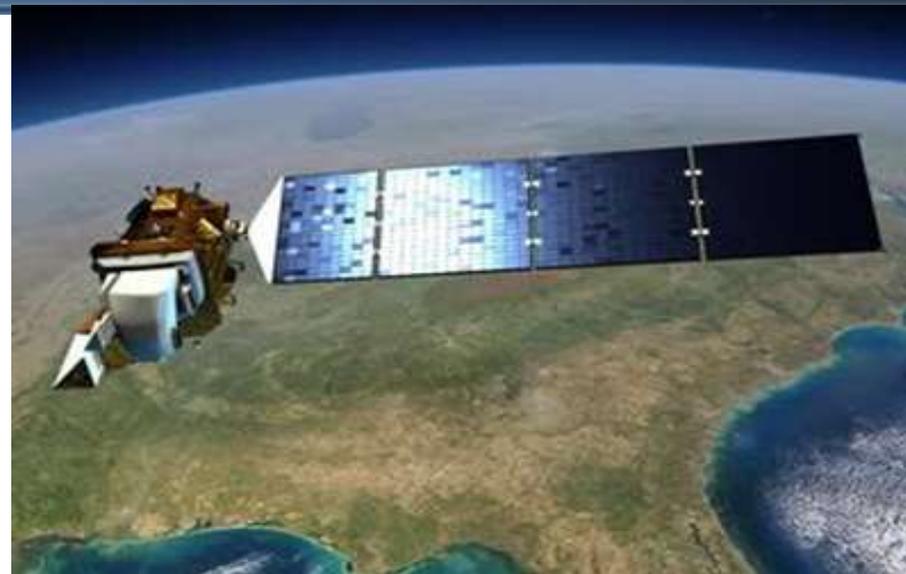




USGS Landsat Program Update

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U.S. Geological Survey
Department of the Interior
September 7, 2017



2018 President's Budget Highlights

2018 LRS budget changes (from 2017 funding levels):

- Landsat 9 Ground System Development (+\$8.3M)
 - Keep pace with NASA for December 2020 launch
- Reduce Satellite Operations (-\$9.0M)
 - Defer non-critical system maintenance, hardware/software refresh
 - Defer distribution of non-Landsat satellite data
- Eliminate National Civil Applications Center [-\$4.8M]
 - Discontinue access to National Systems and Commercial Data to support disaster risk reduction, environmental monitoring
- Reduce Science, Research and Investigations [-\$3.3M]
 - End research into ECVs and CDRs; slow development of new products
- Eliminate Educational Outreach Grant program (-\$1.2M)

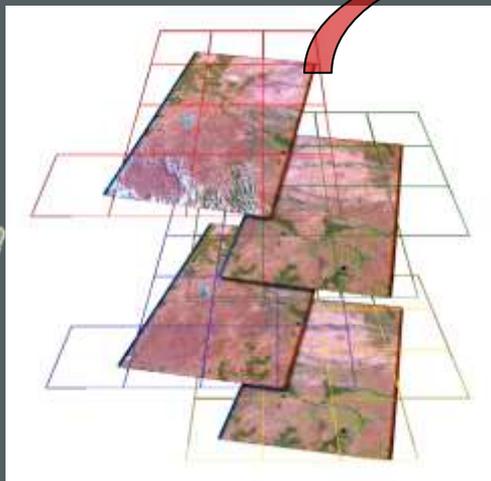
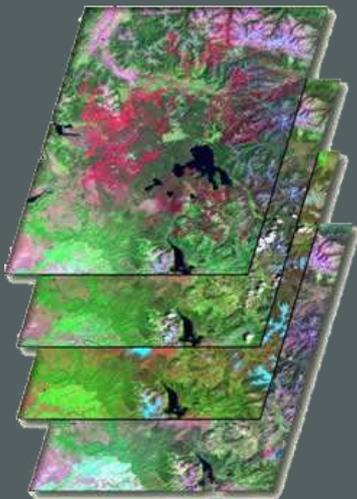
Release of Analysis Ready Data (ARD) for Landsat

- USGS EROS released [Landsat Analysis Data Ready \(ARD\)](#) products (from 1982 to present, for conterminous United States, Alaska, and Hawaii) on October 30, 2017, to make the Landsat archive more relevant for the new generation of Landsat applications.
 - U.S. Landsat Analysis Ready Data (ARD) are consistently processed to the highest scientific standards and level of processing required for direct use in monitoring and assessing landscape change. ***A fundamental goal for Landsat ARD is to significantly reduce the magnitude of data processing for application scientists***, who currently have to download and prepare large amounts of Landsat scene-based data for time-series investigative analysis.

