RECOVER

An Automated, Cloud-Based Decision Support System
for Post-Fire Rehabilitation Planning

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ABSTRACT:

RECOVER (Rehabilitation Capability Convergence for Ecosystem Recovery) is a site-specific decision support system (DSS) that automatically brings together in a single analysis environment the information necessary for post-fire rehabilitation decision-making. RECOVER is the result of a close collaboration between NASA's Applied Sciences Program, Idaho State University's GIS Research and Training Center, the Bureau of Land Management (BLM), and Idaho Department of Lands (IDL). RECOVER uses the rapid resource allocation capabilities of cloud computing to automatically collect Earth observational data, derived decision products, and historic biophysical data so that when the fire is contained, wildfire management agencies will have at hand a complete and ready-to-use RECOVER dataset and GIS analysis environment that is customized for the target wildfire.

The RECOVER DSS is made up of a RECOVER Server and a RECOVER Client. The RECOVER Server is a specialized Integrated Rule-Oriented Data System (iRODS) data grid server deployed in the Amazon Elastic Compute Cloud (EC2). The RECOVER Client is a full-featured Adobe Flex Web Map GIS analysis environment. When provided a wildfire name and geospatial extent, the RECOVER Server aggregates site-specific data from pre-designated, geographically distributed data archives. It then does the necessary transformations and re-projections required for the data to be used by the RECOVER Client. It exposes the tailored collection of site-specific data to the RECOVER Client through web services residing on the Server. RECOVER is transforming this information-intensive process by reducing from days to a matter of minutes the time required to assemble and deliver crucial wildfire-related data.

Last year, we successfully demonstrated RECOVER's feasibility and identified new areas where RECOVER could be useful. Over the next three years, we will deploy RECOVER into operational use in the Western US and will expand participation to include USGS, the US Forest Service, and Burned Area Emergency Response (BAER) Teams. We will focus on enabling four key work processes: pre-fire, active-fire, and post-fire decision making and long-term recovery monitoring. We believe the RECOVER project is making a highly-leveraged, high-value contribution to our national wildfire efforts. Although difficult to quantify, RECOVER provides an even larger return on investment when viewed from a broader perspective that takes into account societal benefits, improved ecosystem services, and more effective natural resource management.