



IAG Webinar East & Southeast Asia



March 6 (Sat), 2021, 15:00–18:20 UTC+9 / 14:00–17:20 UTC+8 / 6:00–9:20 UTC



Dr. Ray Y. Chuang
National Taiwan University,
Taiwan

15:00 – 15:40

Mountain building process of the frontal mountain belt through an earthquake cycle in central Taiwan

Large dip-slip earthquakes have a major contribution to raise mountains while earthquake-induced landslides lower mountains, making mountain building uncertain. We use imaging geodesy for synthetic aperture radar images to reconstruct 3D coseismic deformation of the 1999 Chi-Chi earthquake and compute uplift due to surface deformation at different stages through an earthquake cycle. We then compare the tectonic uplift and coseismic landslides to evaluate how a large earthquake influence mountain building process. We found that the volumetric difference and spatial mismatch of the uplift and landslides both suggest that the frontal Taiwan mountain belt should keep surface uplift.

Dam failure and a catastrophic flood in the Mekong basin (Bolaven plateau), southern Laos, 2018

A reservoir dam failure in Laos on July 23, 2018 caused catastrophic flooding that resulted in many fatalities and displaced thousands of individuals. Our analysis shows that the dam collapsed as the reservoir was ~10 m below its full capacity. Inspection of photographs of failed dam confirms that the failure was structural. Analysis of imagery and field observations reveals that the flooding inundated ~46 km² of villages downstream. Through 2D hydrological modeling, we calculate a peak flood discharge of ~8,500 m³/sec. The dam failure and concomitant losses are consistent with common inadequacies in this region in assessing potential impacts.

15:40 – 16:20



Dr. Edward Park
Nanyang Technological
University, Singapore



Dr. Noelynna T. Ramos
University of the Philippines,
Philippines

16:20 – 17:00

Coastal tectonics and extreme wave events inferred from emergent sea-level indicators and overwash deposits: Examples from the Philippines

Surrounded by active subduction zones and frequented by strong typhoons, coastal communities in the Philippines are constantly at risk from the impacts of tsunamis and storm surges. We use geological, geomorphological, and sedimentological data to understand and model coastal processes and their accompanying hazards. Emergent marine terraces provide clues to long-term tectonic deformation and sea-level changes while coastal boulder deposits potentially imply emplacement by an extreme wave event. These new geological and geomorphological data are essential inputs to modeling source mechanisms and hazard scenarios.

Coastal morphological features analysis by means of UAV-derived high-resolution DEMs for selecting tsunami vertical evacuation routes and planning

Determining tsunami evacuation routes and safe areas can be established from the least cost distance anisotropic model by considering coastal morphological features. We use an example in Gunungkidul, Yogyakarta, Indonesia, a tropical coastal karst region with a typical karst cone formation. High-resolution orthomosaic images and DEMs generated from the Structure from Motion process were used as the main data. The results show that tsunami vertical evacuation is the main alternative in tsunami evacuation planning in this area, and the assembly point locations and evacuation routes provided by the government are ineffective because of the inappropriate model used.

17:00 – 17:40



Prof. Muh Aris Marfai
Universitas Gadjah Mada,
Indonesia



Dr. Yuichi S. Hayakawa
Hokkaido University, Japan

17:40 – 18:20

Applications of terrestrial laser scanning and structure-from-motion photogrammetry for geomorphological change detections and recognition

Geomorphological applications of high-definition topography (HDT) data have been widely performed in these days. One of the advantages of HDT data is its feasibility for the quantitative and three-dimensional (3D) change detections of small landforms for the observation times, and here some case studies including coastal and fluvial erosion are introduced. Furthermore, the 3D data can be utilized for the dissemination of such small environmental changes that have not been well recognized by many people through some applications of 3D printing and artwork.

Message from coordinators/chairpersons

The IAG Geomorphology Week started in 2020, and this webinar is the very first activity for Geomorphology Week in East and Southeast Asia. Researchers from four IAG National Scientific Members (Indonesia, Japan, Singapore, and Taiwan) and also the Philippines (which will soon join the IAG) will give talks on various aspects of East and Southeast Asian geomorphology, from mountains to coasts. We plan to regularly organize similar webinars for this region, including talks from researchers from other National Scientific Members such as China, Myanmar, South Korea, and Vietnam.



Prof. Takashi Oguchi
The University of Tokyo,
Japan



Dr. Kay Thwe Hlaing
Yangon University of
Education, Myanmar

INTERNATIONAL GEOMORPHOLOGY WEEK 2021