

## Popular-science summary

For more than a hundred years, the Late Cretaceous palaeotectonic evolution of SE Poland has intrigued geologists. The existing interpretations developed in the last 50 years do not explain the entire geological history of this fragment of Poland, especially during the Mesozoic times. In the last decades, two concepts were developed independently by different authors. They focused mainly on the beginning of the inversion movements (uplift), as well as facies and bathymetric (environmental) interpretations of a large Trans-European (Poland, Germany, Denmark) sedimentary basin, known as the Danish-Polish Trough. The inversion of this trough in consequence led to the formation of the Mid-Polish Anticlinorium.

So far, SE Poland, i.e. the San Anticlinorium, which is currently devoid of Mesozoic sediments, and the Roztocze Hills to the north, during the Late Cretaceous, was included into the axial part of the Danish-Polish Trough, which was supposed to represent its deepest sedimentary environments.

A series of studies performed over the past few years have supplied contrary data to this interpretation, showing that from the Coniacian/Santonian times the area constituted a land-mass rather than the axial and deepest part of the Danish-Polish Trough. Recent discoveries of deltaically influenced sedimentation in the Roztocze Hills area within Upper Cretaceous deposits (Campanian and Maastrichtian), progressively lower sand contribution, and progradation of deposits to the NE from the recent San Anticlinorium seem to be in line with this interpretation. This imposes the need of revision of the existing palaeotectonic model of this part of Poland and force the adoption of a new facies and bathymetric model, which would be just opposite compared to most previous interpretations.

In this context, the provenance of terrigenous material (including quartz and heavy minerals; density  $> 2.9 \text{ g/cm}^3$ ) coupled with planned absolute age determinations based on zircon from the Campanian siliciclastic deposits of Roztocze might shed new light on possible burial and subsequent erosional history. **The crucial issue is to define the source rocks for the Upper Cretaceous siliciclastic deposits of the Roztocze Hills. Was it the Mesozoic cover of the San Anticlinorium or were the basement rocks of this structural element undergoing erosion already during the Cretaceous times?**

The provenance analyses, for the first time, will allow to create spatial distribution maps of terrigenous material for particular isochronous time-intervals for the Campanian and Maastrichtian. It will allow identification of the main phases of terrigenous material input into the Roztocze Hills area from the recent area of the San Anticlinorium, and the identification of these events on high-resolution seismic profiles.

The project will be based on fieldwork in the central and eastern part of the Roztocze Hills. This area gives insight into the Campanian and Maastrichtian (Upper Cretaceous) sedimentary sequences, allowing for precise chronostratigraphic calibration, essential for detailed palaeotectonic interpretations.

Solving these problems along with recognizing the scale and rate of uplift should give better understanding of the inversion processes in the entire system of European basins inverted during the Late Cretaceous. Additionally, it will become the base for a new model of palaeotectonic evolution of SE Poland during the Late Cretaceous, with all far-reaching interpretative consequences.