International Open Government Data Conference

Technologies for Transparency—Dynamic Open Data Publishing with Open APIs

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The Lunar Mapping and Modeling Project

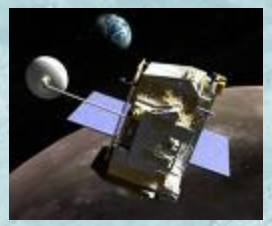
The Moon within Reach

Project Background & Overview

- The Lunar Mapping and Modeling Project (LMMP) was initiated in 2007 to help in making the anticipated results of the Lunar Reconnaissance Orbiter (LRO) spacecraft **useful** and **accessible** to future missions, to the public and to other future applications
  - The LMMP is managing and developing a suite of lunar mapping and modeling tools and products
- New instruments are giving us amazingly dense data sets
- The most highly detailed view of our Moon we have ever seen
- New discoveries altering the way with think about the Moon and our solar system

Multiple Global Data Sources

- LRO (USA)
- Kaguya (Japan) gravity model data)
- Chandrayaan-1 (India)
- Clementine (USA)
- Lunar Prospector (USA)
- Apollo (USA; metric & panoramic cameras)






Multiple Global Customers

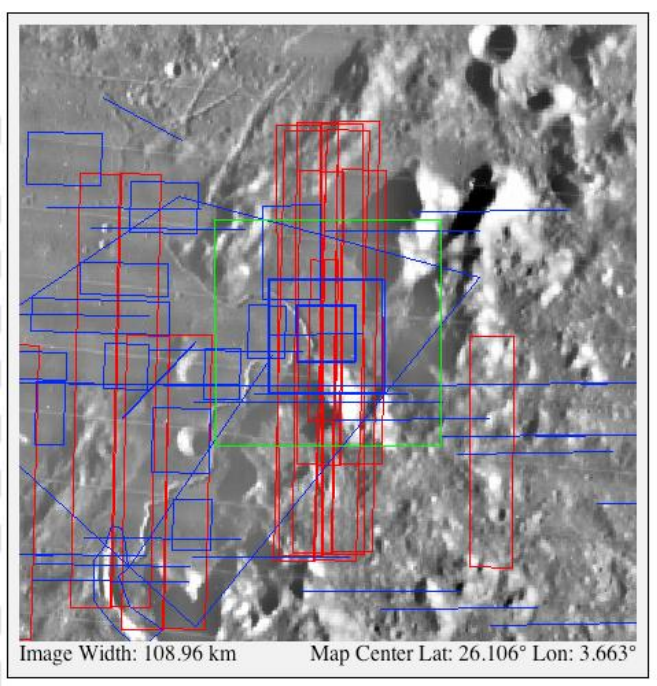
- The information provided through LMMP will assist them in:
  - planning tasks in the areas of landing site evaluation and selection
  - design and placement of landers and other stationary assets
  - design of rovers and other mobile assets
  - developing terrain-relative navigation (TRN) capabilities
  - assessment and planning of science traverses
- The science communities
- The commercial community (e.g. Google Lunar X-prize, gamers)
- Public Engagement & Education communities!

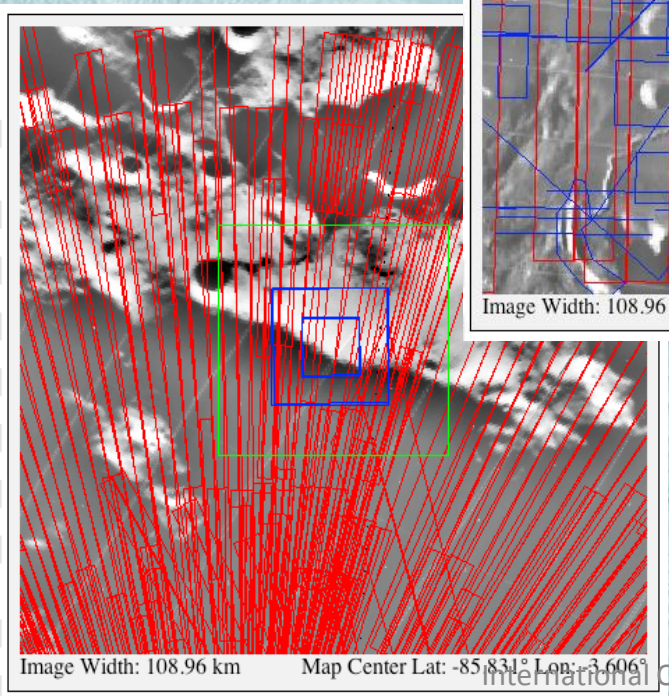
Participatory Exploration: It's fundamental to NASA's core mission

