RECOVER: A Geotechnical Approach

NASA RECOVER
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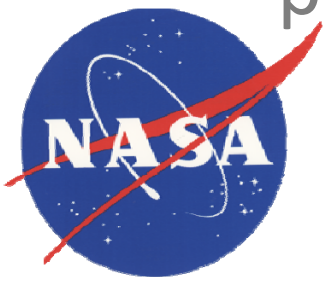
Jeff May

What is RECOVER?

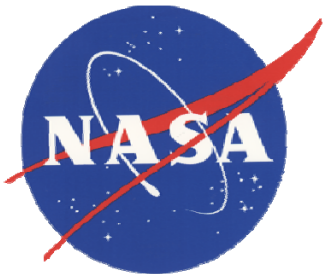
- RECOVER: Rehabilitation Capability Convergence for Ecosystem Recovery
- NASA Applied Sciences Program sponsored project



RECOVER is a NASA Applied Sciences sponsored project. K. T. Weber (PI), J. Schnase (Co-PI) and M. Carroll (Co-PI), Goddard Space Flight Center

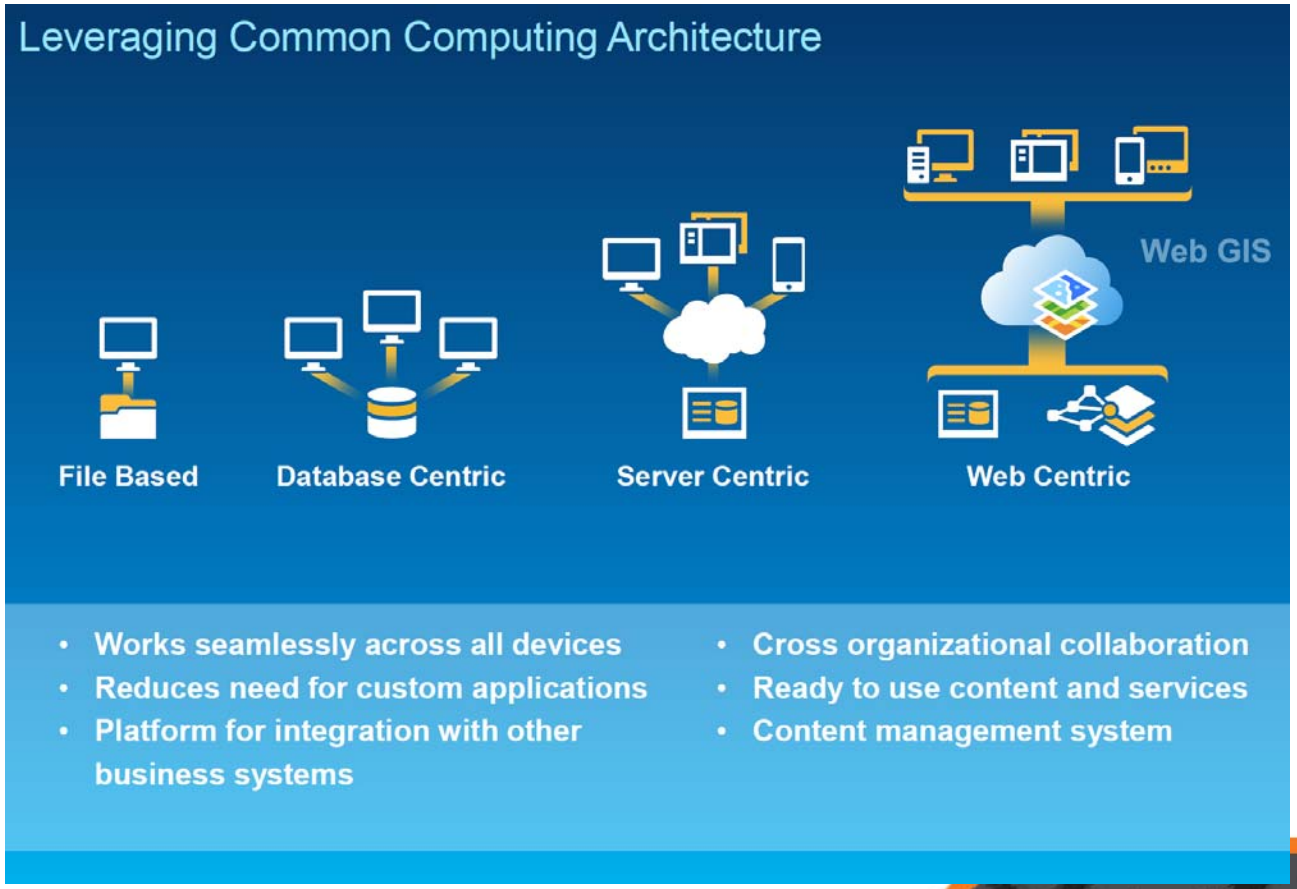
What is RECOVER?

