

# RECOVER – An Automated Burned Area Emergency Response Decision Support System for Post-fire Rehabilitation Management of Savanna Ecosystems in the Western US



NH23C-1543

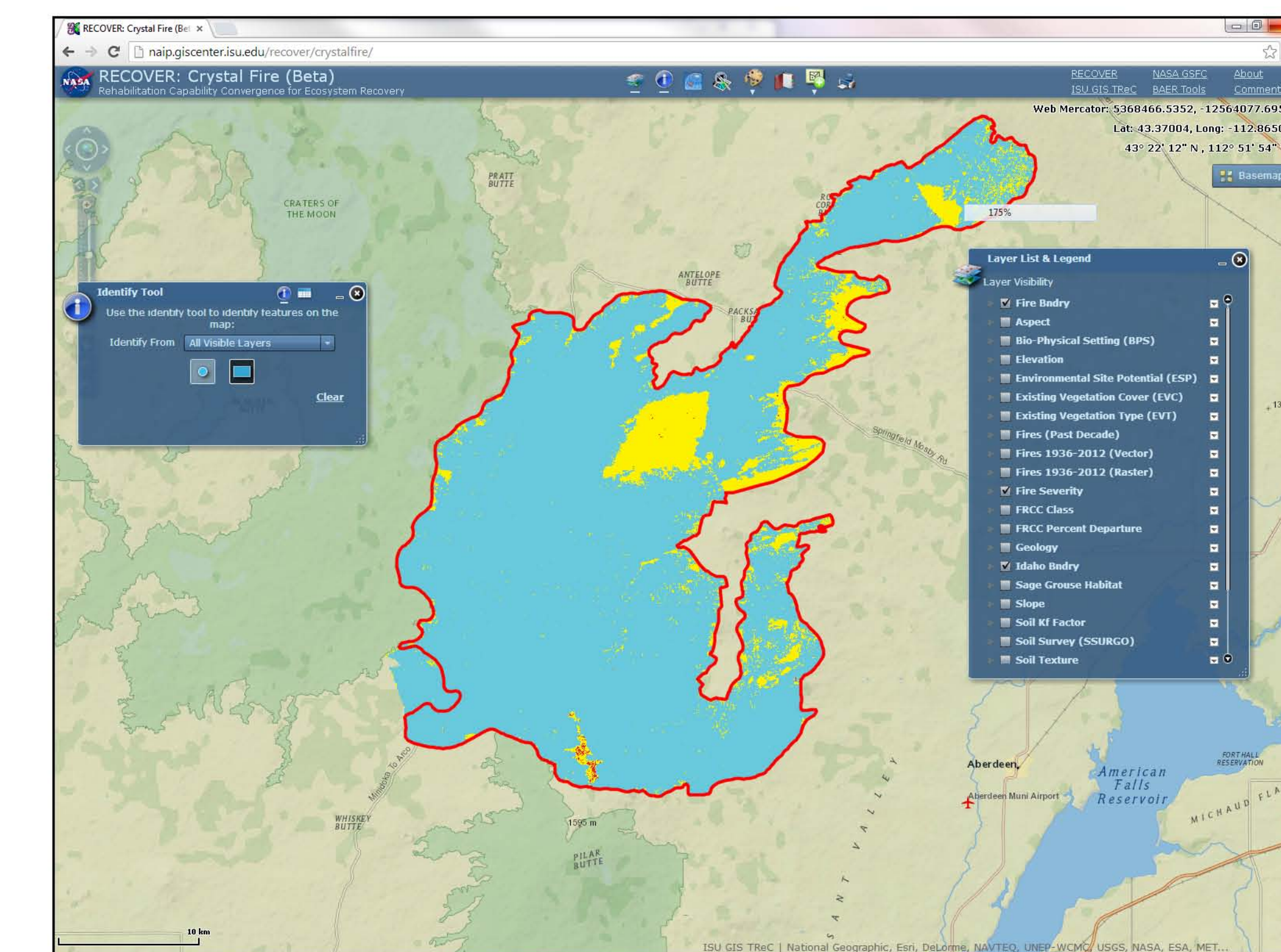
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## ABSTRACT

In partnership with the Department of Interior's Bureau of Land Management (BLM) and the Idaho Department of Lands (IDL), we are building and evaluating the RECOVER decision support system. RECOVER – which stands for Rehabilitation Capability Convergence for Ecosystem Recovery – is an automatically deployable, context-aware decision support system for savanna wildfires that brings together in a single application the information necessary for post-fire rehabilitation decision-making and long-term ecosystem monitoring.