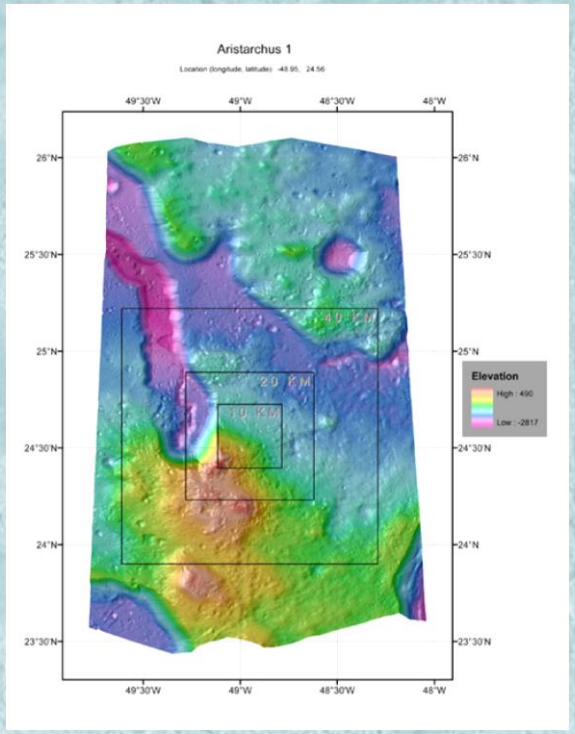
- Portal will be available to provide interactive capabilities
- Downloads of data encouraged; APIs to be published

Combined Sources Create Digital Elevation Models

Local DEMs from LRO Camera (LROC) Narrow Angle Camera (NAC) covering 50 mission regions of interest (ROI)





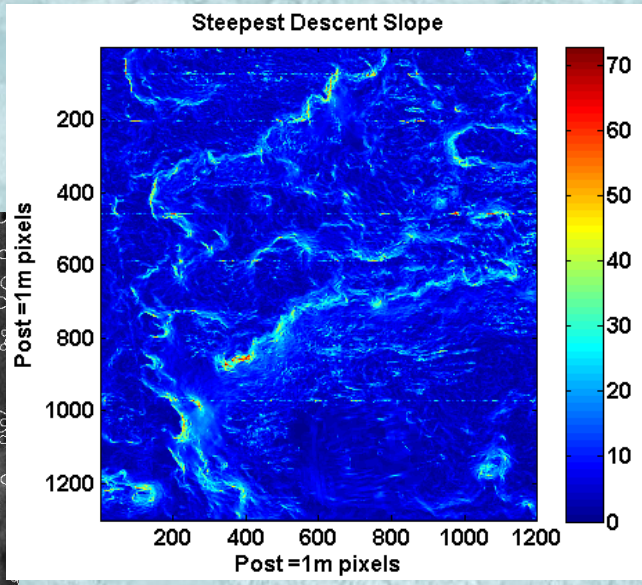


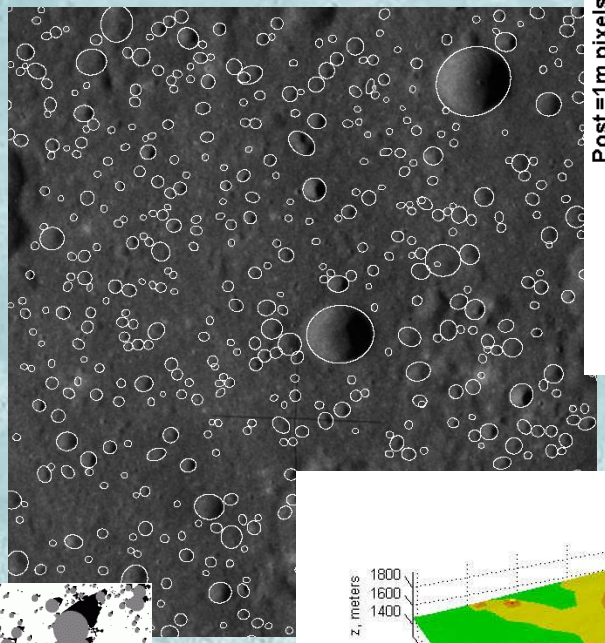
Preliminary USGS Aristarchus Plateau (DEM 1) from JSC/ASU Apollo Pan Cam Scans

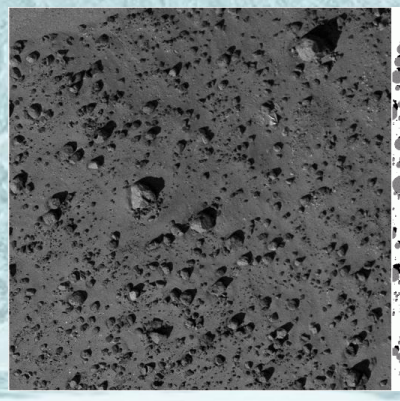
Malapert Mountain (left) and Apollo 15 (right) ROIs showing in red the NAC images acquired through the 1st month of mapping orbit

