



USGS EROS Center

Data Access, Archiving and Distribution



U.S. Department of the Interior
U.S. Geological Survey

Mission Area

Data Acquisition, Archiving and Access

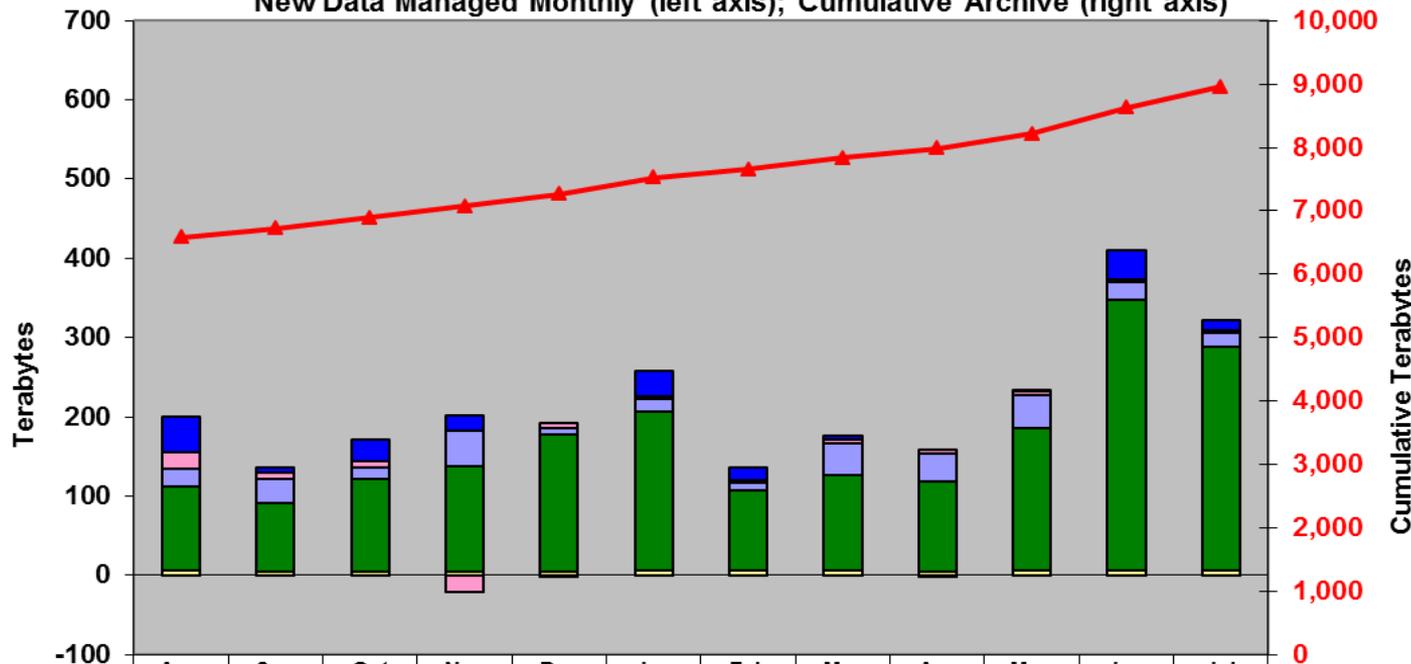
Ensure that scientists, decision makers, and the public have ready access to land change information and to safeguard and expand the national archive of remotely sensed land data.

- Preserve and distribute the centers data and information products
- Manage the NASA EOS/DAAC requirements
- Operate existing user interfaces and develop future information access methodologies
- Manage hazards and disaster response activities
- Operate user services and application assistance support in concert with the other branch's
- Support the development, implementation, and operation continuum thru direct coordination with science based personnel

EROS Consolidated Report on Data Managed

All Projects with Detail – Monthly/Cumulative

LPDAAC, LANDSAT, OTHER SATELLITE, NON-SATELLITE, and GEOSPATIAL DATA MANAGED
 New Data Managed Monthly (left axis); Cumulative Archive (right axis)

