NASA RECOVER: Getting the most out of GIS for Wildfire Decision Support

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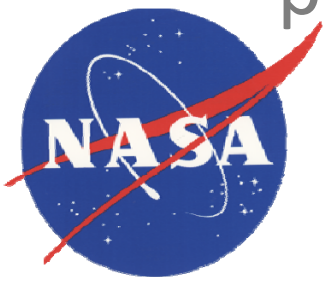
1- ISU GIS TReC
2- NASA Goddard Space Flight Center

What is RECOVER?

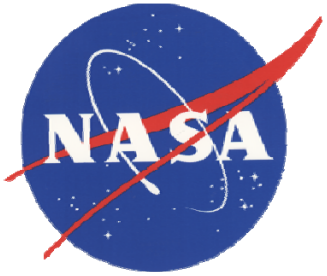
- RECOVER: Rehabilitation Capability Convergence for Ecosystem Recovery
- NASA Applied Sciences Program sponsored project



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

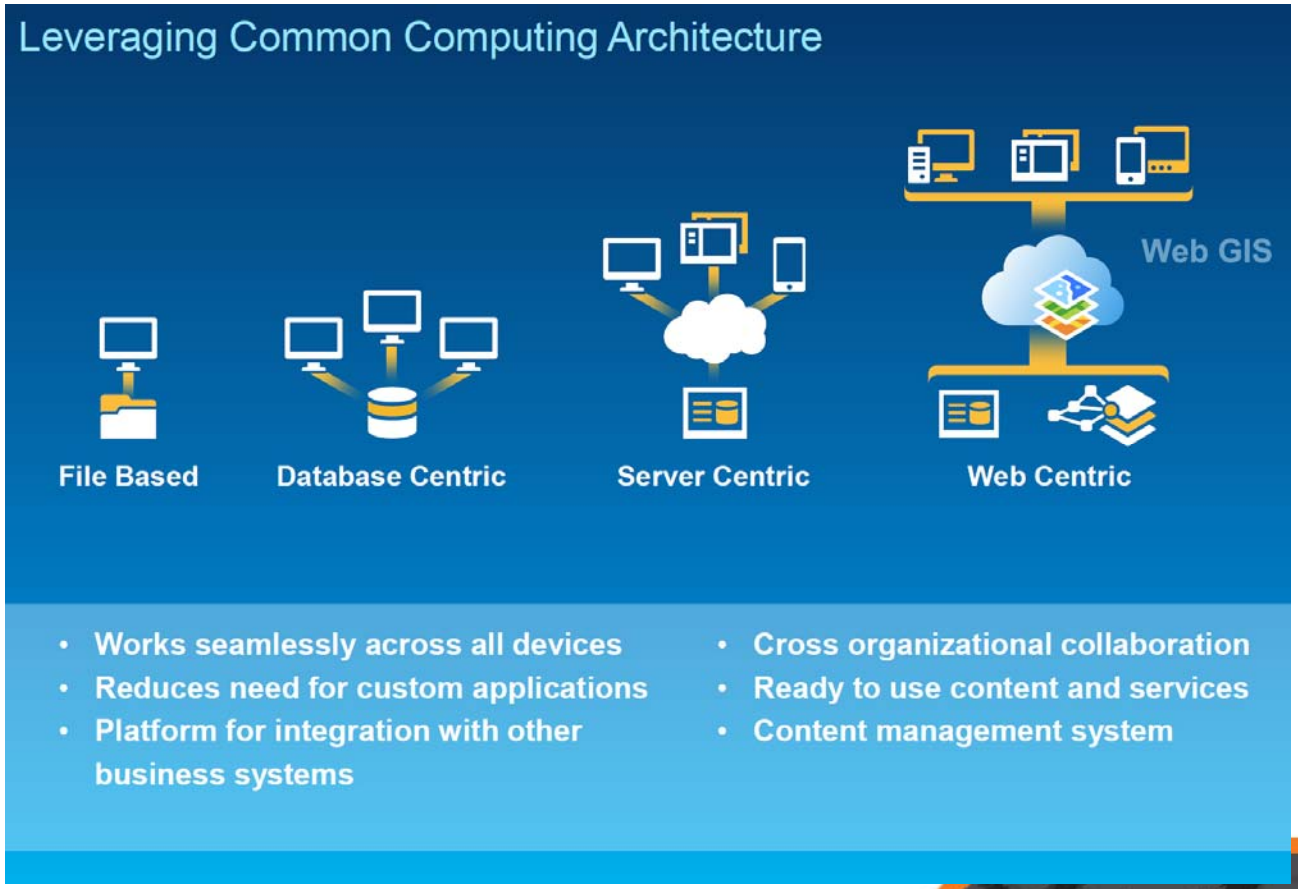
What is RECOVER?

