

Institute of Earth and Environmental Sciences of the UMCS (INoZiŚ) conducts research in cooperation with national and international partners. In addition to the Lublin area (with a permanent measurement network of meteorological and hydrological elements, including the Roztocze Research Station), they include Spitsbergen (based on the UMCS polar station in Calypsobyen) and the Ukrainian area. An important source of their funding are research projects obtained from the National Science Center (NCN), as well as from the National Center for Research and Development (NCBiR) and other science funding institutions in Poland.

The Institute employs specialists with high scientific and practical competence in geology, geomorphology, hydrology, hydrochemistry, climatology, geographic information systems (GIS), soil science and terrestrial laser scanning (TLS).

Modern analytical equipment enables precise quantitative analyses of environmental features and includes, among others: element analyzers, spectrometers and spectrophotometers, multiparametric probes, liquid and gas chromatograph, laser diffractometers, microscopes of various types (including a scanning electron microscope).

Research conducted at the Institute focuses on several issues:

**1/ the transformation of the natural environment (waters, soils) under the influence of modern climate change and increasing anthropogenic pressure.** Hydrologists at INoZiŚ monitor and warn about changes in water relations that pose flood risks, drought risks, and monitor water resources with drinking water quality. They also study areas of natural retention, which are also habitats for biodiversity. Studies are being conducted on the hydrochemistry and geochemistry of the environment in the context of human impact.

**2/ contemporary and historical evolution of geosystems (loess, lake-peat, glacial-periglacial) using state-of-the-art research methods, including remote sensing techniques and geospatial analysis.** Research is carried out in the field of modern slope processes and gully erosion. It is important to emphasize the high scientific standing of the research leaders in this field, which results in international cooperation (among others, Prof. Jean Poesen ranked first among physical geographers among the Top2% of the world's best-published scientists).

**3/ quaternary stratigraphy and paleogeography.** Lublin region, as an area of thicker loess covers, is particularly predisposed to the study of their stratigraphy. The glacial and interglacial record of the Pleistocene, visible in loess, is recognized both in profiles from Poland and Ukraine. In addition, studies of Pleistocene stratigraphy and paleogeographic, paleoecological and paleoclimatic studies are being carried out based on geological profiles from eastern Poland in cooperation with the Polish Geological Institute-National Research Institute.

**4/ geoarchaeology and geodiversity conservation.** Lake and peat bog geoarchives are studied in terms of their genesis and evolution since the end of the last glaciation. Reconstructions of the phases of human management from the Neolithic to modern times are being carried out in conjunction with radiocarbon dating of sediment profiles and archaeological findings. Also, gully erosion areas are excellent archives containing a detailed geoarchaeological record of the history of human-environment interaction over the past several thousand years. The Institute is one of the leading centers of geotourism research in the country and a major one in the world.

**5/ bioclimatology** in terms of changes in both thermal-humidity conditions and air quality, especially in urban areas (the importance of the urban heat island).