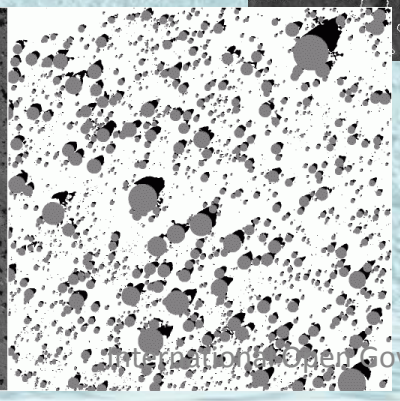
Created Products - Hazard Maps

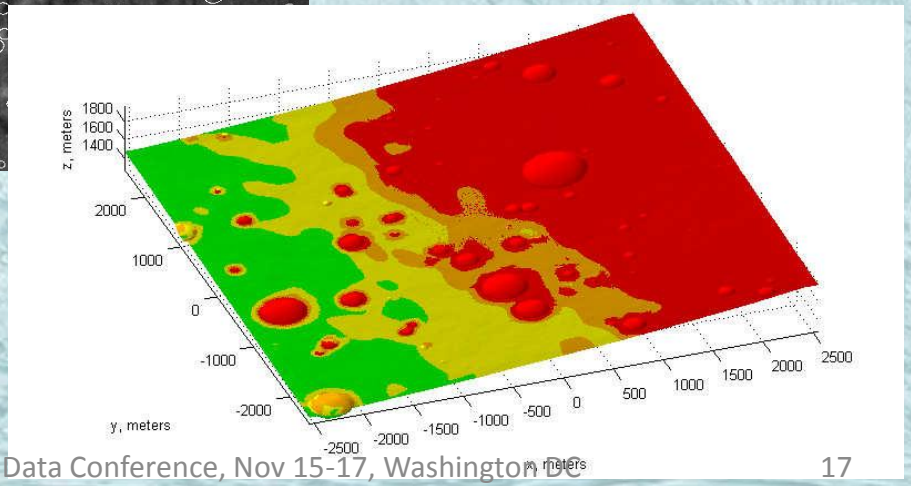
- Craters
- Boulders
- Slopes
- Surface Roughness



