IAG Webinar Eastern Europe

4 March 2025, 12:00–15:00 CET

Coordinators: Anita Bernatek-Jakiel*, Mihai Micu**, Florin Tatui***
*Jagiellonian University, **Romanian Academy, ***University of Bucharest

INTERNATIONAL GEOMORPHOLOGY WEEK 2025

12:10–12:30

Metrics of Kolga Coastal Ridge System as an Indicator of Relative Shore-Level and Storminess Variations in Eastern Baltic Sea

Triinu Jairus, University of Tartu, Estonia

Kolga strand plain is located on the southern coast of the Gulf of Finland, where a ridge-swale system has developed along an uplifting, nearly non-tidal coastline. This study integrates airborne LiDAR elevation data, GPR survey, sedimentological analyses, and OSL dating to refine our understanding of Holocene sea-level variations and storminess. This coastal system consists of at least 24 prominent swash-aligned ridges, some with aeolian aggradation. Ridge metrics provide insights into coastal progradation phases associated with Ancylus and Litorina Sea transgressions. Variations in ridge morphology suggest periods of increased storminess, establishing the Kolga strand plain as an archive for reconstructing past coastal dynamics.

12:30–12:50

Beach-dune landforms along the South Bulgarian Black Sea Coast (contemporary conditions and anthropogenic impact)

Ilia Tamburadzhiev, Sofia University ''St. Kliment Ohridski'', Bulgaria

Sandy beaches in the southern part of the Bulgarian Black Sea Coast, where coastal dunes are present, were studied. The results are related to the exposure of the beaches and the relief features around the bays, as well as to the prevailing wind direction. A classification of beach-dune landforms was carried out, identifying two main types of coastal dunes – primary and secondary. For the analysis of anthropogenic impact, particular focus is placed on the destroyed dunes.

12:50–13:10

Calving waves influence the morphodynamics of Arctic beaches, case study – Eqip Sermia glacier (West Greenland)

Oskar Kostrzewa, University of Wrocław, Poland

Ongoing climate warming is leading to rapid changes in the Arctic environment, including major changes in the cryosphere. One of the effects of recent rapid retreat of marine-terminating glaciers is the exposure of new coastlines. The calving of such glaciers often trigger tsunami-like waves that pose a serious threat to coastal environments. These powerful waves are not only able to shift glacial mélange in front of ice cliffs and redistribute icebergs, but also flood and remodel local cliffs and beaches.

13:10–13:30

10Be data from Făgăraș and Retezat Massifs set the timeframe of the last glacial activity in Southern Carpathians during Younger Dryas and Early Holocene

Daniela Pascal, University of Bucharest, Romania

Past glaciations extent and chronology in the Romanian Carpathians have been disputed along most of the 20th century. Despite the recent studies presenting numerical age datings of the glacial landforms, the view on the latest glacial activity remained in debate due to the results from Retezat Massif, where authors found no evidences of Younger Dryas glaciers. We bring in the discussion new data from Retezat and the Făgăraș Massif. The new 10Be exposure ages collected from the highest moraines, fit the Younger Dryas-Early Holocene interval, in agreement with European records, suggesting the glaciers reformation and advance during the Younger Dryas.

13:30–13:50

Palaeoclimate implications from periglacial phenomena in the Volyn loess-palaeosol sequences (NW Ukraine)

Oleksandr Bonchkovskyi, Institute of Geography of National Academy of Sciences of Ukraine, Ukraine

Palaeocryogenic structures are widespread in the Northern European loess belt, acquiring the most developed forms in the Volyn loess-palaeosol sequence. Here, various periglacial phenomena occur at different stratigraphic levels, attesting to multiple cryogenic events in the Middle and Late Pleistocene. However, only some of the cryogenic events clearly indicate the existence of permafrost (MIS 8, 6, 4, 2), whereas other demonstrate cryogenesis under deep seasonal freezing (MIS 10, 9b, 7d, 7b, 5d, 5b, Younger Dryas). Finally, quantitative climate reconstructions were performed for each cryogenic event based on the morphogenetic features of the periglacial complexes.

13:50–14:10

Semiautomatic detection of the channel of the watercourse using machine learning and LiDAR data

Lukáš Michaleje, Institute of Geography Slovak Academy of Science, Slovakia

Within this study, we are exploring the possibility of expanding preliminary flood hazard assessment with quickly obtained parameters for large areas using detailed data. We choose hilly lands and uplands of western Slovakia with frequent flooding. Our main goal is the detection of channels of watercourses with the help of a machine learning algorithm (deep forest) and detailed LiDAR data. This first step would help in calculating the capacity of the channel and basic hydraulic parameters such as maximal depth, wetted perimeter, bed slope and cross-sectional area of flow.

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Provenance recorded in the microtextures of silt grains – examples of loess deposits in Poland and Ukraine

Martyna Górska, Nicolaus Copernicus University in Toruń, Poland; Universidade de Lisboa, Portugal

What can be inferred from the surface of silt grains originating from loess deposits? The origin of sediments forming loess deposits is the subject of a long-standing debate. Due to the nature of the aeolian transport of silt grains, the origin of wind-transported silt grains is recorded on their surface - shape, roundness, and micro-relief reflect the source-related processes that modified the grains before wind transport. The provenance (in terms of formative processes and geographical sources) of selected loess profiles in Poland and Ukraine will be examined based on micromorphological analysis of grain surfaces using a scanning electron microscope (SEM).

14:30–14:50

Grassland degradation in NE Romania. Insights of a methodological approach to drivers identification

Georgiana Văculișteanu, Alexandru Ioan Cuza University of Iași, Romania

Our study focuses on identifying the main drivers of grassland degradation in the NE part of Romania. Through satellite NDVI-derived data at different spatial and temporal resolutions, we managed to understand grassland behaviour from multiscale perspectives. The applied method focuses on trend detection and breakpoint surveillance, pointing out some degradation triggers as climatic, anthropogenic, geomorphologic, geologic and hydrologic. The study highlights many unexpected perspectives, cancelling some unfounded theories and highlighting the importance of a multiscale analysis and fieldwork validation when plant sensitivity is involved.