The NASA RECOVER DSS

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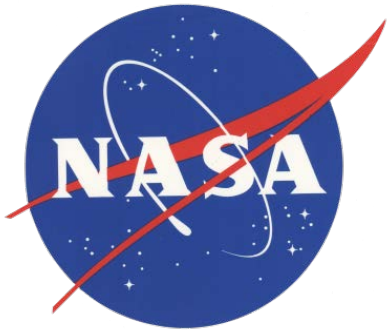
What is RECOVER?

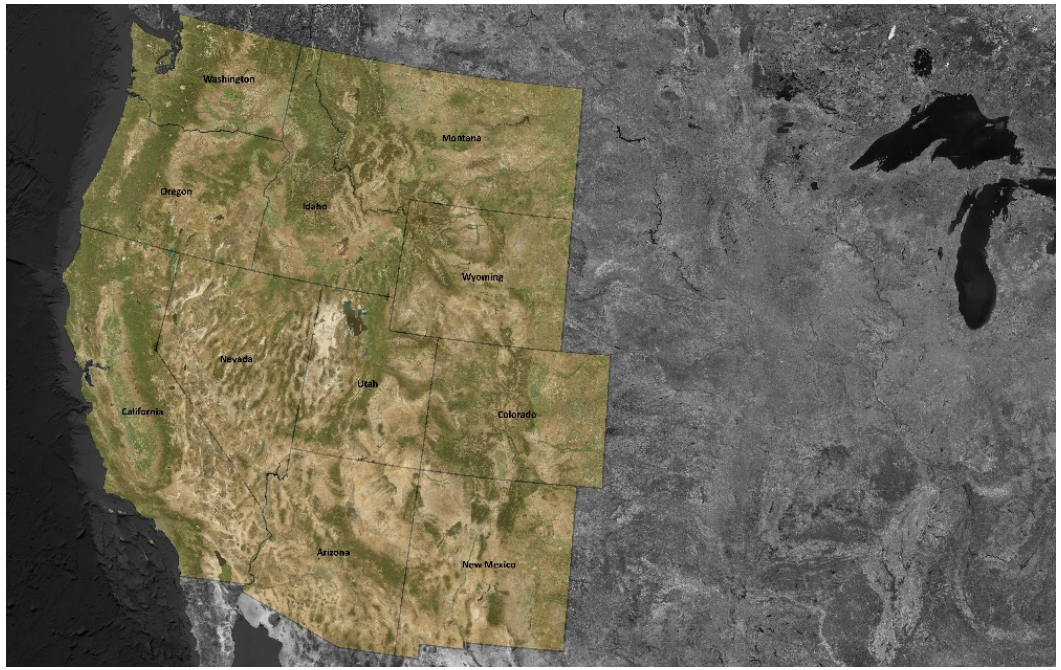
- Customer-driven, Customer-centric*
- Decision Support System (DSS)
  - Rapid assembly of site-specific data
  - Delivered in customized GIS analysis environment
  - Wildfire focus



* Our “customer” is currently, any agency/organization managing wildfires (BLM, NPS, USFS, NWS, etc.)

