



SUSTAINABLE LAND IMAGING ARCHITECTURE STUDY INDUSTRY & PARTNER DAY



Landsat Program Overview

*Landsat 8 – Operational Land Imager (OLI)
image taken May 28, 2013 of the
Copper River – Gulf of Alaska*

U.S. Geological Survey
September 18, 2013

Landsat Mission

Objective:

- Acquire, archive, and distribute multispectral imagery affording global, synoptic, and repetitive coverage of the Earth's land surfaces at a scale where natural and human-induced changes can be detected, differentiated, characterized, and monitored over time.

Importance:

- The importance of Landsat derives not only from current sensor observations, but also from **long-term data archiving, a global data acquisition strategy, an open data policy, rigorous calibration, and a commitment to data continuity.**

Operational Continuity:

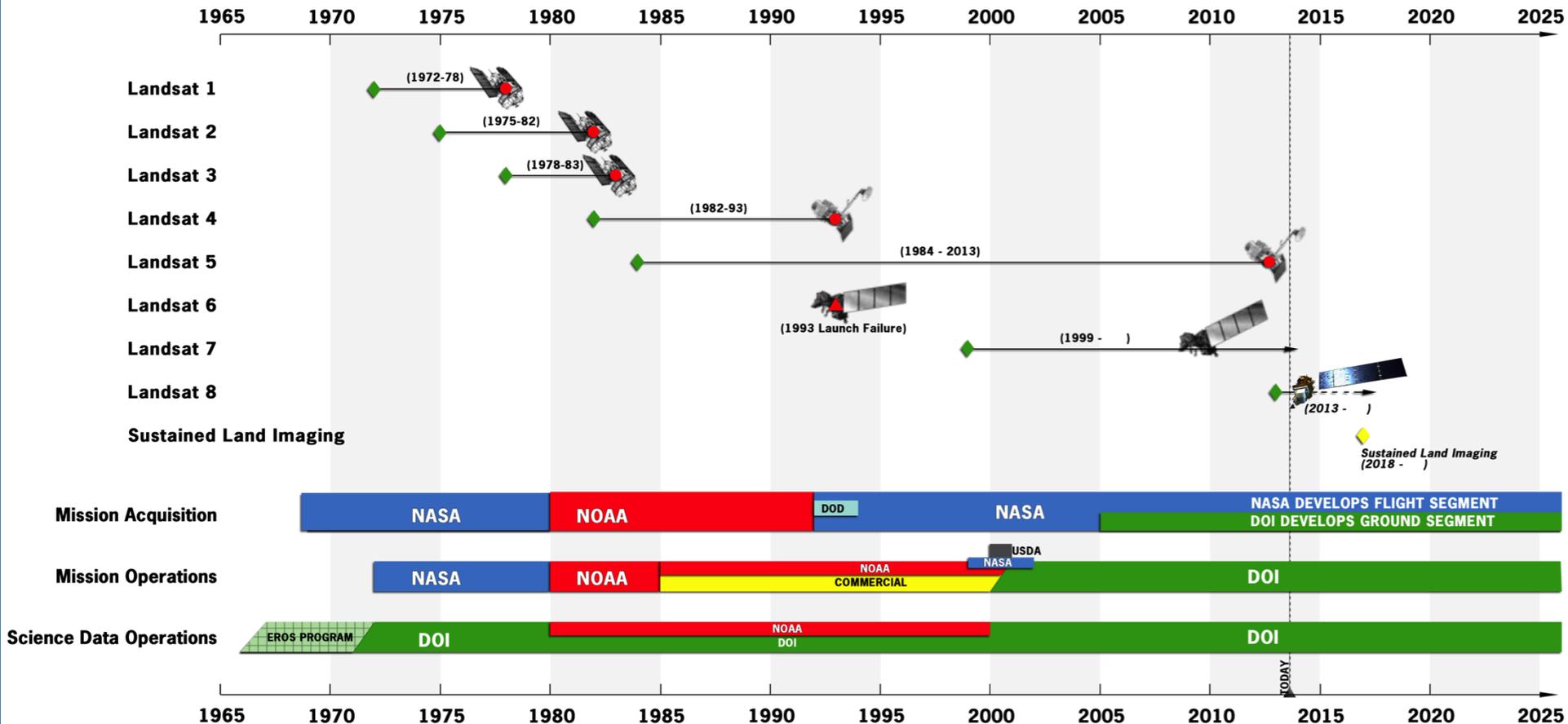
- Following four decades of successful imaging under changing program management structure and objectives, one-off satellite builds, and uncertainty about the future, we are now on a path toward sustained land imaging.

