



USGS Land Remote Sensing and Data Sharing Activities

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*Panel Discussion on Earth Observation Satellite Data-
Sharing Policies and Partnerships*

Secure World Foundation/Woodrow Wilson Center

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USGS Roles and Responsibilities

- Remotely-sensed and geospatial information support research and monitoring on **climate and land use change, ecosystems, energy and mineral resources, environmental health, natural hazards, and water resources**
- Federal responsibility to provide notifications and warnings for **earthquakes, volcanic eruptions, and landslides**
- Seismic networks support NOAA's **tsunami** warnings
- Stream gages and storm surge monitors support NOAA's **flood and severe weather (including hurricane)** warnings
- Geomagnetic observatories support NOAA and AFWA **geomagnetic storm** forecasts
- Interagency and International Cooperation for **Enhanced Data Access and Improved Science**

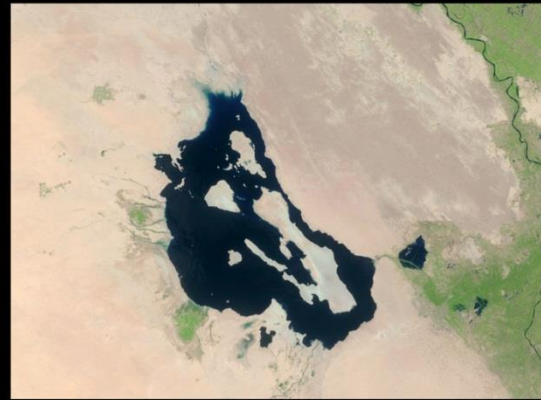


Bahr al Milh, Iran

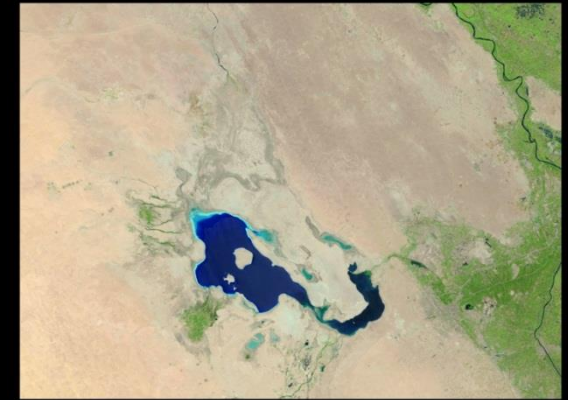
Image Change Sequence From Landsat 5, 7, and 8



Landsat 5
July 16, 1995



Landsat 7
May 11, 2003



Landsat 8
June 15, 2013



Bahr al Milh (also called Lake Razazah) is a salt sea in Iraq, fed by the Euphrates River via canal.

Water levels of the shallow lake vary with the seasons; however, levels have been drastically low in the past decade, as can be seen in these [Landsat images from 1995, 2003, and 2013](#).

