IAG Webinar East & Southeast Asia

March 6 (Mon), 2023, 7:00 UTC (15:00 SGT, 16:00 JST)

Coordinators: Noelynna T. Ramos & Takashi Oguchi
Univ. Philippines, Philippines & Univ. Tokyo, Japan

INTERNATIONAL GEOMORPHOLOGY WEEK 2023

07:10–07:30

Thermochronology to quantitively access the long-term erosion process

Dr. Noriko Hasebe, Institute of Nature and Environmental Technology, Kanazawa University, Japan

Radiometric dating offers the formation age of rocks. But what does “formation” mean? When a target system (e.g., rock or mineral) is closed and diffusion becomes negligible, the accumulation of daughter elements begins and the clock starts ticking. As diffusion is mainly temperature dependent, the measured age represents time since the target material cooled below the closure temperature. By using multiple chronological methods with different closure temperatures, the cooling history of a rock can be estimated. A cooling is often caused by the erosion of overlying rocks. Thus estimated erosion rates and their relationship to topography on the Pacific coast of western Japan is presented as an example.

Understanding evolving controls of post-seismic landslides after the Wenchuan Earthquake, China

Dr. Yunus Ali Pulpadan, Indian Institute of Science Education and Research Mohali, Punjab, India

07:30–07:50

Strong earthquakes, especially on mountain slopes, can generate large amounts of unconsolidated deposits, prone to remobilization by aftershocks and rainstorms. Assessing the hazard they pose and what drives their movement in the years following the mainshock has been less explored, primarily because multitemporal landslide inventories are lacking. By exploiting multitemporal inventories covering the epicentral region of the 2008 Wenchuan Earthquake and a set of conditioning factors (seismic, topographic, and hydrological), we aim to understand the temporal evolution of these factors affecting debris remobilizations. Our results have important implications on the way conventional susceptibility assessment models should be employed in earthquake affected regions.

07:50–08:10

Changes in water surface area and volume of a saline lake in Southern Mongolia

Dr. Davaadorj Davaasuren, Department of Geography, School of Art& Science, National University of Mongolia, Mongolia

The saline lakes in southern Mongolia are one of main indicators of local climate changes. Many research and studies focused lake water surface areas those are changeable with meteorological condition and surface water dynamics and most saline lakes are shrinking in last 30 years. We used remote sensing based on the Landsat satellite database to assess the long term water surface area changes in Boontsagaan lake. The lake water surface area is then used to estimate the lake depth and lake volume changes. The result shows the lake surface area and volume changes are up to around 20% of current lake condition.

Distribution of earthquake-induced landslides: A case study of the 2022 Taitung earthquakes in Taiwan

Dr. Chi-Wen Chen, Department of Geosciences, National Taiwan University, Taiwan

08:10–08:30

In September 2022, a series of earthquakes with the largest foreshock of MW 6.5 and the main shock of MW 6.9 occurred in eastern Taiwan, known as the 2022 Taitung earthquakes. Comparing satellite images before and after the earthquakes, a total of 45 landslides were identified. We attempted to analyze the spatial distribution of landslides induced by the 2022 Taitung earthquakes and to explore its relationship with the distribution of earthquake source fault. In addition, we also analyzed the topographic conditions of landslide distribution and further explored the impact of topographic effects.

08:30–08:50

Warming-driven erosion and sediment transport in the world’s cold regions

Ms. Ting Zhang, Department of Geography, National University of Singapore, Singapore

The world’s cold regions have experienced unprecedented warming, glacier retreat and permafrost degradation since the 1950s, altering erosion processes and increasing sediment supplies. Here, we present a global inventory of warming-driven increases in erosion and sediment yield, including 76 locations from the Arctic, European mountains, High Mountain Asia and Andes. Continuous deglaciation will likely increase sediment fluxes until reaching a “Peak Sediment”, which can be decades to hundreds of years later than the meltwater peak. Thereafter, sediment-transport regimes are predicted to shift from the ongoing temperature-dominated regime toward a rainfall-dominated regime roughly between 2100-2200.

Response of Kelantan delta system to late Holocene sea-level changes and present-day human activities

Dr. Edlic Sathiamurthy, University Malaysia Terengganu, Malaysia

08:50–09:10

Sunda shelf sea level dropped since the Holocene high-stand, 4-7 ka BP ago. It was approximately 2-7 m higher than present day levels. The Kelantan delta was probably a wave dominated system developed during the HST. It shifted to an identifiable seaward position before switching to another two new locations, one which is the modern location as sea level dropped. Lidar data and multi-spectral satellite images were used together with a generalized Sunda Shelf sea level curve to examine the response of the delta system to sea level change from the HST to present-day. Current changes to the delta due to human activities are evident especially on severely eroded coastlines.