolidation (LGAC)

- Over 1.285 Million scenes collected so far
 - Over 400,000 “New”
- Critical goal of data preservation
 - Especially oldest MSS data on aging media
 - Data format and processing method knowledge
- Completed Canada, Germany, Taiwan, Indonesia, Puerto Rico
- Many stations in work



Landsat 5 TM image transcribed from CCRS D-1 tape – available in archive

The Woodcock Metric

1,285,035



MSS – Past, Present, Future

- Current system cannot ingest raw ‘serial’ MSS data or create products
- **MSS – LGAC**
 - Investigation began with data from Canada (CCRS)
 - Format used by CCRS (and other stations) different
 - Previous MSS “orphan” effort essential in LGAC MSS success
- **Landsat 5 MSS – Newly Acquired**
 - Began operating MSS on Landsat 5...again
 - Format similar to CCRS data



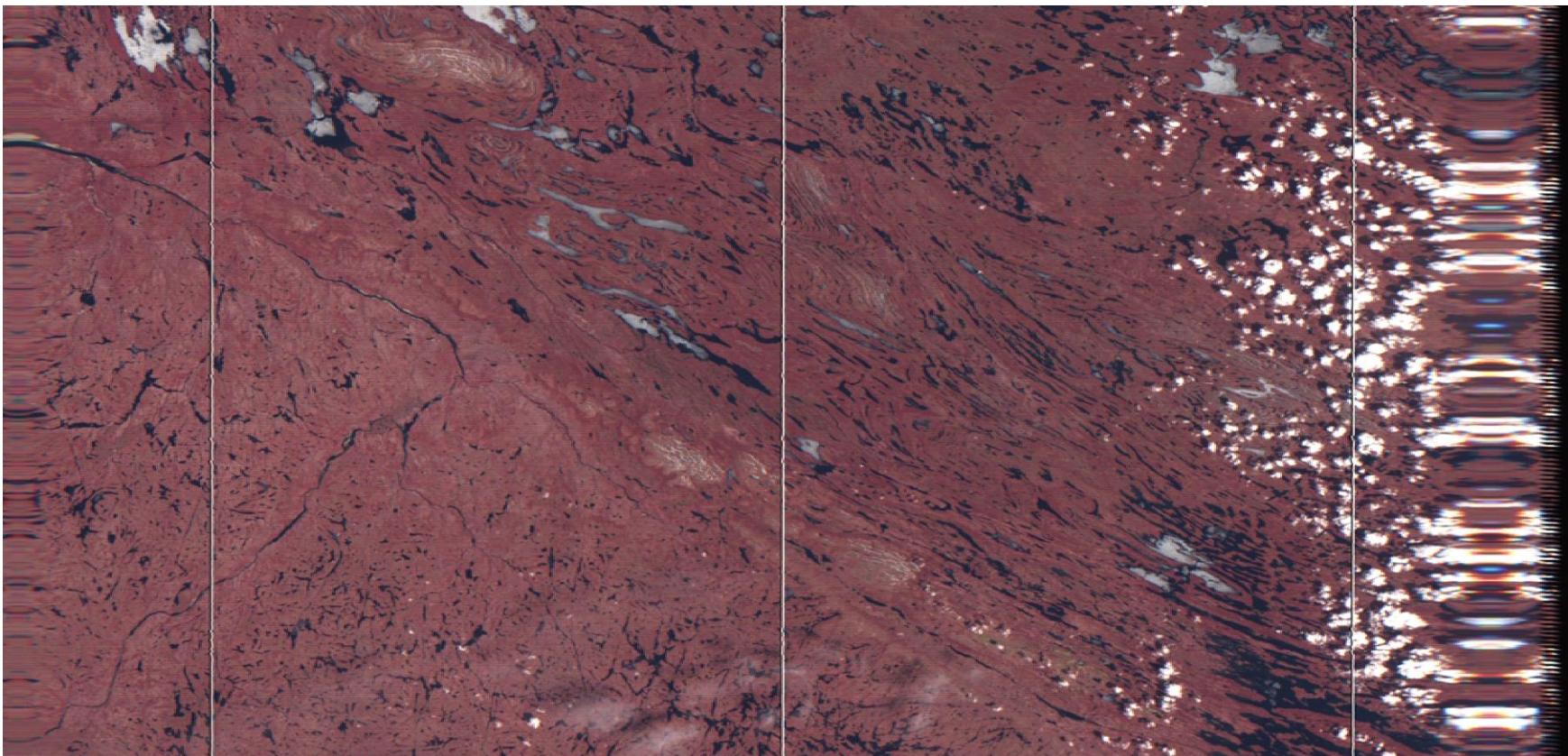
MSS – Past, Present, Future

- **MSS Archive Conversion System (MACS) 5.0 in development (tentative release date of May 2013)**
 - Ingest, process and distribute newly acquired Landsat 5 MSS data
 - Will eventually process the CCRS and other LGAC MSS data as well
 - A subsetter function will need to be added in a future release or a stand alone tool
 - Will not process Landsat 3 ‘line start anomaly’ data
 - Further analysis is required