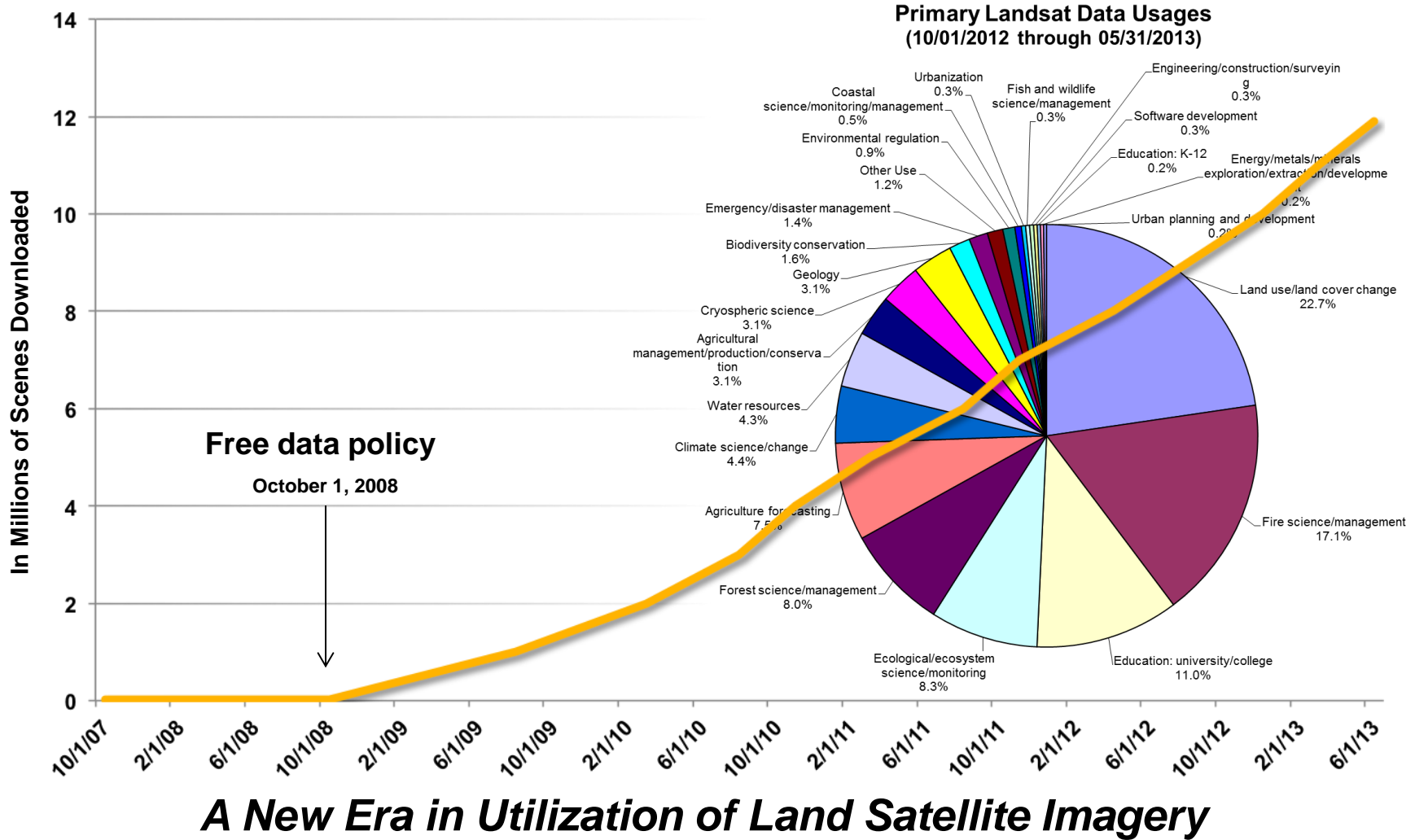
The Landsat archive holds millions of images from the past 41 years, providing all users time series views of all areas of the world. Imagery from the new Landsat 8 satellite continues to add to this vast archive.

Landsat 8 Benefits

- **More image data**
 - 41 year record is extended to 45-50 years, or more
 - 60% more coverage – 400 scenes/day vs. 250 scenes/day with Landsat 7
 - 100% of global data collected goes to the US archive each day vs. ~40% with Landsat 7
- **Better image data**
 - 5x improvement in signal to noise ratios
 - 12 bit quantization
 - Improved cartographic accuracy due to advanced spacecraft geolocation capabilities
 - Provides greater sensitivity to detect changes in surface properties
- **New measurements – and new applications**
 - Coastal aerosol band (0.433–0.453 μm) –detection of water column constituents (e.g., chlorophyll, suspended materials)
 - Cirrus band (1.360–1.390 μm) – improves overall image quality because of better cloud screening
 - Additional thermal band – improves accuracy and precision of temperature measurements