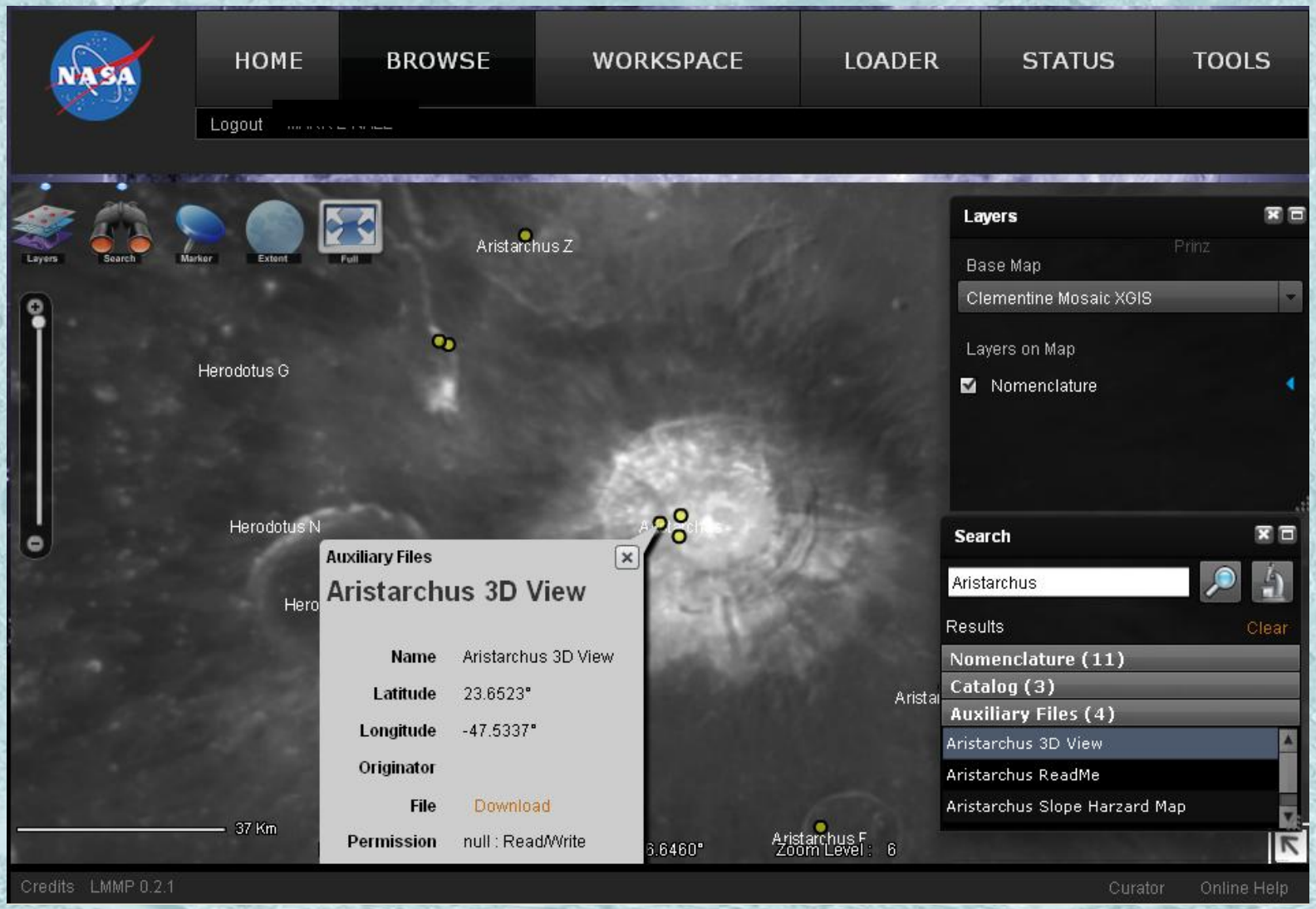




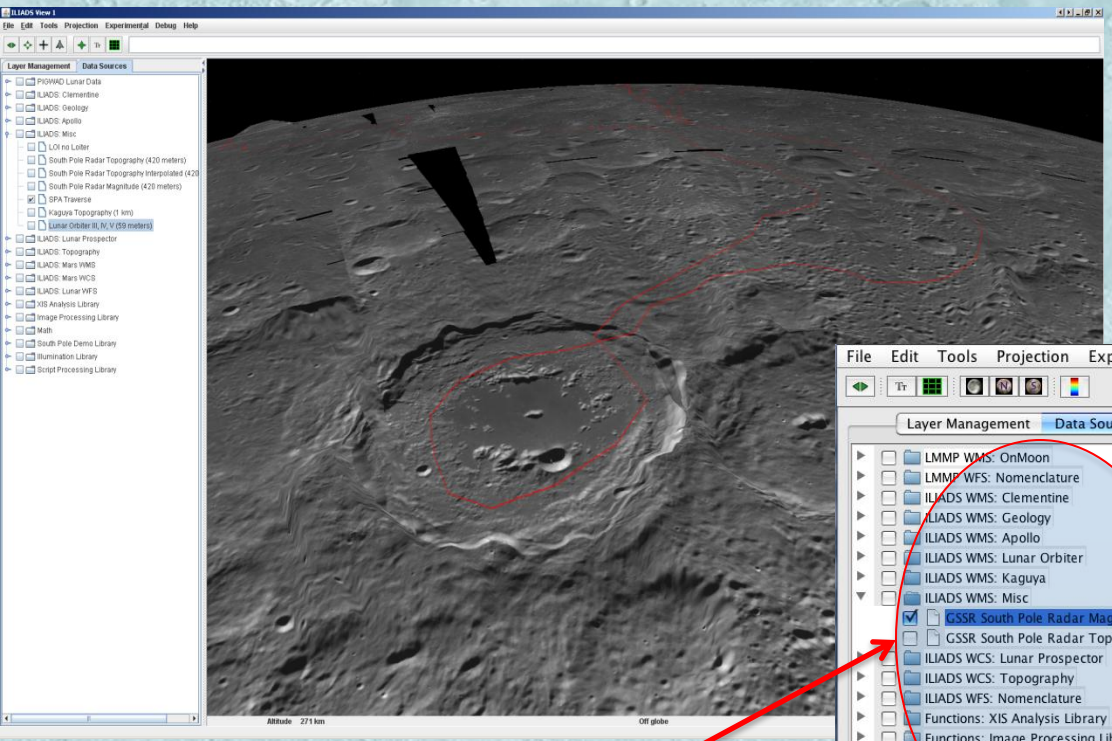




Search, Locate & Download Auxiliary Files

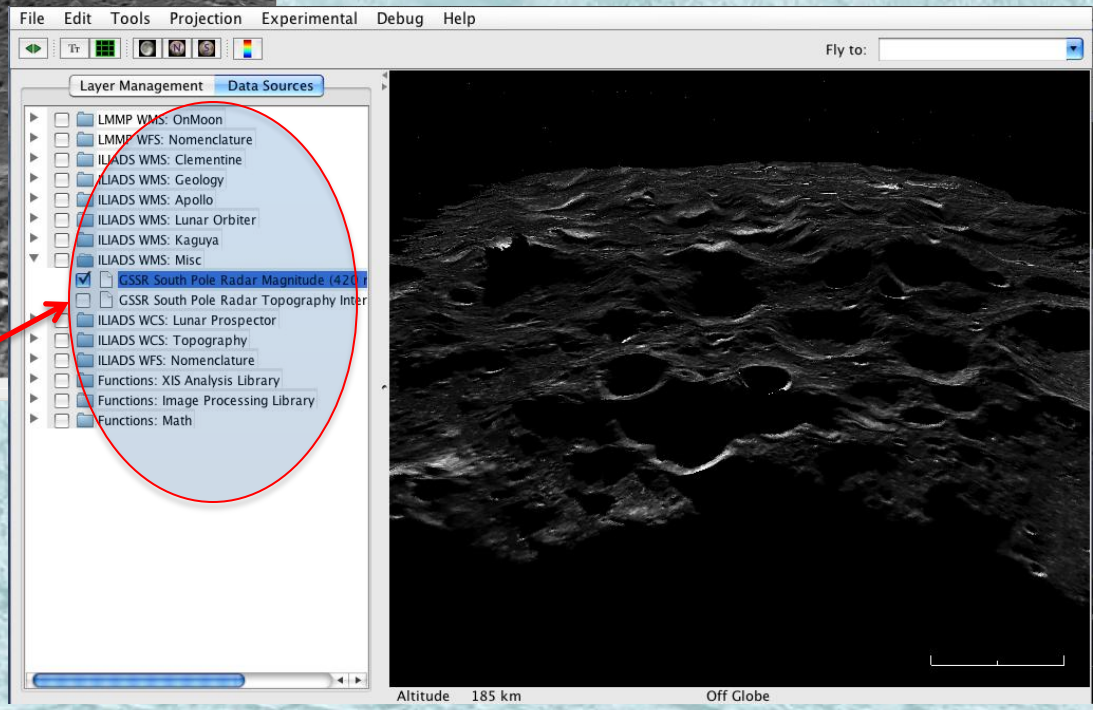