- 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 any wildfire management agency (BLM, NPS, USFS, etc.)

Benefits of RECOVER

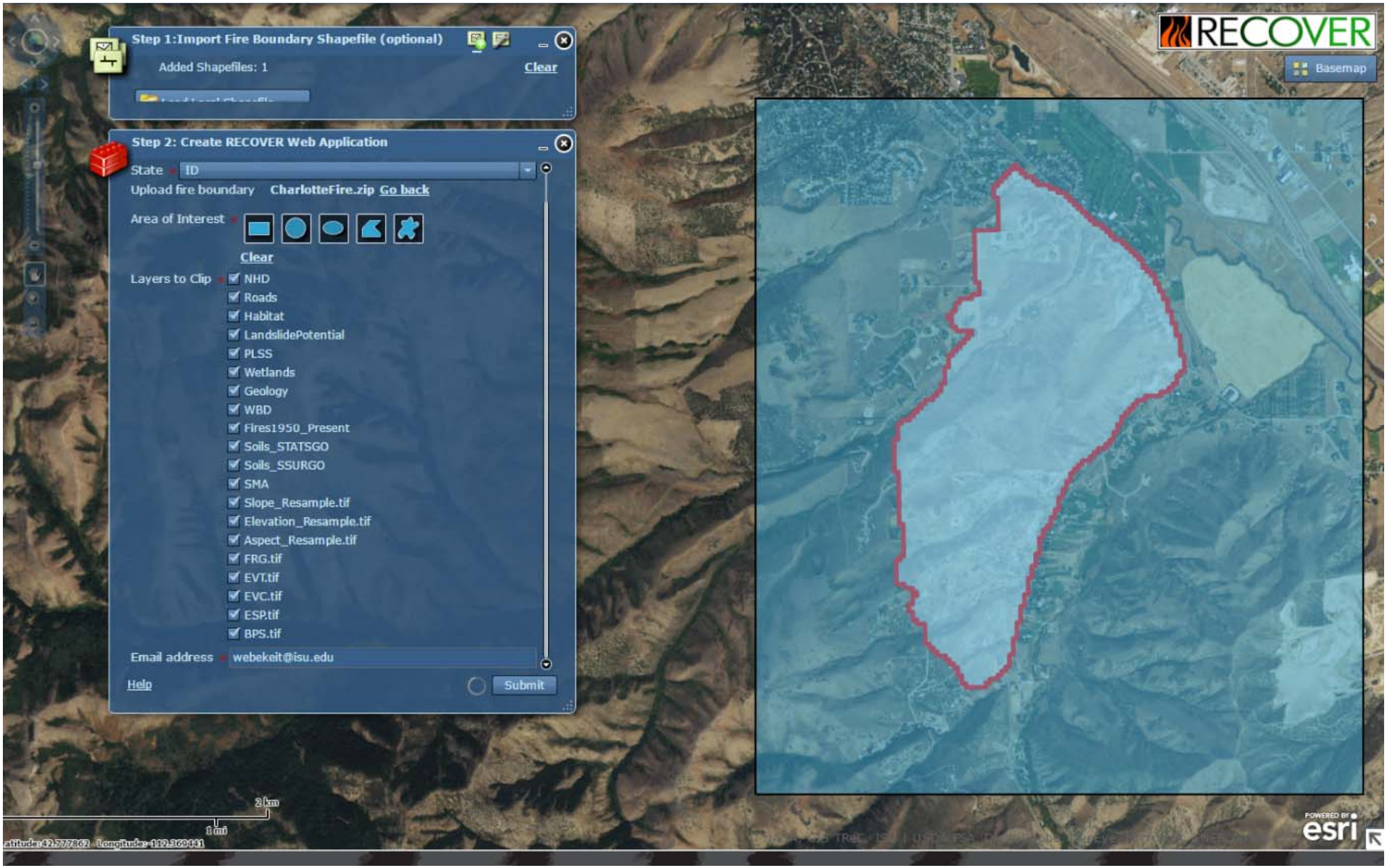


How Does it Work?

