IAG Webinar Oceania

Thursday 6 March 2025 4-5.30 pm AEDT (6-7.30 pm NZDT)

Coordinators: Dr. Sarah McSweeney, A/Prof. Tim Cohen, Dr. Sam McColl
University of Canterbury, University of Wollongong, and GNS Science

INTERNATIONAL GEOMORPHOLOGY WEEK 2025

16:05–16:20

Bringing the seabed to the surface; geomorphology mapping to support Australia's sustainable ocean economy

Dr. Rachel Nanson, Geoscience Australia, Australia

Australia's marine estate offers high-quality offshore renewable energy (ORE) resources that are essential to meet net zero emissions targets. European ORE activities over the last decade have demonstrated that standardised seabed geoscience data underpin consistent decision-making. Geoscience Australia recently led a collaboration with European geoscience agencies to develop a new Ocean Best Practice geomorphology classification framework. This framework integrates seabed (bathymetry, sedimentology) and sub-seabed (sub-bottom imagery, geology) data to consistently classify and illustrate the distribution of geomorphic features. Dr Rachel Nanson will provide an overview of this new approach and examples of its application to marine datasets.

16:20–16:35

Deep learning in the shallows, an automated approach to mapping hāpua morphodynamics

Alaina Baker, School of Earth and Environment, University of Canterbury, New Zealand

Hāpua are freshwater river mouths that are parallel to the coastline with a dynamic gravel or mixed sand and gravel barrier intermittently separating them from the marine environment. Field work at these lagoons is challenging, which means hāpua studies tend to focus on individual sites and therefore occur in isolation from one another. Remote sensing is used to assess changes in hāpua processes and morphologies. Neural networks have also been used to automate the creation of lagoon, barrier, and lower river masks. This talk will discuss the process of deep learning integration within coastal zones and the potentials of scalability.

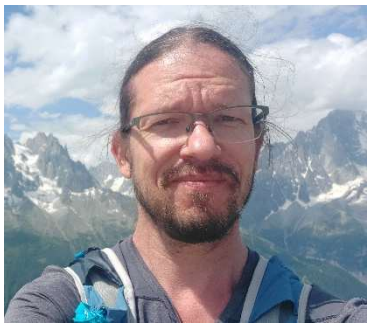
16:35–16:50

Spatial and temporal representativeness: 44-year erosion monitoring on sandstone shore platforms in Victoria, Australia

Dr. Runjie Yuan, School of Geography, Earth and Atmospheric Sciences, The University of Melbourne, Australia

Shore platforms are intertidal rock ledges developed along the erosional shorelines. The erosion records are usually obtained by monitoring small rock surfaces (total area of 0.1 – 5 m2) over 1 – 3 years, from which downwearing across landform systems up to km2 in extent is inferred. To address the spatial and temporal difference between the scales of human measurement and landform evolution, this research reports erosion rates achieved from sandstone shore platforms developed in south-eastern Australia which has the world's longest platform downwearing records (44 years). The temporal representativeness of these monitoring rock surfaces over the landform scale is also discussed.

16:50–17:05



Aquatic plants are ecosystem engineers: seed and fine sediment trapping by plants growing in streams

Dr. Scott A McKendrick, School of Ecosystem and Forest Sciences, University of Melbourne, Australia

Plants occupying stream channels act as physical ecosystem engineers, both influencing and responding to hydrogeomorphic processes. Instream vegetation also promotes seed/propagule dispersal, deposition and retention through greater hydraulic complexity and acting as physical obstacles, shaping plant community dynamics. These plant/sediment processes result in a synergistic feedback effect promoting hydrogeomorphic complexity and biogeomorphic successional processes. In this presentation I will discuss the outcomes of a study investigating the role of aquatic and amphibious plants occupying the stream channel and their influence on biotic and abiotic processes in degraded lowland streams.

17:05–17:20

Large earthquake recurrence on the Willunga Fault and implications for landscape evolution of the Mt Lofty Ranges, South Australia

Dr. Dan Clark, Geoscience Australia, Australia

In mid-2022 a final two of ten paleoseismic trenches were excavated across the Willunga Fault on the western range front of the Mt Lofty Ranges ~40 km south of Adelaide. Evidence is preserved for six surface-rupturing earthquakes within the last ca. 150 ka, which are associated with an average slip rate potentially as much as ca. 65-70 m/Myr. A continuation through time of this rate is implied by the ~200-250 m of vertical separation of the Miocene-Pliocene unconformity surface across the Willunga Fault between the Willunga Embayment and the intramontane Myponga and Meadows basins. The current relief of the Mt Lofty Ranges might therefore be implied to be predominantly Pliocene and younger.