Soil erosions as indicator of abrupt climate changes during Quaternary

Galović, Lidija; Hećej, Nina; Husnjak, Stjepan; Beerten, Koen; Poch, Rosa Maria; Šorša, Ajka; Pandurov, Mihajlo; Gajić, Rodoljub; Stejić, Petar; Ružičić, Stanko

Soil erosions as indicator of abrupt climate changes during Quaternary

Lidija Galović[1], Nina Hećej[1], Stjepan Husnjak[2], Koen Beerten[3], Rosa Maria Poch[4], Ajka Šorša[1], Mihajlo Pandurov[5], Rodoljub Gajić[5], Petar Stejić[5], Stanko Ružičić[6]

[1]*Croatian Geological Survey, Sachsova 2, Zagreb, Croatia (lgalovic@hgi-cgs.hr)*
[2]*Faculty of Agriculture, University of Zagreb, Svetošimunska 25, Zagreb, Croatia*
[3]*Belgian Nuclear Research Centre SCK CEN, Boeretang 200, Mol, Belgium*
[4]*University of Lleida, Plaça de Víctor Siurana, 1, Lleida, Catalonia, Spain*
[5]*Geological Survey of Serbia, Rovinjska 12, Belgrade, Serbia*
[6]*Faculty of Mining, Geology and Petroleum Engineering, Pierottijeva 6, Zagreb, Croatia*

Summary

"Abrupt climate changes–Evidence from Quaternary sedimentary sequences in Croatia" is a four-year research project that is funded by the Croatian Science Foundation and started on April 1st, 2021. A fundamental and multidisciplinary approach is producing meaningful data on past abrupt climate changes (CC). Interpretation of these data helps to create the basis both for comparison of paleo- and modern climate changes and for predicting their dynamics in the future.

The specific geological, pedological, geomorphological and climatic diversity of Croatia enables us to study in high-resolution the parallel development of abrupt CC during the Late Pleistocene and Holocene. Four investigated locations are only 300 km apart: loess/palaeosol sequences and dunes in the Pannonian area (continental climate) on the one hand, and fluvioglacial sediments and karst lacustrine sediments in the Dinaric area (Mediterranean climate) on the other hand.

In all those environments, warm periods (interstadials) are archived in geological successions as palaeosols. The ages of these palaeosols and overlying sediments indicate time gaps (hiatuses) in sedimentary successions. Since the upper parts of soil profiles are missing, it can be concluded that the ends of warm periods were characterized by strong soil erosion during the investigated period (last 120 ka). Such events are preserved on each investigated location with different recent and palaeoclimate conditions.

Key words: Abrupt climate changes, Croatia, Quaternary, soil erosion

Graphical abstract