IAG Webinar Australia & New Zealand

4th March 10:00-12:00 UTC+8 (15:00-17:00 UTC+13) *Coordinators: Susan Conway & Ian Rutherfurd*

INTERNATIONAL GEOMORPHOLOGY WEEK 2021

Shaun Eaves
Victoria University of Wellington,
New Zealand

10:00 – 10:20

Reconstructing Holocene climate change using New Zealand mountain glaciers

Understanding pre-industrial or natural climate variability provides an important context for assessing the impact of anthropogenic climate change. Mountain glaciers are sensitive climate indicators, thus geological records of their past variability offer the potential to augment instrumental records. Here we present new cosmogenic 10Be data from moraines and proglacial bedrock that constrain fluctuations of Dart Glacier, New Zealand, over the last 8,000 years. We integrate these new data with existing moraine chronologies for the region and interpret the underlying climate drivers using the physical framework of transient global climate model simulations.

Geomorphology of beaches geologically controlled by reefs, platforms and headlands

Beaches that are geologically controlled by rock and coral formations are the rule, not the exception. In this talk, we explore the many ways through which geology influences beach morphology and morphodynamics, including by accommodation, sediment supply, and gradients in wave energy alongside geologically-induced rip currents. Given the prevalence of geologically controlled beaches along the world's coasts, it is paramount for coastal management to consider how these beaches differ from unconstrained beaches.

10:20 – 10:40

Shari Gallop
University of Waikato,
New Zealand

Jack Koci
School of Earth and Environmental Science,
James Cook University,
Townsville, Australia

10:40 – 11:00

Gully Erosion and the Great Barrier Reef

Gully erosion is globally significant land degradation problem. In tropical north-east Queensland, Australia, gullies are a major source of sediment and particulate nutrients delivered to the Great Barrier Reef World Heritage Area. High sediment and nutrient loads in coastal waterways are detrimentally impacting the health of this spectacular marine ecosystem. Remediating gullied landscapes and preventing further degradation is a major focus of investment toward improving coastal water quality. This presentation will explore some recent research into the mapping, modelling and management of gully erosion in savanna rangelands tributary to the Great Barrier Reef.

Field observations of geomorphic change during estuary entrance openings

Intermittently Open/Closed Estuaries (IOCE) are estuaries with entrances that periodically close to the ocean. They are artificially opened when floodwaters build up behind the beach berm and inundate property surrounding the lagoon. During entrance openings, geomorphic change at the mouth is very rapid. Understanding the links between geomorphic change at the mouth and hydrodynamic processes in the lagoon is important for predicting the change in estuary water level, tidal exchange, and physicochemical processes. My research compares field observations from estuaries in Victoria (Australia) to determine what factors control differences in the rates and magnitude of geomorphic change during entrance openings.

11:00 – 11:20

Sarah McSweeney
School of Geography
The University of Melbourne
Australia

Alex Sims
Honorary Fellow, School of Geography, The University of Melbourne & Consultant, Alluvium Consulting Australia,

11:20 – 11:40

Catchment scale sediment pulse dynamics

Landslides, volcanic eruptions, tailings dam failure and accelerated catchment erosion generate sediment pulses that have a profound impact on the waterways they migrate into. How large sediment pulses migrate through a catchment network has important implications for in-stream habitat, channel stability and the frequency and duration of flooding in nearby communities. In this talk I use examples from rivers around the world to examine the role of scale and network structure on sediment pulse dynamics. I finish by offering an alternative conceptualisation of pulse dynamics: the formation of a train of standing, stationary sediment waves.