RECOVER uses state-of-the-art cloud-based data management technologies to improve performance, reduce cost, and provide site-specific flexibility for each fire. The RECOVER Server uses Integrated Rule-Oriented Data System (iRODS) data grid technology deployed in the Amazon Elastic Compute Cloud (EC2). The RECOVER Client is an Adobe Flex web map application that is able to provide a suite of convenient GIS analytical capabilities. In a typical use scenario, the RECOVER Server is provided a wildfire name and geospatial extent. The Server then automatically gathers Earth observational data and other relevant products from various geographically distributed data sources. The Server creates a database in the cloud where all relevant information about the wildfire is stored. This information is made available to the RECOVER Client and ultimately to fire managers through their choice of web browser. The Server refreshes the data throughout the burn and subsequent recovery period (3-5 years) with each refresh requiring two minutes to complete. Since remediation plans must be completed within 14 days of a fire's containment, RECOVER has the potential to significantly improve the decision-making process.

RECOVER adds an important new dimension to post-fire decision-making by focusing on ecosystem rehabilitation in semiarid savannas. A novel aspect of RECOVER's approach involves the use of soil moisture estimates, which are an important but difficult-to-obtain element of post-fire rehabilitation planning. We will use downscaled soil moisture data from three primary observational sources to begin evaluation of soil moisture products and build the technology needed for RECOVER to use future SMAP products. As a result, RECOVER, BLM, and the fire applications community will be ready customers for data flowing out of new NASA missions, such as NPP, LDCM, and SMAP.