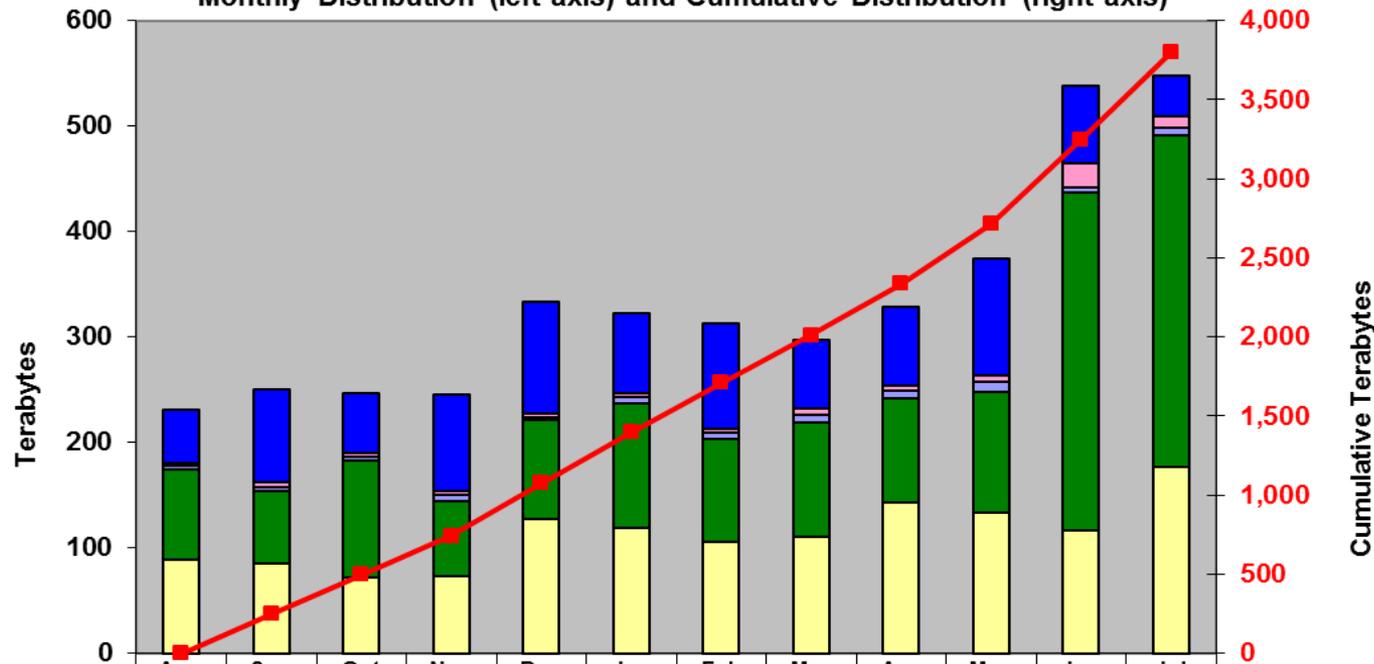


	Aug 12	Sep 12	Oct 12	Nov 12	Dec 12	Jan 13	Feb 13	Mar 13	Apr 13	May 13	Jun 13	Jul 13
All Data Collected - Monthly	77.40	48.52	57.19	57.91	55.08	60.12	32.83	58.33	52.49	97.74	197.23	118.30
Geospatial Managed Monthly	44.86	7.33	26.54	18.47	-1.85	32.51	15.28	5.94	-2.07	0.21	35.81	13.47
Other Satellite Managed Monthly	21.36	6.86	7.99	-21.96	5.45	3.97	4.34	4.41	4.74	5.16	4.14	3.40
Non-Satellite Managed Monthly	22.23	31.10	14.74	46.01	8.37	16.10	9.14	40.22	34.65	40.78	21.71	16.66
Landsat Managed Monthly	105.60	86.16	116.95	132.94	173.52	199.13	101.94	120.82	113.52	180.60	342.33	283.59
LPDAAC Managed Monthly	5.73	4.72	4.44	4.01	4.12	6.71	5.19	5.20	4.75	5.52	5.51	5.37
Cumulative Terabytes Managed	6586	6722	6892	7072	7262	7520	7656	7832	7988	8220	8630	8952

EROS Consolidated Report on Data Distributed

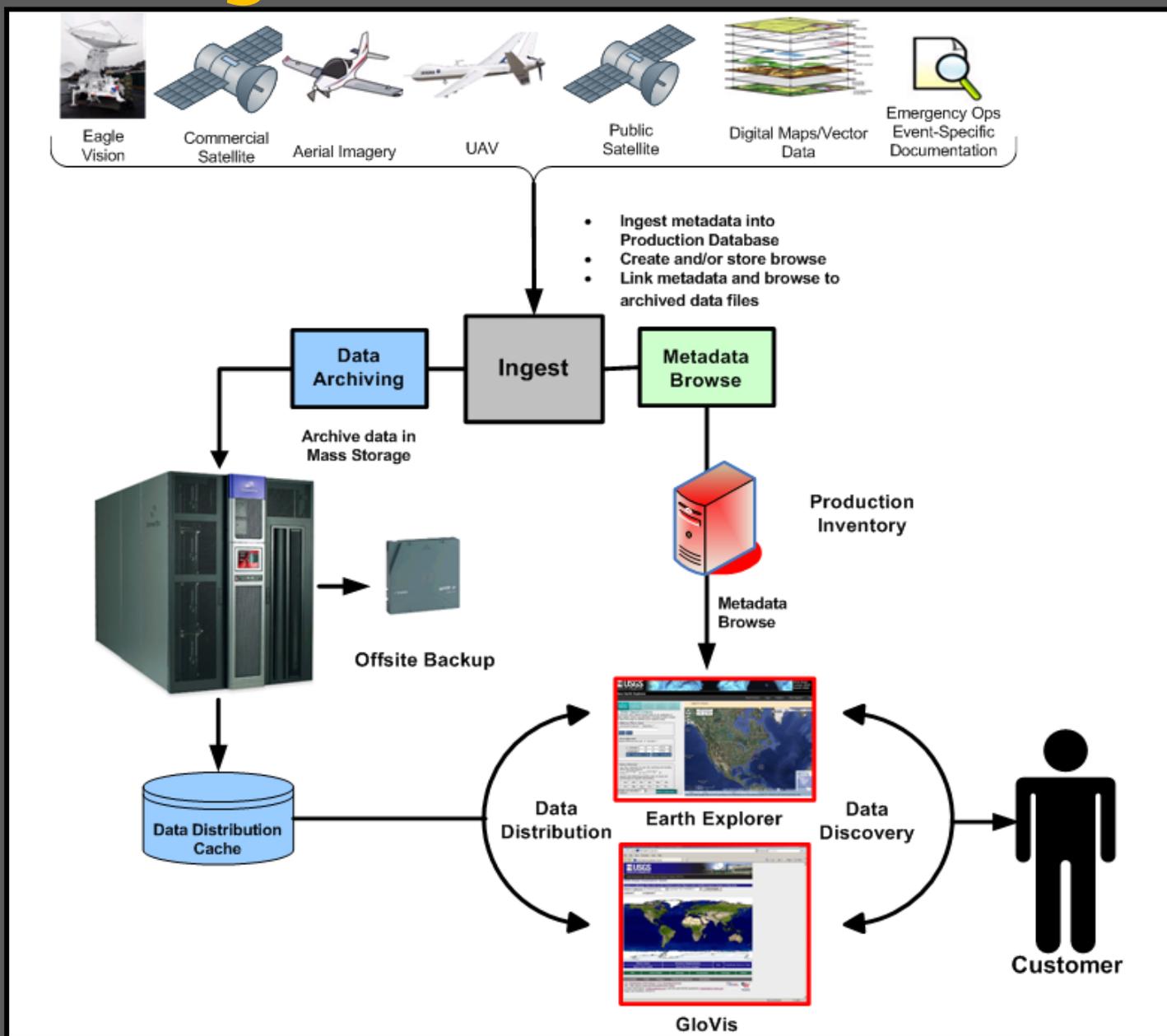
All Projects with Detail – Monthly/Cumulative

