

IAG Webinar Central and Western Europe

3rd March 2022, 13:30 – 16:15 CET Coord.: Emmanuel Reynard, UNIL, Switzerland, Susan Conway, CNRS, France

13:30 – 13:40 Introduction *Emmanuel Reynard, University of Lausanne, Switzerland*



13:40 – 14:00

Water origin and quality of rock glacier springs. Case studies in the Swiss Alps

Chantal Del Siro, University of Applied Sciences and Arts of Southern Switzerland SUPSI, Switzerland

While the knowledge on the dynamics and internal structure of rock glaciers is well developed, there is a lack of understanding of their hydrological functioning. The origin and the quality of water emerging from rock glaciers are not well known, together with its contribution to aquatic systems. The physico-chemical analysis of six rock glacier outflows in the Swiss Alps carried out during the 2020 warm season is presented. The seasonal evolution of some physico-chemical parameters (such as EC, SO₄²⁻, Ca²⁺ and Mg²⁺) could indicate the progressive ground ice melting contribution in the water emerging from active rock glaciers. A conceptual model is also presented.



14:00 – 14:20

Mountain biogeomorphology: what do plants do on unstable mountain slopes?

Jana Eichel, University of Utrecht, The Netherlands

Mountain slopes are usually steep and highly unstable as sediments fall, slide, freeze, thaw or are transported by water. Nevertheless, some plants can grow on moving mountain slopes and even stabilize them. In this talk, we will explore how and under which conditions mountain plants survive geomorphic disturbances and stabilize moving sediments. Using examples from periglacial slopes and glacier forelands, we will shine a light on how alpine plants promote landform development and closely couple paraglacial adjustment and vegetation succession following glacier retreat.



14:20-14:40

Exploring the stochastic impact of landslides on long-term catchment-averaged denudation rates using a numerical modelling approach

François Clapuyt, Université Catholique de Louvain, Belgium

In active tectonic regions where in-situ cosmogenic radionuclides have frequently been used to constrain denudation rates, landslides contribute to the overall sediment load transported by fluvial systems. Using a numerical modelling approach, we account for the stochastic impact of landslides on ¹⁰Beryllium concentration evolution and quantify the over- or underestimation of cosmogenically-derived denudation rates. We evaluate to what extent landscape parameters induce large ranges of overestimation variability and from which threshold of catchment size the overestimation is negligible.



14:40-15:00

Historical extreme events in coastal depositional environments

Pierre Pouzet, University of Nantes, France

In the context of climate change, studying coastal risks involves the hazard's historical fluctuations to understand the ocean-climatic parameters that guide its variability. The talk focuses on the detection of historical extreme events in coastal depositional environments. Surveys in western France highlight three stormy periods at approximately 1330-1360 AD, 1570-1620 AD and 1690-1720 AD. They are part of climate pejoration phases; storm activity appears to increase during positive phases of North Atlantic Oscillation, but no strict correlations can be established. A dendrochronological approach is suggested to extract recent storms impacting dune stands in coastal environments.



15:10-15:30

The stunning lavaka of Madagascar: a human-induced phenomenon?

Liesa Brosens, Katholieke Universiteit Leuven, Belgium

The rolling hills of Madagascar's highlands are scarred by large amphitheater-shaped gullies called 'lavaka'. The role of human disturbances in their formation remains highly debated. We shed new light on this conundrum by developing a population dynamics approach based on (historical) aerial imagery and by comparing long-term erosion rates from cosmogenic nuclides with current mobilization rates from high resolution topography. We demonstrate that lavaka erosion rates must have dramatically increased over the last centuries in response to more intensive land use, which is consistent with observed changes in floodplain sedimentation regime.



15:30-15:50

Geoarchaeology of Mediterranean hybrid urban deltas

Ferréol Salomon, CNRS and University of Strasbourg, France

Main sedimentary and geomorphological processes are known to reconstruct the evolution of river deltas during the last millennia. Numerical models exist now to reconstruct their dynamics. These dynamics could have been modified by human activities especially for long term urbanized deltas. Along with classical geomorphological approach, Mediterranean river deltas need geoarchaeological studies to reconstruct their evolution and to understand their specific morphologies. This presentation will be based on the analysis of two urbanized Mediterranean deltas: the Tiber delta in Italy and the Francolí delta in Spain.



15:50-16:10

Scientific and didactic interest of eight geomorphological landscapes of the Central High Atlas (Morocco)

Jonathan Bussard, University of Lausanne, Switzerland

Geomorphological landscapes – defined as landscapes whose geomorphological component is of heritage interest – are interesting supports for the dissemination of scientific knowledge in geomorphology. The didactic interest is particularly high when landforms are clearly visible, large and contrasted, and when the processes responsible for their formation are active. We show a selection of 8 geomorphological landscapes in the M'Goun Geopark (Central High Atlas, Morocco) that have high (but unknown) scientific interest and where the development of geomorphological and landscape interpretation services has a high potential.

16:10 – 16:15 Conclusion *Susan Conway, CNRS, Nantes, France*

INTERNATIONAL GEOMORPHOLOGY WEEK 2022