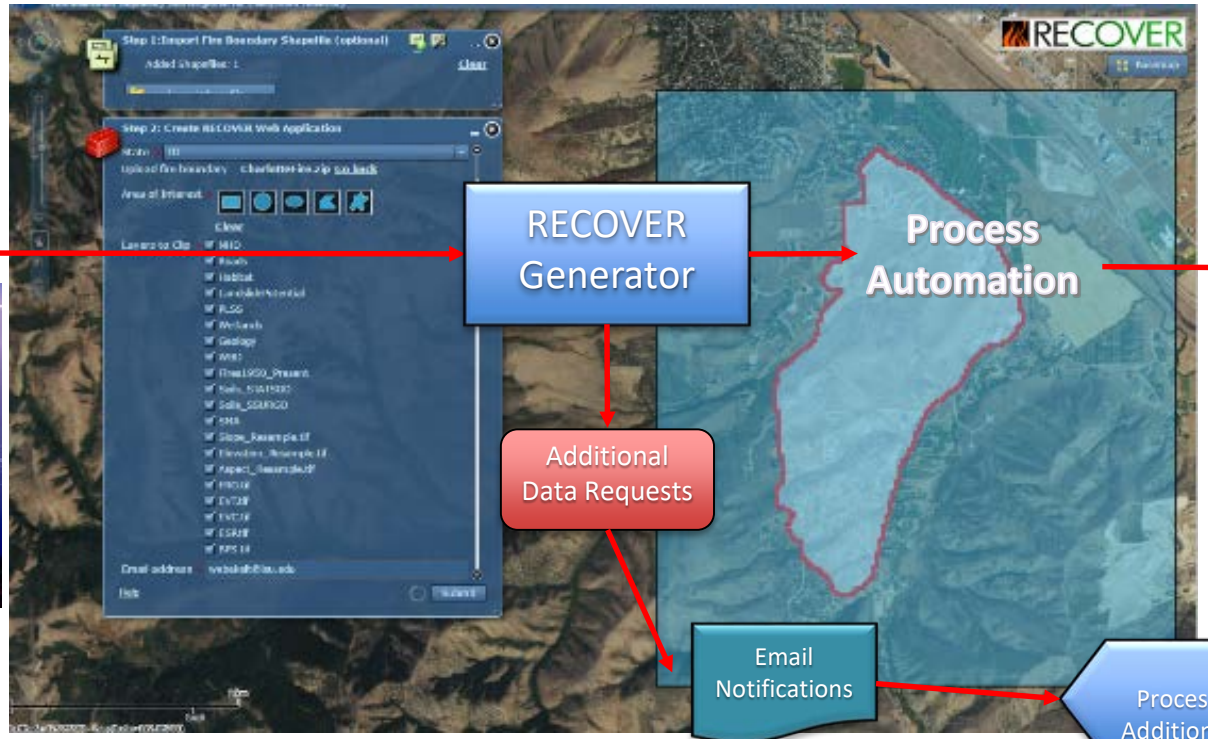
Data Architecture

- RECOVER covers the Western US
- Esri ArcGIS
  - Vector feature classes (file Geodatabase)
  - Raster images (TIF)
  - Automated Map and GeoProcessing Services (python)



How Does it Work?