LPDAAC, LANDSAT, OTHER SATELLITE, NON-SATELLITE and Geospatial DATA DISTRIBUTED
 Monthly Distribution (left axis) and Cumulative Distribution (right axis)



Geospatial Data	50.64	88.29	56.44	92.29	106.28	75.61	100.01	65.74	74.47	110.53	73.47	39.34
Other Satellite	2.38	4.17	3.69	3.44	3.52	3.87	4.12	5.73	4.79	6.02	22.49	11.07
Non-Satellite	3.53	3.47	4.09	6.29	3.05	5.97	6.55	7.65	7.42	10.57	5.09	6.81
Landsat	85.06	69.04	110.87	71.00	92.83	117.22	96.73	107.85	98.44	113.92	320.13	314.42
LPDAAC	89.07	85.12	71.99	72.88	127.99	119.54	106.11	110.60	143.43	133.45	116.45	176.65
Period Cum. Terabytes Distributed	0	250	497	743	1,077	1,399	1,712	2,010	2,339	2,713	3,251	3,799

Data Management



Long Term Archive

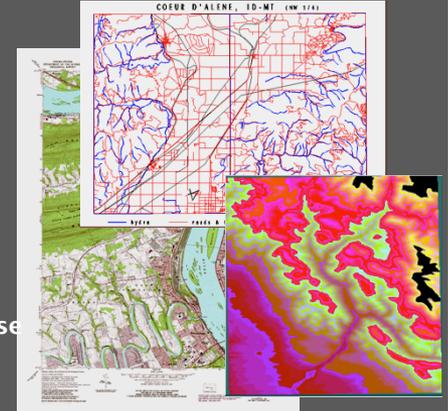
Aerial Photography Collections

- U.S. Geological Survey Photography 1939 – 1995
- National High Altitude Photography 1980 – 1989
- National Aerial Photography Program 1987 – 2004
- Space Acquired Photography 1969 – 1984
- Other U.S. Federal Aerial Photography 1937 – 1999
- Side-Looking Airborne Radar 1980 – 1994
- High Resolution Orthorectified 2003 – Present
- National Agriculture Imagery Program 2003 – Present



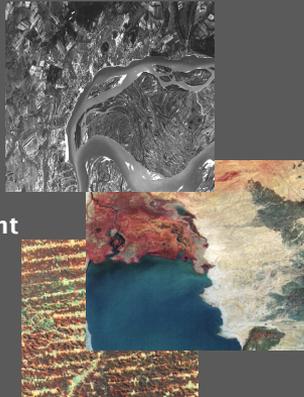
Cartographic – Topographic Collections

- Digital Line Graphs
 - 1:24,000*
 - 1:100,000
- Digital Elevation Models
 - 7.5°
 - 15' Alaska
 - 2 Arc Second**
 - 1:250,000
- Digital Raster Graphics
 - 1:24,000
 - 1:100,000
 - 1:250,000
- Digital Orthophoto Quads
- National Atlas
- National Elevation Database
- SRTM