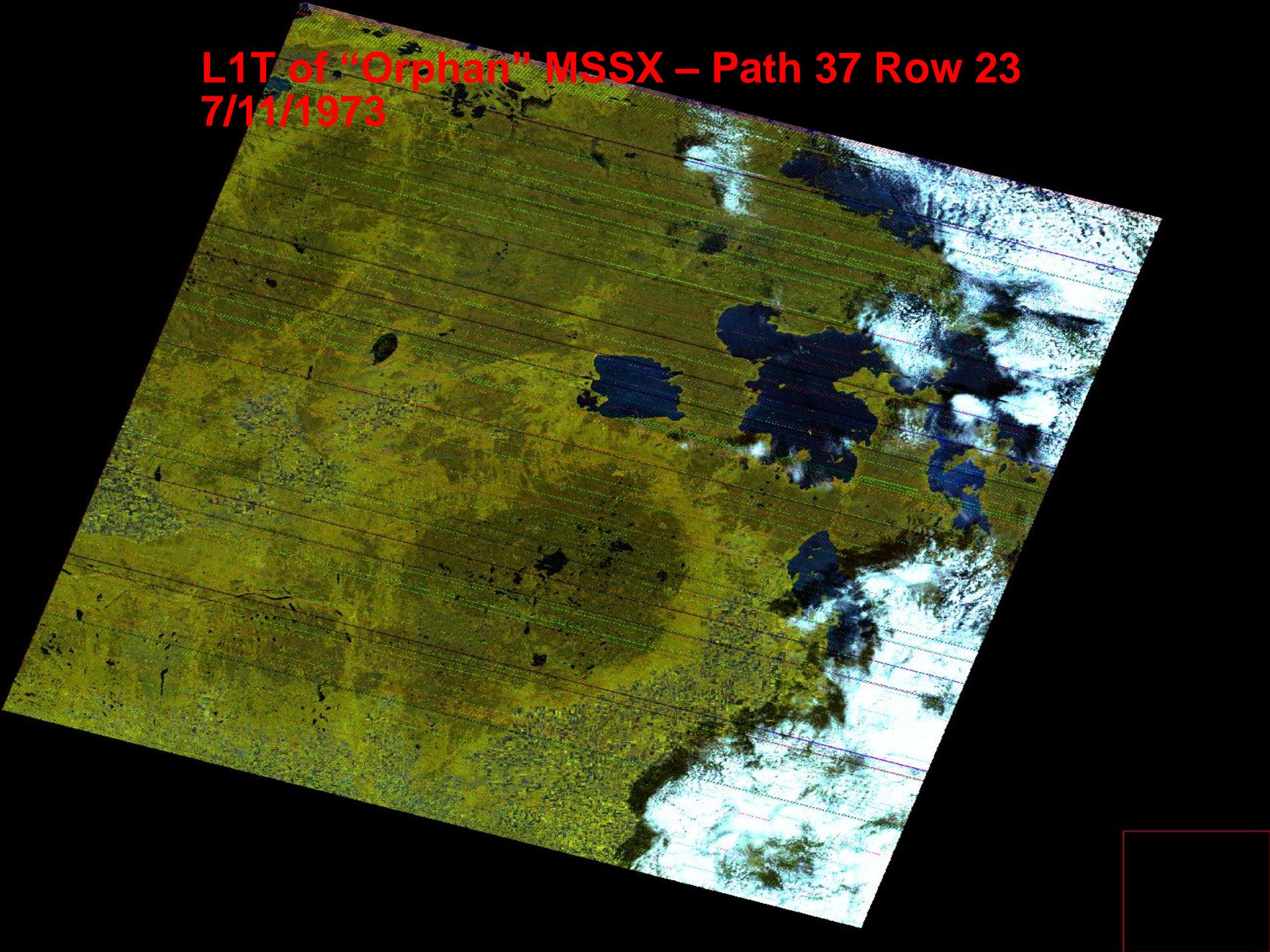


MSS 3-Line Configuration

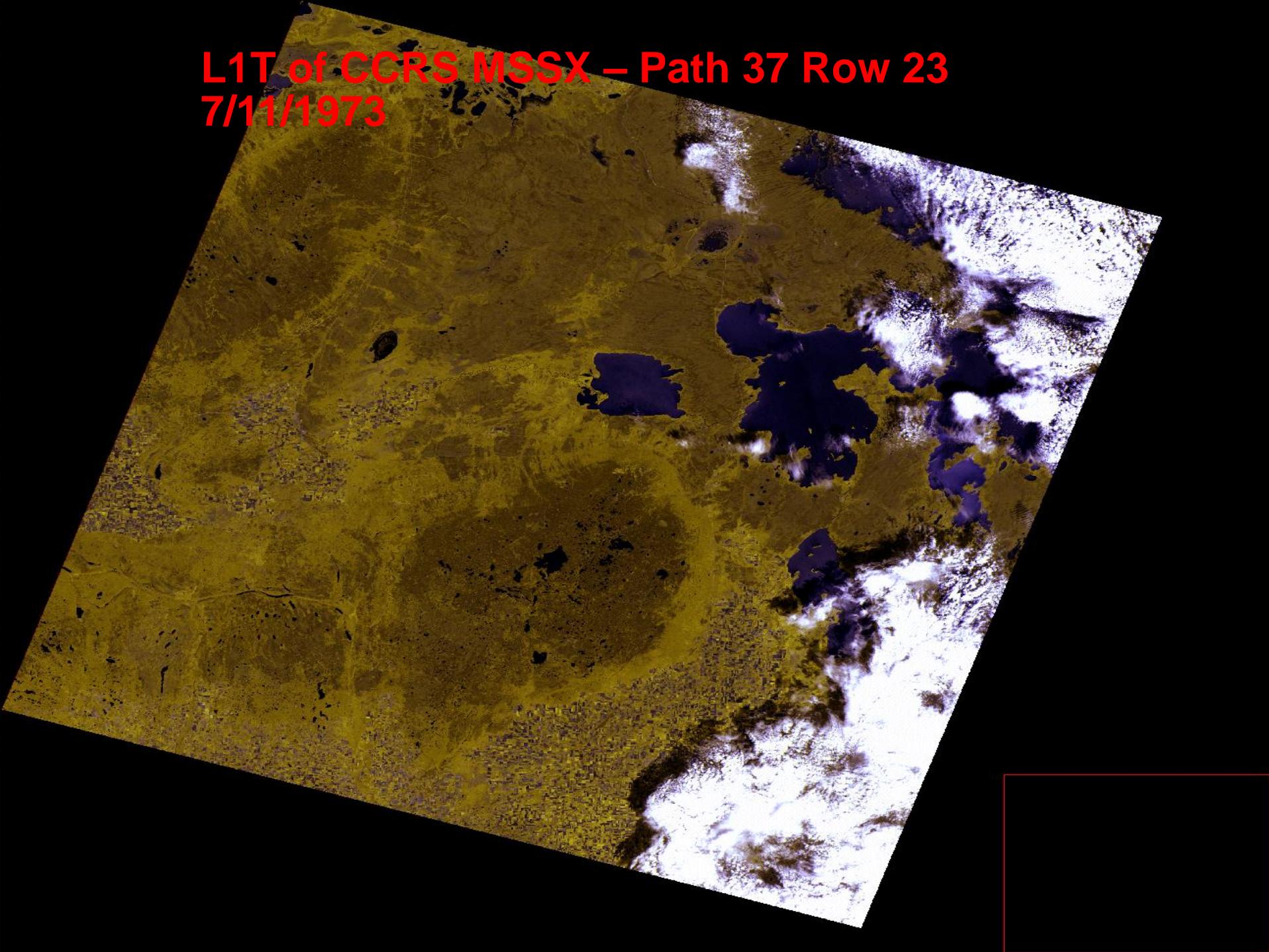
- Current mode of operation
 - First and last markers give a good start/end point to line up scans but unfortunately leaves the middle marker



L1T of “Orphan” MSSX – Path 37 Row 23
7/11/1973

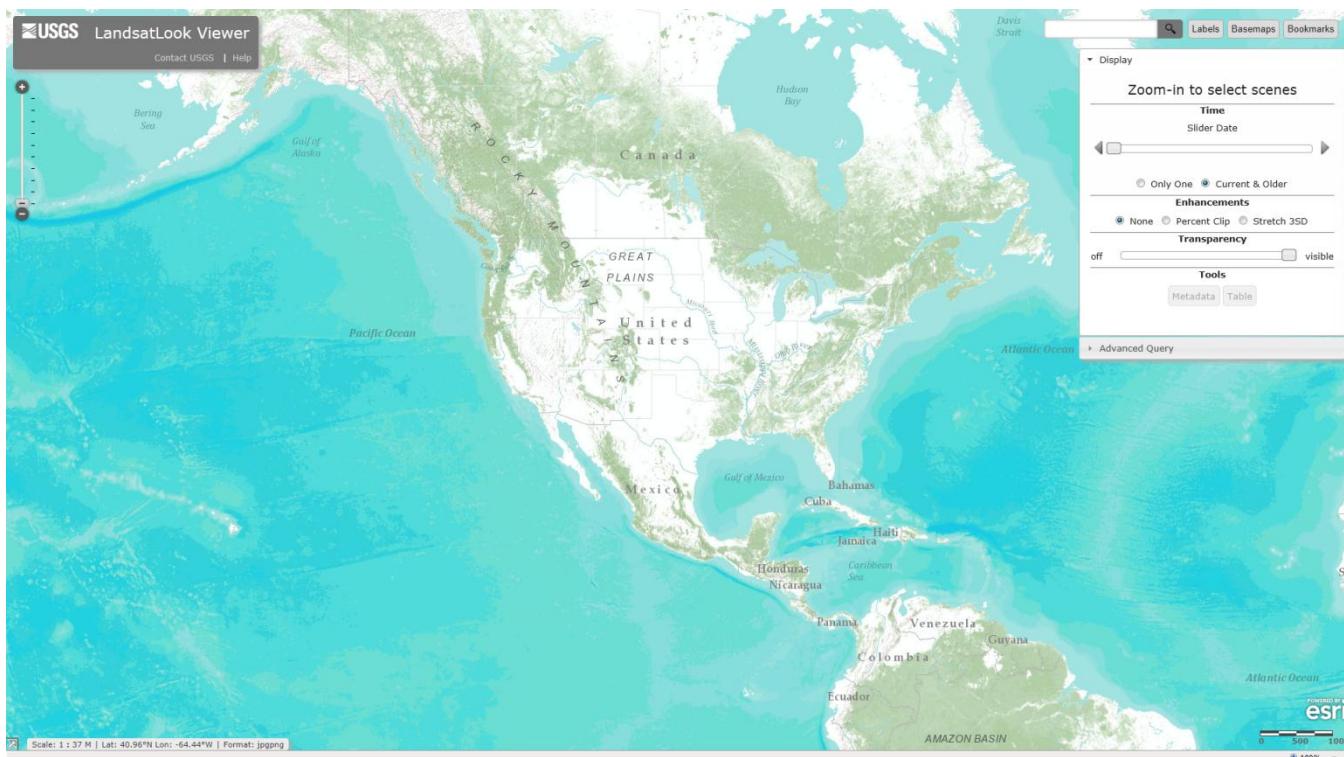


L1T of CCRS MSSX – Path 37 Row 23
7/11/1973



LandsatLook Viewer

- Began prototype viewer using LandsatLook full resolution browse images
 - <http://landsatlook.usgs.gov>



Landsat Plans

- Preparing for Landsat 8 operations
- Continue collection of LGAC data
- Complete TM-A algorithm transition to LPGS
- Continue modifications for MSS data
- Preparation for Top of Atmosphere reflectance product (around L8 launch)
- Investigating enhancements for data quality
 - Better cloud assessment scores
 - Improved geometric and radiometric accuracy
 - Quality band implementation

