Submitted Abstract

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Abstract

Post-wildfire debris flows/floods originating from the 2021 wildfires areas in BC have impacted highways and railways. The Lytton Creek wildfire started on June 30, 2021, one day after Canada's highest ever temperature (49.6 °C) was recorded at Lytton, B.C. The fire destroyed the village of Lytton. Post-wildfire debris floods and flows occurred on August 16, 2021, during the first period of significant rainfall after the fire. These events affected watersheds around the First Nations village of Nicomen, located 14 km east of Lytton. The debris flows/floods also affected Highway 1 and the Canadian Pacific Railway along the Thompson River. This paper examines and compares six post-wildfire debris flow/flood events from the Lytton Creek Wildfire burnt area. The discharge capacities of culverts were, in some cases, overwhelmed, and debris flowed across the highway and railway track. Simulations were performed to analyze debris flow depths and velocities. Fieldwork conducted after the debris flows provided data to constrain and calibrate the simulations. The simulations consider rainfall hydrographs at 10-minute intervals and high-resolution digital terrain models obtained from point clouds created from lidar surveys and structure-from-motion processing of UAV aerial images. We discuss the potential use of these simulations to optimally guide low-cost mitigation measures (e.g. placement of deflection structures, retention barriers and enhancing the capacity of culverts) for areas susceptible to wildfire hazards.