Land Processes DAAC Future and Strategy   **7/7/04**

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Current Events

NASA is in the midst of a significant reorganization driven by concern over the lack of progress in NASA human space flight and launch technology programs and their impact on the US. In addition to the current published NASA plan to reduce Earth Science funding by 14% over the next four years[1], the Agency is moving it's focus away from the Earth, and it is possible that that puts Earth Science (as opposed to planetary science) at increased risk.

Also, the Congressionally mandated and Presidentially appointed US Commission on Ocean Policy[2] has recently recommended (among other things, and so far only in a draft report) that all earth remote sensing satellite operations should be moved from NASA to NOAA. NASA would focus on technology and sensor development, science, and continue satellite development and launch if necessary. All that work would be closely coordinated with NOAA and stacked up against national operational requirements. Ground processing and public distribution is not specifically addressed, but would likely also be transitioned to NOAA.

In addition to and even preceding these developments, NASA appears to be favoring smaller and more distributed data centers in order to add flexibility to the systems, responsiveness to the science community, and hopefully lower costs to NASA. The current DAAC system of relatively large discipline-specific data centers is not being reinforced with new missions and work.

The desire for this shift to smaller and more distributed data centers is tempered by the difficulty that the more distributed approach has with several key problems: data management of very large archives particularly across competitive award boundaries, user service to the public, decreased ability of users to find data in multiple diverse user interfaces and metadata models, and so on. A key caution is that the public and Congress in the past were significantly dissatisfied with the more distributed model, but today are generally satisfied with the current, less distributed EOSDIS model[3].

Nonetheless, the less distributed EOSDIS 'adaptive processing' model in place since 1996 or so has much room for improvement. The current thinking at NASA seems to be to move from 'missions to measurements', with the "measurement teams" responsible for integrating data from multiple sensors. How many

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[1] The FY04 $1563K figure is the Earth Science budget minus earmarks. The minimum is $1343K in FY08. See p. 15 of http://www.nasa.gov/pdf/55522main_FY05_Budget_Briefing020304.pdf.

[2] See http://oceancommission.gov/ for background and the draft report.

[3] See the recent American Customer Satisfaction Index Survey (a one page description of this survey is appended to this white paper).

measurement teams (One for each measurement? One for each discipline?) is still being worked out, but the general idea is to make the measurement teams responsible for all functions including data management, distribution, and user services. Whether the measurement teams will do that themselves, be encouraged to work with the DAACs, be mandated to work with the DAACs, or allow anyone including the DAACs to competitively bid is still TBD. Current practice seems to be to leave it up to the measurement team.

The difficulties in correcting the weaknesses of the current model without losing its strengths are significant enough that NASA has been working on it for over five years without success. While work continues on trying to define what the end result will be, a tiger team has recently been set up to define where EOSDIS should go from it's current state. This team, called the "EOSDIS Evolution" tiger team, has just formed; and Vanessa Griffin / ESDIS and Michele Ferebee / Langley DAAC represent the DAACs.

For the LP DAAC, the good news is that we are continuing to do good work for our users and for NASA. The not-so-good news is that the future is uncertain due to the shift away from DAACs, and doubly uncertain with the major transformation NASA is going through.

What does this mean for the LP DAAC and the land remote sensing community?

Given this uncertainty, and the limited ability of the LP DAAC to influence these events, what should we do?

The LP DAAC Strategy

The LP DAAC held an off-site meeting attended by the LP DAAC leadership team to discuss the future of the LP DAAC. Senior managers from the US Geological Survey's (USGS) EROS Data Center (EDC) attended in order to give us the benefit of the latest thinking of the USGS, to enable the LP DAAC to remain aligned with it's host institution.

First, we decided that having an LP DAAC was still better for users, the USGS, NASA and the taxpayers than not having an LP DAAC. Second, after much discussion, we made some small but significant changes in our strategic goals. The new ones are:

1. **Act as advocates for our users and customers on with respect to the LP DAAC and Long Term Archive (LTA), specifically regarding NASA land remote sensing data.**

    This is the only new goal, yet it recognizes the need for us to be more proactive in defining and planning our future. To carry out this goal, we will

have to know more about who are users are, and what data, products, and services they want.

One restriction that remains, however, is that we currently obliged to focus on NASA and NASA data sets. Work that is not related to NASA in any way will likely be transferred to other parts of USGS EDC.

2. **Do an outstanding job for our users (i.e. people who need our data and services).**

   Not only will user service remain a high priority for us, but also we need to be more proactive and make sure we have the data, products, and services they need (with an emphasis on easy access).

   There will be significant cost pressures in the future, and the challenge is to continue to offer good service to our user community.

3. **Do an outstanding job for our customers (e.g. NASA).**

   Customers want their users to be satisfied with their products and level of service, low cost of operations, a reliable partner, access to a long-term archive, and the chance to explore advanced technology and operations efficiency (NASA in particular is interested in this).

   In the near-term, NASA is very interested in our ability to reduce our costs while maintaining our level of service. In addition, we can also help NASA reduce costs elsewhere by transitioning software and knowledge to other DAACs and organizations.