- Customer-driven, Customer-centric*
- Decision Support System (DSS)
  - Rapid assembly of site-specific data
  - Delivered in customized GIS analysis environment
  - Wildfire focus



* Our “customer” is the USDI BLM, Idaho Dept. of Lands, and other wildfire management agencies (National Park Service, USFS, etc.)

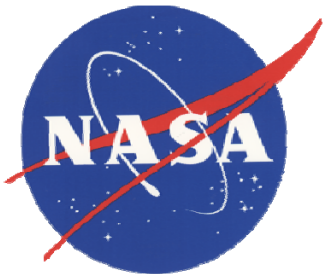
Benefits of RECOVER



How Does it Work?

That's Nice, but How does it do it?

- Three servers with "ArcGIS for Server" as their singular functional role
- Our newest server, is dedicated strictly to RECOVER



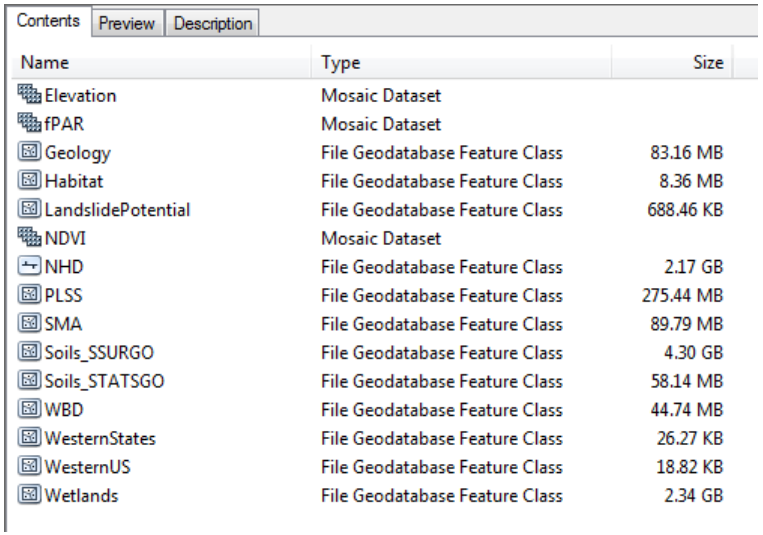
Let's Look Under the Hood

Under the Hood

- Dell PowerEdge R720 server
  - Windows Server 2012 R2
  - Two (2) 8-core Xeon E5 Processors (16 cores total)
  - 112 GB RAM
  - 3.5 TB Hard drive space
  - Dual redundant, hot swappable power supplies
  - Hardware RAID 5 fault tolerance
- Gigabit Ethernet

Data Architecture

- RECOVER covers the Western US
- Esri ArcGIS 10.3
  - File Geodatabase
  - Vector and raster data
  - Map Services and WFS
  - Image Services and WCS

