

IAG Webinar East and Southeast Asia



March 6 (Wed), 2024, 14:00–17:00 (UTC+8)

Coordinators: Takashi Oguchi and Kay Thwe Hlaing
The University of Tokyo, Japan, and Yangon University of Education, Myanmar

14:00–14:20



Landslide occurrence patterns based on landscape characteristics in Sukajaya District, Bogor Regency, Indonesia

Boedi Tjahjono, Dept. of Soil Science and Land Resource, IPB University, Indonesia

Sukajaya District is located in the Halimun-Salak Mountains area. At the beginning of 2020, this region experienced a landslide disaster triggered by heavy rainfall, causing nine fatalities. For mitigation programs, knowing the pattern of landslide events based on landscape characteristics is important. According to the results of landslide points mapping, it shows that the landslide predominantly occurs in landscapes characterized by "mixed plantation" land use, "denudational lava flow" landforms, "steep" slopes, and "upper" slope positions. So, for the Sukajaya case, the most prone areas to landslides are on "lava flow landforms with moderate to steep slopes and have mixed garden land use."

Landslide wetlands as creators of diversity in mountainous regions in Japan

Natsuki Sasaki, Meiji University, Japan

Landslides have recently gained recognition as a critical player in contributing to geodiversity and promoting biodiversity. Wetlands are one of the representative landscape elements associated with landslides. Following their initial formation through primary landslide activity, subsequent landslide events and soil mass erosion can contribute to creating new wetlands or affect the succession of existing wetlands. Due to these landslide dynamics, wetlands with different succession stages, including lakes, fens, and bogs, coexist and maintain mosaic landscapes within a single large-scale landslide for a long time. Moreover, landslide wetlands, recharged by abundant groundwater, can be less vulnerable to global warming than wetlands primarily recharged by snowfall.



14:20–14:40

How does the extent of headwater catchment change with relief?

Hui Chen and Jongmin Byun, Department of Geography Education, Seoul National University, South Korea

The headwater catchment (HC), which consists of hillslopes, valley heads (VHs), and colluvial channels, serves as a sediment source for downstream drainage networks. It varies in size from 10^4 to 10^6 m² with a large variation across regions. Relief, linked to hillslope gradients, influences mass movement processes like landslides and debris flows, thus potentially impacting HC's development. Here, to understand the relationship between HC's size and relief, we identified the HC's extent based on the slope-area relationships. Our results revealed that the HC expanded with relief, indicating frequent mass movement. This demonstrates that relief is a critical variable in determining the extent of geomorphic units within the HC, which are important considerations in disaster management strategies.



14:40–15:00

River morphology evolution driven by mass movements in tectonic active regions – case of the lower Tsangpo River in eastern Himalaya

Dr. Guo-An Yu, Institute of Geographic Sciences & Natural Resources Research, Chinese Academy of Sciences, China

The Eastern Himalaya is one of the most tectonic active regions globally. Morphology in this area is normally in a critical equilibrium state, which is highly prone to be influenced by mass movements (e.g., landslides and debris flows). The fluvial processes of the lower Tsangpo River in this area are investigated to understand the morphodynamics influenced by modern and historical mass movements and examine the feedback between river morphology and mass movements. The dynamic adjustment of river morphology in this region is often in circulation between states "stable-unstable", and a negative feedback exists driving the morphology back to a new equilibrium state.



15:00–15:20

Sediment formation and development of terraces of the Tui River in Southern Mongolia

Narangerel.S, Head of Physical Geography and Environmental Research, IGG, MAS, Mongolia

Here, we present the results of geomorphological and sedimentological investigations at the Ikh Bogd mountain range and the River Tui basin in the valley of Gobi Lakes in central and southern Mongolia. Morphological investigations at the mountain range show at least five different terrace levels, reaching up to 70 m above the present floodplain. Along the river Tui, four to five terrace levels were identified. Sedimentological data (grain size, carbonate content, XRF, CNS, TOC) of the different terrace levels reveal two types of surfaces as young and old. The results indicate the formation of different morphological stages, which were followed by a long period of stability and soil formation.



15:20–15:40

Recent intensification of riverbed mining in the Mekong Delta revealed by extensive bathymetric surveying

Ms Rachel Lau, National Institute of Education, Nanyang Technological University, Singapore

Large-scale sand extraction in the Vietnamese Mekong Delta (VMD) has substantially impacted its riverine environment, yet effective regulation and sustainable management face challenges due to limited data. This study, based on extensive bathymetric surveys spanning 800 km² of the VMD from 2017–2022, reveals significant riverbed deepening, particularly in the upper Hau (Bassac) and Tien (Mekong) Rivers. Variable incisions, widespread pockmarks, and lowering riverbed elevations provide strong evidence of sand mining's influence on riverbed morphology. The proximity of bank collapse to pitted riverbeds also indicates sand mining-induced erosion. This evidence-based assessment aims to inform sediment budgets and enhance regulatory frameworks for sustainable sand mining in the VMD.



15:40–16:00

INTERNATIONAL GEOMORPHOLOGY WEEK 2024

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Coastal geomorphology as geological heritage and tourism resources in Terengganu, Malaysia

Dr. Dony Adryansyah Nazaruddin, Marine Geoscience Program, Faculty of Science and Marine Environment, Universiti Malaysia Terengganu (UMT), Malaysia

The captivating coastal geomorphology in Terengganu, Malaysia, serves as a potential geological heritage and tourism resource. The inventory, characterization, and assessment of important geological/geomorphological sites in the state's coastal areas are crucial for analysing their potential. Therefore, nine important sites are chosen for this purpose including Keluang-Bubus-Dendong Hills, Setiu Wetlands, Chendering Beach, Batu Pelanduk Beach, Teluk Bidara Beach, Kemasik Beach, Penunjuk Beach, Janda Baik Waterfall, and Marina Beach, which contain several coastal features such as rocky shorelines (with sea caves, arches, stacks, cliffs and wave-cut platforms), wetlands, granite tors, coastal waterfall and so on.

Successive ruptures along the Masbate segment of the Philippine Fault

Deo Carlo E. Llamas, Philippine Institute of Volcanology and Seismology (PHIVOLCS), Philippines

The 2020 M_w 6.6 earthquake in Masbate, Philippines, the second $M > 6$ event in 17 years, revealed a 23-km-long surface rupture along the Philippine Fault. Through morphotectonic and seismicity analysis, our study unveils fault slip dynamics. The rupture characteristics demonstrate how fault properties influence rupture initiation and propagation. Measuring cumulative and coseismic slip, we calculate a slip rate of 2.8 to 3.8 cm/yr and a recurrence interval of 16 to 41 years for similar earthquakes. Comparative analysis with the 2003 M_s 6.2 quake reveals overlapping ruptures and varied slip patterns, underscoring fault properties' significance in earthquake dynamics and hazard assessment.



16:20–16:40

16:40–17:00



Back to the classroom – Sharing Geomorphology in practice

Dr. Kit Ying Angel Ng, Lecturer in Geography and Resources Management, The Chinese University of Hong Kong

This presentation provides a personal journey of the ongoing career development as a geohazards assessment practitioner as well as a lecturer in geomorphology. The author highlights the 'hands on' development of 'reading the landscape' knowledge and skills in practice, the importance of gaining Charterships, continual professional development, and proactively transferring the knowledge and skills in the industry and tertiary education. The 'make it real' design of professional development courses in the industry and tertiary education at undergraduate and postgraduate levels could enhance learning experiences by incorporating fieldwork and consultancy projects.

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