Plan Your Trip To The Moon
Integrated Lunar Information Architecture



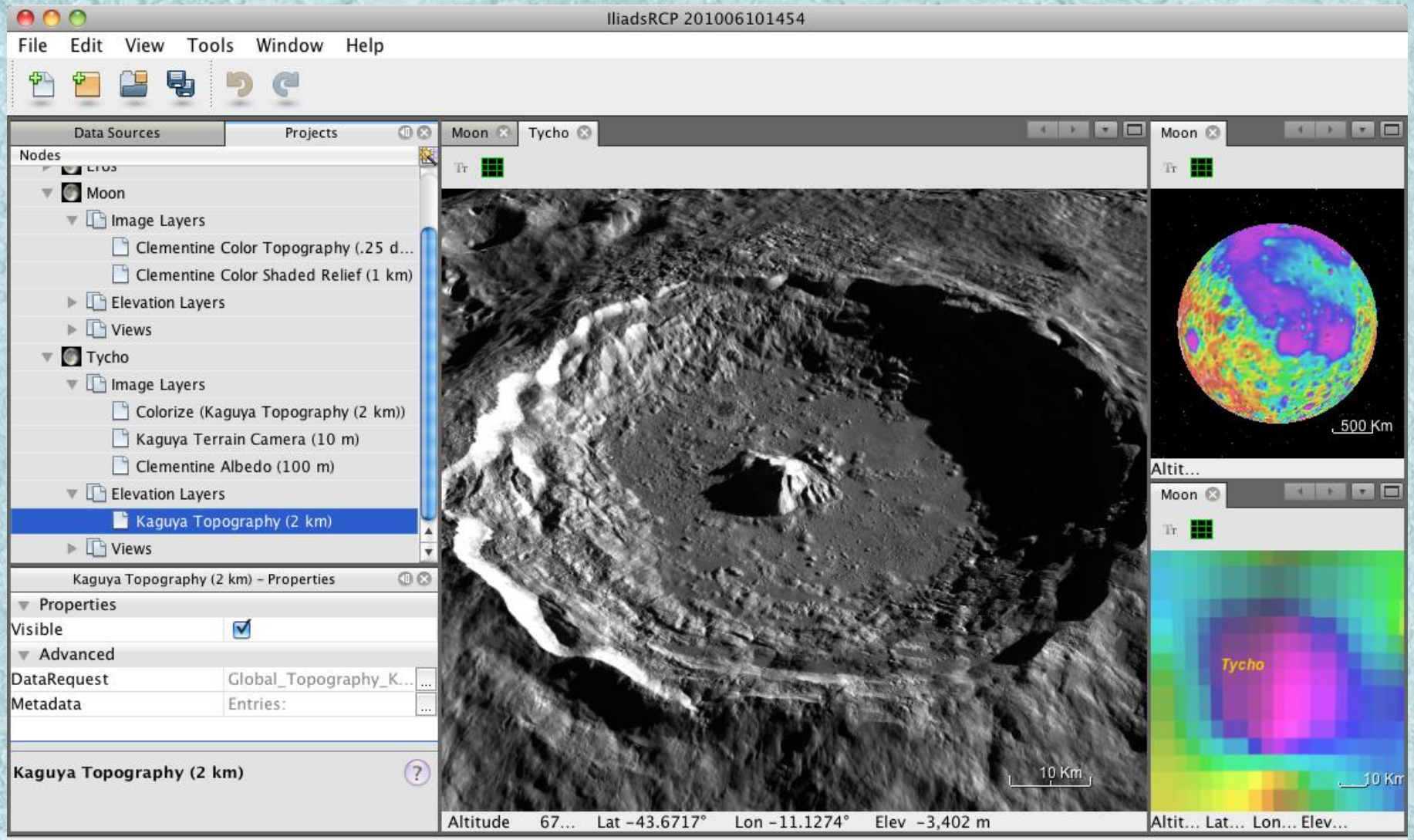
Lunar Surface Traverse Tool
(oblique view)

