



Burned Watershed Geohazards

2024 Program Update

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THE 2024 WILDFIRE SEASON was active in California with 7,194 wildfire incidents resulting in just over one million acres burned by the end of October. The number of incidents was slightly above, and acres burned slightly below, the five-year average.

Watershed Emergency Response Teams (WERTs), led by CAL FIRE and the California Geological Survey (CGS), are state teams deployed to identify postfire hazards that threaten life-safety, property, and infrastructure. A fundamental step in the WERT process is the identification and characterization of Values-at-Risk (VARs) using a combination of modeling and professional judgment

from a wide range of disciplines including hydrology, geology, geomorphology, and meteorology.

The burned watershed geohazards (BWG) team conducted 16 postfire reconnaissance surveys in 2024. Of those, nine resulted in WERT deployments, where more than 330 VARs were identified and site-specific recommendations were made to mitigate postfire hazards. The greatest number of VARs were identified on the Bridge and Line Fires. WERT reports detailing these VARs and other findings are available online at <https://www.conservation.ca.gov/cgs/bwg/recent>. The other seven postfire reconnaissance surveys were

documented in memoranda only, and forwarded to our partners at CAL FIRE and CalOES.

As wildfire activity wanes, the BWG team is instrumenting areas of high postfire debris flow and debris flood potential to capture data that will inform rainfall triggering thresholds as well as improve our understanding and ability to model postfire runoff-induced hazards.

To support hazard mitigation planning efforts across California, the BWG team developed a statewide pre-fire map of postfire debris-flow hazards. This map product uses terrain, soil data, simulated burn



This page: Derek Cheung conducts hillslope transects on the 2021 Dixie Fire in October 2024. These observations track changes in vegetation recovery and grain size distribution in the burn area and improve our understanding of how susceptibility to flash floods and debris flows change with time after wildfire. Photo: Rebecca Rossi

Facing page: Rebecca Rossi and Paul Richardson prepare for a helicopter flight over the 2024 Park Fire burn area. Flights over the burn area help WERT members assess areas most susceptible to postfire flood and debris flow hazards and determine areas of highest priority for site visits on the ground. Photo: Don Lindsay.

severity, and the USGS debris-flow likelihood and volume models, to estimate the potential for postfire debris flows across the state for a given rainfall intensity. The map will support communities in identifying areas that are most susceptible to debris-flow hazards and provides information they can use to plan for and mitigate postfire flood and debris-flow hazards before an area is burned. The map will be made publicly available as a GIS layer, and development of a scientific journal article describing methods and use cases is underway. BWG will work with partners to facilitate the application of this map product to their planning efforts.

From May 20-22, 2024, the BWG team attended the “Establishing

Directions in Postfire Debris-Flow Science” conference in South Lake Tahoe. The conference, supported by USGS, brought together nearly 100 scientists from federal and state government agencies, university, consulting, and NGOs representing various disciplines related to postfire debris-flow science such as geomorphology, hydrology, engineering, remote sensing, ecology, and atmospheric science. The format consisted of presentations, poster sessions, and interactive breakout groups, all guided to identify and develop group consensus on establishing science directions. The three top priorities that emerged from breakout discussions and voting exercises were: (1) process-based understanding of regional

postfire debris-flow hazards, which involves improved understanding of the processes driving postfire debris flows across climates and geologies; (2) a centralized data hub and standardization of data formats, which would support various efforts such as debris-flow model development and verification; (3) science communication and outreach to improve public understanding of postfire debris flow hazards and to provide support to communities where postfire hazards are emerging, as well as improve communication and collaboration between scientists and decision makers.

Learn more about burned watershed geohazards at <https://www.conservation.ca.gov/cgs/bwg>