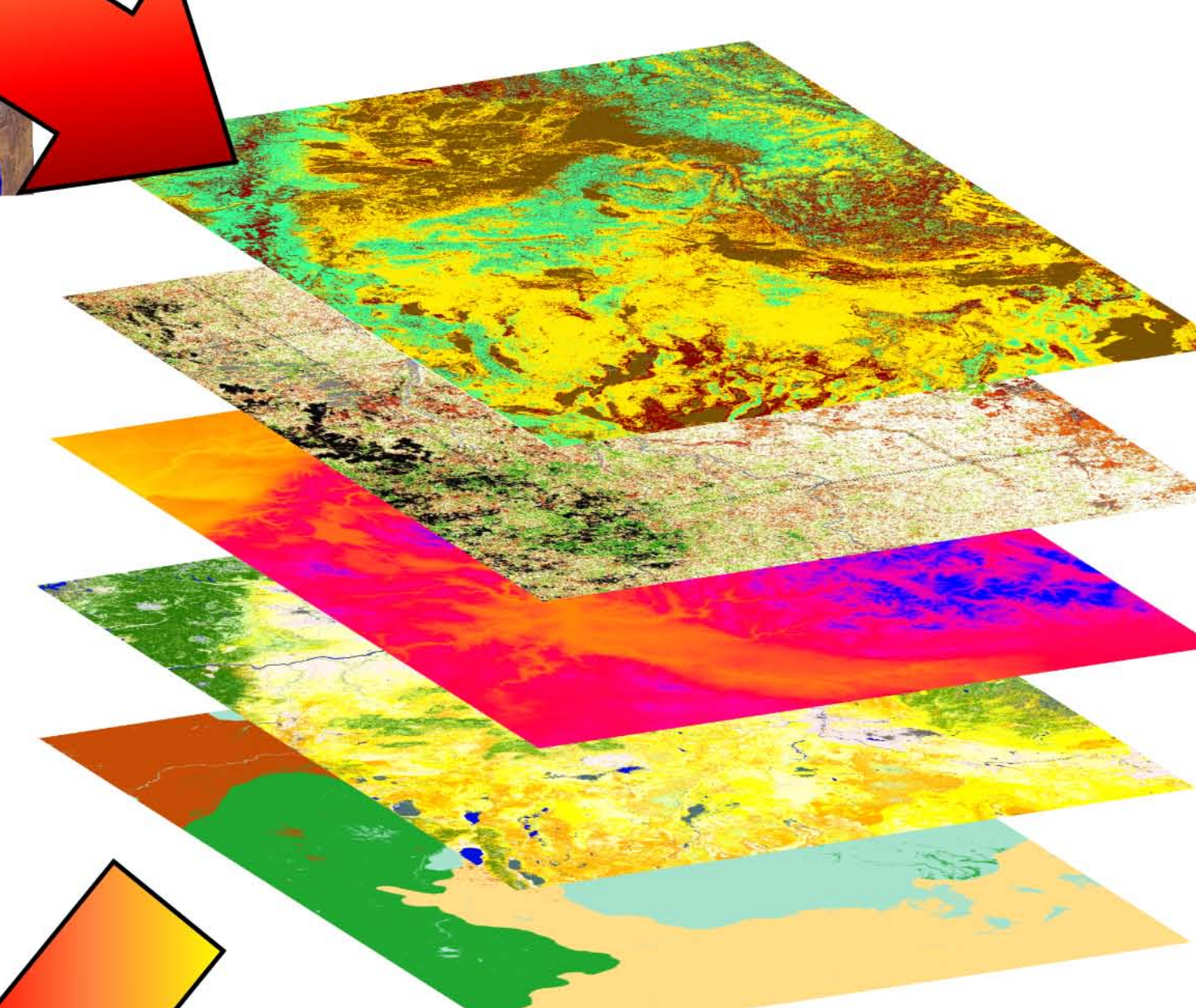


RECOVER Client

Understanding the process used by partner agencies (BLM and IDL) to formulate a post-fire rehabilitation plan was critical to the RECOVER team. This knowledge allowed for development of a client-centric, rapid-response, decision