National Space Policy/USGS Responsibilities

The Secretary of the Interior, through the Director of the USGS, shall:

- Conduct research on natural and human-induced changes to Earth's land, land cover, and inland surface waters and **manage a global land surface data national archive and its distribution;**
- **Determine the operational requirements for** collection, processing, archiving, and distribution of land surface data to the U.S. Government and other users; and
- In support of these needs, **the Director of the USGS and NASA Administrator shall work together in maintaining a program for operational remote sensing observations.**

USGS/NASA Landsat Partnership Since 1966



NASA/USGS Landsat Roles

NASA:

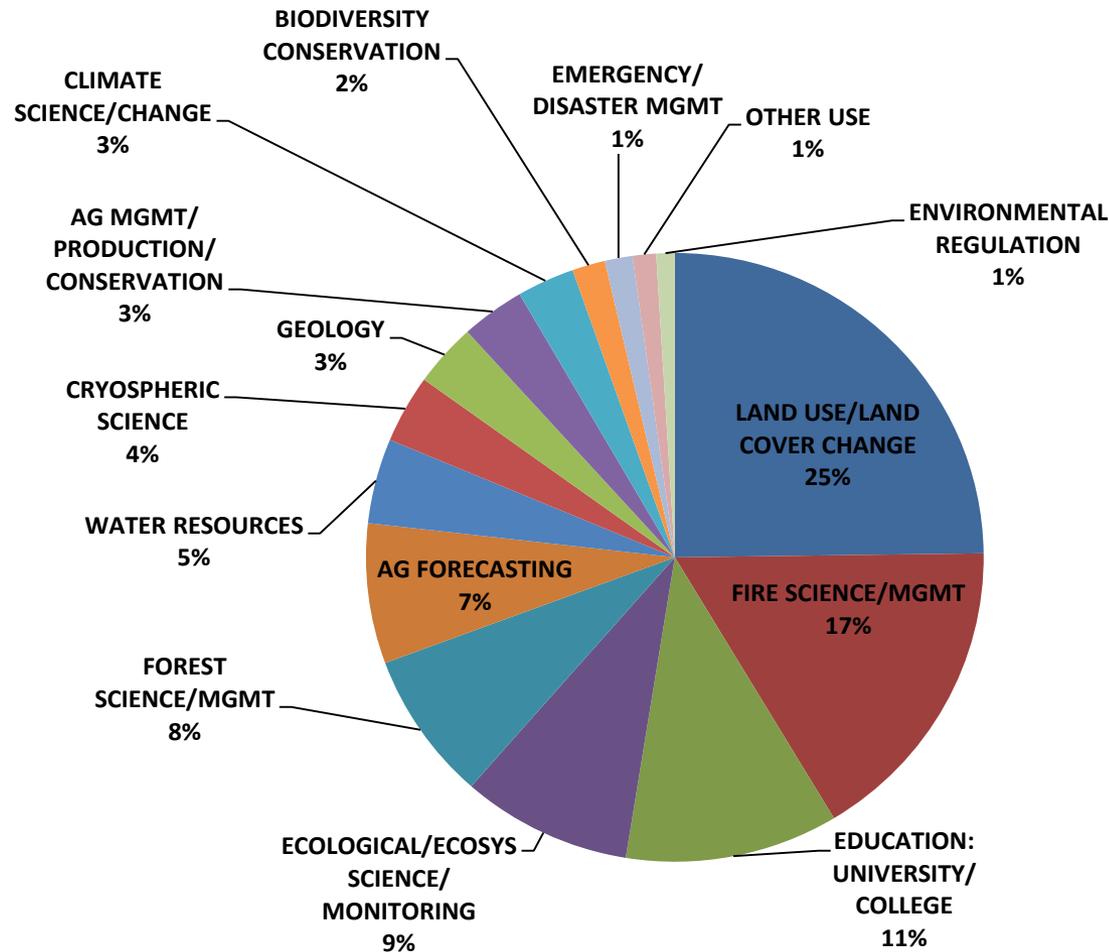
- Develops sensors, satellites, and launches land imaging space systems
- Co-chairs USGS-funded Landsat Science Team
- Performs Earth-system measurements and research using land-image data

USGS:

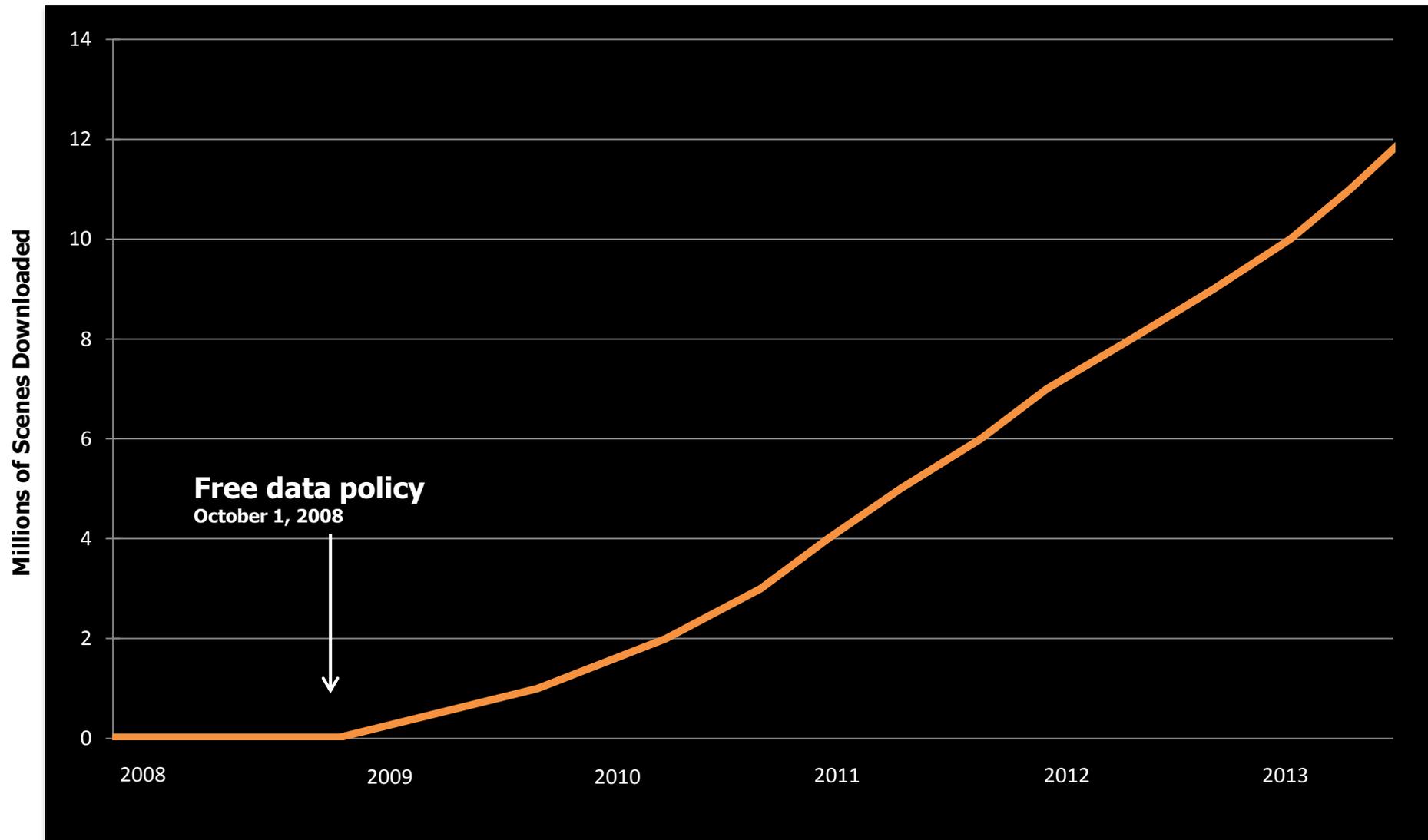
- Documents user land imaging requirements
- Develops ground systems for land imaging space systems
- Operates land imaging satellites
- Collects, processes, archives and disseminates land-image data
 - Establishes global land-coverage acquisition strategy
 - Coordinates International Partner ground receiving station network
 - Distributes data and information products at no charge
 - Develops new data products and applications

Landsat Data Users

Oct. 2012 – Apr. 2013



Increasing Demand for Free Landsat Data



Future Directions

- **In a Landsat 9 timeframe (data acquisition beginning in 2018), there are a few options available that meet requirements, ranging from a clone of Landsat 8 to options requiring new technology development.**
 - These near-term solutions have varying levels of cost and risk
 - Several partial solutions may provide sufficient data to augment the Landsat data stream or partially mitigate a data gap
- **Technology development and demonstration now should significantly reduce costs, improve performance, and/or decrease risks in the timeframe of 2023 and beyond.**
 - A number of promising instrument and platform technologies (including hyperspectral imaging, smallsats, cheaper launch vehicles, hosted payload opportunities, etc.), but significant development required
 - Revolutionary developments underway in ground systems; processing and dissemination approaches will benefit from new concepts and technologies

Key Challenges for the 2013 RFI

- **USGS sees two connected challenges:**
 - **Near-term need for observational continuity given:**
 - Landsat 7 reaching end of fuel in the next 3-4 years
 - Landsat 8 Thermal Infrared Sensor design life of 3 years (Class C instrument)
 - **Long-term need to ensure continuation and continual improvement of satellite-based land imaging**
- **Both challenges need to consider:**
 - **Observational requirements necessary to preserve continuity with the 41-year archive**
 - **Risk tolerances of this operational program**
 - **Goal of lowering the overall costs associated with:**
 - Building, launching and operating future space segments
 - Ground systems and data and information archival processing systems

- http://espd.gsfc.nasa.gov/landimagingstudy/documents/Industry_Partner_Day_Presentations.pdf
- Six speakers from OSTP, NASA HQ, USGS HQ