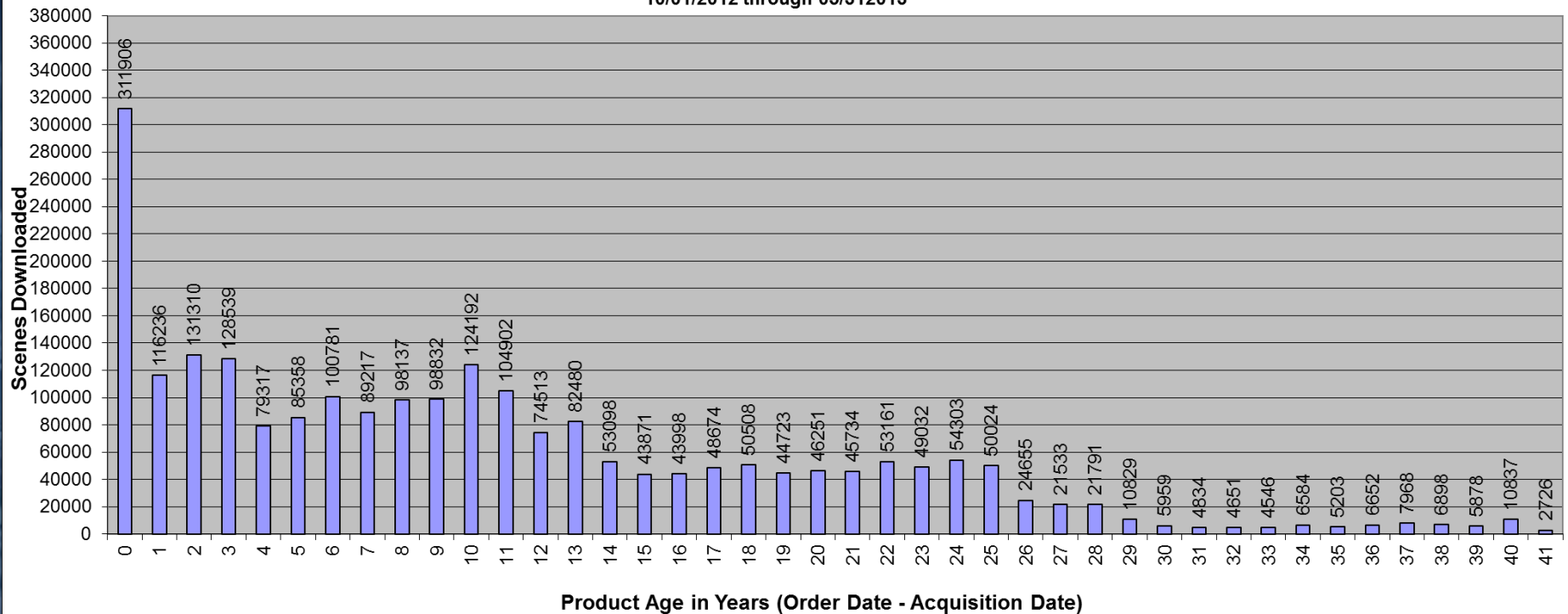
Free, Web-Enabled Landsat Data

The Landsat Experience



Age of Landsat Scenes Downloaded

Standard Product Age
HTTP and Bulk
10/01/2012 through 05/31/2013



Landsat Data: One Estimate of Annual Productivity Savings

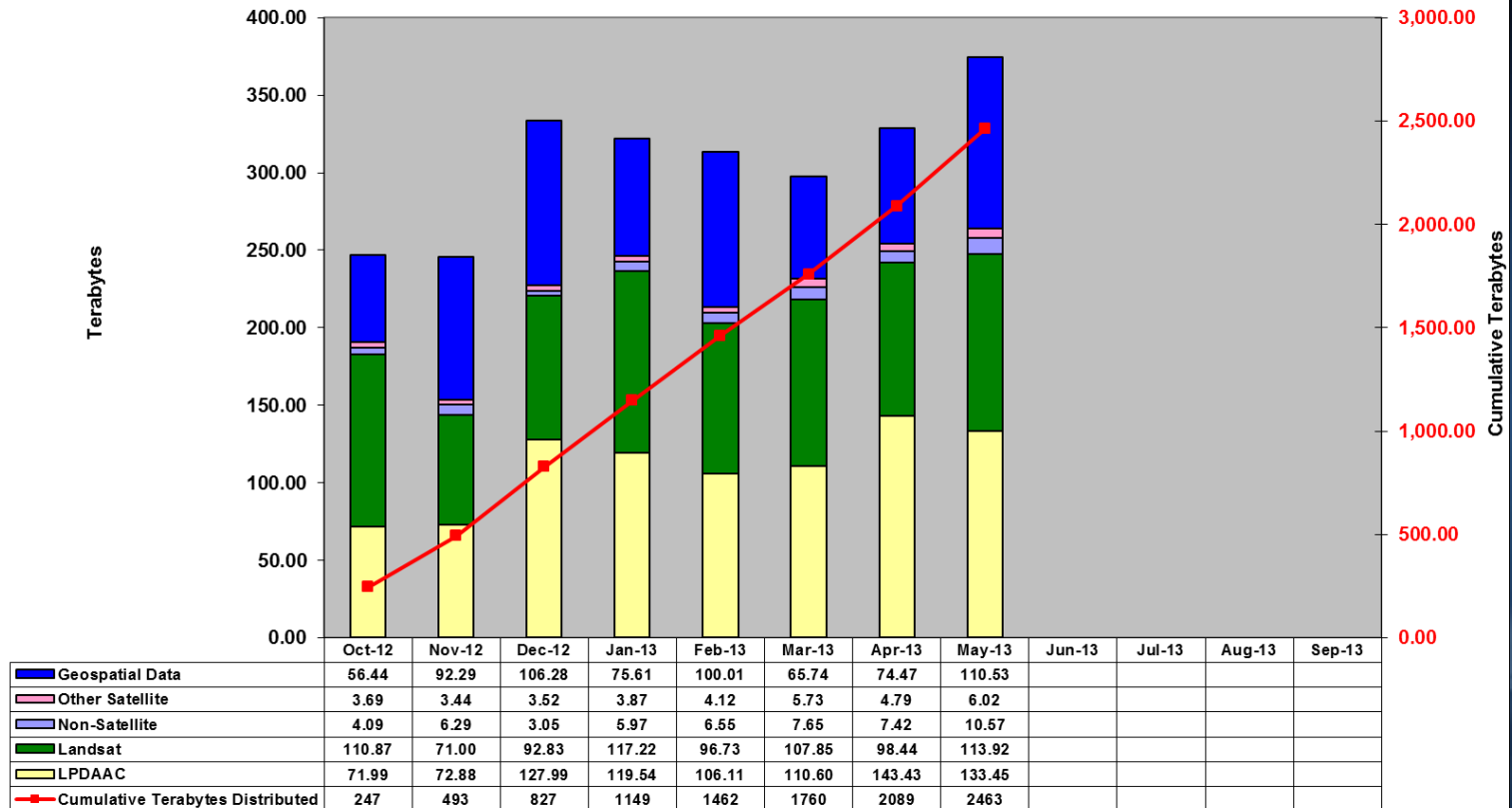
Application	Annual Efficiency Savings
Monitoring Consumptive Water Usage	\$20-73 million
U.S. Government Mapping	Over \$100 million
Forest Health Monitoring	\$12 million
National Agricultural Commodities Mapping	Over \$4 million
Flood Mitigation Mapping	Over \$4.5 million
Forest Fragmentation Detection	Over \$5 million
Forest Change Detection	Over \$5 million
World Agricultural Supply and Demand Estimates	Over \$3-5 million
Fire Management Support	\$28-30 million
Coastal Change Analysis	\$1.5 million

***Annual Economic Value of Landsat far Exceeds
the Cost of its Development and Operations***



A Wide Range of Web-Enabled Datasets

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



Recommendation that Space Agencies Provide to Users....

- Satellite data (imagery) and ancillary data (e.g., DEMs) that are **freely available**, readily consumable and **easily shareable**
- A simple and limited number of interfaces (hardware and software)
- Different data types for purposes of training and capacity building
- Rapidly-generated information/analysis products for situational awareness and decision-making
- Long time series of data/information to support longitudinal studies
- A wide range of satellite data types for advanced R&D
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*The full value of satellite observations
can only be realized when they are
freely available and easily shareable*