

Implementation of RI-SI-EPOS project – SLO KARST NFO

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Project “DEVELOPMENT OF RESEARCH INFRASTRUCTURE FOR THE INTERNATIONAL COMPETITIVENESS OF THE SLOVENIAN RRI SPACE – RI-SI-EPOS”.

The operation is co-financed by the Republic of Slovenia, the Ministry of Education, Science and Sport and the European Union from the European Regional Development Fund.

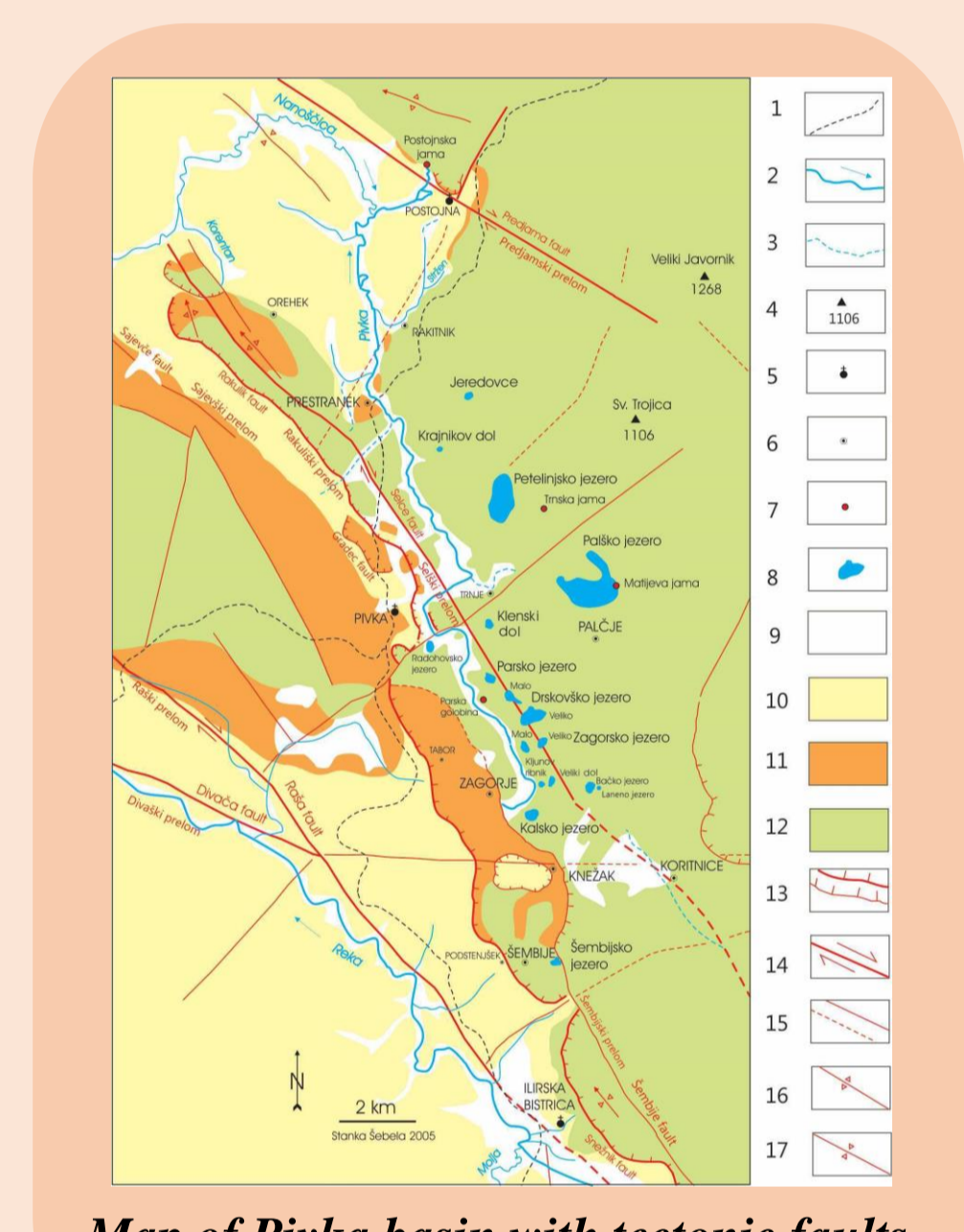
<https://www.zrc-sazu.si/en/programi-in-projekti/ri-si-epos>