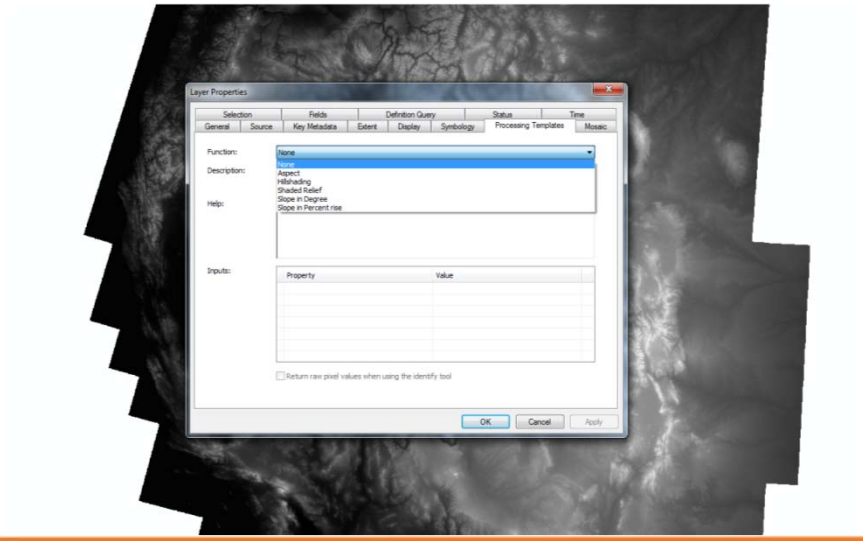


Contents | Preview | Description

Name	Type	Size
Elevation	Mosaic Dataset	
fPAR	Mosaic Dataset	
Geology	File Geodatabase Feature Class	83.16 MB
Habitat	File Geodatabase Feature Class	8.36 MB
LandslidePotential	File Geodatabase Feature Class	688.46 KB
NDVI	Mosaic Dataset	
NHD	File Geodatabase Feature Class	2.17 GB
PLSS	File Geodatabase Feature Class	275.44 MB
SMA	File Geodatabase Feature Class	89.79 MB
Soils_SSURGO	File Geodatabase Feature Class	4.30 GB
Soils_STATSGO	File Geodatabase Feature Class	58.14 MB
WBD	File Geodatabase Feature Class	44.74 MB
WesternStates	File Geodatabase Feature Class	26.27 KB
WesternUS	File Geodatabase Feature Class	18.82 KB
Wetlands	File Geodatabase Feature Class	2.34 GB

Leveraging Best Available Solutions

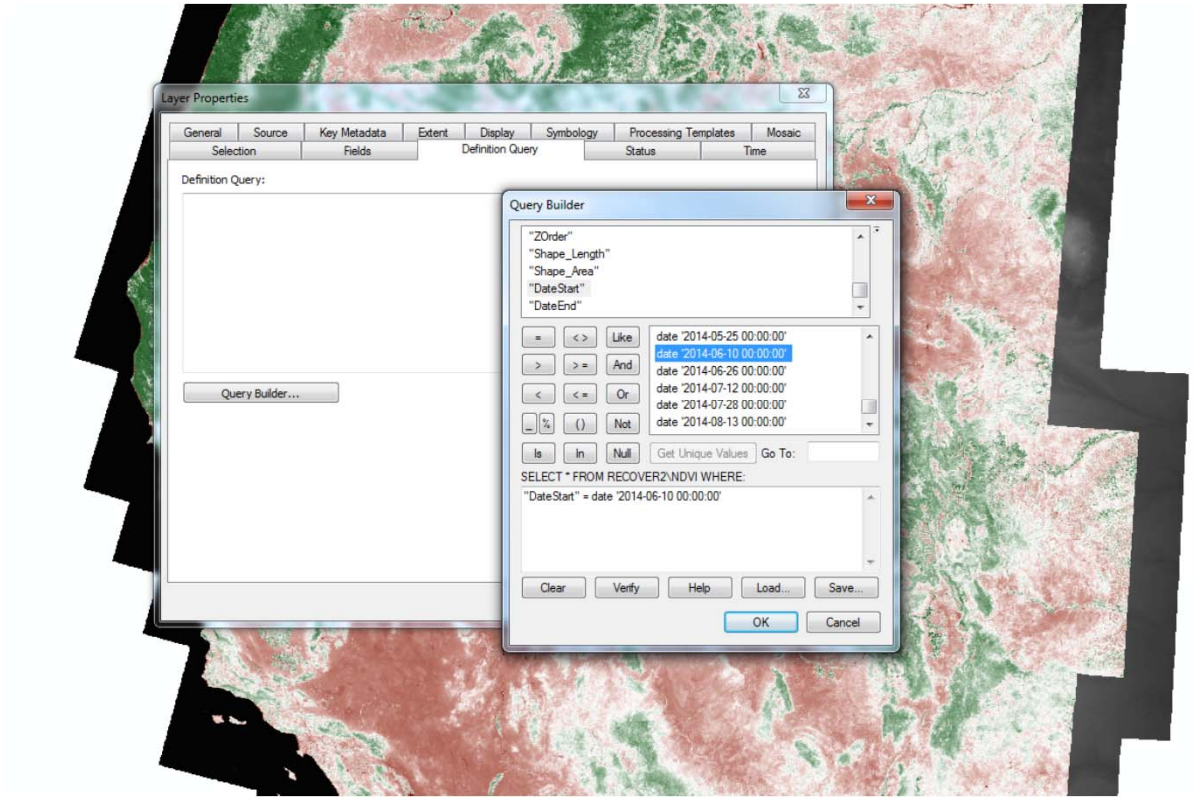
- Mosaic dataset (MD) tips and tricks
  - Raster Server Functions (function chains)
  - Applied to elevation data (10m pixels)



