

# Lidar Use in Haiti

A new last minute addition to the International Lidar Mapping Forum conference program will include two presentations on how Lidar is being used in Haiti to assess the damage from the recent earthquake and the future probability of subsequent earthquakes. Imagery of the region damaged by the M7 Haiti earthquake, including high-resolution photography and airborne Lidar, has revealed a variety of ground failure that resulted from shaking.

Surprisingly, the Enriquillo Fault seems to have not ruptured at the ground surface, so the negative result obtained from imagery has significant implications. The USGS issued a statement, based on imagery analysis, that because it is clear that the rupture of the Enriquillo Fault was clearly farther west than Port-au-Prince, and because rupture was buried deep on the fault, there is a significant risk of not only regular aftershocks, but also the threat of a subsequent large event that could occur even closer to Port-au-Prince.

The probability of one or more subsequent earthquakes of M7 or greater increased by about 3% for the 30 days following 21 January 2010. Although this is a low probability, it would be a potentially very high impact event. High-resolution imagery was crucial to this assessment.

Kenneth W. Hudnut, Ph.D, Geophysicist at the U. S. Department of the Interior - U. S. Geological Survey will present 'The M7.0 Haiti Earthquake of 12 January 2010: How Lidar Helps' at the upcoming International Lidar Mapping Forum. The paper will focus, not only on the future probability of aftershocks, but also on how LiDAR data is being used to assess the distribution of earthquake-induced landslides in Haiti and in the general relief effort by assisting agencies with assessing the damage to buildings, roads, bridges and port facilities.

Building on the overview presented in Dr Ken Hudnut's paper, John Antalovitch, President and Andrew Mitchell, Lidar processing specialist of Kucera International in Willoughby, OH, are then giving a paper on their Lidar missions in January this year covering the Haiti earthquake fault area and Port Au Prince and Leogane.

Kucera International Inc. in collaboration with the Rochester Institute of Technology (RIT) and ImageCat of Long Beach, California was sponsored by the World Bank to perform a high resolution aerial Lidar and multispectral image survey of primary earthquake damaged areas and fault zones. The surveys were performed from Kucera's dual-sensor port twin-engine aircraft using Kucera's Leica ALS60 aerial Lidar system and RIT's WASP multispectral sensor. The aerial flyover was conducted from January 21 through January 27 and covered Port-au Prince, Leogane, Petit Goave, Grand Goave, Fermante, Jacmel, and the western and central Enriquillo fault line. The team members worked round-the-clock to process and distribute the aerial data immediately following acquisition to the World Bank and other assisting organizations. The data is currently being used for the ongoing relief and rebuilding effort.

Kucera's presentation will review the performance of the aerial survey, the expedited processing and distribution of the aerial data, and potential future refinement and applications of the data.

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