IAG Webinar Southern Europe

4 March 2025 at 16:00–18:00 CET

Coordinators: Francisco Gutiérrez, *University of Zaragoza, Spain*
Efthimios Karymbalis, *Harokopio University of Athens, Greece*

INTERNATIONAL GEOMORPHOLOGY WEEK 2025

16:00–16:15

Geomorphological analysis and landslide susceptibility mapping of the Čemernica River Basin, Serbiat

Aleksa Anđelković, University of Belgrade, Serbia

This study provides a systematic analysis of the geomorphological characteristics of the Čemernica River Basin in Serbia, with a particular focus on key processes such as ravine formation, landslides, and erosion. Using topographic maps, geological data, and QGIS software, a landslide susceptibility map was created to assess terrain stability and highlight high-risk zones. The research synthesizes data on elevation profiles, slope gradients, and relief energy, offering a comprehensive overview of the basin's geomorphological dynamics. By categorizing and contextualizing these processes, the study establishes a foundational framework to guide future research on geomorphological hazards, landform evolution, and sustainable management in the Čemernica Basin.

16:15–16:30

Understanding the spatio-temporal pattern of slope instability clusters in the Cantabrian Mountains

Laura Rodríguez-Rodríguez, Departamento de Geología, Universidad de Oviedo, Spain

Slope instability clusters refer to areas where gravity deposits, such as rock avalanches and landslides, are spatially concentrated and superimposed. Understanding the combination of factors dealing to a recurrent activity of instability processes is crucial in regards to hazard assessment. This webinar will be focused on two study cases from the Cantabrian Mountains that exemplify the challenges of dating and interpreting these records.

16:30–16:45

Recent paleoseismological investigations from two active faults in central and northern Greece?

Christina Gallousi, Department of Geography, Harokopio University, Athens, Greece

Paleoseismological investigations from two active faults in central and northern Greece—the Gyrtoni Fault in northern Thessaly and the Angelochori Fault in northern Greece—will be presented. Three trenches excavated along these faults are described to highlight their Holocene seismotectonic behavior. In both study areas, Optically Stimulated Luminescence (OSL) dating of fluvial-colluvial sediments and pottery samples was applied to determine the timing and displacement of surface-faulting events. The results enhance the understanding of regional seismic hazard and recent tectonic activity.

16:45–17:00

Database framework of geomorphological markers of climate change: insights from semi-arid areas of southern Italy

Lucia Contillo, Basilicata University, Matera, Italy

Climate change geomorphological indicators allow monitoring landscape evolution over time, detecting early signs of degradation or instability. A multiscale database framework of geomorphological markers was designed to analyze and monitor parameters and indices reflecting the climate change impacts on semi-arid Mediterranean areas. Integrating different methodologies, such a database attempts to assess erosion rates and aridification processes over relatively short timescales. Some South-Italian test-sites exemplify rapid landscape evolution driven by climate extremes. The model aims to provide to geoscientists a replicable protocol for assessing climate-driven geomorphological changes, contributing to a global perspective on ongoing changes and reinforcing the importance of mitigation strategies.

17:00–17:15

Chronology of the glacial and post-glacial dynamics during the Late Pleistocene in the Upper Garonne Basin, Central Pyrenees

Marcelo Vieira Fernandes, Friedrich Schiller University Jena, Germany; University of Lisbon, Portugal

The Upper Garonne basin, Central Pyrenees, hosted the largest Quaternary glacier in the Pyrenees, although little was known about its glacial chronology. Geomorphological, geochronological and modelling approaches were applied to understand the glacial and postglacial dynamics. In the foreland, the maximum ice extent of the Penultimate Glaciation was constrained using cosmic-ray exposure dating. After the Last Glacial Maximum, a massive glacial retreat occurred during the onset of the Bølling-Allerød (B-A). During the B-A-Younger Dryas transition, moraines formed the high valleys and cirques. The deglaciation of the mountain slopes and cirques favoured paraglacial adjustment, developing slope failures and rock glaciers.

17:15–17:30

Automatic detection of landforms and its application in studying Eurasian lynx (*Lynx lynx*) ecology

Špela Čonč, Anton Melik Geographical Institute, Research Centre of the Slovenian Academy of Sciences and Arts, Ljubljana, Slovenia

Automated landform detection methods enable accurate and cost-effective mapping. Besides geomorphology, remote sensing techniques can also benefit wildlife ecology research. To demonstrate the applicability of such approaches to ecology, we investigated the selection patterns of different landforms by Eurasian lynx (*Lynx lynx*). We used high-resolution LiDAR DTMs to detect landforms and calculate topographic characteristics. Using lynx GPS telemetry data, we found that lynx preferred steep, rugged, rocky areas for day-resting and selected areas near karst depressions at night, often hunting ungulates nearby. Our study emphasizes the value of remote sensing in understanding animal habitat selection, providing insights for better species management and conservation.

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Channel response to anthropogenic vegetation removal: Lessons from a meandering river in Croatia

Katarina Pavlek, Department of Geography, University of Zagreb Faculty of Science, Zagreb, Croatia

Channel changes in the meandering Orljava River were analysed over the past 50 years, focusing on flood impacts before and after the 2011 anthropogenic removal of riparian vegetation. Channel features were mapped using topographic maps and aerial images, with object-based image analysis applied to the latter. Statistical tests identified factors affecting channel dynamics. Results show that lateral migration rates quadrupled, and channel widening increased by 40% post-removal. Migration rates correlated negatively with vegetation presence and positively with flood magnitude, duration, and channel slope. These findings highlight vegetation's crucial role in stabilizing riverbanks and mitigating erosion, emphasizing the need for restoration.

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