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RAPID: Monitoring and modeling watershed-scale post-wildfire streamflow response through space and time

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Data Management Plan

1. Types of data

Data collected will include: (1) time series of observations from *in-situ* sensors installed at fixed monitoring locations (e.g. streamflow gages, rain gages, etc.) by our project team, (2) in-situ point measurements such as hillslope infiltration, (3) similar datasets collected by other collaborators in the watershed, and (4) public geospatial datasets such as soil burn severity maps, digital elevation models (10 m), etc. Additionally, long-term USGS streamflow records are already available in the study area. Existing measurements will be integrated with new field measurements we collect within the scope of the proposed project.

2. Data and metadata formats, standards and organization

The proposed project will employ a tiered data management strategy to handle raw, transformed, and model output data.

Raw data include discharge and precipitation data collected in prior studies and by the project team, and downloaded streamflow and meteorological data. External-sourced raw data will be stored in original format (digitalized) along with metadata containing data collection methodologies or citations. Data collected by the project team will be integrated with existing USGS streamflow records and ongoing data being collected by other entities in the study area. We will standardize site naming conventions, variable names, and file naming conventions before integrating the existing and current study data sets. We will prepare metadata that conform to the Dublin Core metadata standard [DCMI, 2012], a well-established standard for sharing environmental datasets and has been implemented in the Consortium of Universities for the Advancement of Hydrologic Sciences (CUAHSI)'s HydroShare data repository (<http://www.hydroshare.org>). We will check the collected raw data for errors starting with initial data entry in the field, downloaded data from instruments (e.g., pressure transducers) in the field, and integration from an instrument output into our final file format before transferring to a data archive.

Transformed data are quantities derived from raw data and include temporally aggregated streamflow data, spatially aggregated geospatial data, and processed aerial images. Beyond maintaining the metadata of the raw data, we will prepare documentation so that others could produce similar outputs given a variety of approaches or computational tools.

Data will be formatted according to data types. 0-D time series will be stored using comma separated value (CSV) text files. 2-D GIS data will be stored using the shapefile format, which is compatible with most GIS software.

Data Storage and Sharing

Throughout the project timeframe, all data produced will be stored at USU's firewalled, cloud-based internal data storage system. We plan to deposit and publish the final products from this project in CUAHSI's HydroShare data repository. Our datasets published on HydroShare will be assigned a permanent and citable digital object identifier (DOI) and become public accessible. Both the USU internal data storage and HydroShare follow a multi-node structure. We anticipate that the two data repositories will meet the 10-year minimum data preservation standard without additional funds beyond the project period.

All data collected and generated within this project will be made available for use by other researchers and people beyond the original research community such as resource managers (see Broader Impacts). A recommended formal citation to the HydroShare depository DOI and/or a relevant publication will be provided to facilitate reuse tracking and attribution to data providers. In order to ensure data transparency, data will be distributed along with accurate and complete documentation that describes the data collection and generation methods.

Roles and Responsibilities

The point of contact for all data sets archived for this project is Dr. Belize Lane, belize.lane@usu.edu. Students will go through a training program for data reproducibility and storage.