Fire Ignition



RECOVER Generator

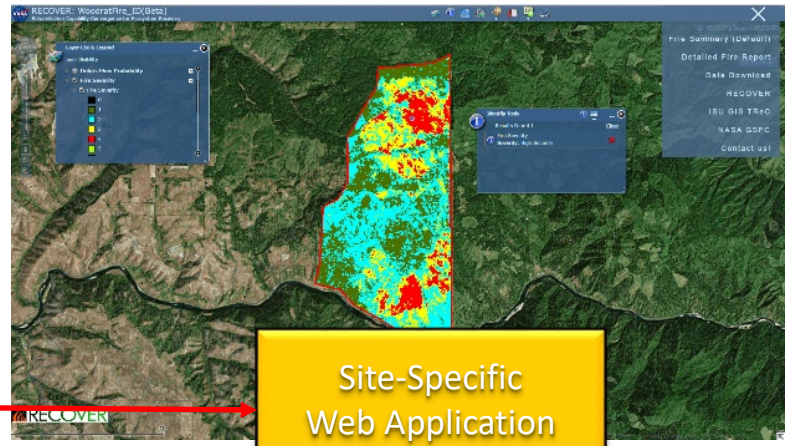
Process Automation

Additional Data Requests

Email Notifications

Process Additional Data

Create Map Services

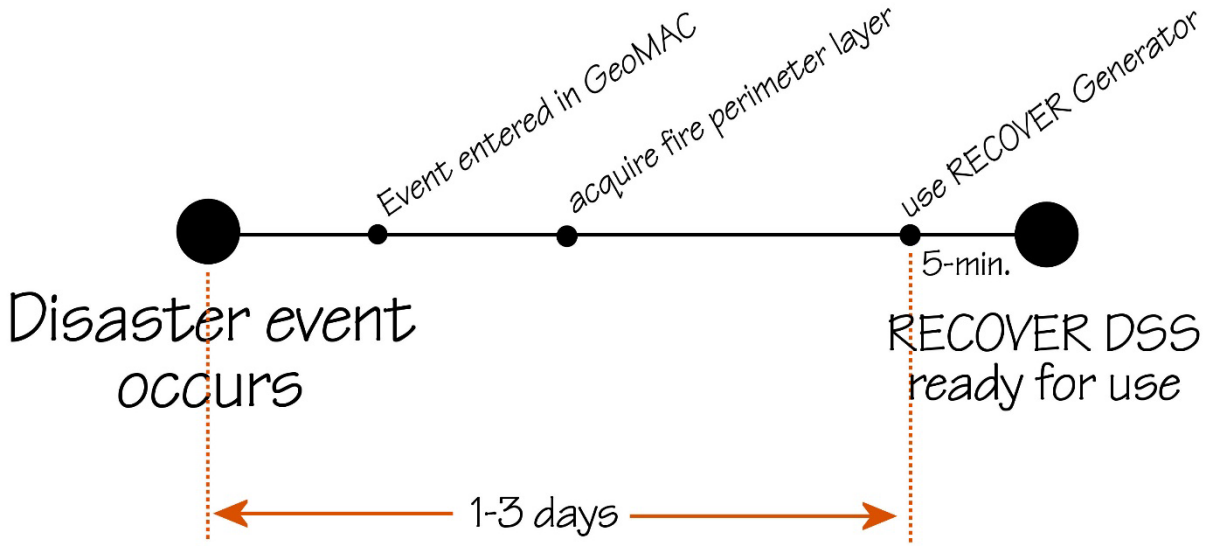


Site-Specific Web Application

Done in 5-minutes!

- Once submitted from our Generator, the web map will be ready in about 5-minutes

Readiness…



- New automation processes will decrease response time by changing the trigger

GIS Layers

- By default each RECOVER web map contains…
  - 26 base layers automatically clipped to fire extent
  - Real-time data streams (Collector)
  - 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

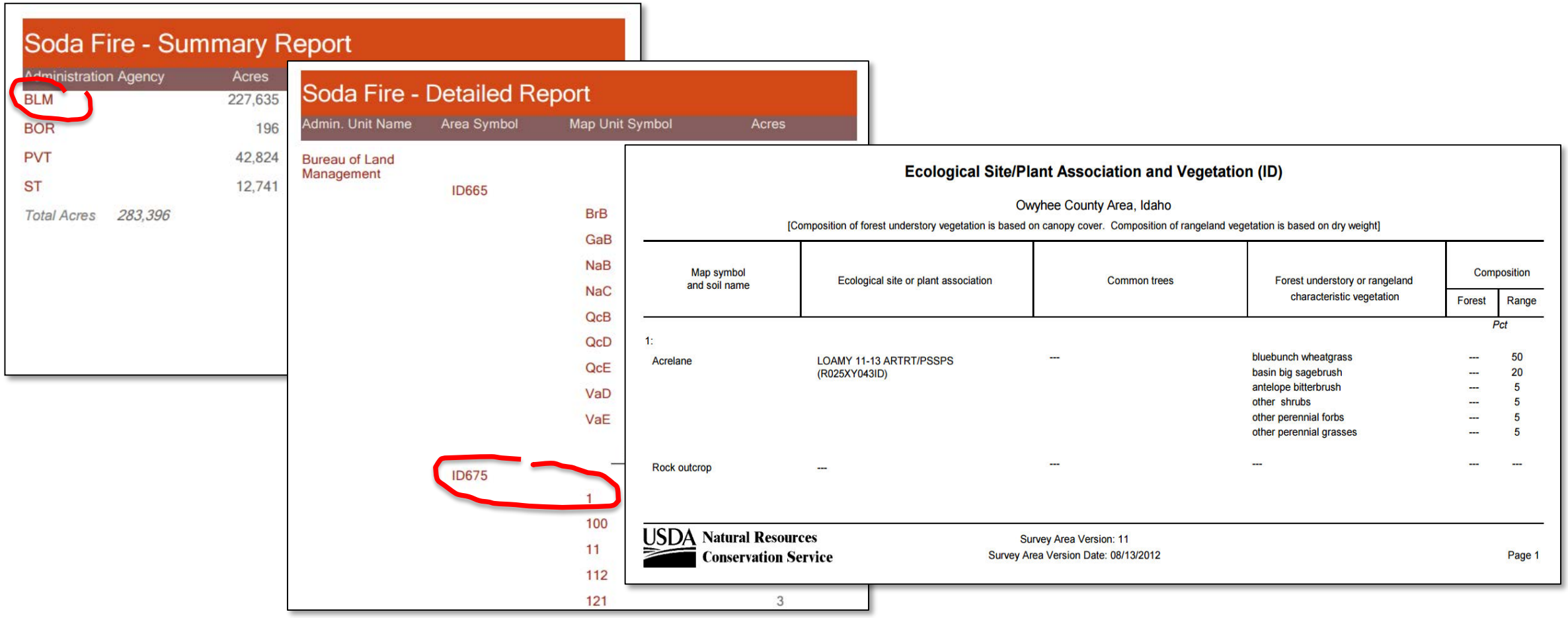
st fire datasets

etation datasets

ography datasets

s USA Contiguous Albers Equal Area Conic USGS version,

Fire-specific Reports



Soda Fire - Summary Report

Administration Agency	Acres
BLM	227,635
BOR	196
PVT	42,824
ST	12,741
Total Acres	*283,396*