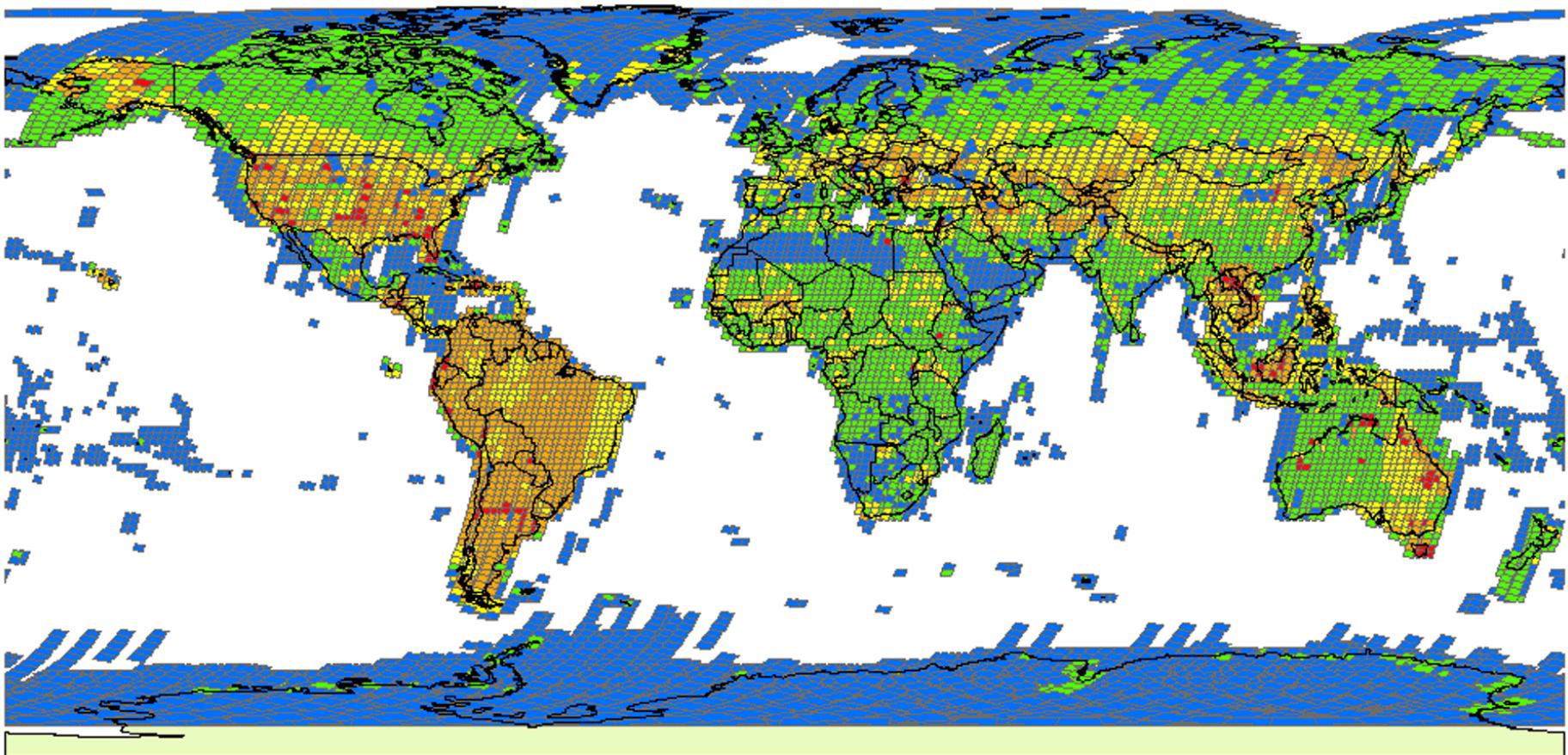


Statistics

- All statistic generated through Oct 2011 – Aug 2012



On-Demand Requests (ETM+)



ETM+ On-Demand Orders

October 01, 2011 through August 31, 2012

1,548,096 Total Cumulative Scenes Delivered

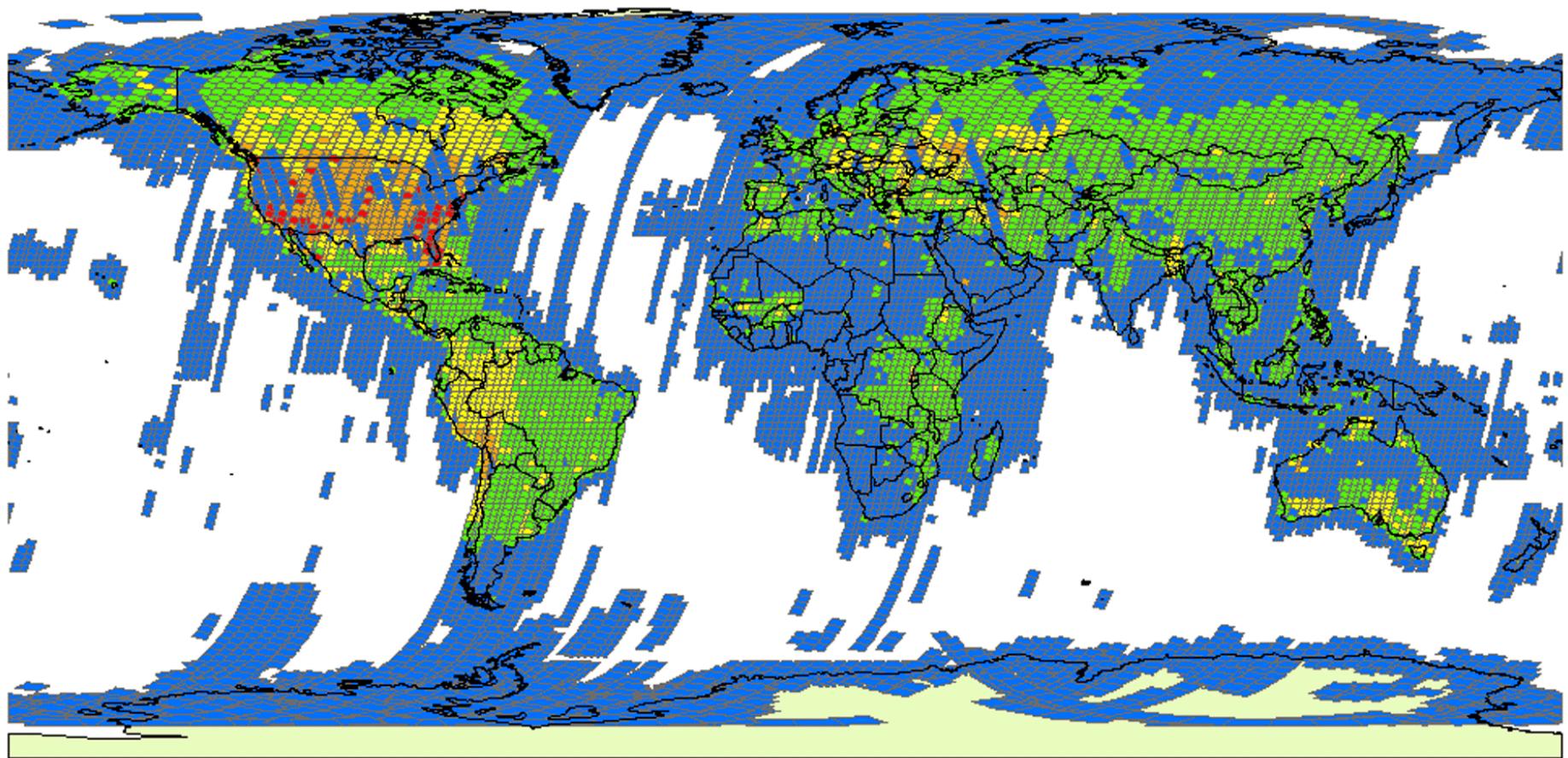
789,059 Total ETM+ Scenes Delivered

16,678 Unique ETM+ Locations

1 - 28 29 - 80 81 - 146 147 - 250 251 - 901



On-Demand Requests (TM)