   In addition to incrementally improving our existing systems on our own, we have also started working with Raytheon to reduce the operations cost of ECS, and have begun looking at alternative system architectures to see if other options offer increased savings.

4. **Enable the transfer of data into the Long Term Archive (LTA).**

   In the offsite meeting, it became clear that while we can act as an advocate for our customers with the LTA, it is not our responsibility to define what the LTA wants to do and how they want to do it.

   However, it is our job to facilitate definition of the data and level of service requirements expected of the LTA. Our job is to focus on supporting our users and customers to the best of our ability.

5. **Transfer knowledge about systems, data, practices, and processes to the USGS and our customers.**

This is particularly important inside the USGS and EDC. We are trying to integrate the lessons learned in the LP DAAC into other USGS EDC projects. On the other hand, there are some significant things going on in the USGS EDC that are helping the LP DAAC, such as OGC services (e.g. Seamless Distribution System) and new user interfaces (e.g. GloVis).

What Does The LP DAAC Plan To Do Differently Now?

Given current events and our new strategy, the LP DAAC will be more proactive in the future. Things to be more proactive at include:

1. Do better analysis of who our users are and what they need/want.

2. Instead of just working the missions that are given to us, investigate which missions and data sets would benefit our users where we can add value, and how do we pursue a role in those missions.

3. Instead of just using systems that are provided to us, explore whether those systems are the most appropriate and cost-effective for our mission.

4. If we think we can support our current and future customers in more innovative ways to further their goals (e.g. higher quality, lower cost, easier transfer to the LTA, etc) while helping our users and staying within the mission of the USGS EDC, pursue that opportunity.

These actions are relevant regardless of the path that NASA takes. Advice is welcome.

The Long Term Archive

The DOI USGS Geography Discipline, of which EDC and the LP DAAC are a part, is not as turbulent as NASA is right now, but faces challenges of it's own. The focus of the Geography Discipline is on *The National Map*, and its attention to satellite data systems is focused on Landsat 7. The Landsat 7 anomaly has resulted in a significant funding shortfall for the USGS, and there has been a lot of Agency, Bureau, and Congressional communications going back and forth. The USGS EDC has had to struggle to maintain its science programs and data systems throughout FY04 due to shortfalls in data sales for Landsat 7 and other product lines. This problem has just recently been satisfactorily resolved (we think) for FY04, but FY05 has not been addressed yet.

A funding initiative for the LTA in FY06 was proposed, and subsequently merged into a Terrestrial Monitoring funding initiative. That initiative is currently working it's way through the system.

In FY04 the LTA has been occupied with preparing to close down it's chemical photographic processing capability (long a mainstay at EDC), previously required for aerial photography dating back to the 1940s and used for satellite data as well. Some very innovative, interesting, and low-cost technology has been implemented, and digital photographs (captured with digital cameras and high resolution scanners) will be the primary product starting in FY05. This change has been driven partly by a desire to improve customer service, but primarily by a need to reduce cost.

At the last Science Advisory Panel meeting, the SAP took an action to send a letter to USGS Director Chip Groat regarding the Long Term Archive. The letter was written by the SAP, reviewed at the USGS EDC, and just recently sent out.

We expect more activity on this in the near future.

Results from the American Customer Satisfaction Index Survey

- EOSDIS received an overall score of 75 on the American Customer Satisfaction Index, the #1 national economic indicator of customer satisfaction.
  - ACSI survey and analysis performed for ESDIS by the National Quality Research Center at the University of Michigan through a Federal Government Contract with the Federal Consulting Group at the Department of Treasury (IAA)
- ACSI provides a normalized index based on modeling of customer satisfaction survey responses that allows benchmark comparisons to other government agencies and industry organizations
  - ACSI currently used by over 40 industries, 200 organizations, and 70 federal agencies
- EOSDIS received a good ACSI score
  - EOSDIS scored 4 points higher than Federal Government Average of 71
  - Also slightly above the average for industry (74)
- ACSI maps the "impacts" of key customer "benefits" to their satisfaction, thus providing feedback on key areas of focus that would increase customer satisfaction
- Over 1016 EOSDIS customers responded to the survey (out of 9,999) and were included in the ACSI analysis and results
- EOSDIS ACSI analysis shows that EOSDIS provides "world class" customer service, scoring a 84 in Customer Support and 84 in Product Delivery (both very high scores)
  - Customers inside the US gave us significantly higher (88) scores than our international customers (82)
- Lower scoring "quality drivers" included Product Search (70), Product Selection and Order (73), and Product Quality (68) (although all were still good scores)
  - Key areas where we could target improvements (to increase ACSI score) include data documentation (content and ease of use), ease of finding/accessing data and ease of using search capability, and ease of identifying appropriate data products.
- Customers indicated that they would be very likely to:
  - Use EOSDIS in the future (score of 90 on a 100 point scale)
  - Recommend use of EOSDIS to a colleague (score of 86 on 100 point scale)
- EOSDIS will conduct annual surveys to measure changes in ACSI that result from our efforts to continuously improve our customer support and data systems.