Soda Fire - Detailed Report

Admin. Unit Name	Area Symbol	Map Unit Symbol	Acres
Bureau of Land Management			
	ID665		
		BrB	
		GaB	
		NaB	
		NaC	
		QcB	
		QcD	
		QcE	
		VaD	
		VaE	
	ID675		
		1	
		100	
		11	
		112	
		121	3

Ecological Site/Plant Association and Vegetation (ID)

Owyhee County Area, Idaho

[Composition of forest understory vegetation is based on canopy cover. Composition of rangeland vegetation is based on dry weight]

Map symbol and soil name	Ecological site or plant association	Common trees	Forest understory or rangeland characteristic vegetation	Composition	
				Forest	Range
				Pct	
1:					
Acrelane	LOAMY 11-13 ARTRT/PSSPS (R025XY043ID)	---	bluebunch wheatgrass	---	50
			basin big sagebrush	---	20
			antelope bitterbrush	---	5
			other shrubs	---	5
			other perennial forbs	---	5
			other perennial grasses	---	5
Rock outcrop	---	---	---	---	---

USDA Natural Resources Conservation Service

Survey Area Version: 11
Survey Area Version Date: 08/13/2012

Page 1

Demo

- https://recover.giscenter.isu.edu/recover3/exerciseFire_UT/

RECOVER Statistics

- 100 wildfires
- ~ 6M acres of burned land
- BLM, USFS, NPS, and NWS
- Up to 40hrs of staff time saved/fire

Additional data requests

- Fire-affected Vegetation (dNBR)
- Debris-flow probability
- NDVI vegetation anomaly

Fire-affected Vegetation (dNBR)

- Pre-cursor to a “Fire severity” layer
- Calculated using Landsat or Sentinel-2 satellite imagery

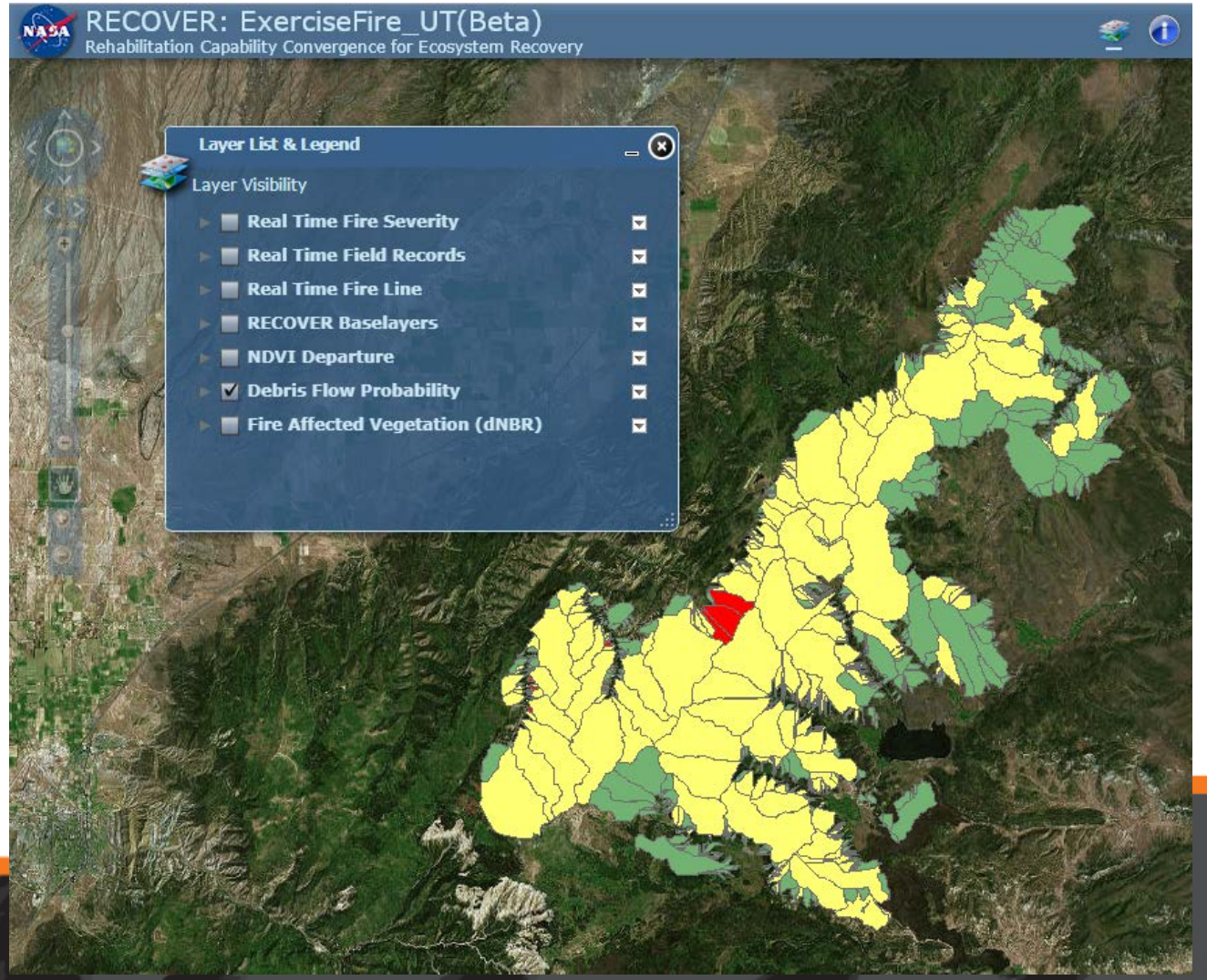
NBR = (NIR-SWIR)/(NIR+SWIR)

