



USGS Perspectives on Landsat

presented to Landsat Science Team by

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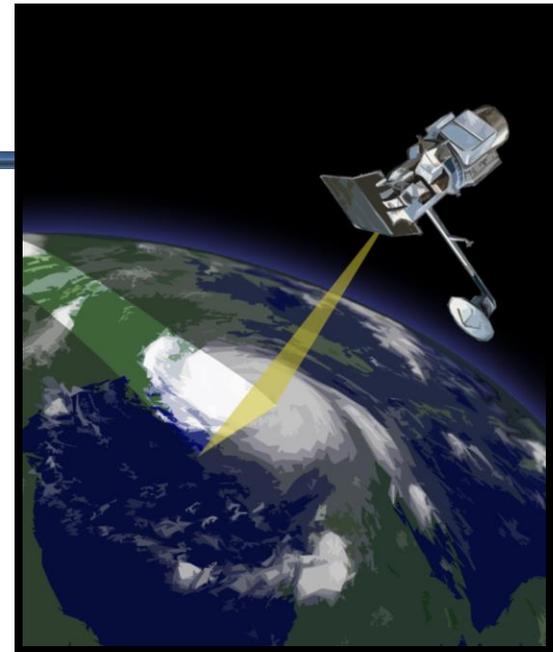
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From the Past: 2010 USGS Perspectives on LDCM & Landsat

- Landsat a high priority for the new Administration (Secretary Salazar and Dr. McNutt)
- Landsat web-enabled data a smash hit!
- Landsats 5 and 7 still soldiering on
- LDCM Confirmed in Dec; TIRS on board; still on track for Dec 2012 launch
 - LDCM Ground System passed its PDR in Sep with no RFAs
 - Ground System funding appears to be in good shape
- Landsat 9 planning underway
 - USGS working with NASA to develop detailed plan called for by Congress
 - USGS planning new L9 budget initiative for FY12
 - Planning to host Requirements Workshops this summer
- New SPOT data on the way
- Beginning early discussions on LDCM-Sentinel-2 Collaboration
- Congress wants Decadal Survey architecture review to better prioritize climate-predictive capabilities and clearly define NASA development and NOAA-USGS operational responsibilities

Today: USGS Perspectives on Landsat

- Landsat remains a high priority for the Administration (Secretary Jewell, Assistant Secretary Gimbel, and Director Kimball)
- Landsat web-enabled data is still a smash hit!
 - Landsat-based information products (i.e., surface reflectance) very popular
- Landsat 7 still soldiering on; 17 years old this year—could last into 2021
- Landsat 8 nearly 3 years old--TIRS issues but OLI working fine
 - Pushing for operational TIRS data by the Spring irrigation season
- Sentinel-2A is launched and the initial data looks great
 - Working to bring Sentinel-2 data to EROS for distribution
 - With Sentinel-2B launch could be 3-4 day multispectral revisit around the world
- Landsat 9 well underway
 - NASA and USGS teams hard at work; targeting 2021 launch and perhaps earlier
 - Ground System funding appears to be in good shape, but 2017 is key
- Landsat 10 and Beyond planning underway
 - USGS developing requirements, tracking NASA technology studies
- OSTP leading second Earth Observation Assessment – delivery this summer
- NRC completed Continuity Study; kicking off new Earth Science Decadal

Challenges

- Establishing a comprehensive, integrated joint-agency “Sustained and Enhanced Land Imaging Program” with NASA, as called for by the NRC Space Studies Board in 2013, capitalizing on NASA and USGS strengths, maintaining current capabilities, and enhancing imaging capabilities and data products via emerging technology
 - Secure consistent funding for current & future needs via effective communication of value
 - Maintain operational continuity of current Landsat missions to minimize any break in revisit
 - Design joint-agency mechanism to effectively conduct joint deliberation & decision-making
 - Invest efficiently in operational systems in response to community user requirements
 - Establish partnerships with commercial firms and international programs
 - Coordinate land-imaging data buys across the Government
 - Conduct R&D for improved data products and new measurement methods
- Maturing and institutionalizing USGS Requirements, Capabilities & Analysis (RCA) processes to significantly expand user need satisfaction across USGS, DOI and the Federal Civil Community
 - Enhance Land Remote Sensing Program products and services to satisfy more user needs
 - Secure new sources of data and information to meet customer needs
 - Drive Land Remote Sensing Program science and technology investigations

The Biggest Challenge? Communications

The key to securing full funding for Landsat 9 is to clearly distinguish between Landsat and the burgeoning commercial Earth Observation small satellite industry. This industry (Planet Labs, Skybox, et al) enjoy superb public relations and strong connections with the Hill. As a result, concerns are being raised with the SLI strategy, particularly with Landsat 9 being a Landsat 8 Rebuild:

- [Hill testimony clip](#)
- Other general concerns with SLI not capitalizing on today's commercial imagery environment, given the selection of Landsat 9 as a Landsat 8 rebuild

We need to be ready to address concerns such as these in our communications within the Administration, on the Hill, and with the General Public.