Satellite Collections

- Declass 1 (Corona) 1960 – 1972
- Declass 2 (KH-7, KH-9) 1963 – 1980
- SPOT Pan/Multispectral 1986 – 1998
- Landsat MSS 1972 – 1992
- Landsat Thematic Mapper
- Landsat 7 ETM+ 1999 – Present
- Landsat 8 OLI/TIRS 2013 -- Present
- EOS/MODIS 2000 – Present
- EOS/ASTER 2000 – Present
- AVHRR LAC/HRPT 1986 – Present
- EO-1 2001 – Present
- SIR-C 1994
- Commercial Data Purchases 2002 – Present



- Collection Diversity
 - Aerial
 - Cartographic
 - Topographic
 - Satellite
- Digital and film archive media
- Static and growing collections

Film Archive



- 59,500 rolls of film
 - 8.6 million images

Film Scanning

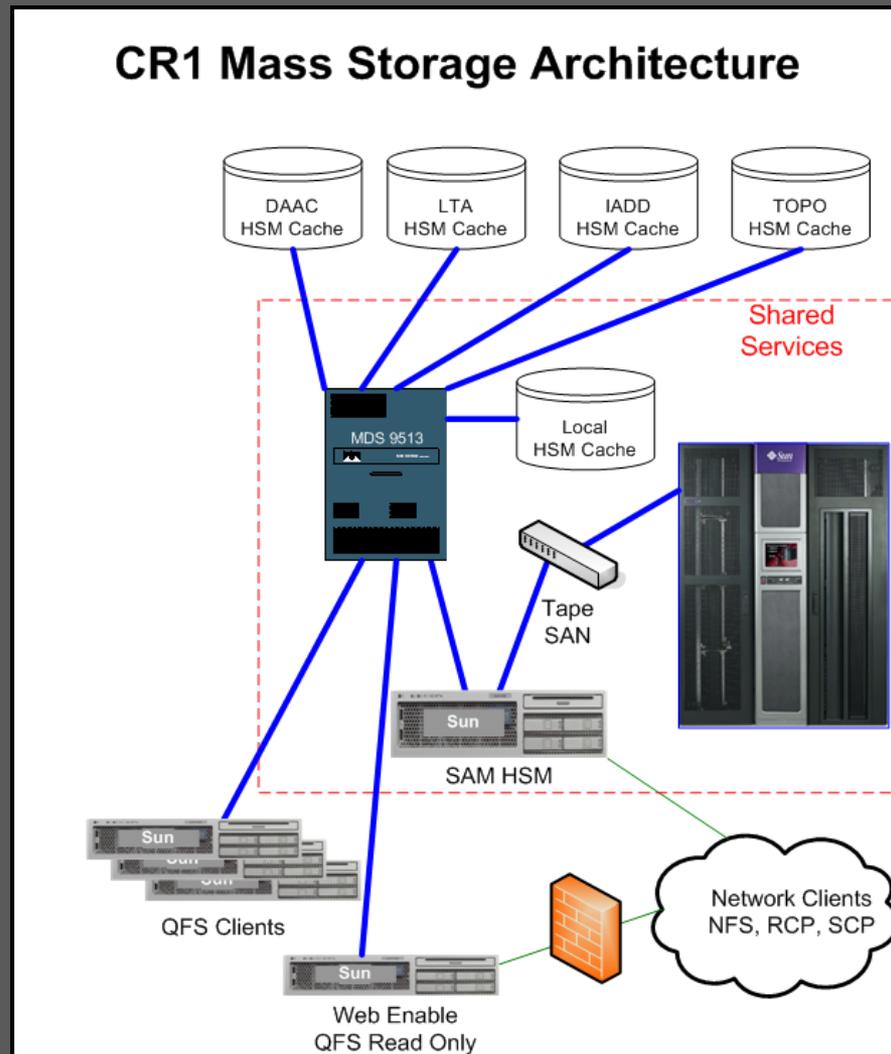
- On-demand high-resolution scanned products from the historical film archive based on customer requests.
 - 25, 14 and 7 micron
 - \$30/file – Internet delivery
 - Billing and accounting performed by USGS Information Delivery Branch staff in Denver



- Systematically scan USGS archive to 25 micron
- Web enabled at no-charge over the internet
- All imagery retrievable from EarthExplorer are candidate for scanning
 - Initial focus on vinegar syndrome (4 yrs)
- Nine Phoenix V scanners operational
- Designed, built and integrated on-site
 - Better Light scanning back camera
- 24 X 5 operations

Digital Archive

- All USGS archived digital data managed in a mass storage system
 - Data migrations
 - Backup copy generation
 - Data distribution
- Backup copies stored on-site and at an off-site location
- Engineering studies lead development and enhancement efforts
 - Mass Storage System
 - Archive Media