Analysis Ready Data (ARD)

- Data processed to a level that enables direct use in applications
 - Allows geospatial, multi-spectral, and multi-temporal manipulations for the purposes of data reduction, analysis, and interpretation
 - Consistent radiometric processing scaled to TOA reflectance, surface reflectance, and brightness temperature
 - Consistent geometry including spatial coverage and cartographic projection – e.g., pixels align through time
 - Metadata of sufficient detail on data provenance, geographic extent, scaling coefficients, and data type

Initial ARD production is focused on the TM through OLI record (1982 – present) for the U.S., but to eventually back through MSS (1972) and global scale



Landsat Level-1 Collection 1

- **A Collection consists of three data categories: Tier 1, Tier 2, and Real-time.**
 - Tier 1 – LE 12m radial RMSE
 - Tier 2 – GT 12m radial RMSE
 - Real-Time – processed immediately upon downlink using preliminary calibration parameters
 - ETM+ processed to Collection 1 within ~14 days with definitive ephemeris and updated bumper mode coefficients
 - TIRS data processed to Collection 1 within ~14 with updated calibration parameters for position of scene select mirror
 - Real-time data are reprocessed for inclusion into Tier 1 or 2
 - ARD are generated using Tier 1 TM & ETM+ and Tier 1&2 OLI/TIRS