The RI-SI-EPOS project (Research Infrastructure-Slovenia - European Plate Observing System) provided new scientific equipment in solid Earth science for partner organizations: ZRC SAZU, GeoZS, IJS and UL FGG. The new research equipment of ZRC SAZU is primarily used at SLO KARST NFO site, which covers 1,000 m² of territory between Postojna and Jelšane. ZRC SAZU is observer of EPOS NFO (Near Fault Observatory) international community. The area south of Postojna is one of the most seismically active areas in SW Slovenia. It is composed mostly of karstified Mesozoic carbonate rocks and partly of non-karstified Eocene flysch. The landscape has numerous karst features including caves, poljes, dolines, uvalas, karst springs, ponors, and karst periodical lakes, with typical karst underground water drainage. The Postojna flysch basin represents the hydrological divide between the Adriatic and Black Sea watersheds, which depends on regional active tectonics. The site development commenced with the installation of seven temporary seismic stations in the area, which were, together with other geoscientific equipment (gravimeter, 3D laser terrestrial scanner, GNSS antenna, TM72 extensometers, spectrometer for methane, drone) provided in 2020. With the new dense seismic network, it is possible to accurately determine locations and other seismic parameters that contribute to the understanding of the kinematics and dynamics of active faults in this area. In addition, in Postojna Cave methane measurements have been added to already existing cave microclimatic monitoring (organized since 2009) and the new TM72 extensometers have replaced older instruments as part of micro-displacement monitoring that has been ongoing since 2004. With new research infrastructure we are collecting a big amount of data based on FAIR principles (make data Findable, Accessible, Interoperable and Reusable) with the aim to be included in national and international database centres.

(<https://www.youtube.com/watch?v=NM1so88QNGc>).



Palčje intermittent karst lake in Pivka basin, (panoramic photo by Matej Blatnik, using the RI-SI-EPOS drone)



Map of Pivka basin with tectonic faults (map by Stanka Šebela)



Measurements with GNSS antenna at Predjama (photo by Matej Blatnik)