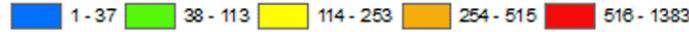
TM On-Demand Orders

October 01, 2011 through August 31, 2012

1,548,096 Total Cumulative Scenes Delivered

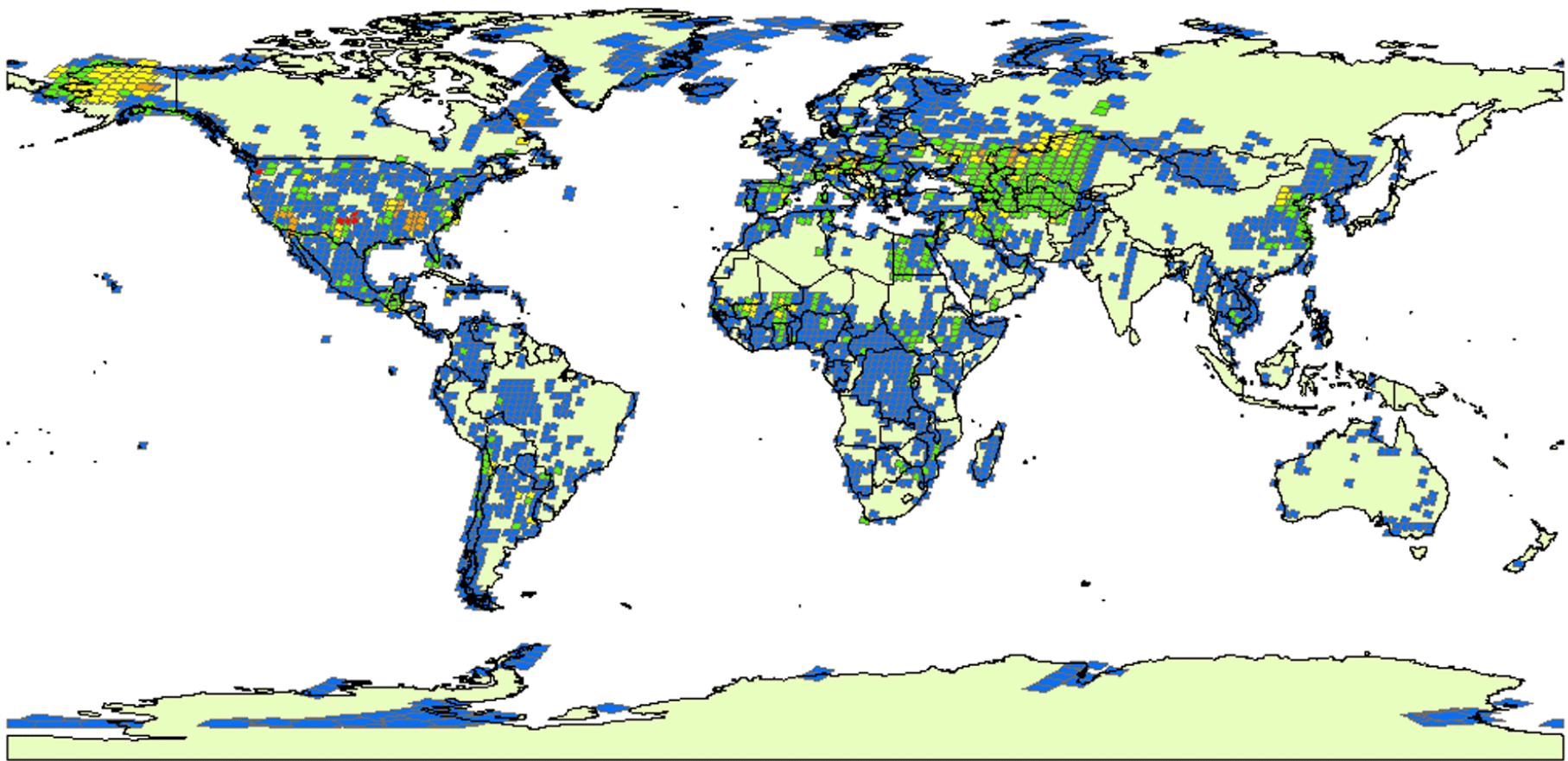
690,715 Total TM Scenes Delivered

16,262 Unique TM Locations

 1 - 37 38 - 113 114 - 253 254 - 515 516 - 1383



On-Demand Requests (MSS – WRS2)



L4-5 MSS On-Demand Orders

October 01, 2011 through August 31, 2012

1,548,096 Total Cumulative Scenes Delivered

68,322 Total MSS Scenes Delivered

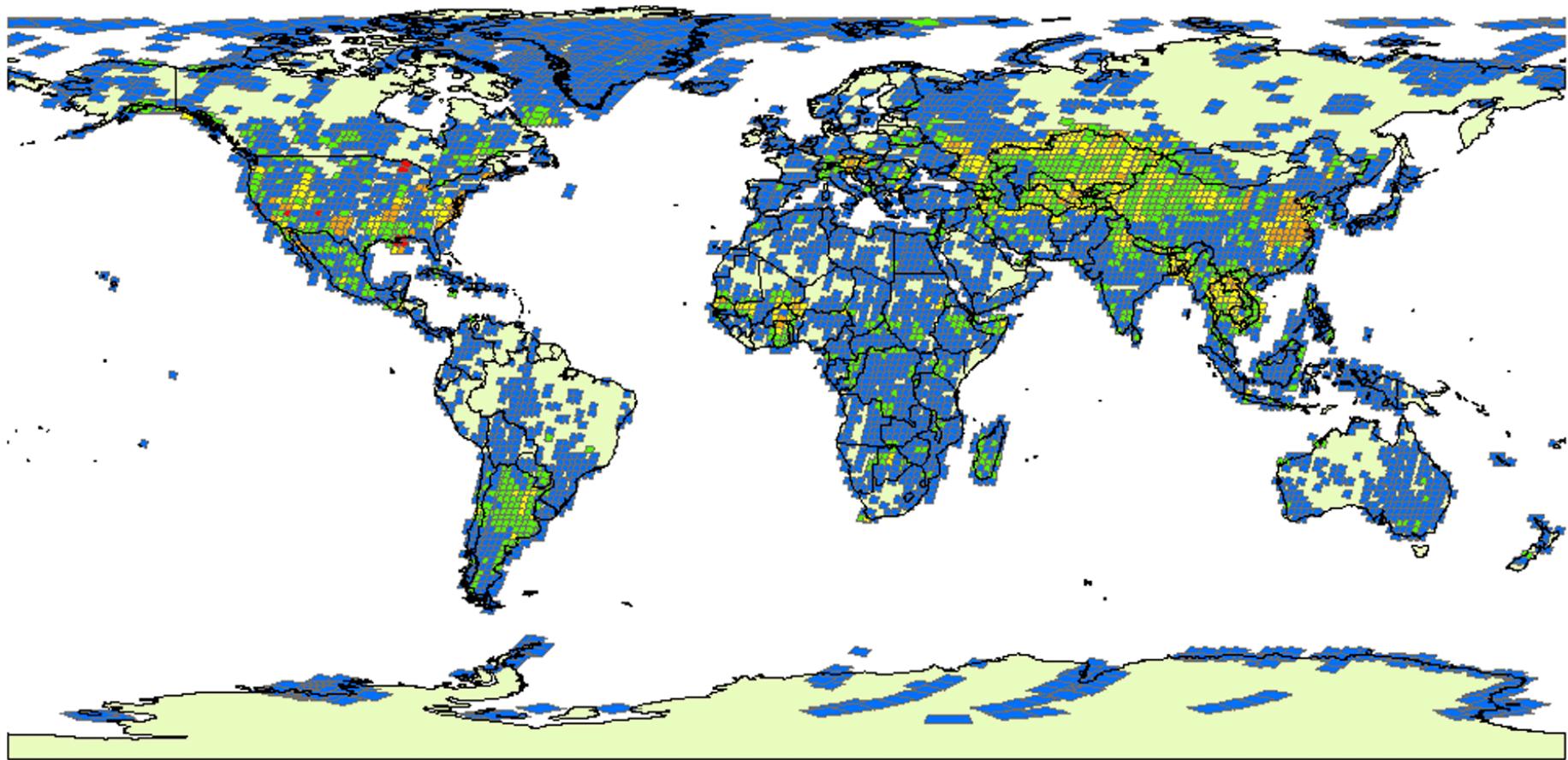
23,598 L4-5 MSS Total Scenes Delivered

2,896 Unique L4-5 MSS Locations

1 - 9 10 - 25 26 - 53 54 - 123 124 - 240



On-Demand Requests (MSS – WRS1)



L1-3 MSS On-Demand Orders

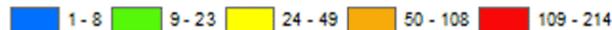
October 01, 2011 through August 31, 2012