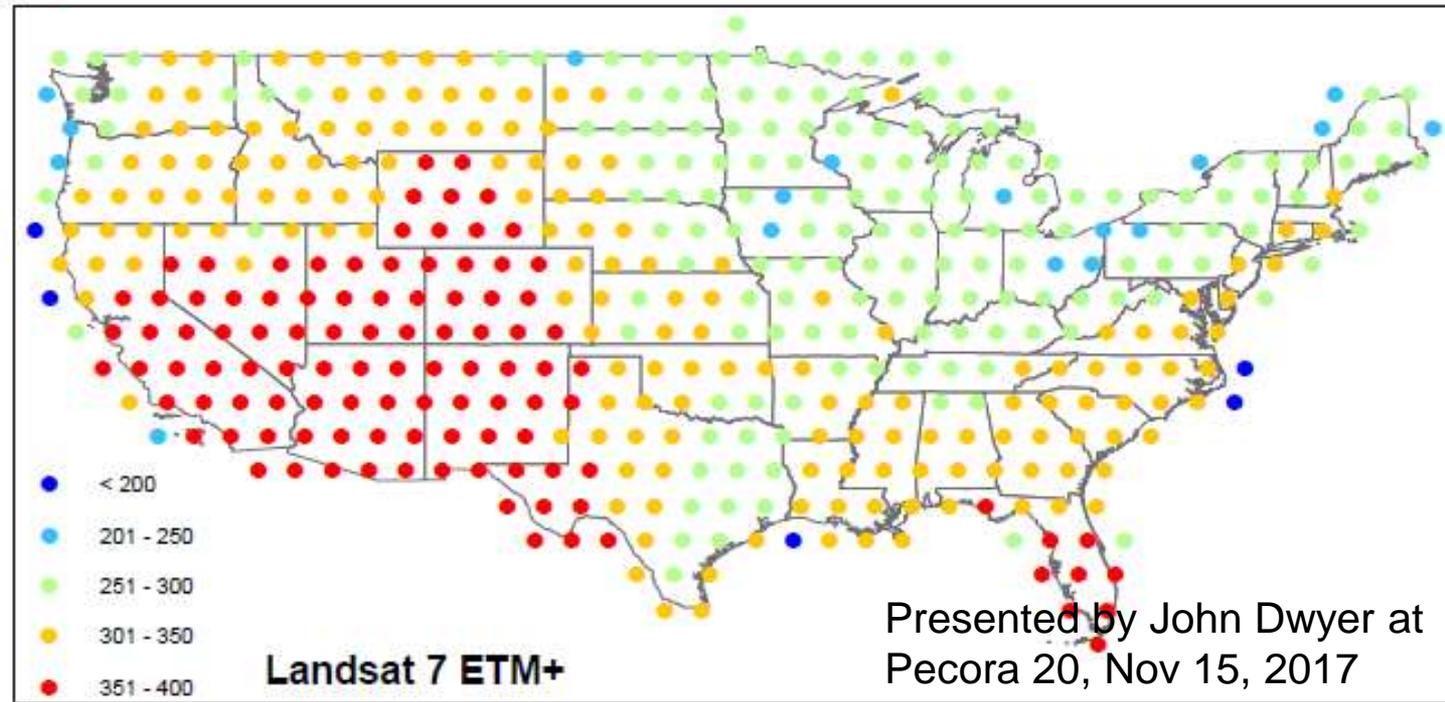
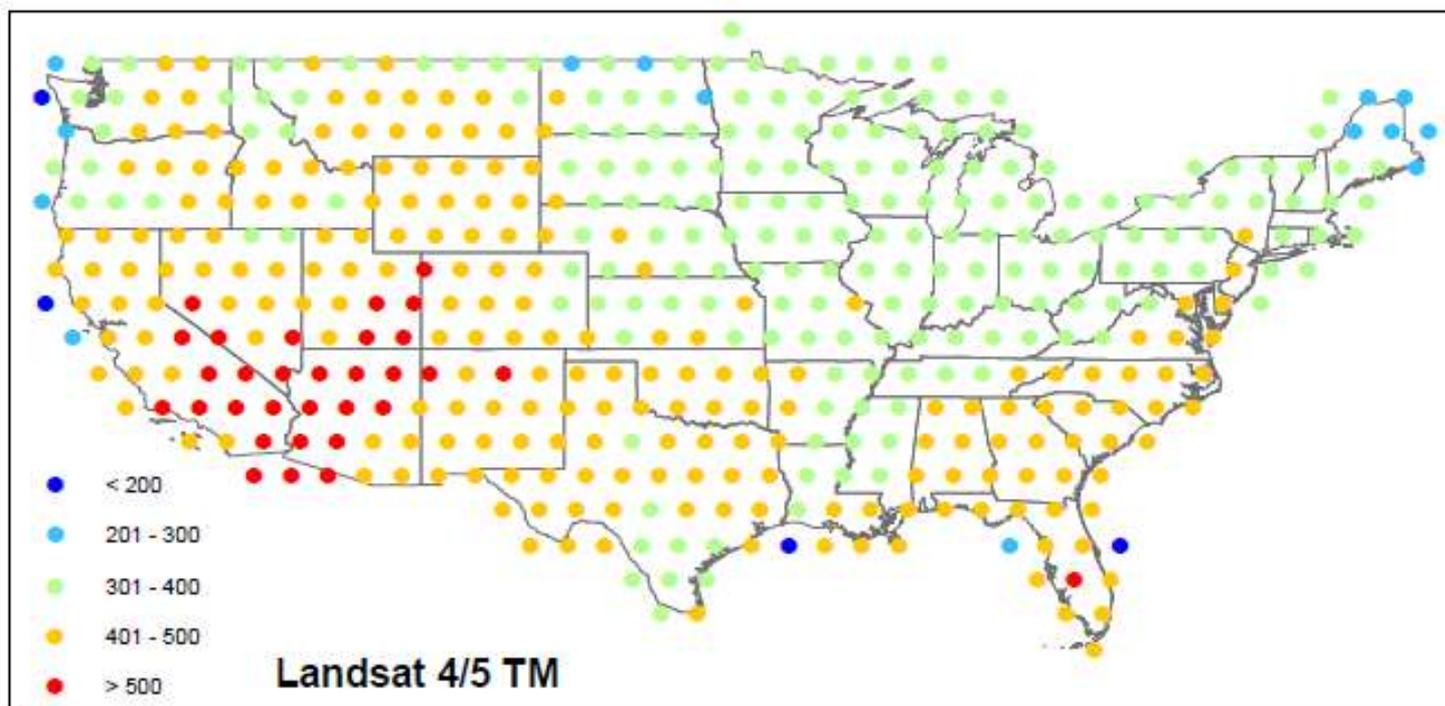


Tier 1 imagery
available in
archive

Landsat Level-1 Collection 1

- Tier 1 LE 12m RMSE
- Tier 2 GT 12m RMSE
- Near Real Time

Archive counts as
of July 25, 2017



Presented by John Dwyer at
Pecora 20, Nov 15, 2017

Investigations due in 2018 to inform follow-on to Landsat 9

- USGS/LRS/RCA-EO User Requirements – Broad and detailed assessment of user requirements from interviews across DOI, USDA and other Federal civil agencies.
- **National Geospatial Advisory Committee / Landsat Advisory Group**
- AmericaView Consortium – Key state and local government requirements
- 2017 Value of Landsat Survey by USGS/Fort Collins Social & Economic Analysis Branch
- Landsat Science Team Report – Integrated expert views from longstanding leaders in the Landsat science community