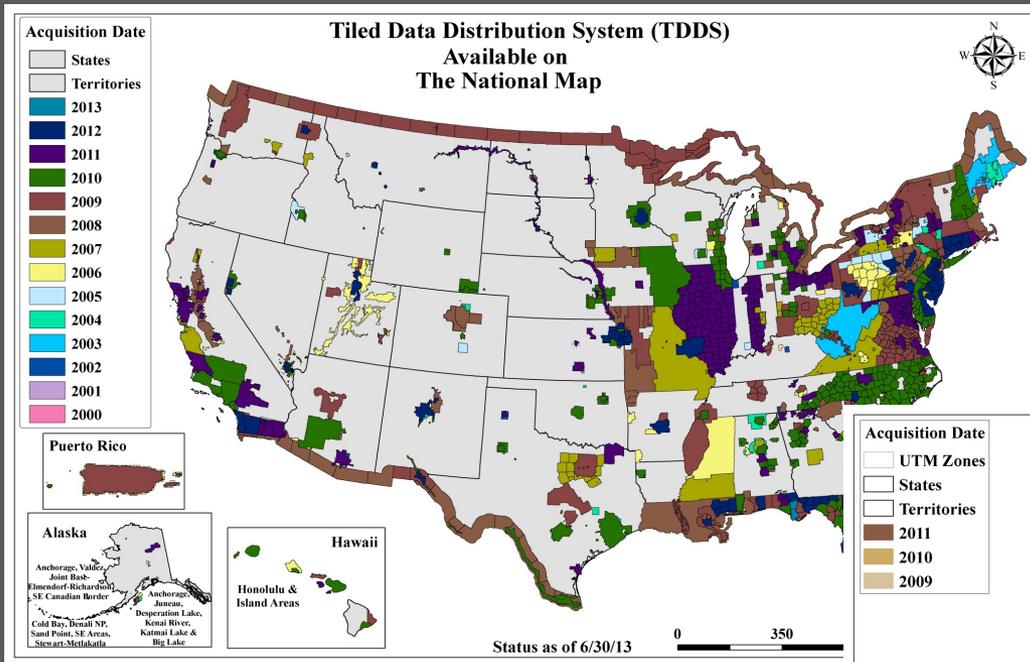
Current total storage is 5.5 PB

Spatial Data Delivery

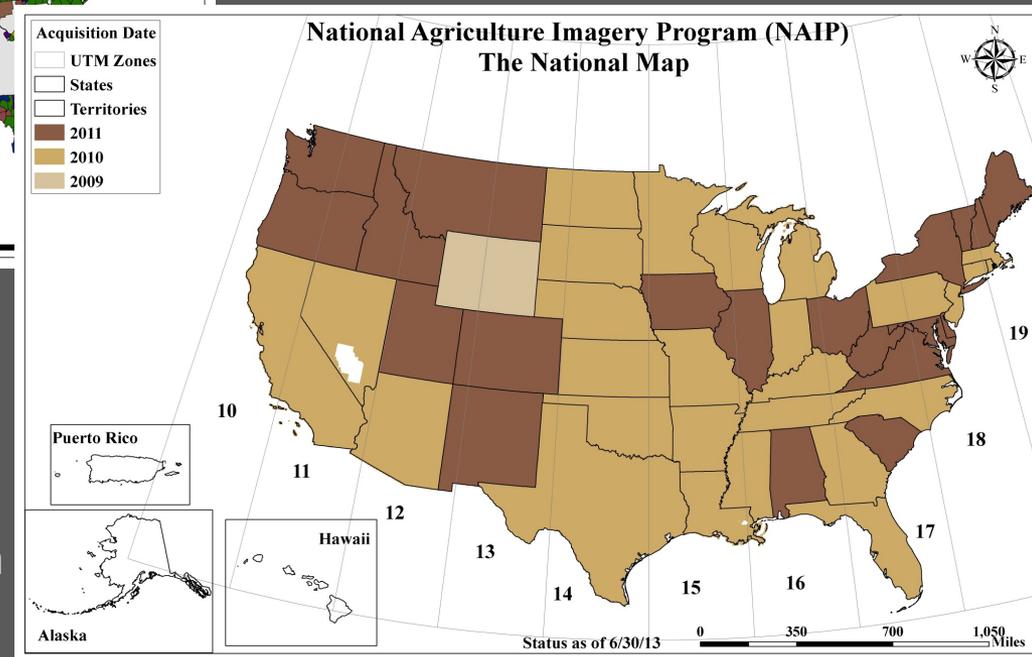
- **Supports the data access and distribution requirements of the National Geospatial Program 's National Map**
 - Multiple data sets including Ortho, Elevation and Landcover Distribution
- **Provides data, access and distribution services thru service level agreements to multiple federal agencies including:**
 - National Geospatial–Intelligence Agency (NGA)
 - Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) Program
 - USDA Forest Service (Fire and Aviation Management)

Spatial Data Sources

EROS supports the The National Map by ingesting, managing and distributing Ortho aerial imagery



1 foot resolution



1 meter resolution

Emergency Operations

- **Liaison Activities**

- Provide 24x7 on-call support and coordination for satellite and aerial image access, acquisition and delivery.
- Provide USGS representation and operational support to the International Charter Space and Major Disasters.
- Assist in requirements development, content definition, and usability testing for USGS emergency response systems.

- **Emergency Operations Support**

- Assure appropriate data is ingested and available.
- Operate and maintain the Emergency Operations Portal web pages including establishment of event presence.



Hazards Data Distribution System (HDDS)



USGS Home
Contact USGS
Search USGS

Hazards Data Distribution System (HDDS)

Home Login Register RSS Feedback Help

Search Criteria Events Additional Criteria Results

2. Select Your Event(s)

Check the boxes for the event(s) you want to search. When done selecting event(s), click the *Additional Criteria* or *Results* buttons below. Click the plus sign next to the category name to show a list of events.