- Benefits of smallsats to the end-user from the current crop of smallsats are frequent revisit, high resolution, and low cost to field--but these come at the cost of few spectral bands, limited calibration and correction, and less reliability
- Smallsat industry immaturity was a factor behind the Administration's decision to adopt the SLI plan, which calls for building a tried and proven, but state-of-the-art multispectral satellite to ensure near-term continuity for the tens of thousands of current Landsat users who rely on that system to meet their research and operational needs, while also investing in the smallsat and sensor technologies necessary to buy down risk and ensure readiness to reliably contribute in the next-generation Landsat

The Biggest Challenge? Communications

There are encouraging public comments from the commercial EO system providers

- “...at Planet Labs we consider ourselves to be in partnership with the civil government earth observation community every day. For example, we use Landsat 8 data for many critical purposes....NASA and NOAA provide a critical foundation for our activities, and without their publically available data, we would be significantly challenged to accomplish our goals. Moreover, the longitudinal history and reliability of these systems are key for industry to prosper, and for scientists to discover greater understanding of our planet.”
--- **Mr. Robbie Schingler (co-founder Planet Labs)** Congressional Testimony for Subcommittee on Space and Subcommittee on Environment Hearing - Exploring Commercial Opportunities to Maximize Earth Science Investments, Nov 17, 2015.

We need a concerted communications campaign, emphasizing the widespread benefits of the Landsat program but also clearly delineating the differences between Landsat and the new earth observation smallsats, as well as the way this industry relies on Landsat

Asks – Improving the global Landsat/mod-res record

- Landsat and Sentinel together make a potent source for higher-rate multispectral observations
 - There continues to be strong user demand for higher-temporal coverage
 - It's time to show the advantages; by the end of 2016/early 2017 we may have 3-4 day multispectral revisit for virtually any land surface on Earth
 - We need a plan to evaluate the benefits from the quality and frequency of this collection capability
- Next Generation Data Product
 - Does L1T remain the standard product of the future, or is it TOA, SR, ARD or something else? We're currently designing the next generation production system; what is the standard product of the 2020s?
- For Land Change Monitoring Assessment and Projection (LCMAP), is Continuous Change Detection & Classification (CCDC) the starter app?
 - Need to show what benefits can be derived from the information from CCDC
 - Need to create new temporal dataset exploitation techniques
 - Need help understanding how USGS can better open up the archive

Backups

FY16 Budget Language

- NASA: “NASA shall develop Landsat-9 as a copy of Landsat-8 and shall maintain a target launch date of calendar year 2020. The agreement reiterates House and Senate language regarding the Thermal Infrared Free-Flyer. NASA is encouraged to continue technology development activities that will reduce the cost of Landsat-10.”
- USGS: “The bill provides...an increase of \$4,300,000 for Landsat science activities for Landsat 9 and no funding for the free flying thermal infrared instrument.”

USGS Land Remote Sensing Program Goals

- **Goal 1 - Operational Capabilities:** *Implement, maintain and optimize operational capabilities to acquire, produce, preserve, and deliver land remote sensing data products and services to address Earth observation requirements.*
- **Goal 2 - Research, Development and Innovation:** *Sponsor science research and investigations, and apply technological innovations, to improve and develop LRS products and services, to meet user needs and enable scientific research and applications.*
- **Goal 3 - Product and Service Management and Innovation:** *Collaborate with strategic partners and end users to develop agreements, funding approaches, and products that will create the highest potential value for the LRS user community.*
- **Goal 4 - Customer Engagement and Communication:** *Ensure that LRS Program products and services are well known, understood, and available to the broadest constituency in order to maximize a tangible return on investment and provide the greatest value to the remote-sensing community.*

Practical Framework for Space-based Global Change Research (2010)

