

Keynote speaker Topic 4

Mr. Liyuan Fei

Profile

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Date of Birth: 24 June, 1954
Nationality: Taiwan

Titles

2011-2012: Secretary General of Engineering Geology
Commission, Taiwan Geology Society

Position Held

2003-2007: Division head of Resource Geology Division, Taiwan
2008-present: Division head of Environmental and Engineering
Geology Division, Taiwan

Research Interests

Engineering geology
Hydrogeology (including hot-spring geology)
Survey (GPS and LiDAR)

Education

Engineering Geology studying, Geology, Tuebingen University, Germany, 1983~1984
B.S., Earth Science, Cheng-Kung University, Tainan, 1977



Abstract

The Road from National LiDAR mapping program to Zonation of the Geohazards in Taiwan

On August 8, 2009, when typhoon Morakot swept through Taiwan, the island nation suffered a devastating disaster, the scope of which it had never seen before. Typhoon Morakot in two days brought 211cm of heavy rain, and in some southern Taiwan areas as much as 300cm of rain was measured. The resulting landslides amounted to 40,594 separate incidents. Responding to the Morakot disaster, our government enacted an emergency measure, entitled "Special Statute for Reconstruction of Post-typhoon Morakot Disaster", which prodded Central Geological Survey to initiate a dedicated project aimed at the preservation of land in zones sensitive to geohazards, due to geomorphological and geological conditions.

As part of this project, airborne LiDAR was deployed to establish a new nationwide DEM (Digital elevation model) with grid size of 1m, and to obtain digital aerial photograph, with grid size of 50cm, simultaneously. The first National LiDAR mapping program was conducted by four survey teams and one quality assurance team. Survey teams operated a variety of laser sensor systems. Weather, terrain relief, and dense vegetation conditions were the three most challenging issues, limiting the performance of this project. After overcoming all the difficulties, we completed the project and achieved our goal, which is, establishing the first National LiDAR map of Taiwan.

In addition, the application of high resolution DEM database to investigate and analyze geologically sensitive areas, geological and topographical characteristics, river system analysis were all part of this project. The key work was to identify and analyze large-scale landslides. We concluded that there were about 600 high-susceptible, large-scale landslide areas in central, southern and eastern Taiwan.

At present we are planning a second phase of National LiDAR program in the near future to further study different issues of large-scale landslides to prevent the Shiaolin Village disaster from ever occurring again.

Keywords: national LiDAR mapping program, large-scale landslides, geologically Sensitive Area