support system known as RECOVER. The RECOVER prototype is being developed and tested for the state of Idaho.

### Data Layers

- Topography
- Geology
- Imagery
- Soils
- Vegetation



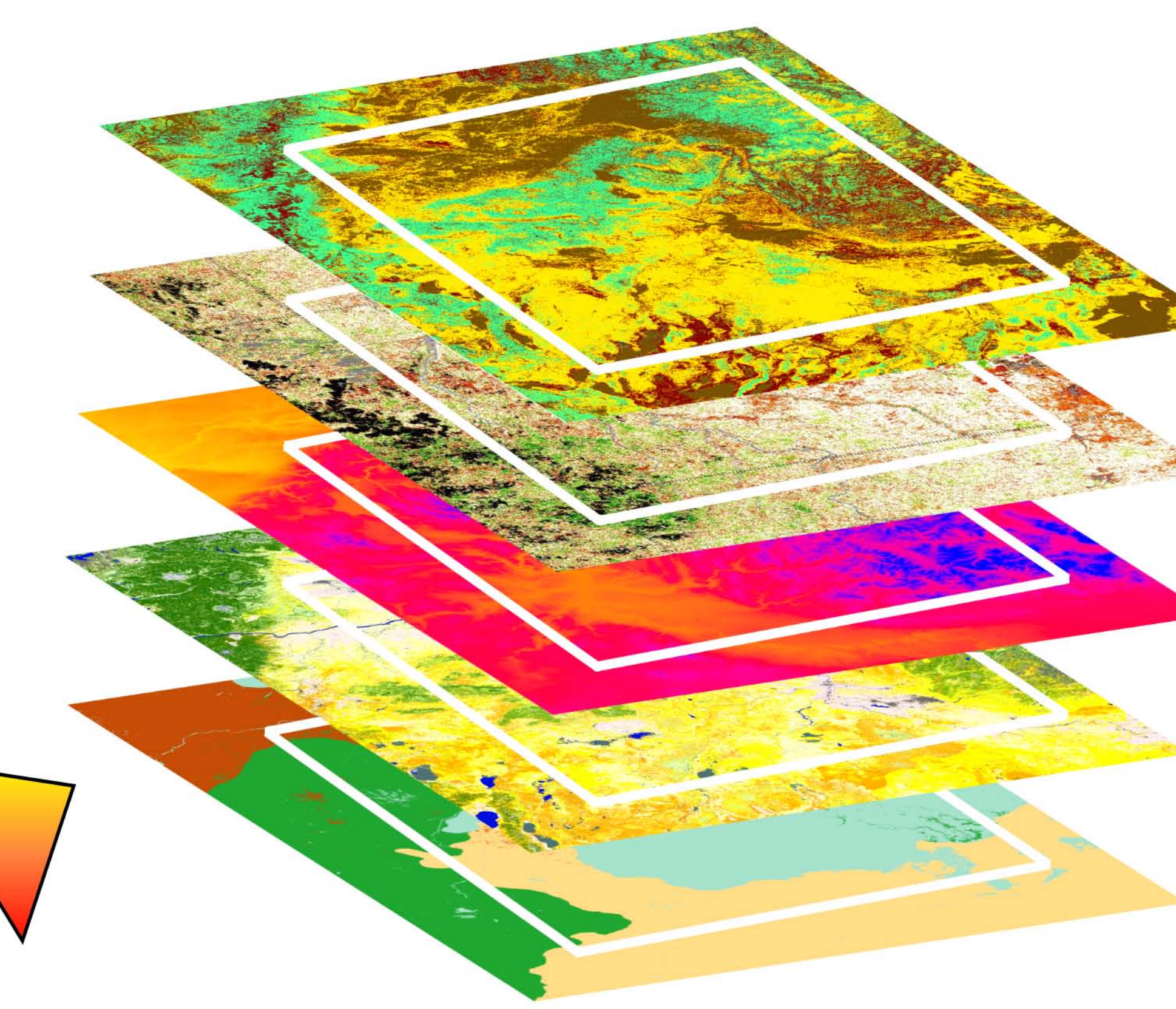
ArcGIS Server is used to create WCS image services