Goldstone Radar of South Pole
(oblique view)

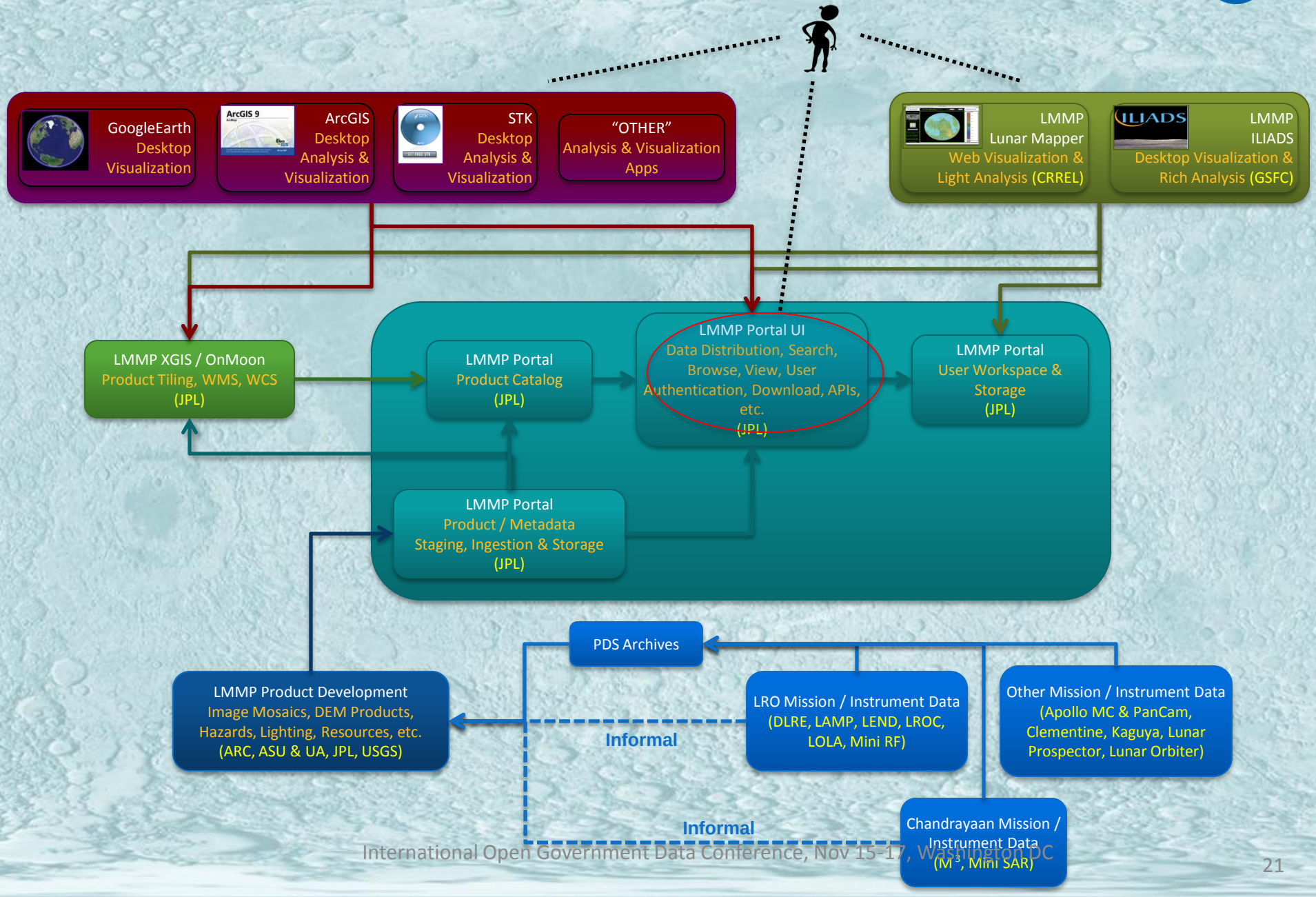


You can pick from multiple data sources, depending on what you want to do

Displays Multiple Data Sources



The Portal Will Serve Up Mashes, APIs, Files



LMMP Milestones

- Apr 2009 – Formulation review
- Jun 2009 – LRO launched!
- Aug-Sep 2009 – Individual product process validation audits
- Sep 2009 – Preliminary System design audit
- Dec 3rd 2009 – Beta release of Mapper, ILIADS, Portal, infrastructure and content
- November 2010 – Version 1 audit
- Early 2011 – Version 1 release

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Why Standard APIs Matter: Increasing the Velocity of Re-use

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clark parsia

What is C&P?