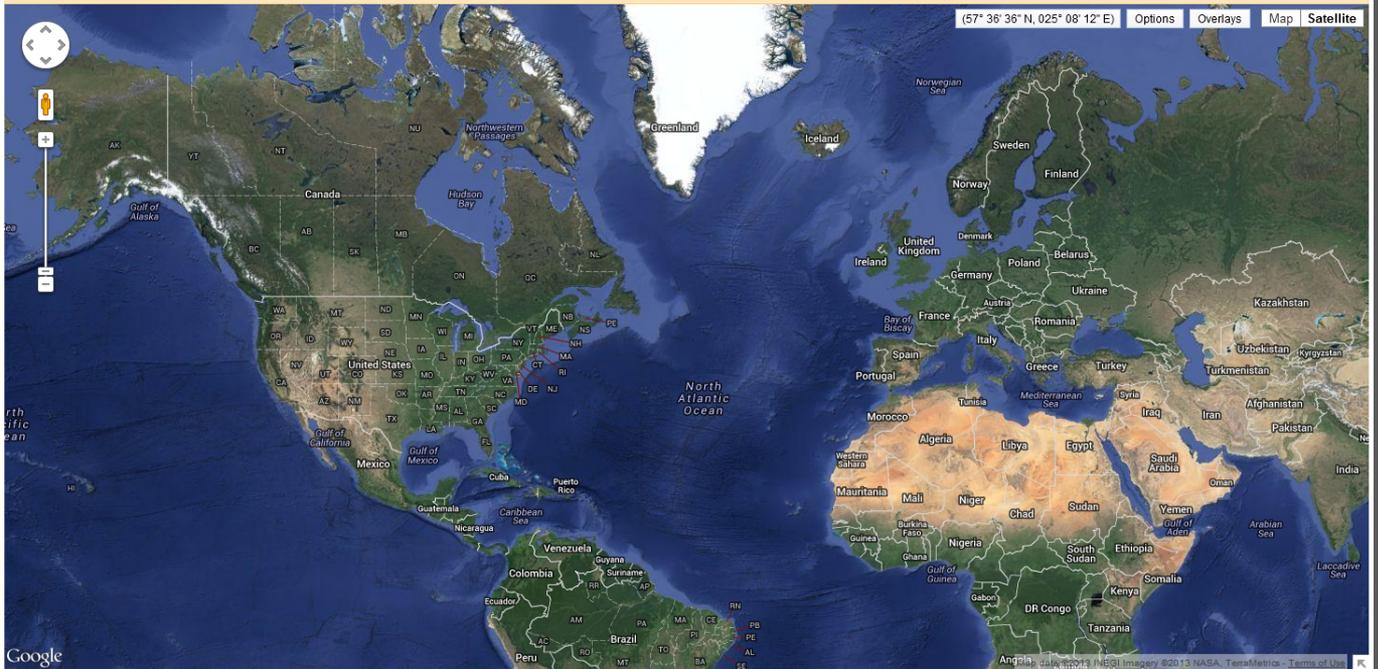
Use Event Prefilter [What's This?](#)

Event Search:

- Baseline
- 2013 Events
- 2012 Events

Search Criteria Summary (Show)

Clear Criteria



The up-to-date Google map is not for purchase or for download; it is to be used as a guide for reference and search purposes only.



Hazards Data Distribution System (HDDS)

● January – July 2013

- Number of HDDS Events: 38
 - Domestic: 27
 - International Charter: 11
- 2013 events included:
 - Black Forest Fire (Colorado Springs, CO) and Yarnell Hill Fire (Prescott, AZ)
 - Flash floods in Chicago, IL
 - Tornado in Moore, OK
 - Fertilizer Plant Explosion in West, TX

● Calendar Year 2012

- Number of HDDS Events (total): 73
 - Domestic: 44
 - International Charter: 29
- 2012 events included:
 - Hurricane Sandy (Northeastern US)
 - Waldo Canyon Fire near Colorado Springs, CO
 - Very active fire season across the Southwest US

Example Event: Hurricane Sandy

- **HDDS Event ID:**
201210_Hurricane_Sandy
- **HDDS Hosted Imagery:**
 - **Aerial imagery**
 - Civil Air Patrol (CAP) (158,011 images)
 - North Carolina DOT (195 images)
 - NOAA (2623 images)
 - AAI Unmanned Aerial Vehicle (UAV) (16 images)
 - US National Guard (18 images) - *RESTRICTED*
 - USGS pre-event (3762 images)
 - **Moderate-resolution Optical Satellite Imagery**
 - Landsat 7 (48 images)
 - ASTER (55 images)
 - SPOT 4/5 (67 images) - *RESTRICTED*
 - EO-1 ALI (19 images)
 - NASA ISS (79 images)
 - DMCii (3 images) - *RESTRICTED*
 - **High-resolution Optical Satellite Imagery**
 - WorldView-1/2 (1028 images) - *RESTRICTED*
 - QuickBird-2 (53 images) - *RESTRICTED*
 - IKONOS (1 image) - *RESTRICTED*
 - RapidEye-3 (3 images) - *RESTRICTED*