- Landsat 8: **NBR = (B5-B7)/(B5+B7)**

- **dNBR = Prefire_NBR – Postfire_NBR**

Debris-flow Probability (cont'd)

- USGS Landslide Hazards Program
- Michigan Tech University

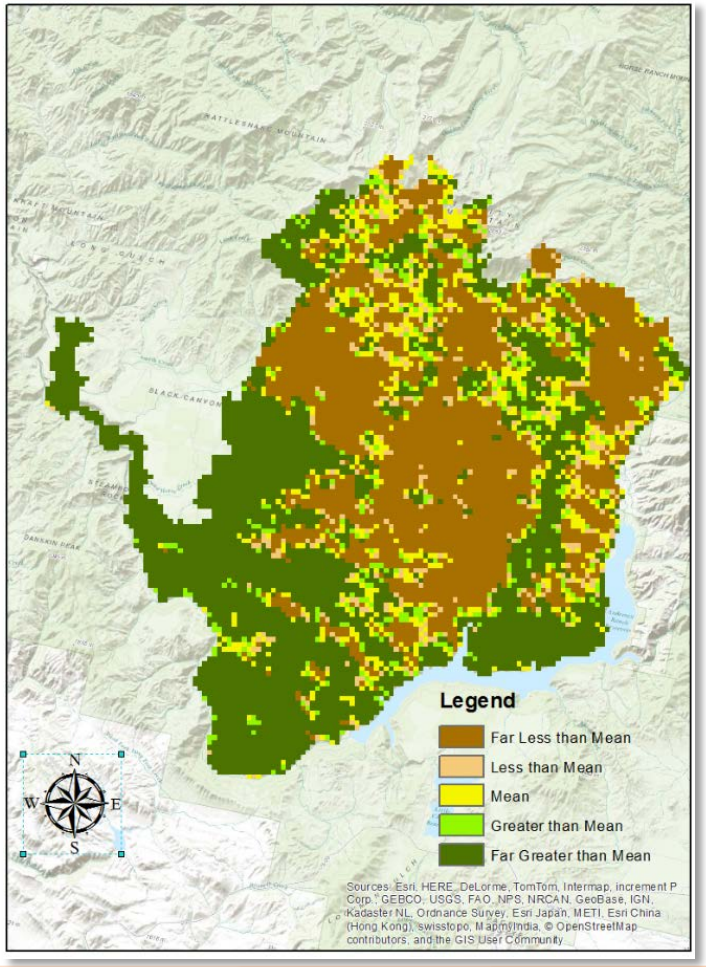


Long-term NDVI Trend

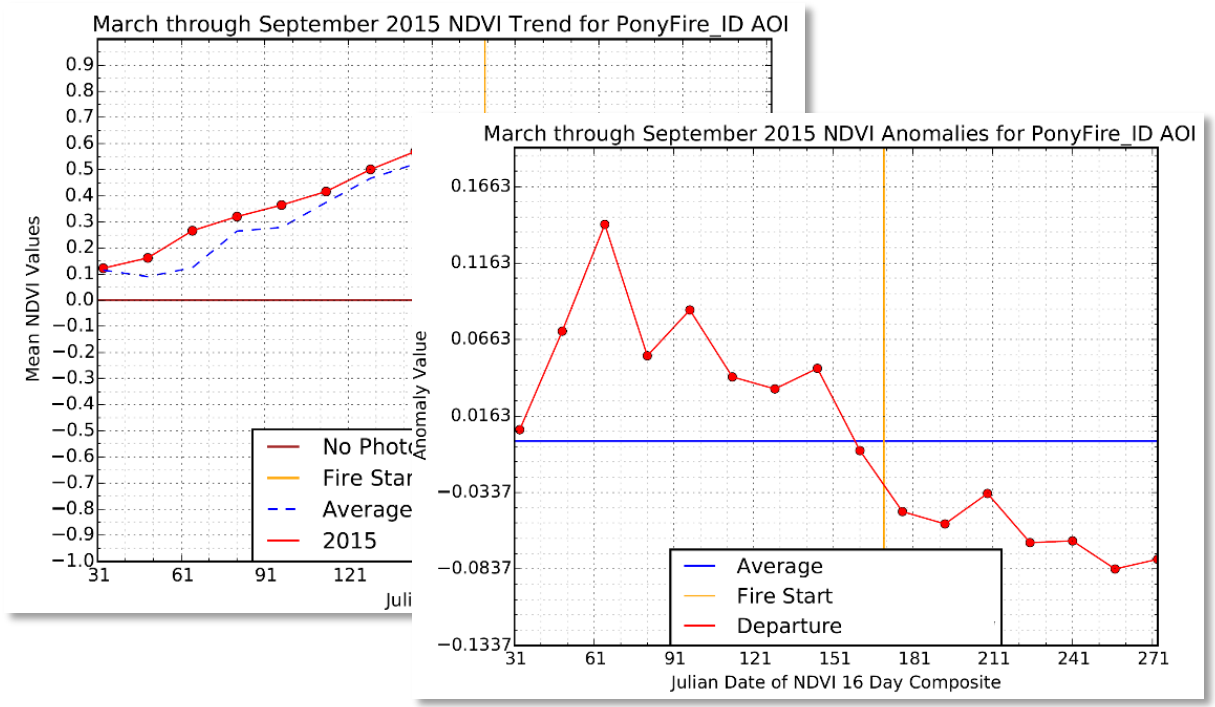
- What does it tell the manager?
- How is it calculated?
  - 16-day MODIS (satellite) NDVI-composite imagery
  - Long-term average NDVI (2001-present) dataset
  - Current fire season compared against long-term trend

NDVI Anomaly Layer

Map layer

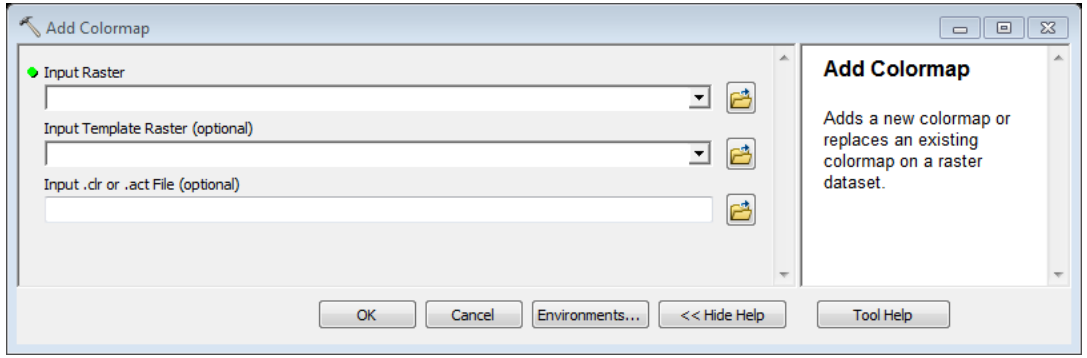


Charts



RECOVER Provides Actionable Information

- Not just a data dump…speak to the user
  - Authoritative source data
  - Common sense Colormaps (raster)



  - Accepted symbology (Map service and Layer files)
  - Meaningful units (acres instead of m^2)

Why RECOVER?

- Cross-Organizational collaboration
- Common operational picture
- Data visualization
- Better informed decisions

The Future

- NASA Funding for RECOVER ends Sep. 30, 2018
- Annual maintenance costs are ~ $70K

Questions?

Visit http://giscenter.isu.edu/research/Techpg/nasa_RECOVER/

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