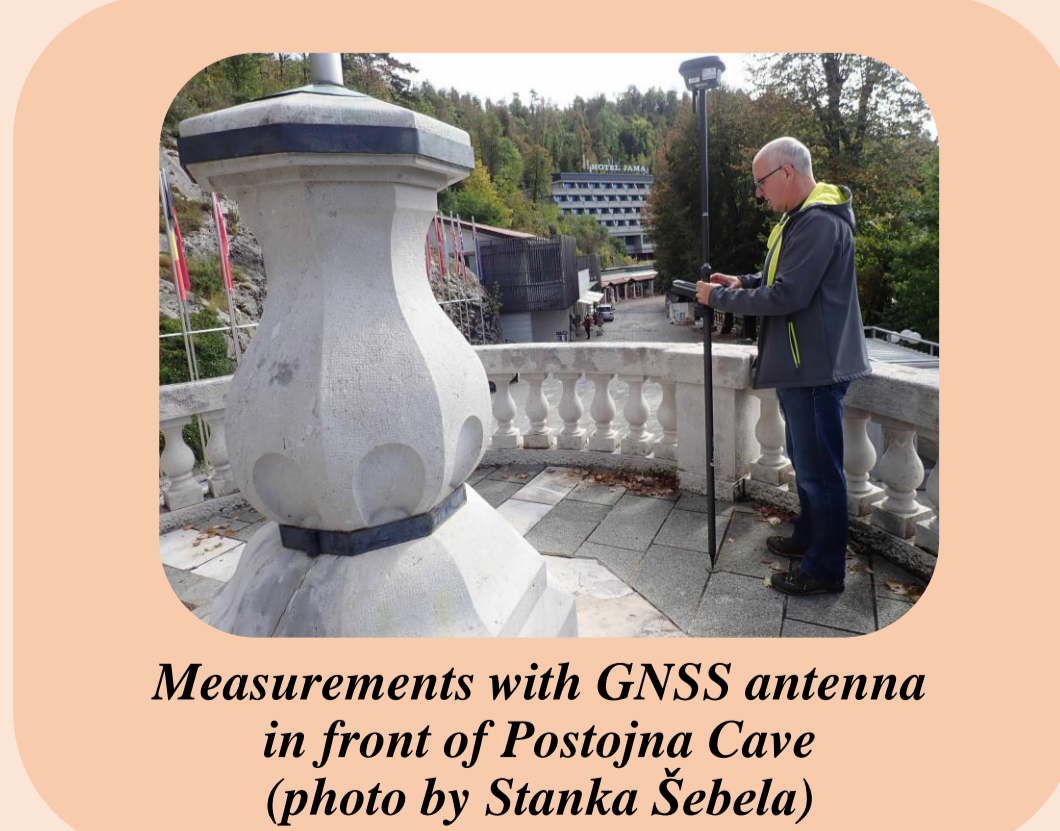


3D laser scanning in Predjama Cave (photo by Matej Blatnik)

DEVELOPMENT OF RESEARCH INFRASTRUCTURE FOR THE INTERNATIONAL COMPETITIVENESS OF THE SLOVENIAN DEVELOPMENT OF RESEARCH INFRASTRUCTURE SPACE – RI-SI-EPOS

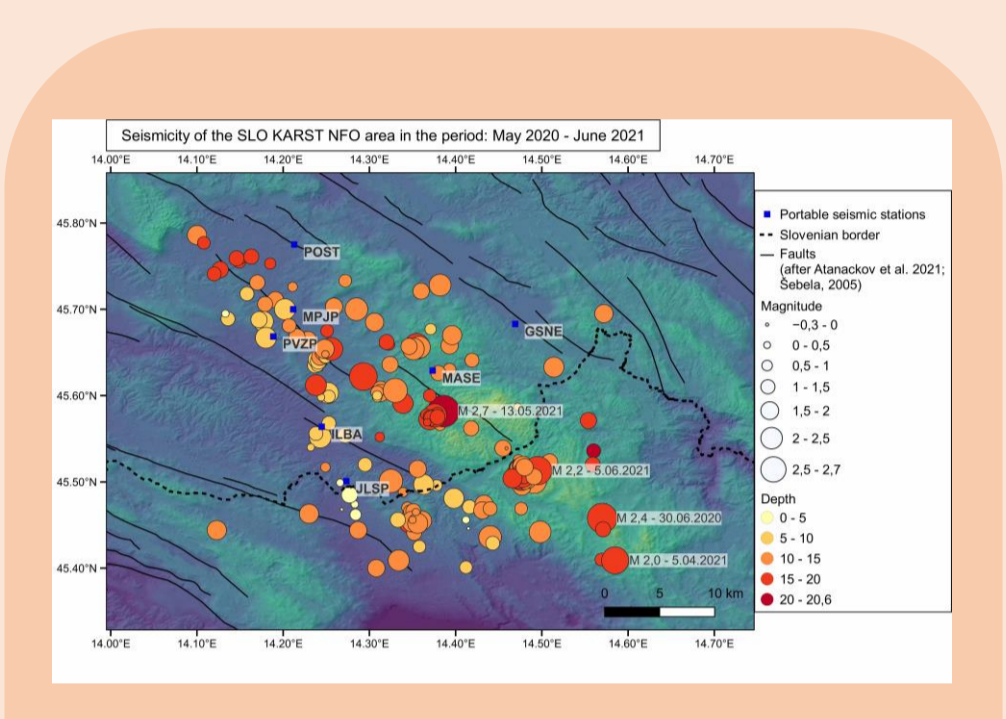
The operation is co-financed by the Republic of Slovenia, the Ministry of Education, Science and Sport and the European Union from the European Regional Development Fund. This operation is being implemented within the framework of the Operational Programme for the Implementation of the European Cohesion Policy 2014-2020, under Priority Axis 1: "Strengthening competitiveness of research, innovation and technological development in the field of science and technology for the growth of the economy". Priority investment 1.1: "Strengthening infrastructure for research and innovation and the capacity to attract excellence in this area, as well as to provide coordinated services, especially those of 'critical importance'". Specific Objective 1.1.1: "Efficient use of research infrastructure and development of knowledge/competences for better national and international cooperation in the Knowledge Triangle".

