IAG Webinar Oceania

Tuesday 5th March (5-6.30 pm NZST; 3-4.30 pm AEST)

Coordinators: Dr. Sam McColl and Dr. Sarah McSweeney
GNS Science and University of Canterbury, New Zealand.

INTERNATIONAL GEOMORPHOLOGY WEEK 2024

17:00–17:15 (NZ)

The effectiveness of grade control programs in halting incision in sand bed rivers

Dr. Alex Sims, Alluvium Consulting, New Zealand

Many sand bed rivers in SE Australia have undergone phases of rapid deepening and widening since European arrival. Waterway managers have successfully used grade control programs to halt incision, establish vegetation and to accelerate river recovery in gullies, but the effectiveness of such works in larger sand bed streams has not been well documented. This presentation assesses the effectiveness of such grade control programs in the Cann River, a sand bed river in East Gippsland, Australia that was transformed from a low energy, meandering waterway into a much larger, deeper and straighter sand bed channel following European arrival.

17:15–17:30

Bedform morphology and change: Barmah-Millewa Forest, Murray River

Alisha Matheson, School of Earth, Atmosphere & Environment, Monash University, Australia

Effective river management requires a detailed understanding of river geomorphology. The Barmah-Millewa Forest reach, a narrow section of the Murray River, has become inundated with excess sandy sediment due to human impacts. This change has increased deposition and altered the morphology of the riverbed, causing a range of ecological, social, and economic issues. This research analyses river bathymetry to investigate changing bedforms and characterizes dune size and shape. This supports other research on the issue and gives us an insight on how the evolving bedform morphology may be impacting river flow and discharge.

17:30–17:45

Data-driven insights on shallow landslide connectivity and sediment delivery to streams

Dr Anatolii Tsyplenkov, Manaaki Whenua Landcare Research, New Zealand

To meet national freshwater goals and lessen sedimentation, we need more precise data on how shallow landslides caused by rain deliver sediment to streams. Using a 40,000-landslide inventory from Northern Hawke's Bay, we developed several morphometric landslide connectivity models. Our findings show landslide connectivity strongly depends on the overland flow distance to streams. A simple model based on this distance was as effective as complex ones and worked well in an independent dataset from the Greater Wellington region. Improvements were seen when incorporating landslide runout distance (RD) into a model, using a stochastic simulation to predict RD for future landslides. This approach significantly enhanced predictions of landslide-stream connectivity. Such models, combined with susceptibility analysis, can aid in more efficient mitigation efforts to reduce landslide erosion.

17:45–18:00

Bog to Bay: The Holocene infill and paleoenvironment of Westernport Bay

Mitchell Baum, School of Geography, Earth and Atmospheric Sciences, The University of Melbourne, Australia

Large estuaries which have a bedrock restricted mouth have an impeded marine hydrodynamic regime. The sedimentary infill of these large structural estuaries (LSEs) in response to Holocene Sea Level Rise (HSLR) is not well understood. During the Holocene, the flooding of Westernport Bay in Victoria, Australia produced relatively shallow depositional unit. A paleoenvironmental reconstruction of Holocene flooding and infill is presented here, and implications for LSE infill are discussed.

18:00–18:15

Six centuries of ring levee construction for polders in a large inland riverine floodplain in China

Hong Jiang, University of Melbourne, Australia

Polder, built with end-to-end connecting dikes to hold high-water outside and to reclaim land inside, has contributed significantly to the agricultural utilization and consequential landscape reshaping of low-lying plains across the world over the last millennium. Compared to the widely discussed coastal polder landscape under official planning and construction of higher authorities, the 20,000 km2 Jianghan Plain in central China had been gradually reshaped into a riverine compartmented polder landscape over six centuries by local inhabitants autonomously. We are revealing the formation process of this special human-made landscape, with assistance of topographic maps and historical materials.

18:15–18:30

The dependence of vegetation bands on band spacing

Ida Gaulke, School of Earth, Atmosphere & Environment, Monash University, Australia

Banded vegetation forms in arid regions and consists of alternating bands of vegetation (groves) and bare ground (intergroves) that align along contours. It acts as a runoff-runon system whereby intergroves, which are highly impermeable, shed water downslope to the adjacent grove which is extremely permeable. No study has yet examined whether relationships between band spacing and macroscopic boundary conditions such as slope, vegetation, rainfall and sediment characteristics, are upheld within the variability of a single site. Here, we analyse these characteristics across sites in eastern South Australia, using LiDAR data and transect-based sampling, to determine band spacing dependence.