- Step 1: Ignition

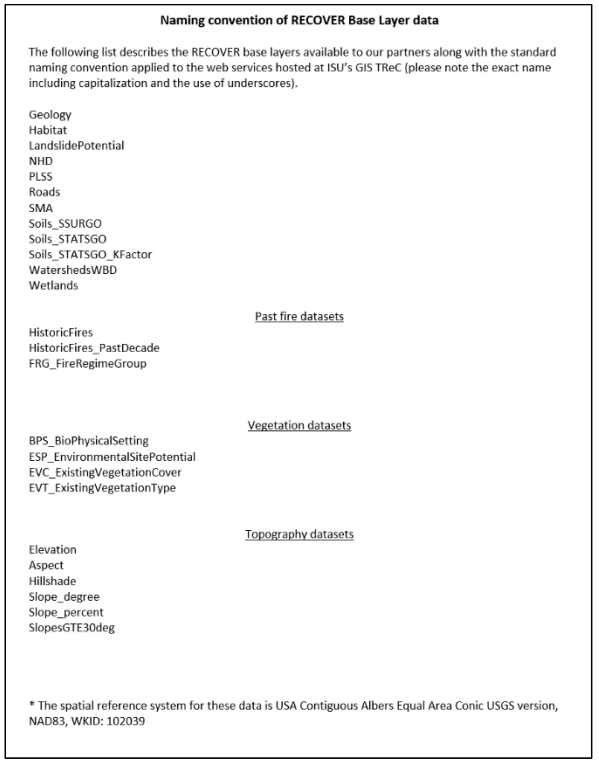
How Does it Work?

- Step 2: Generate the RECOVER Web Map


Step 1:Import Fire Boundary Shapefile (optional)
Added Shapefiles: 1
Clear
Step 2: Create RECOVER Web Application
State
ID
Upload fire boundary
CharlotteFire.zip
Go back
Area of Interest
Clear
Layers to Clip
NHD
Roads
Habitat
LandslidePotential
PLSS
Wetlands
Geology
WBD
Fires1950_Present
Soils_STATSGO
Soils_SSURGO
SMA
Slope_Resample.tif
Elevation_Resample.tif
Aspect_Resample.tif
FRG.tif
EVT.tif
EVC.tif
ESP.tif
BPS.tif
Email address
webekeit@isu.edu
Help
Submit
RECOVER
Basemap
2 km
1 mi
POWERED BY esri

What's Happening

- Our RECOVER server is…
  - Clipping 21 base layers (raster and vector) to the AOI polygon
  - Assembling these layers into a Map Service with uniform symbology/colormaps and naming
  - Creating fire-specific reports



Naming convention of RECOVER Base Layer data

The following list describes the RECOVER base layers available to our partners along with the standard naming convention applied to the web services hosted at ISU's GIS TReC (please note the exact name including capitalization and the use of underscores).

Geology
Habitat
LandslidePotential
NHD
PLSS
Roads
SMA
Soils_SSURGO
Soils_STATSGO
Soils_STATSGO_KFactor
WatershedsWBD
Wetlands

Past fire datasets

HistoricFires
HistoricFires_PastDecade
FRG_FireRegimeGroup

Vegetation datasets

BPS_BioPhysicalSetting
ESP_EnvironmentalSitePotential
EVC_ExistingVegetationCover
EVT_ExistingVegetationType

