

DESCRIPTION FOR THE GENERAL PUBLIC

The project called „*Structure of the Knipovich Ridge Based on Seismic Investigations*” (KNIPSEIS) corresponds with the European Polar Board programme. During polar arctic expedition in the North Atlantic Ocean, modern research equipment (Ocean Bottom Seismometers – OBS) will be deployed at the ocean bottom in the region of the Knipovich Ridge, west of Spitsbergen. An active seismic experiment using artificial sources of seismic energy will be performed. The seismic stations will record natural local and distant earthquakes as well. The area of investigations is located in the region which is a natural geodynamic laboratory where deep physical processes express at the ocean bottom as spreading along the Mid-Atlantic Ridge, and control driving mechanism of extension of the ocean. In this area, we observe process of formation of the new oceanic crust. This process is connected with the drift of Eurasian and North America plates. It is essential for understanding the whole Earth's tectonic history, occurring today. The purpose of the research is detailed determination of the structure of the Earth's crust and upper mantle using seismic methods and its geotectonic interpretation.

Analysis of the data obtained during the study will be conducted using standard and new methods of interpretation, particularly on active magmatic processes in the mid-oceanic ridge, and on the deep Earth's structure. The active-source data collected will be used for 2-D seismic modelling of the lithospheric structure of the Earth. Moreover, passive seismic data from local and distant earthquakes can be used to determine deeper Earth's structure of the area. Thanks to new generation of seismic stations and new methods of interpretation of experimental seismic data used, the obtained results will extend our knowledge about structure and development of the Earth. They will help to determine in detail physical processes acting in mid-oceanic ridges which are the key structures for plate tectonics. The results will expand our understanding of the evolution of the Atlantic Ocean and the Arctic. They could also explain the influence of the Knipovich Ridge activity on the generation of local earthquakes in the region of the Svalbard Archipelago. New models of the Earth's crust and upper mantle will allow to model and determine more accurately deeper structures of the Earth in this region which is the key region for the Earth's evolution, even in the planetary sense.