Geophysical Research Abstracts
Vol. 13, EGU2011-8182, 2011
EGU General Assembly 2011

Regional distribution of landslides induced by the January 2010 Haiti earthquake

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On 12 January 2010, Mw 7.0 earthquake struck the Port-au-Prince region of Haiti. The event killed more than 220,000 people and triggered thousands of landslides in the epicentral area and mainly along the side slopes of the Momance River. Here we present the mapping of the distribution of landslides triggered by the earthquake. An extensive landslide interpretation was carried out using sets of optical high resolution satellite images (e.g. GeoEye-1, Quickbird and IKONOS) as well as aerial photos for both the pre- and post-earthquake situation, which were made freely available for the response and rescue operations. Different parts of the landslides (depletion, accumulation, and transportation areas) were identified and mapped as polygons using multi-temporal visual image interpretation based on satellite imagery and morphological elements of landslide diagnostic indicators. Nearly 1,800 individual landslides with different sizes and types were mapped. The mapped pattern of coseismic landslides shows that the landslides are highly concentrated in the side slopes of the structurally controlled major rivers such as Momance and Frorse Rivers that drain the central slopes of the region towards to north rather than the near surroundings of mainshock of the earthquake. The landslide areas and epicentral distances are not within the expected exponential form according to worldwide data, while the pattern and abundance of landslides correspond to the vertical component of ground motion and conspicuously reflect the morpho-tectonic characteristics of the region.