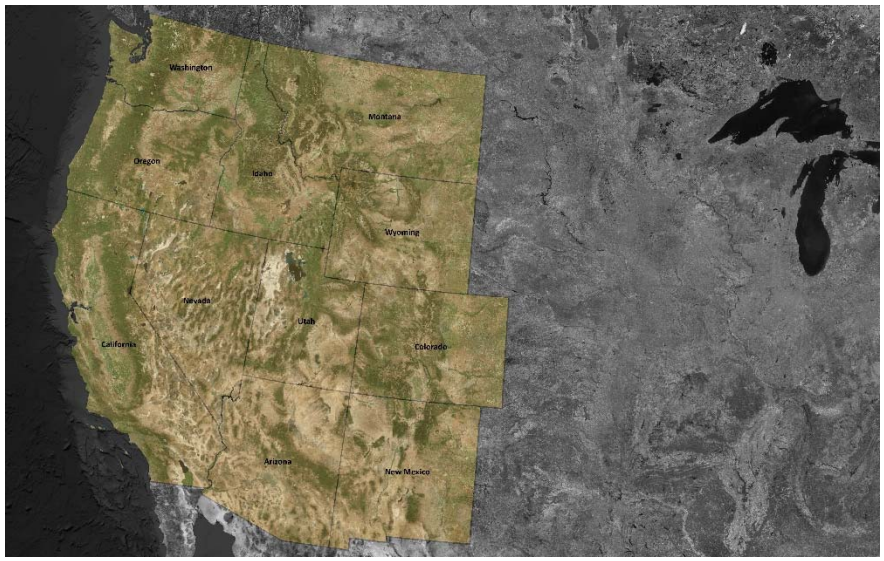
Topography datasets

Elevation
Aspect
Hillshade
Slope_degree
Slope_percent
SlopesGTE30deg

* The spatial reference system for these data is USA Contiguous Albers Equal Area Conic USGS version, NAD83, WKID: 102039

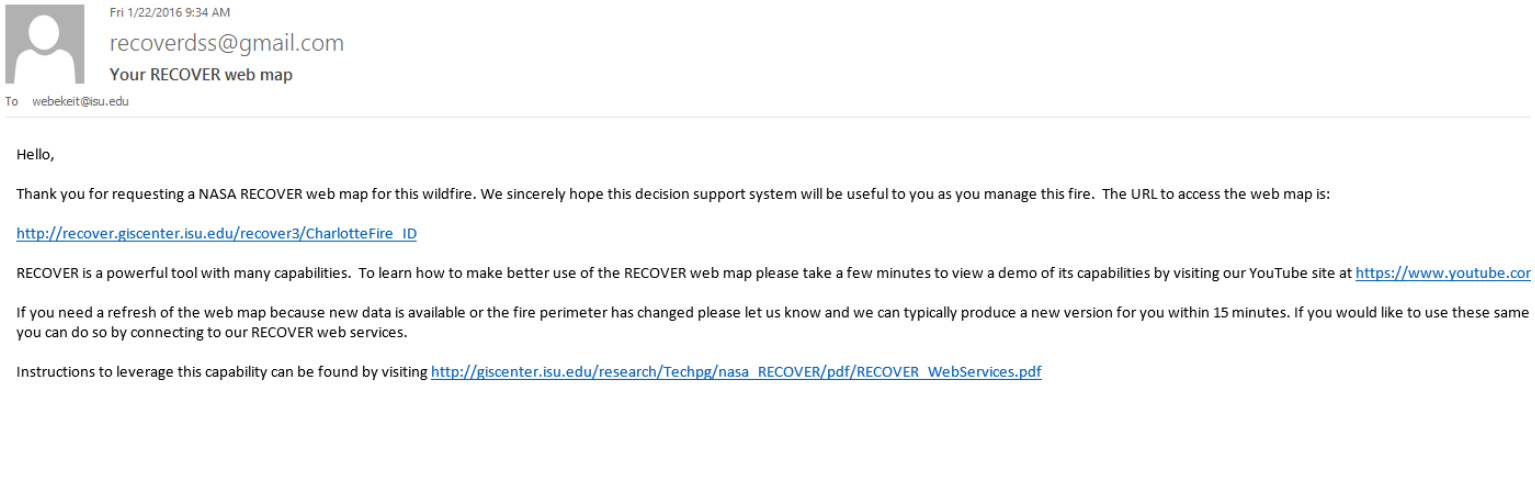
Data Architecture

- RECOVER covers the Western US
- Esri ArcGIS 10.3.1
  - File Geodatabase
  - Vector and raster data
  - Automated Map Services



How Does it Work?

