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Landslides Triggered by the 12 May 2008, M 7.9 Wenchuan, China Earthquake

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The 12 May 2008, M 7.9 Wenchuan earthquake in eastern Sichuan Province of China triggered tens of thousands of rock falls, rock slides, rock avalanches, and deep, complex, landslides. Of the approximately 87,000 deaths caused by the earthquake, more than 20,000 have been attributed to landsides. Numerous villages were buried by large landslides. Air-blasts resulting from the rapid failure and movement of landslides were observed and documented from numerous eye-witness accounts. More than 100 landslide-dammed lakes were created by the earthquake, 33 of which were evaluated to determine if spillway construction was necessary to minimize flooding by future breaching of the landslide dams. Spillways were ultimately constructed on at least 16 landslide dams.
Preliminary observations in the field and from satellite imagery indicate that the most common types of landslides were rock falls and rock slides that ranged in size from several hundred cubic meters to several hundred thousand cubic meters in volume. There were hundreds to perhaps as many as one thousand landslides exceeding 1 million cubic meters in volume. The largest landslide identified using Jaxa's Alos/Prism satellite imagery (2.5 m resolution) is nearly 1 billion cubic meters in volume and is located approximately 12 km north-northeast of the city of Hanwang. This landslide appears to have resulted from the failure of a 1.5-km section of ridge crest that now occupies most of the adjacent valley to the northeast; its toe spills over the next ridge crest to the northeast. The satellite imagery of 4 June 2008 shows two small lakes dammed by the slide debris. Within the mountainous areas in the near-field zone of shaking, rock slides dammed chains of lakes in many drainages. Sections of streams 2-3 km long have been completely covered by rock debris as of the 4 June imagery
The debris from the triggered landslides is being redistributed rapidly by post-earthquake rainfall. A 100-year rainstorm in September 2008 remobilized many earthquake-triggered landslide deposits into debris flows, which resulted in additional fatalities, road closures, and flow restrictions of even large rivers such as the MinJiang River near Yingxiu. Increased sedimentation from the landslide debris triggered by the 12 May earthquake could significantly reduce storage capacities of the numerous reservoirs in the region.
To assist with hazard mitigation and reconstruction efforts, the U.S. Geological Survey will collaborate with the China Geological Survey to transfer methods and technology to produce probabilistic landslide hazard maps for hazardous areas in Sichuan Province.