### RECOVER Server



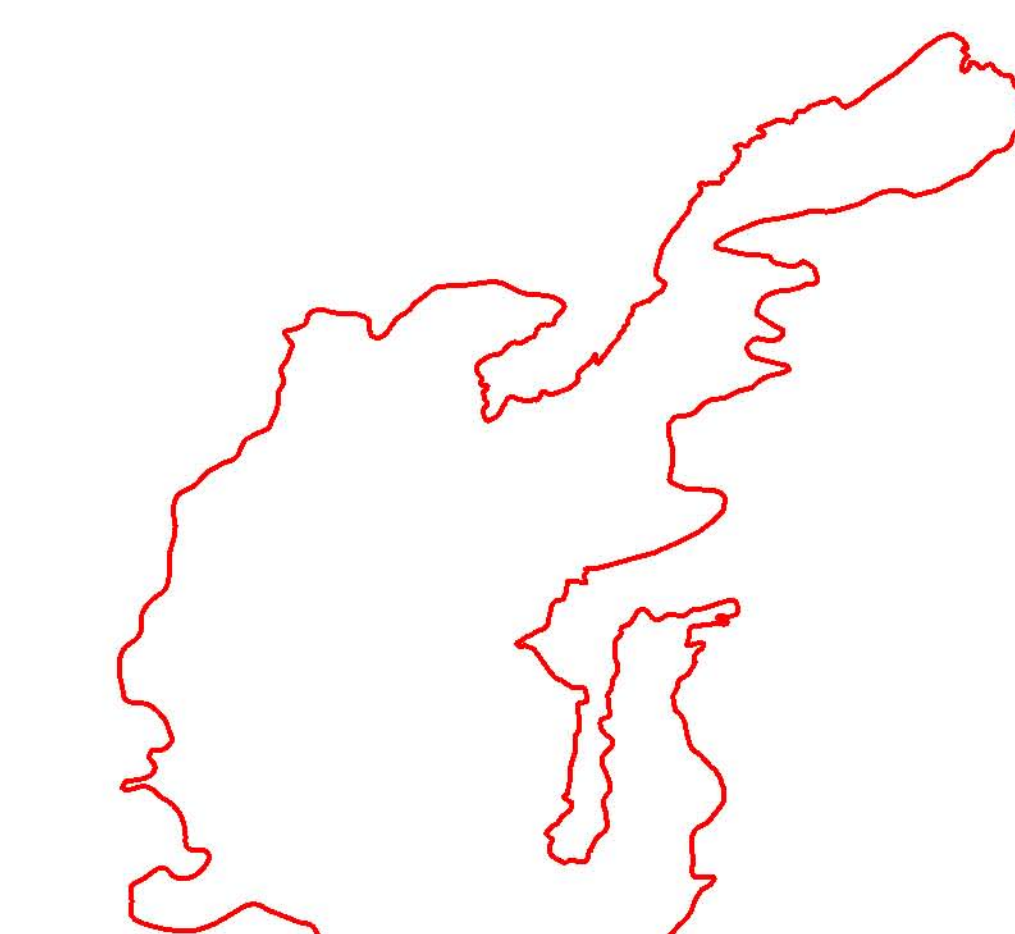
iRODS  
Amazon Cloud

WCS services are clipped to a specified spatial extent using NASA iRODS services powered by Amazon EC2 Cloud

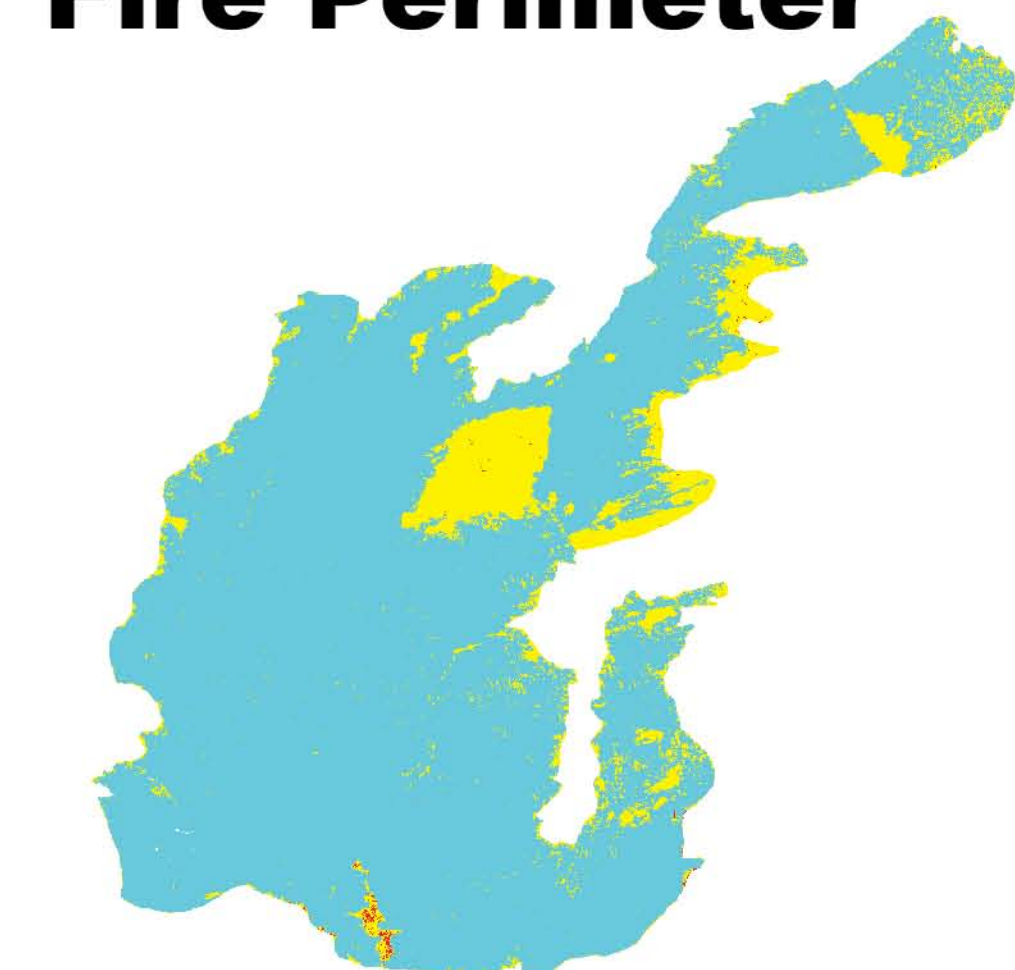


Clipped data plus fire specific data is uploaded to ArcGIS Server as image services

### Fire Specific Data



Fire Perimeter



Fire Severity

### Acknowledgements

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