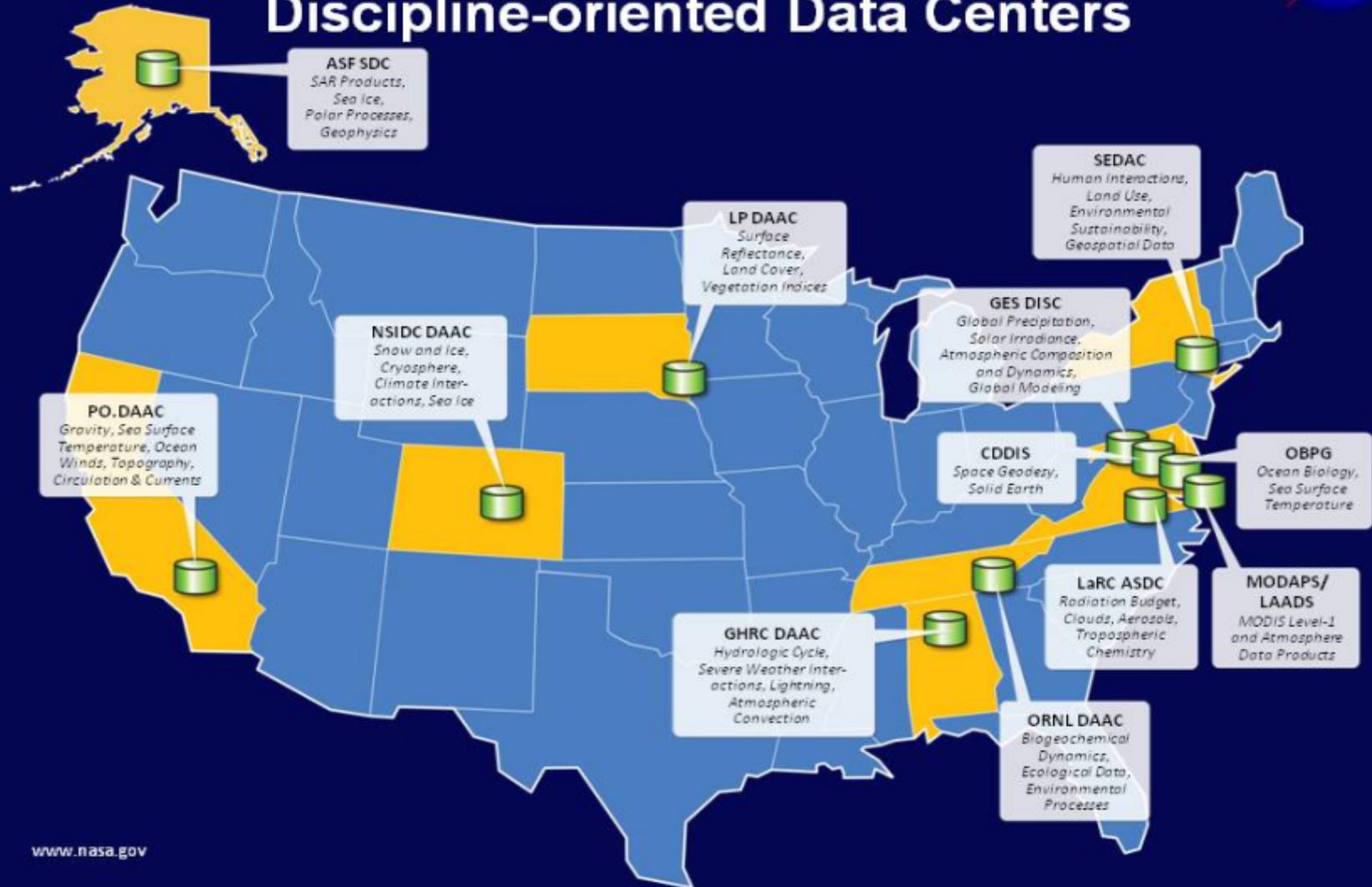
Example RS-16 (UAV) image from AAI for Hurricane Sandy (Barnegat Light, NJ; 2 Nov 2012)

Land Processes Distributed Active Archive Center (LP DAAC)

