The SR 530 Landslide: River response and flood risk

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On March 22, 2014, an 8 million cubic meter landslide moved across the floodplain of the North Fork Stillaguamish River in Snohomish County of western Washington. The landslide moved through the Steelhead Haven neighborhood, traversed a 1.4-km section of Washington State Route 530 (SR 530), and traveled as far as 2 km in places. The landslide caused 43 fatalities. Officially named the SR 530 Landslide, the mass movement dammed the North Fork Stillaguamish River to a depth of 7 m forming an impoundment lake 4 km long and 3.3×10^6 m^3 in volume. After 25 hours, the impoundment lake overtopped the landslide deposit in a topographically low trough establishing a new river channel. In the days and weeks following the landslide, a multiagency team of engineers and scientists worked in the Emergency Operations Center to assess the risk of a dam-breaching flood to downstream communities, monitored the elevation of the impoundment lake, anticipated flood risks from approaching storms, worked with Snohomish County officials and contractors to lower the water level of the impoundment lake, and applied available scientific and engineering data and tools in support of the search, rescue, and recovery effort. By June, the impoundment lake was fully drained for river flows less than 57 m^3/s (2,000 ft^3/s) with no rapid breaching of the impoundment; however, due to the constricted channel through the landslide deposit, the pool will likely return with higher flows in the coming flood season potentially affecting residents upstream from the landslide. Downstream aggradation caused by sediment eroded from the landslide could increase flood risk. Through the coming flood season, the multiagency team will continue to monitor aggradation in the river and changing flood-risk conditions.