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Distribution of large landslides and landslide dams triggered by the Wenchuan earthquake, Sichuan, China

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On May 12, 2008, the Wenchuan earthquake with a moment magnitude of 8.0 occurred on the NE-SW trending Longmenshan fault zone at the eastern margin of the Tibetan Plateau, just west of the Sichuan basin, China. It not only caused severe damage to infrastructure, but also triggered a large number of landslides, rockfalls, rock avalanches, and debris flows. One third of estimated 88000 casualties of the earthquake were considered to be caused by landslides. Through the interpretation of post earthquake satellite images a rapid inventory was made of landslides in the earthquake affected area. The database contained more than 9500 individual landslides, mapped as single points, of which approximately 41 % were landslides, 28 % rockfalls, 10 % debrisflows and the rest other types of mass movements. The landslides were also classified according to their size, into 4 classes, with 2.5 % as huge containing the largest landslide (Daguangbao landslide, in Anxian county) with an estimated volume of 742 millions m3.

Pre- and post Aster images have been processed in order to compare the situation before and after the earthquake, through image processing. Digital Elevation Models derived from Aster data have also been used in selected areas in order to calculation the displaced volumes of landslide materials. Visual interpretation of Aster image was also carried out, and also of high resulotion images and aerial photographs.

Some of these landslides formed natural dams in the rivers, with the potential secondary hazard of subsequent dam-break flooding. The image interpretation resulted in the identification of 256 landslide dams caused by the Wenchuan earthquake. Detailed data was collected for 32 landslide dams. Some of these dams posed serious threats to people due to the substantial volume of water accumulated in the impounded lake and the subsequent rapid release of the impounded water. The paper focuses on the statistical analysis of the landslides and landslides dams. Some of the large landslides are described in more detaile, such as the Donghekou landslide dam.