National Aeronautics and Space Administration



Discipline-oriented Data Centers

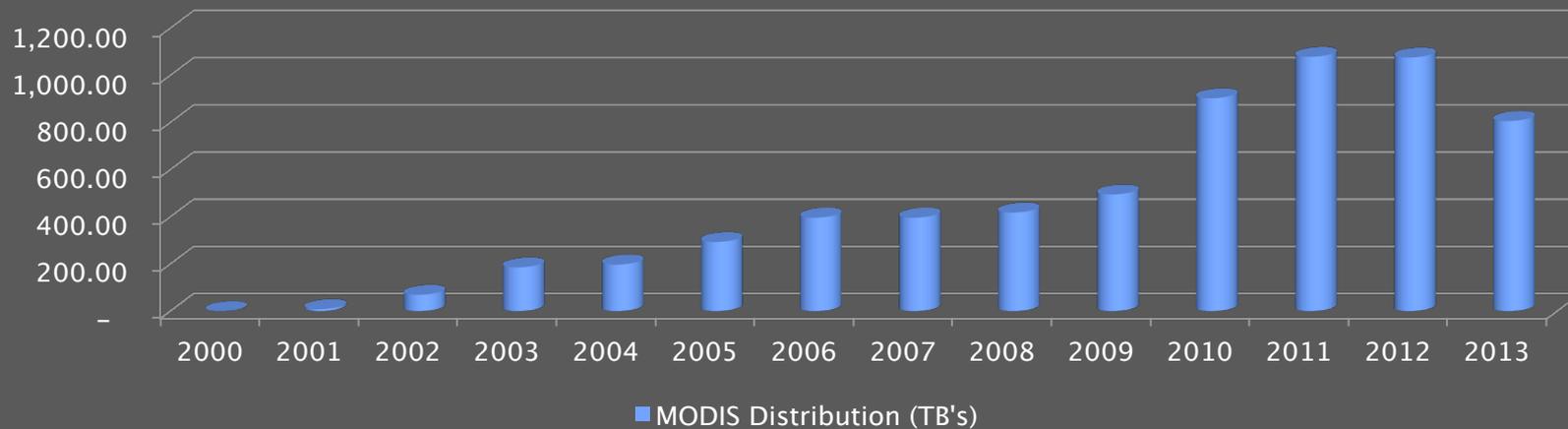


Land Processes Distributed Active Archive Center (LP DAAC)

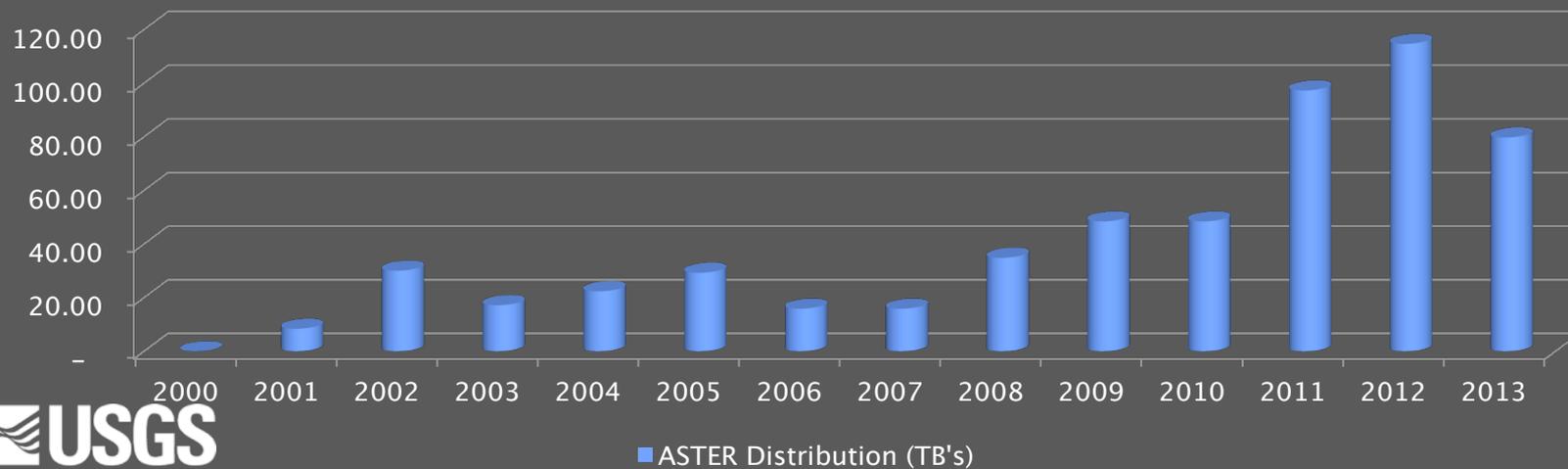
- **Funded by NASA per interagency MOU**
- **First went operational in 1994**
- **Supports two types of instruments and three missions**
 - Other community type data sets (NASA proposals)
 - South Dakota State U. – Web Enabled Landsat Data (WELD)
 - U. of Maryland – Global Forest Cover Change (GFCC)
 - U. of Arizona – Vegetation Index and Phenology (VIP)
 - **Jet Propulsion Laboratory – NASA Digital Elevation Model**
- **Uses integrated set of NASA and USGS systems**
 - NASA systems are owned and Configuration Managed by NASA
 - USGS, USGS contractor, and NASA contractor staff maintain the equipment
- **Data ingested and distributed via USGS networks**
- **NASA pushes hard for technology advancement**
 - 2 PB of NASA data is online
 - 2.5 PB of disk, all data is on spinning disk
- **Data will eventually transition to USGS in the 2020 timeframe**

LP DAAC Performance Metrics

MODIS Distribution (TB's)



ASTER Distribution (TB's)



Accessing Data

- EarthExplorer

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

- Global Visualization Viewer

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

- LandsatLook

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

- NASA ECHO

 - <https://wist.echo.nasa.gov/api/>

- Hazards Data Dist. System

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

