

Title: Erosion and Best Management Practices after Forest Fire: How Water Quality Monitoring and Bioassessment Studies Reveal Impacts of the Ponderosa, Rim, and King Fires.

Sierra Pacific Industries (SPI) manages 1.66 million acres of forestlands in California. Since 2000, SPI's Research and Monitoring Program has studied timber operations and fire as they relate to water quality, sedimentation, erosion, aquatic life, and habitat. Research has been facilitated by a growing network of stations collecting continuous water quality and weather data. Twenty-two continuous water quality monitoring stations collect data for 10 parameters. Over 90 weather stations (32 permanent) collect data for 13 critical fire-related parameters pertaining to air, wind, and soil. SPI's monitoring data is supplemented by field and laboratory bioassessment studies focused on algae, benthic macroinvertebrates, and physical habitat assessment. Monitoring and bioassessment data is produced under a formal quality assurance system that is comparable with the Surface Water Ambient Monitoring Program, including data upload to the California Environmental Data Exchange Network.

The Ponderosa (2012), Rim (2013), and King (2014) fires burned a combined >380,000 acres with almost 58,000 of those acres on SPI forestlands. A dataset of over 2 million relevant results has allowed SPI's Research and Monitoring Program to study a variety of aspects of the pre- and post-fire environment. This presentation will discuss pre- and post-fire turbidity, flow, water temperature, and dissolved oxygen results and how they relate to California Stream Condition Index Scores from 2014-2017 bioassessment studies.

The presentation will also address SPI's development and implementation of Best Management Practices (BMPs) in response to wildfire. For example, ongoing water quality data and hillslope monitoring suggested that contour tilling and salvage logging mitigated fire-related sediment erosion and delivery to streams. BMPs that were implemented post-fire were revised; the new approach began treatment in areas adjacent to streamside buffer zones first, and then treatment was applied outward from the streams. Contour tilling and salvage logging was subsequently adopted by SPI and applied to 9,875 acres following the Ponderosa Fire. These BMPs were also implemented immediately post-fire in the Rim and King Fires."

Presenter: Dr. Cajun James, Sierra Pacific Industries, Forestry Division, Research and Monitoring Program

Since 2000, Dr. Cajun James has worked at Sierra Pacific Industries to establish the Research and Monitoring Department. She develops and directs several large monitoring networks, integrating water quality studies with the largest private weather station and repeater network in the United States. Dr. James' specialties include water quality, benthic macroinvertebrates, land-use related erosion, instream wood recruitment, canopy cover estimation, near stream microclimate studies, watershed analysis, pre- and post-wildfire sedimentation, riparian responses to forest management and wildfire, rare plant surveys, road erosion inventories and modelling, and fire forecasting using the National Fire Weather Danger System.
http://spi-ind.com/research/SPI_Research_and_Monitoring_QAPP.pdf