- Clark & Parsia, LLC--semantic software firm since 2005
- Offices in DC & Cambridge, MA
- Software products for end-user & OEM use
- Software development and integration services
- Specialize in Semantic Web, web services, and advanced AI technologies for federal and enterprise customers

http://clarkparsia.com/

Twitter: @candp

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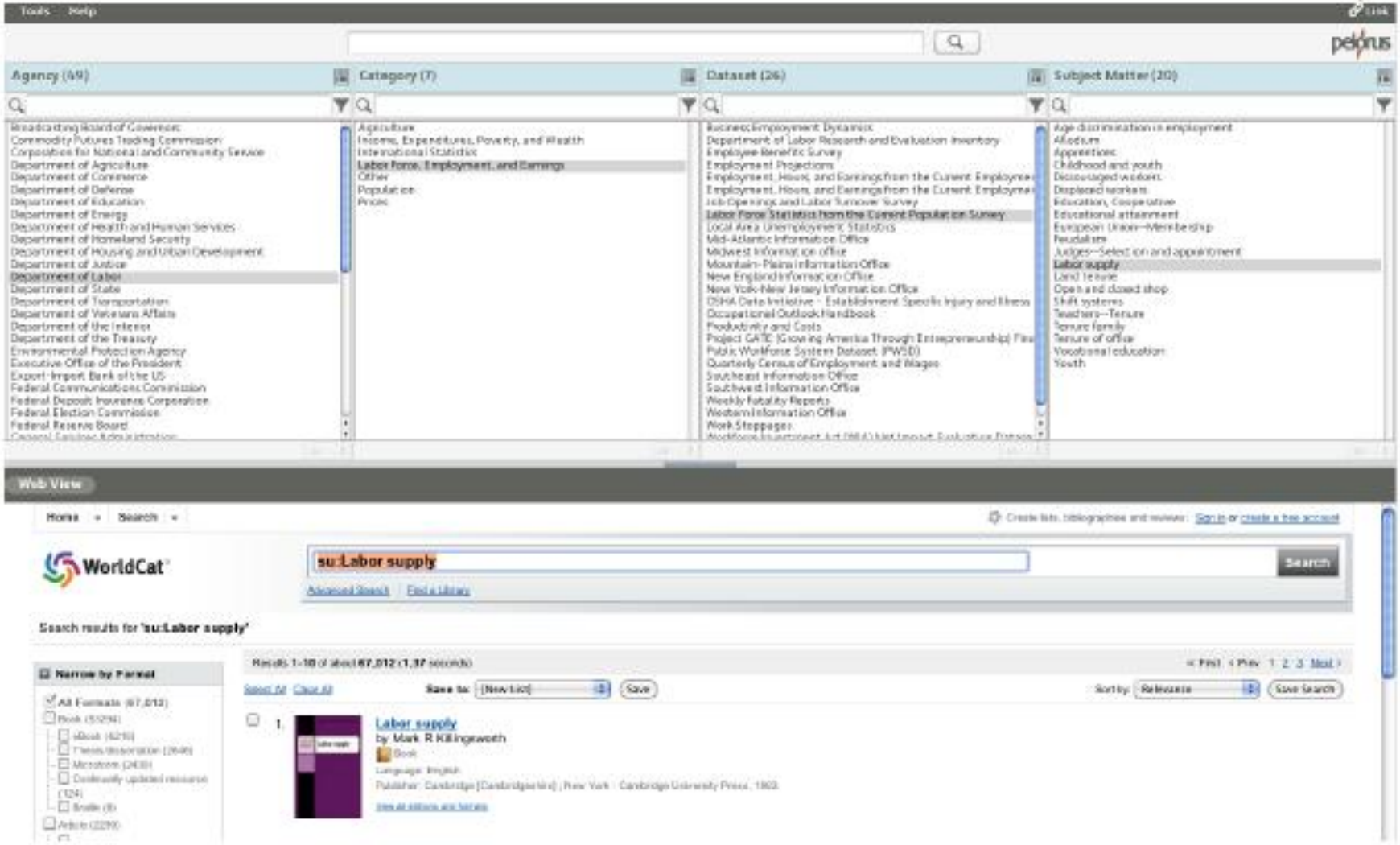

http://datagov.clarkparsia.com

So what...?