Leveraging Best Available Solutions

- MD data cubes
  - 325 scenes for the Western US describing photosynthetic activity with NDVI (2001-present)
  - Stored in one MD
  - Served as one service (not 325 image services)
- This approach is used for NDVI and fPAR

Accessed through *Definition Query*



Leveraging Best Available Solutions

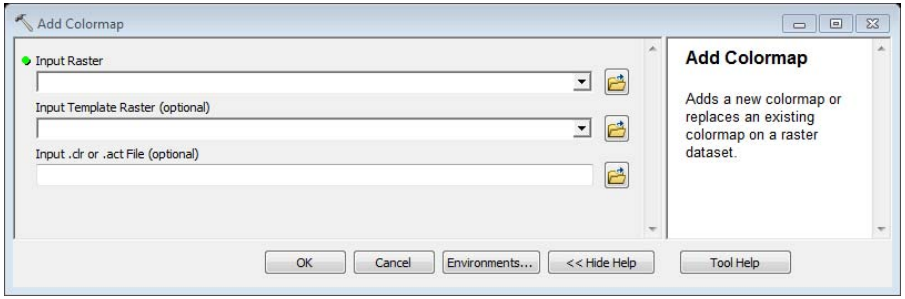
- Web Optimize the source data
  - Raster data types (32-bit vs 16-bit)
    - Hundreds of GB vs. tens of GB
  - Vector attribute tables
    - Apply coded value attribute domains
    - Short integer instead of Text

Why?

- Each service carries overhead
  - Minimizing the number of services running (active) increases performance
  - Speed is critical

Transform Data into Information

- Help your data speak to the user
  - Authoritative source data
  - Common sense Colormaps (raster)



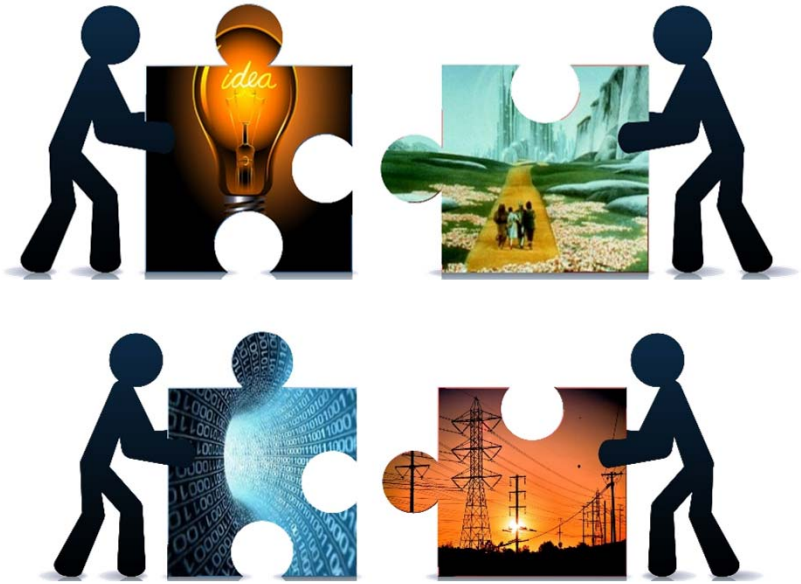
  - Accepted color schemes (Map services and Layer files)

Listen to the Customer

- "Make it mobile"
- "High-resolution is nice, but fast is critical"
  - NIFC
- "Drowning in Data, but still thirsting for Information"
  - RSAC

Assemble a Great Team

- Idea
- Plan
- Infrastructure
- Data
- **People**



Questions?

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