1,548,096 Total Cumulative Scenes Delivered

68,322 Total MSS Scenes Delivered

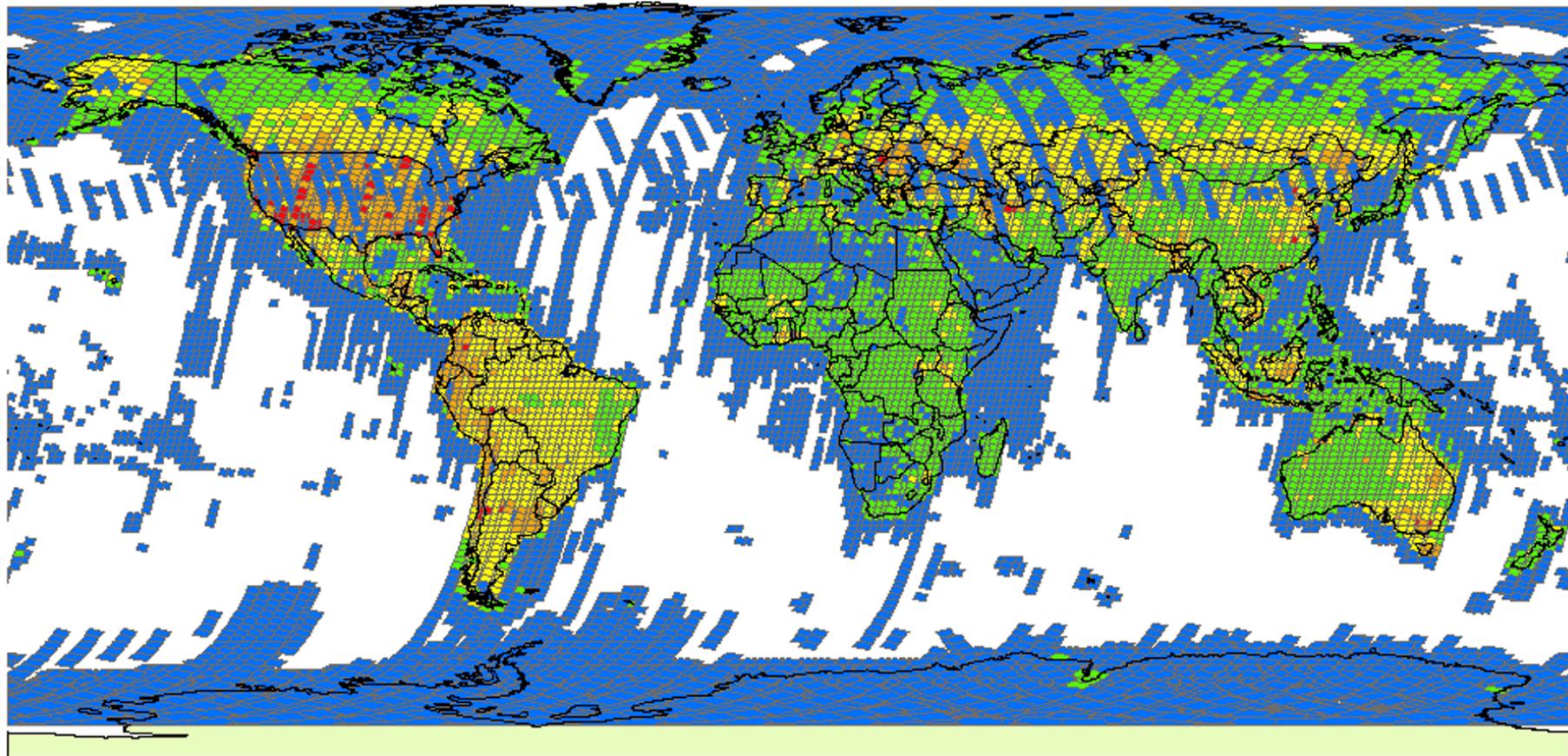
44,724 Total L1-3 MSS Scenes Delivered

5,545 Unique L1-3 MSS Locations

 1-8 9-23 24-49 50-108 109-214



All Downloads (WRS2)



WRS2 Standard L1T Downloads

via User Interface and Bulk Users

October 01, 2011 through August 31, 2012

2,525,175 Cumulative Scenes Delivered

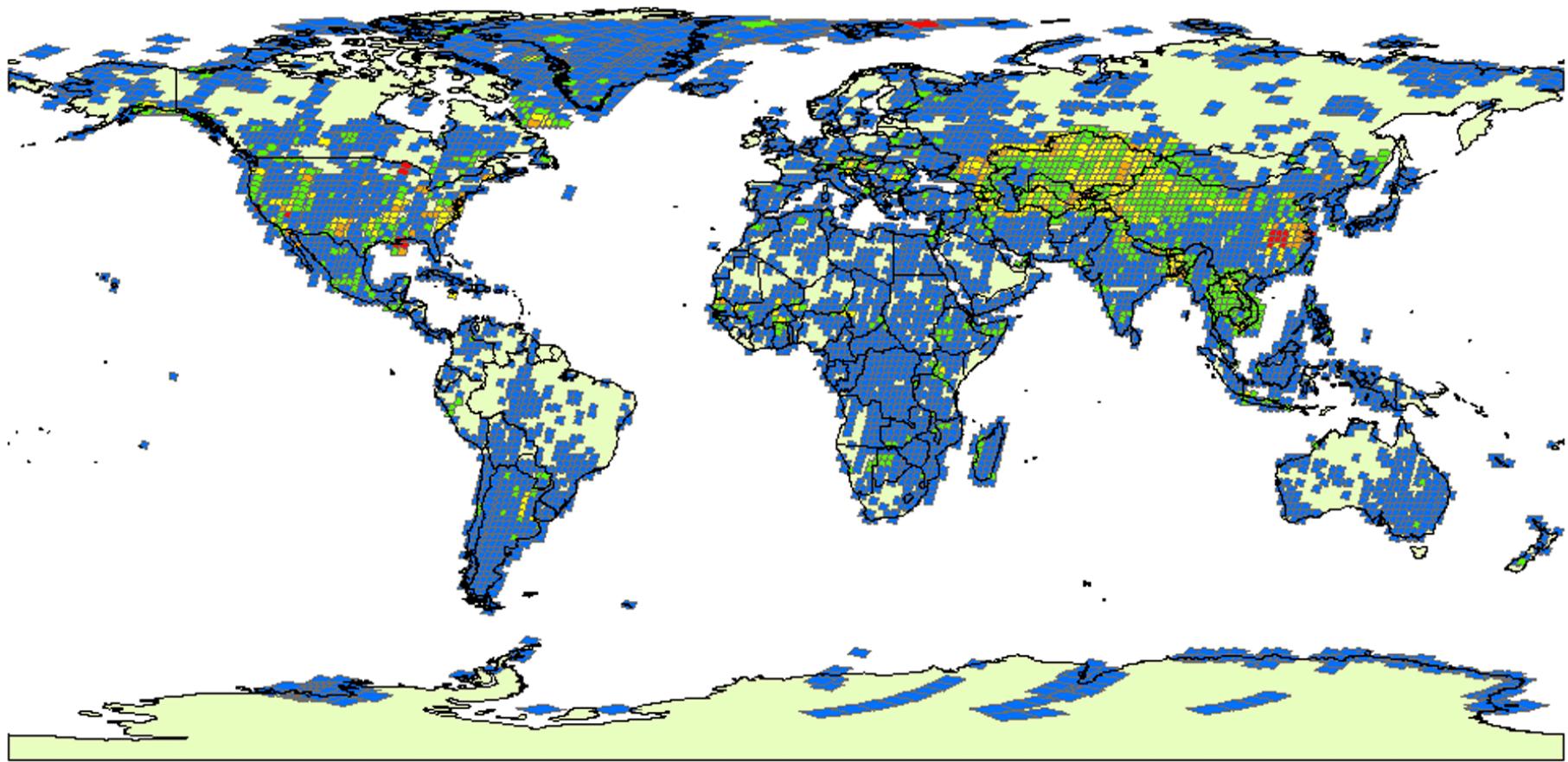
2,461,126 Total WRS2 Scenes Delivered

21,826 Unique WRS2 Locations

1 - 90 91 - 282 283 - 557 558 - 1027 1028 - 2573



All Downloads (WRS1)