- Step 3: Check your E-mail



Fri 1/22/2016 9:34 AM

recoverdss@gmail.com

Your RECOVER web map

To webekeit@isu.edu

Hello,

Thank you for requesting a NASA RECOVER web map for this wildfire. We sincerely hope this decision support system will be useful to you as you manage this fire. The URL to access the web map is:

http://recover.giscenter.isu.edu/recover3/CharlotteFire_ID

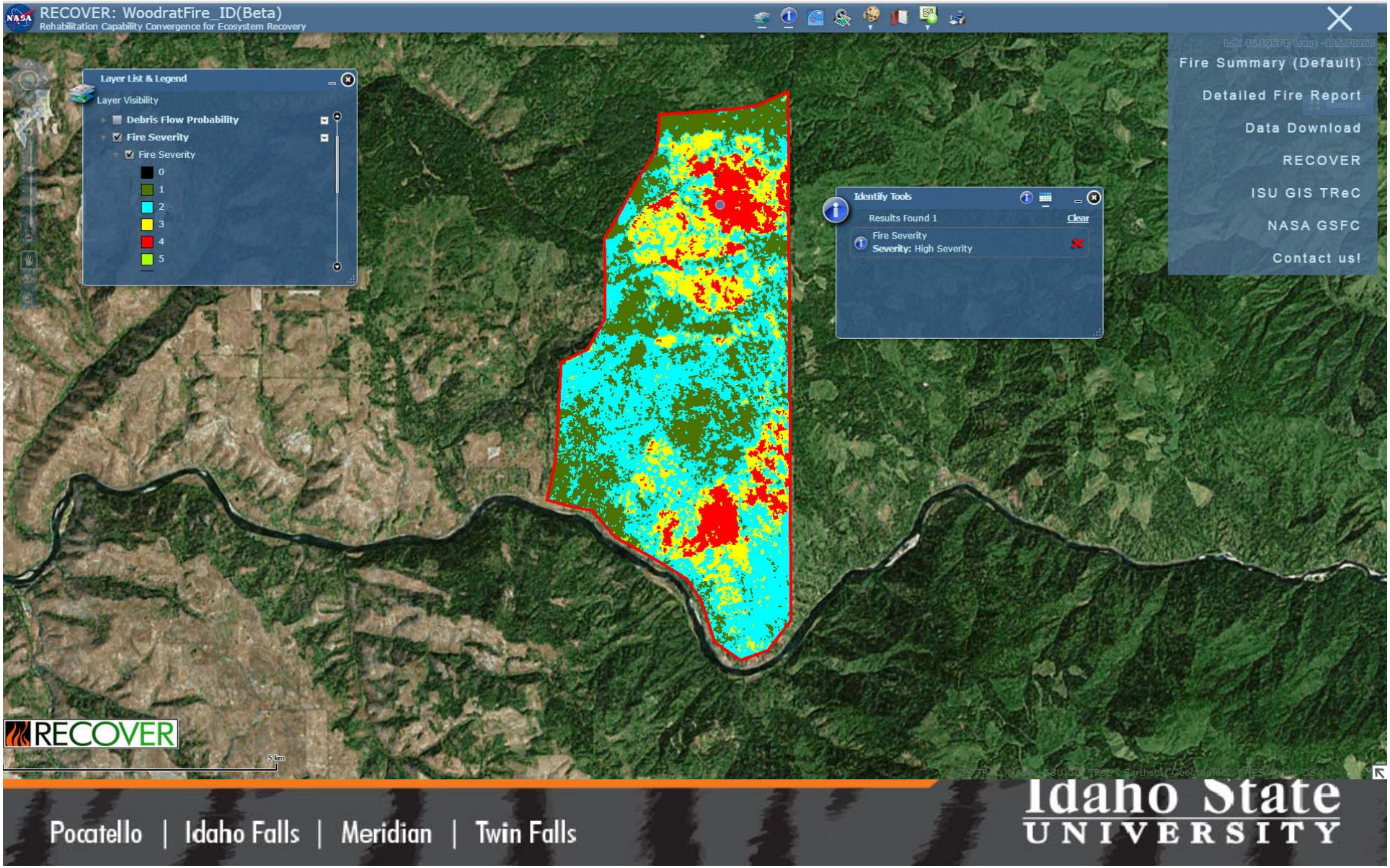
RECOVER is a powerful tool with many capabilities. To learn how to make better use of the RECOVER web map please take a few minutes to view a demo of its capabilities by visiting our YouTube site at https://www.youtube.cor

If you need a refresh of the web map because new data is available or the fire perimeter has changed please let us know and we can typically produce a new version for you within 15 minutes. If you would like to use these same you can do so by connecting to our RECOVER web services.