- A motivating example about the role of standards in promoting re-use
- A relatively trivial example, but with good utility
- Important metrics:
  - 90 minutes of work
  - for a junior programmer, w/ 3 months of experience
  - zero: meetings, phone calls, architects, UML diagrams, etc.
  - Yes: **zero meetings, i.e., uncoordinated app/data integration**
- How is that possible?□□□
  - de facto Web APIs (REST)
  - Standards: URIs, HTTP, RDF, SPARQL, etc.

How, in some detail

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- Opening government data gives 3rd parties a *reason* and a *means* of engaging with the data & the data's owner
- But it doesn't necessarily provide an ***efficient means***
- Data plus APIs and standards = efficient means of re-use
- Not all APIs (or API styles) are created equally
  - When in doubt, do what the Web does (REST)
  - In most cases, there shouldn't be any doubt
- Using data standards means tools, skills, and infrastructure re-use is more likely
- **Conjecture**: To increase the velocity of data re-use, increase the amount of *tool re-use*
  - Tools coalesce & form around standards & APIs

Re-use is a matter of details...

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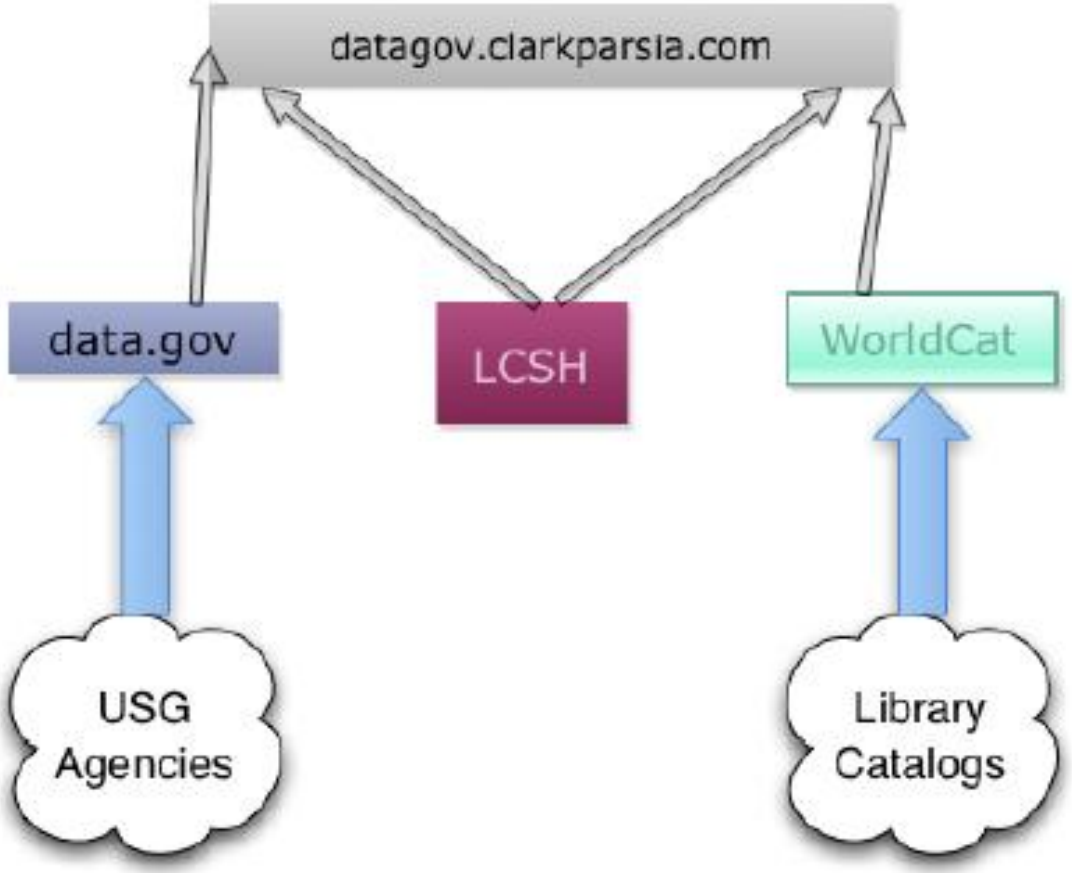
- Standards and APIs are cohesive collections of *worked out details*; worked out, so they can just be *used* straightaway
- Basing Government Open Data efforts on standards and APIs *reduces the ambiguity that results in meetings, delay, and friction*
- Working out the multitude of (mostly) arbitrary details kills re-use velocity, especially when organizational boundaries must be crossed
- Ad hoc data standards and eccentric APIs decreases the likelihood that a junior programmer can do something interesting in 90 minutes

Questions?

Thank you for your attention.



Relating data.gov datasets to relevant books

Examples...

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1. State Department data about Darfur
2. NASA global warming data
3. Federal Reserve data