WRS1 Standard L1T Downloads

via User Interface and Bulk Users

October 01, 2011 through August 31, 2012

2,525,175 Total Cumulative Scenes Delivered

64,049 Total WRS1 Scenes Delivered

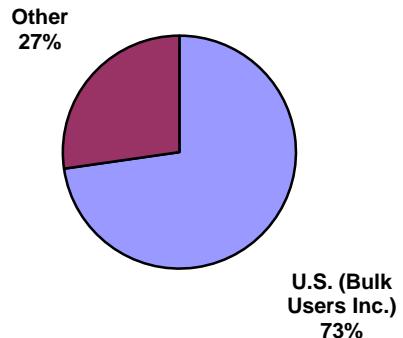
5,328 Unique WRS1 Locations

1 - 14 15 - 39 40 - 75 76 - 167 168 - 531

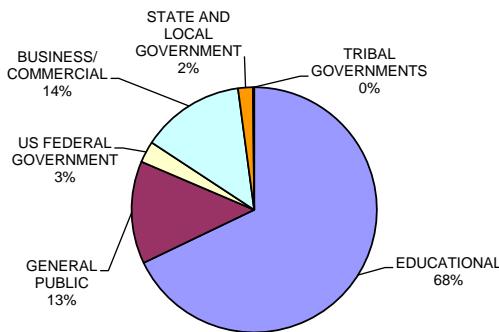


Customer Demographics (Oct 2010 – Apr 2011)

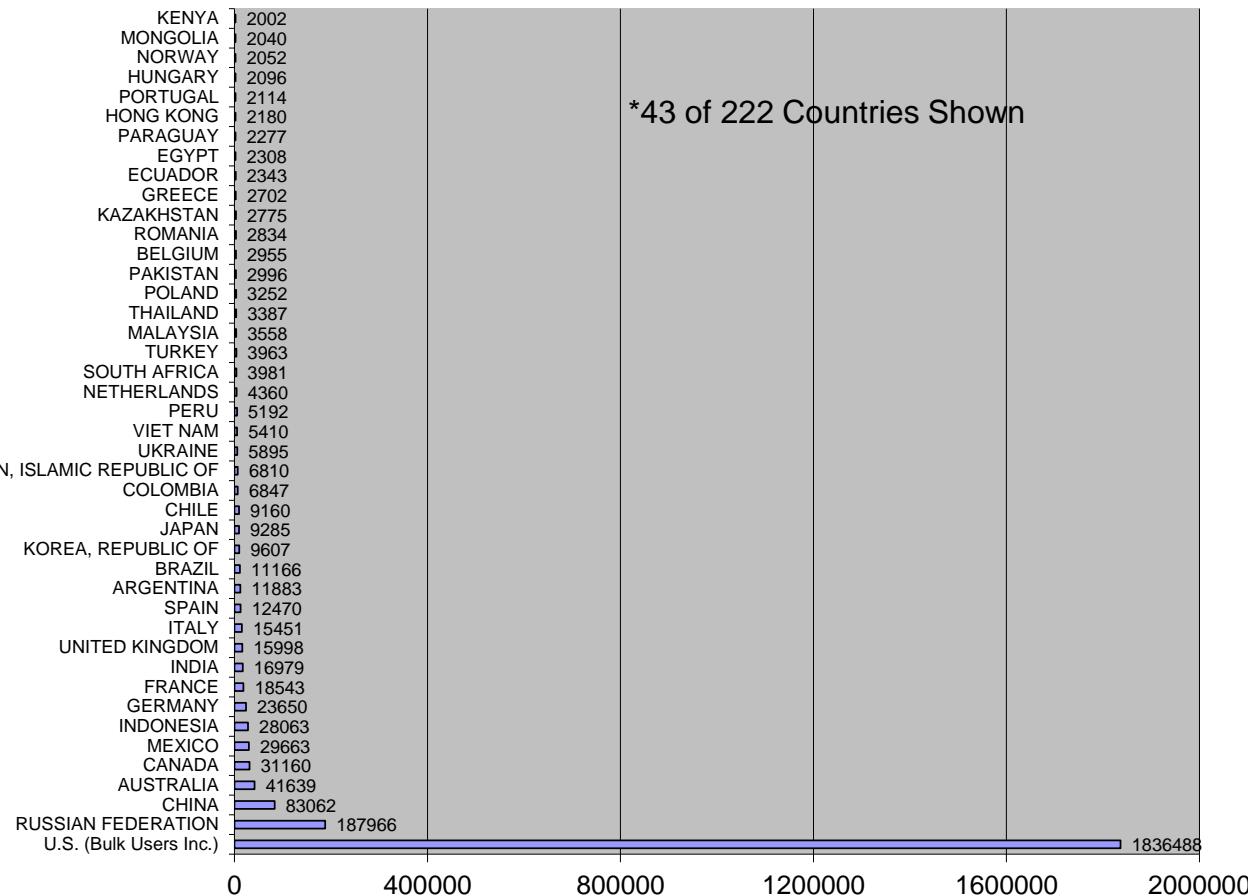
Downloads by Country



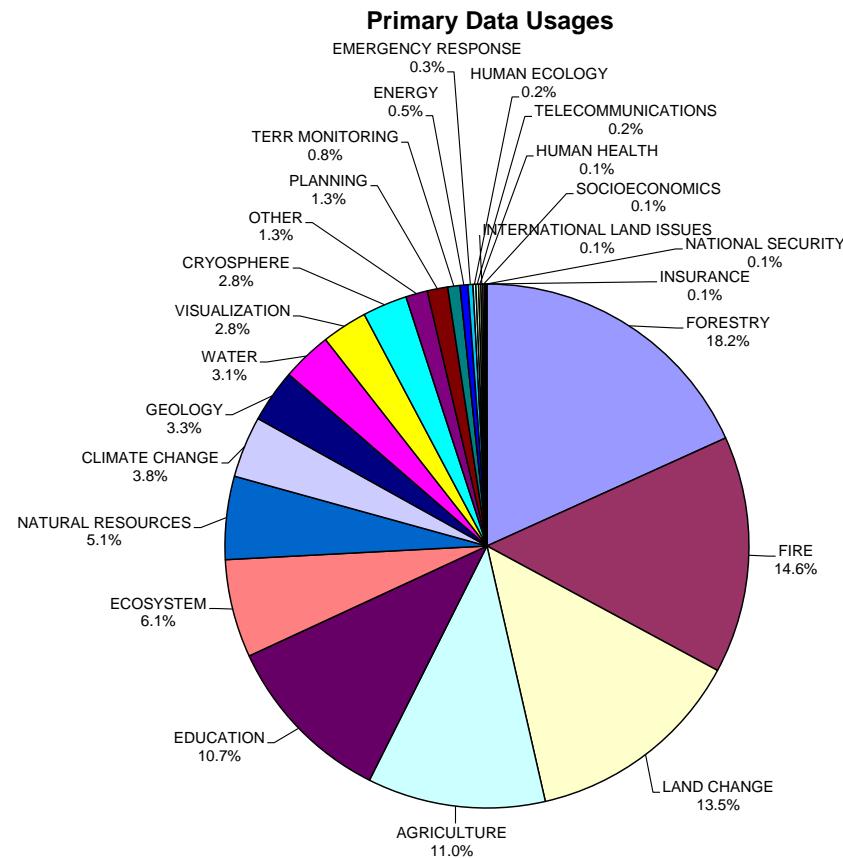
Affiliation



Standard L1T Downloads by Country
(Countries with >2000 Scenes Downloaded)