Instructions to leverage this capability can be found by visiting http://giscenter.isu.edu/research/Techpg/nasa_RECOVER/pdf/RECOVER_WebServices.pdf

How Does it Work?

- Step 4: Visit and use your Web Map
  - Visit YouTube for a full tour
  - http://bit.ly/recoverdemo

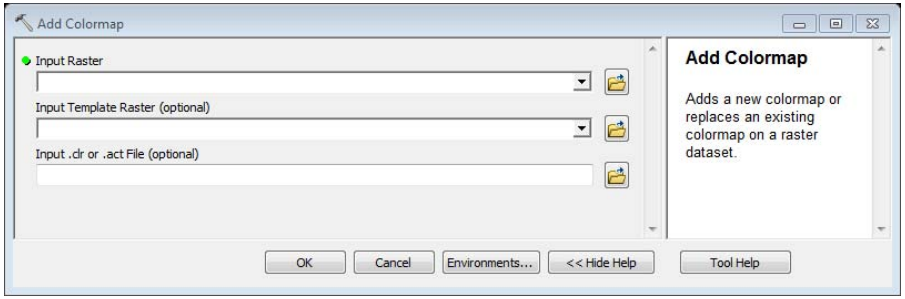

RECOVER: WoodratFire_ID(Beta)
Rehabilitation Capability Convergence for Ecosystem Recovery
Layer List & Legend
Layer Visibility
Debris Flow Probability
Fire Severity
Fire Severity
0
1
2
3
4
5
Identify Tools
Results Found 1
Clear
Fire Severity
Severity: High Severity
Fire Summary (Default)
Detailed Fire Report
Data Download
RECOVER
ISU GIS TReC
NASA GSFC
Contact us!
RECOVER
5 km
Pocatello | Idaho Falls | Meridian | Twin Falls
Idaho State
UNIVERSITY

GIS Layers

- Each RECOVER web map contains 21 base layers
- One real-time data feed (Collector)
- Fire-specific reports
- And *may* contain a **fire severity** layer and **debris-flow probability** layer
- As well as other fire-specific layers provided by "you"

Transform Data into Information

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



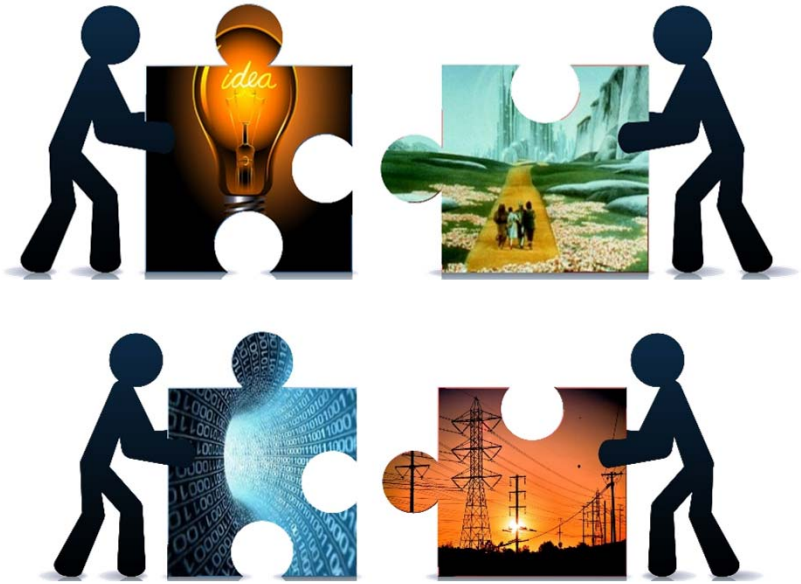
  - Accepted symbology (Map service and Layer files)

Listen to the Customer

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

Assemble a Great Team

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



Questions?

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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 (soon 10 Gbps)