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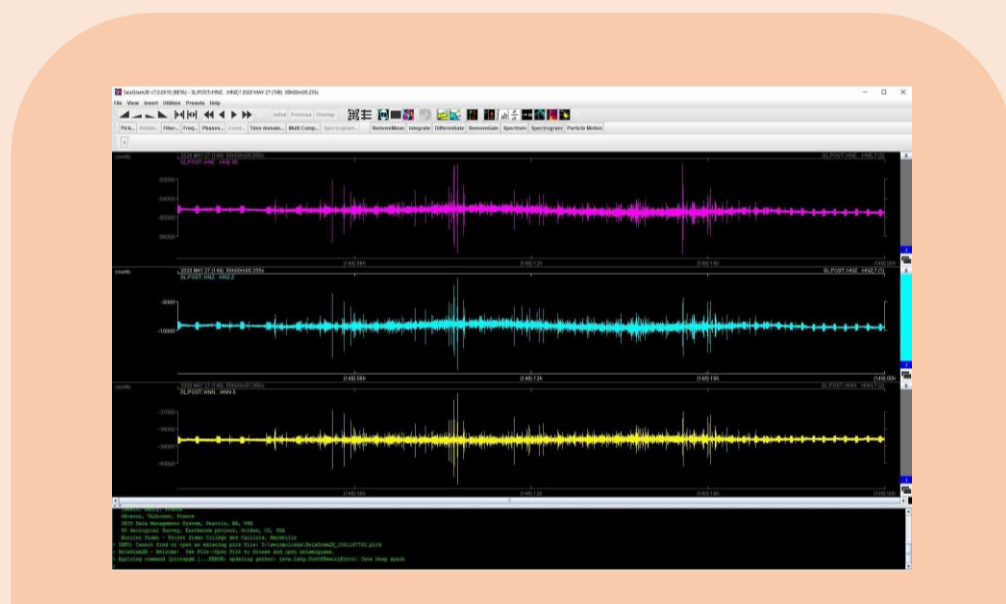


Measurements with GNSS antenna in front of Postojna Cave (photo by Stanka Šebela)