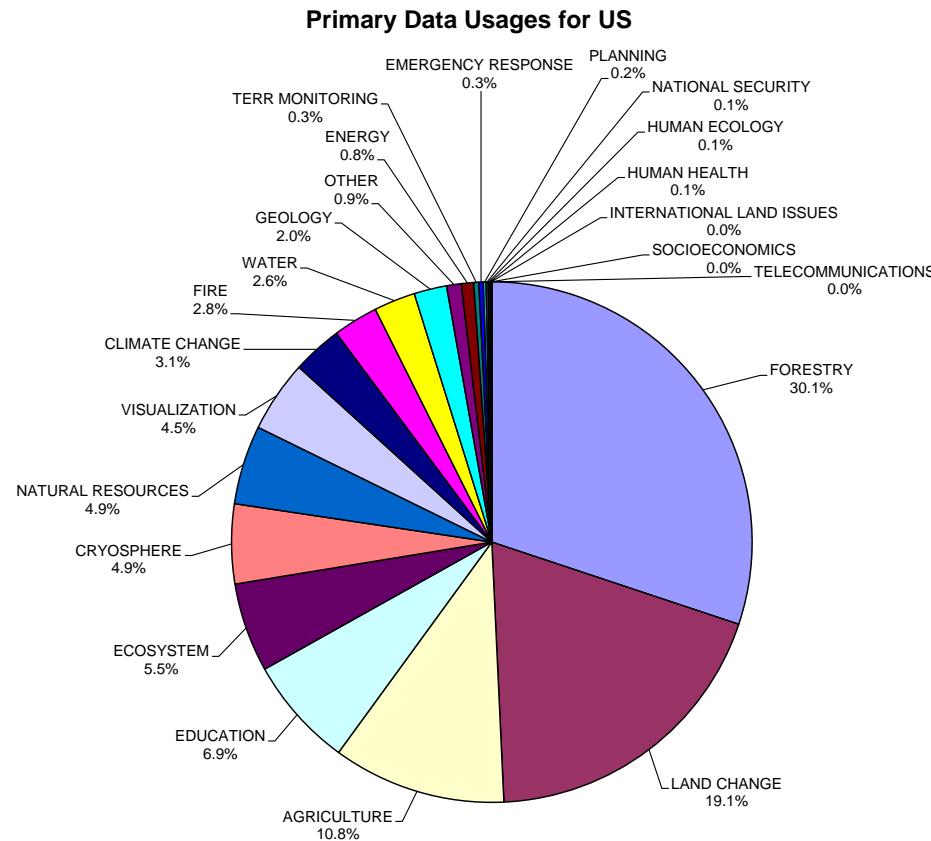


User Reported Primary Use of Landsat



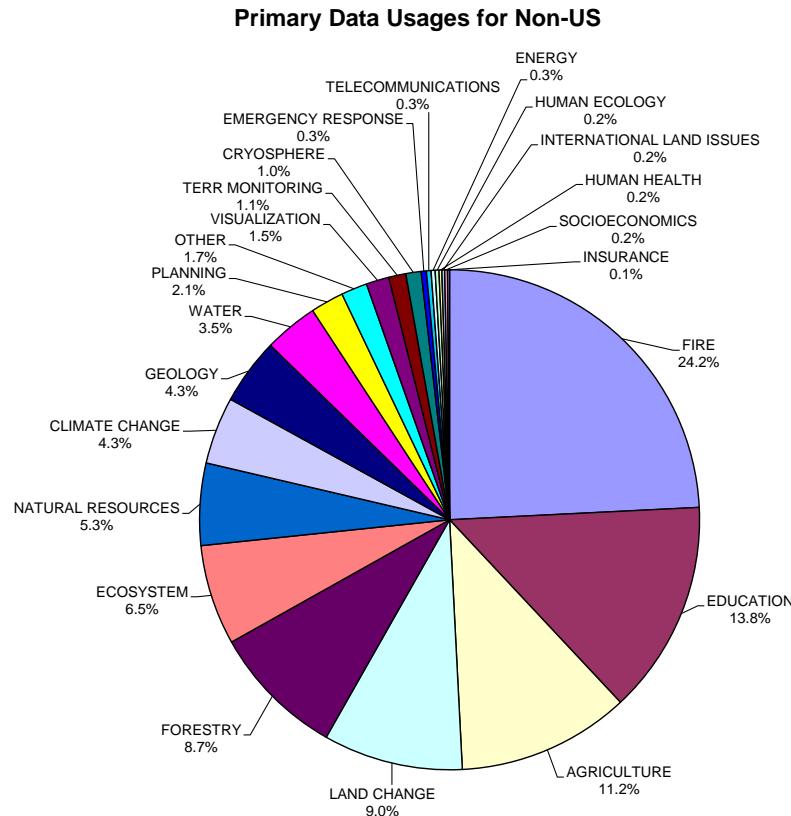
User Reported Primary Use of Landsat

U.S. Users Only

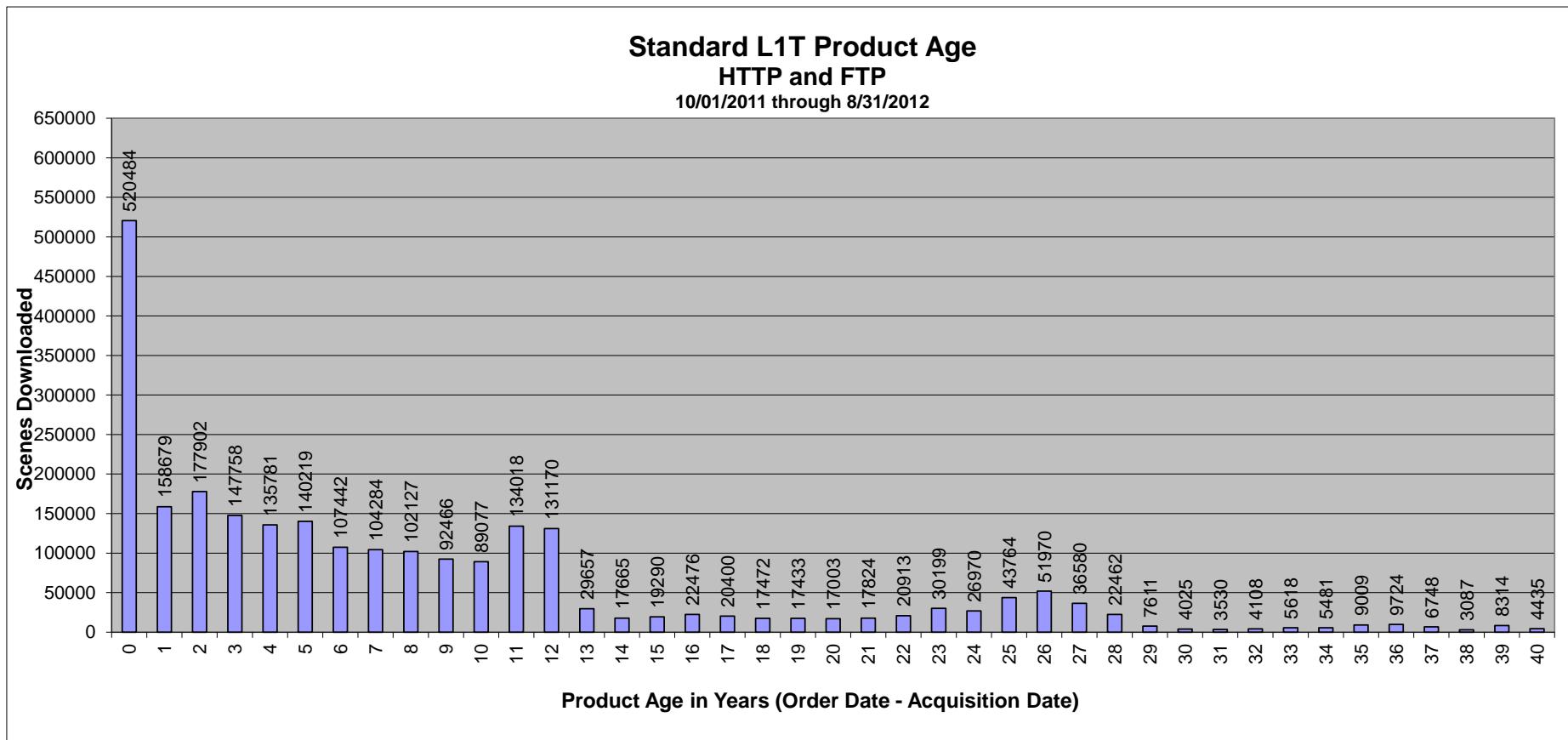


User Reported Primary Use of Landsat

~~Non-U.S. Users Only~~

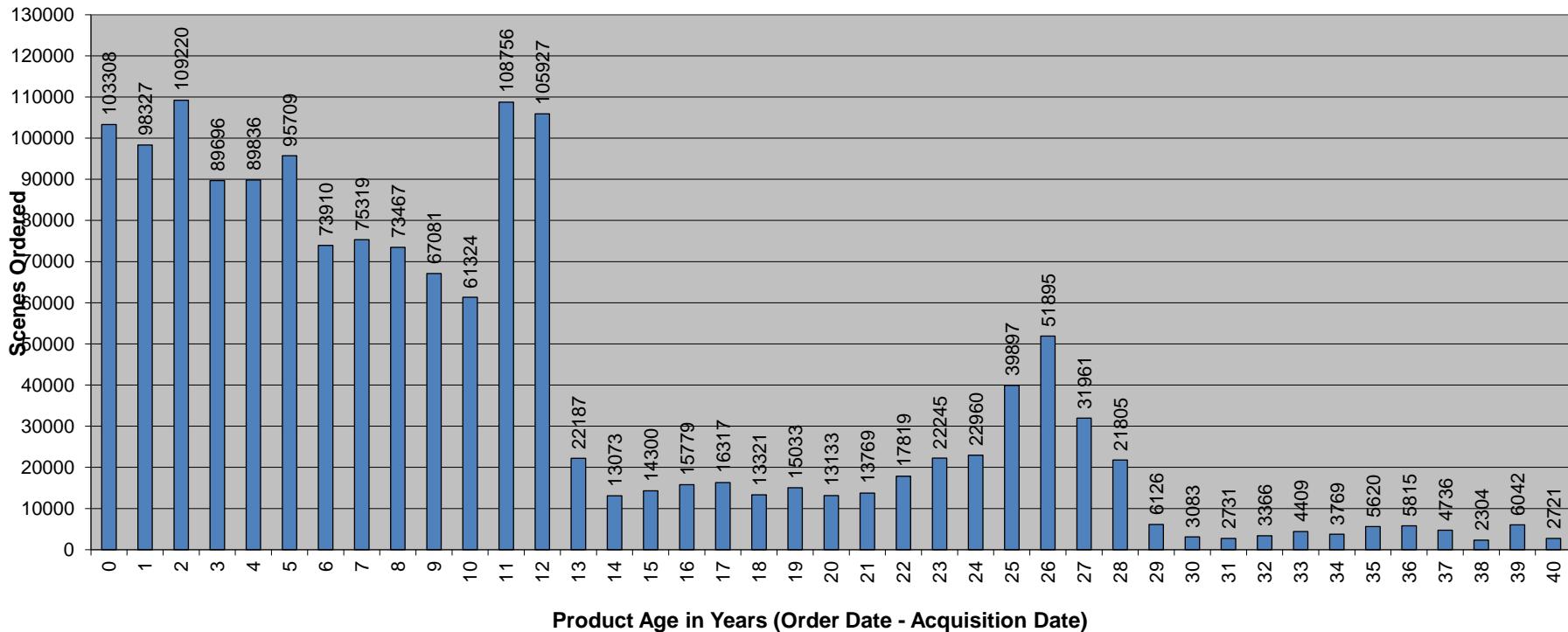