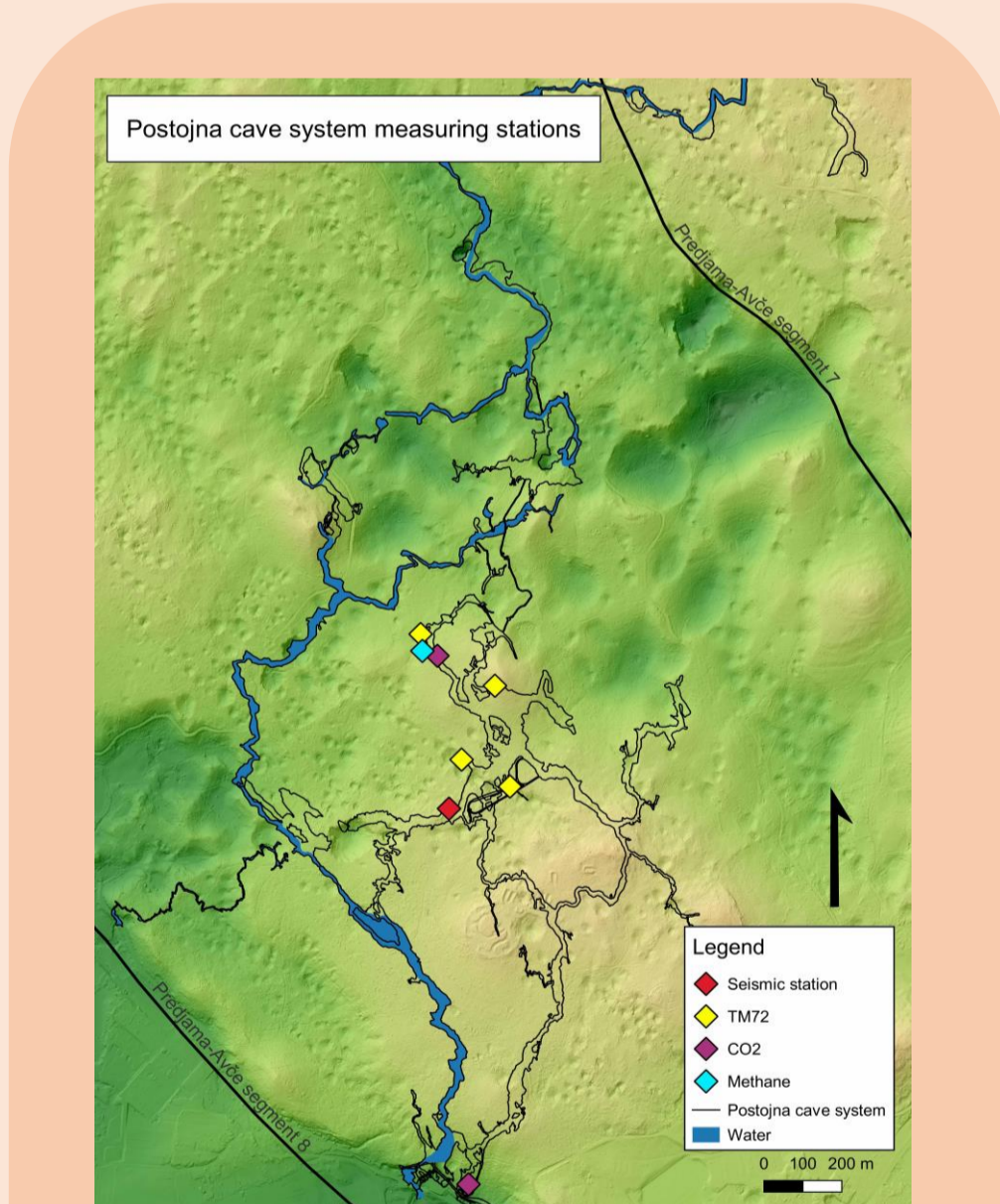
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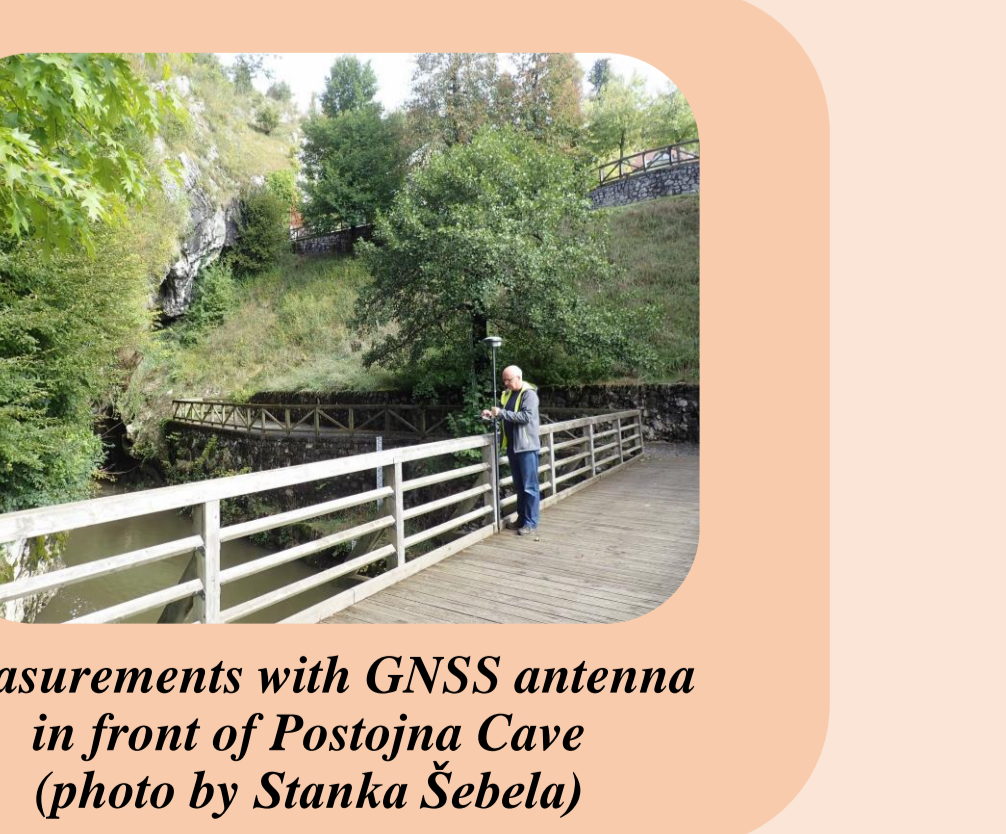
Seismicity of the area with temporary seismic stations in the period May 2020 – June 2021 (map by Uroš Novak)



Earthquake detected on 27th May 2020 by a temporary seismic station in Postojna

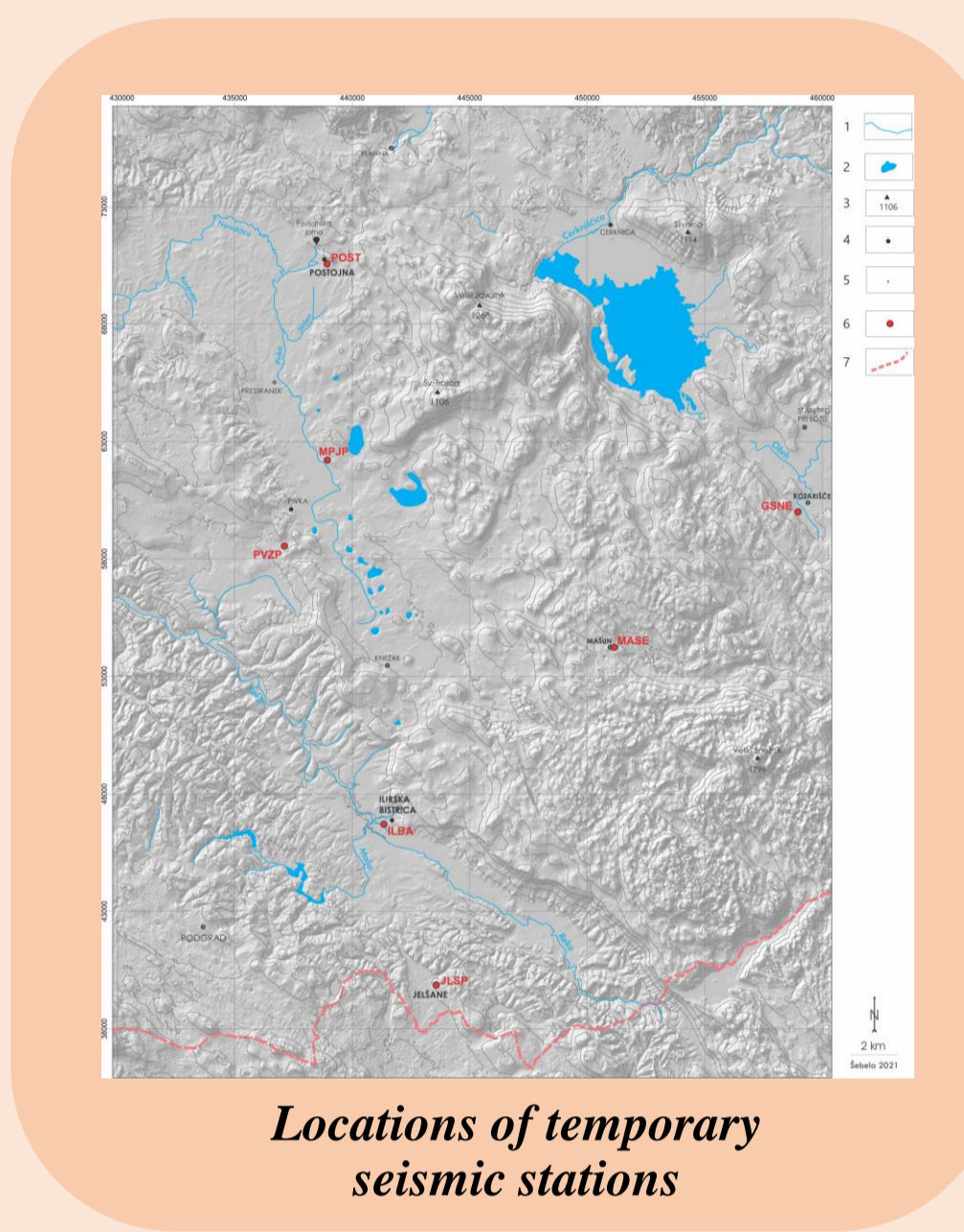


Map of Postojna Cave System with locations of extensometers and spectrometer for methane (map by Uroš Novak)



Measurements with GNSS antenna in front of Postojna Cave (photo by Stanka Šebela)

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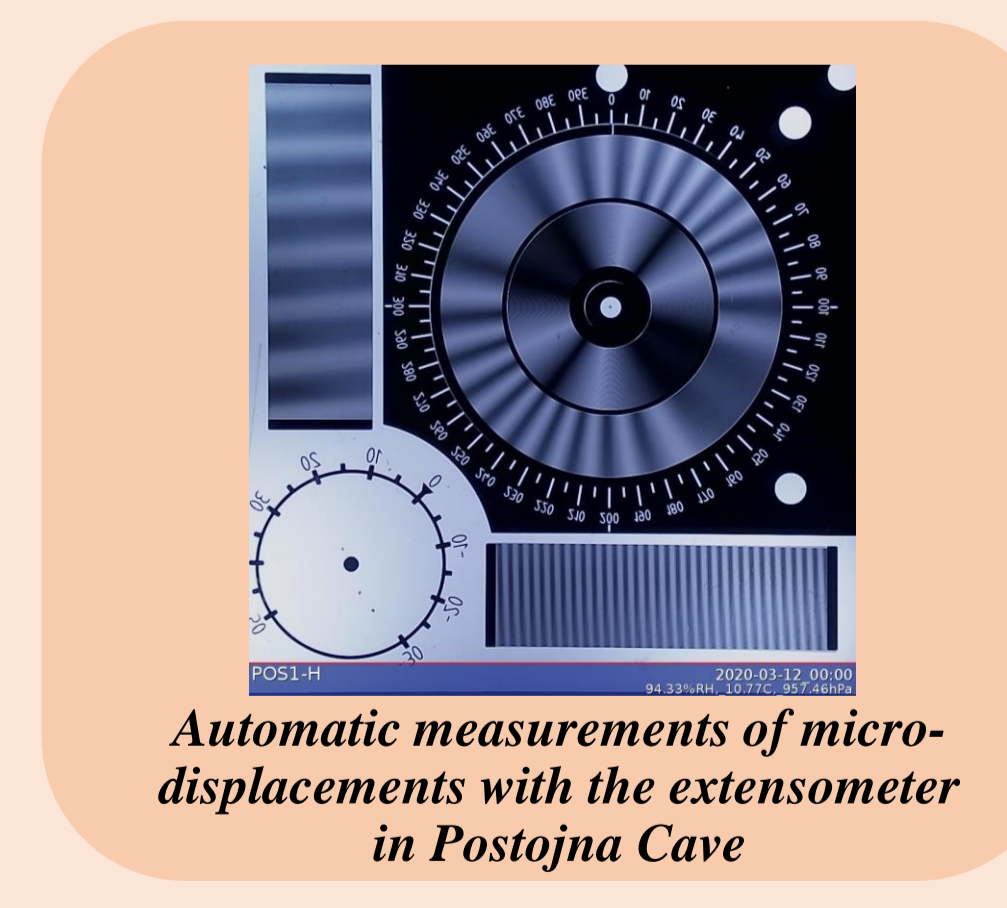
Locations of temporary seismic stations



Temporary seismic station in Jelšane (photo by Stanka Šebela)



Extensometer in Postojna Cave (photo by Stanka Šebela)



Automatic measurements of micro-displacements with the extensometer in Postojna Cave



Spectrometer for methane in Postojna Cave (photo by Stanka Šebela)