Age of Scenes Downloaded

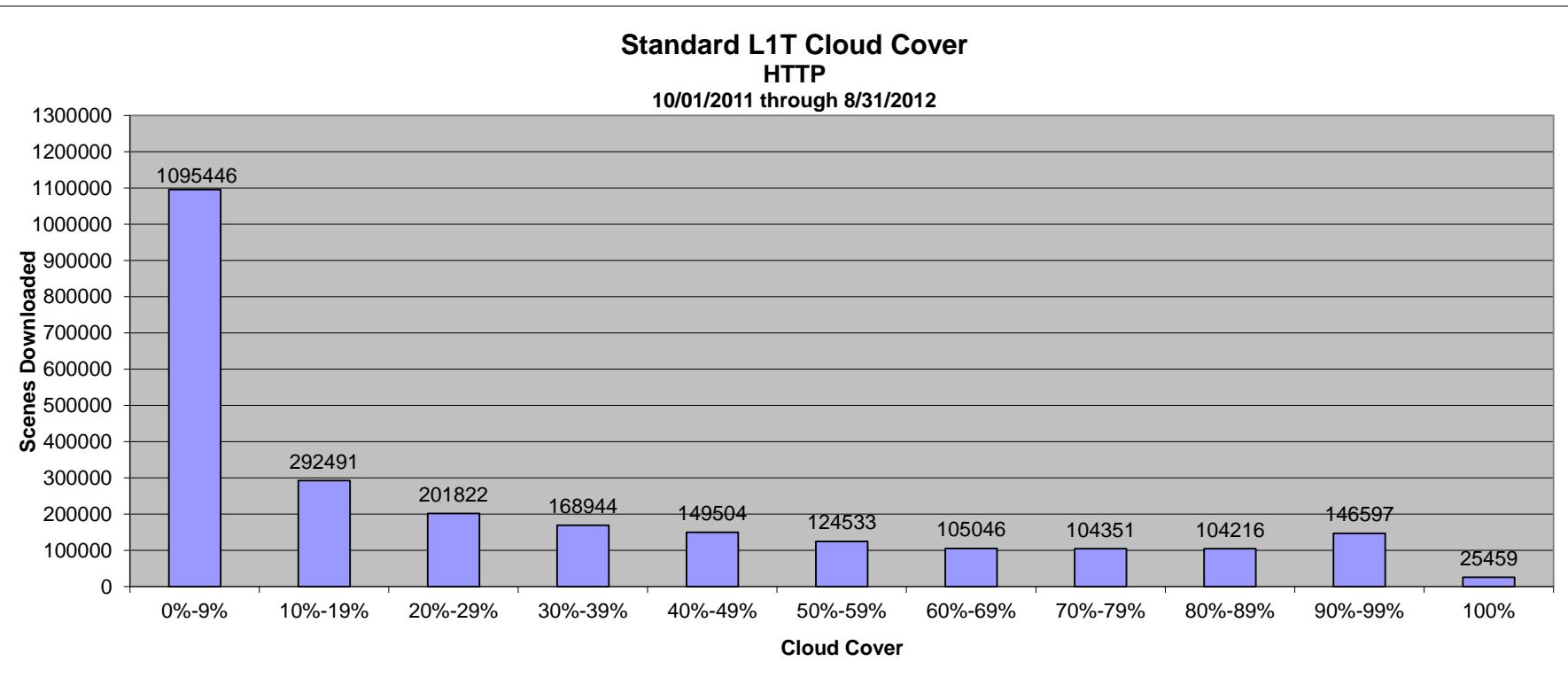


Age of Scenes Ordered from Archive

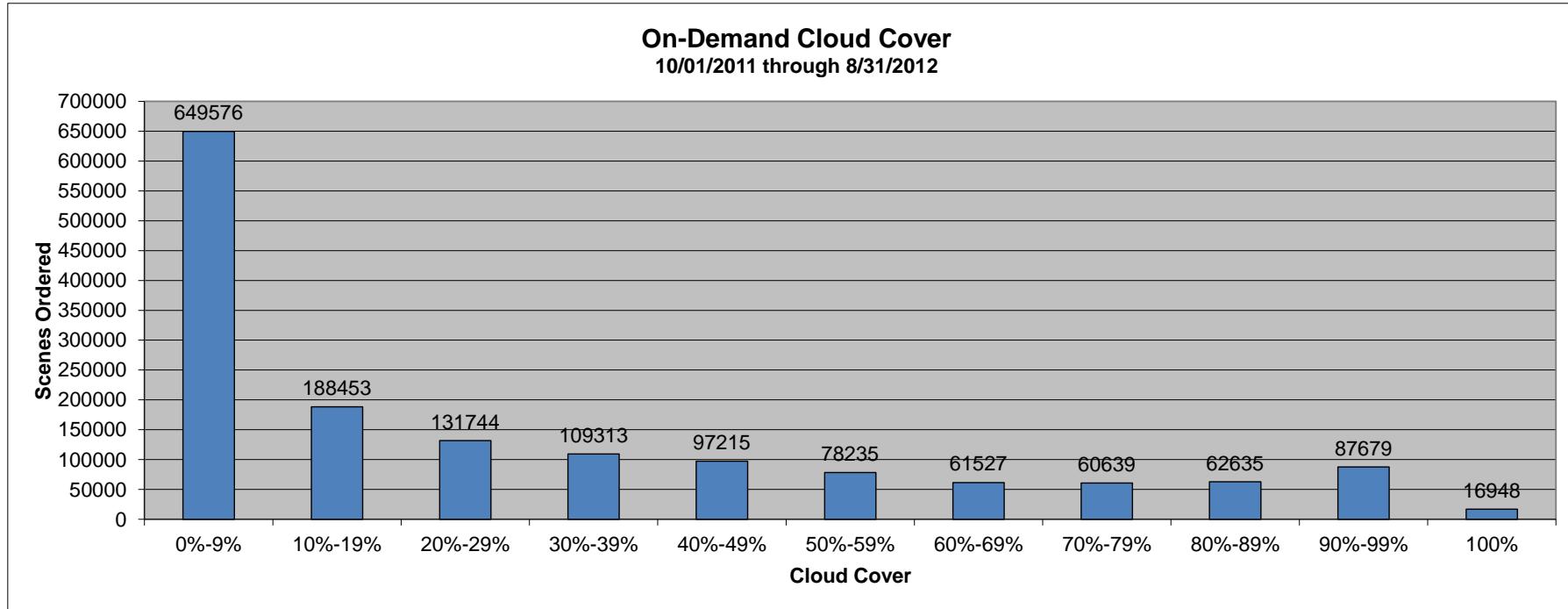
On-Demand Product Age
10/01/2011 through 8/31/2012



Cloud Cover of Scenes Downloaded



Cloud Cover of Scenes Ordered from Archive



Age of Scenes Ordered

