

Currently, using sophisticated measuring tools we are able to record and monitor various natural processes, occurring in the local and global scale. However, advanced measuring instruments and research methods came into common use relatively recently, thus we do not have any direct numerical evidence of past natural conditions of former geological periods. In order to reconstruct them, we extract the information recorded in a sediment features. The sediment cores derived from the bottom of water reservoirs can be compared to the natural archives, storing information about the evolution of biotic and abiotic components of the environment. The discipline of science dealing with interpretation of environmental data encrypted in sediments is palaeogeography. For West Pomeranian palaeogeographers particularly interesting object of study is the Szczecin Lagoon. Its origin, changes in spatial extent, development of the shoreline and the sediment cover, changes in water level and reasons of these transformations have been for many years the subjects of multifaceted palaeoenvironmental studies. Considering research conducted so far, there still remain unrecognized white card – Lake Nowowarpieńskie, which is in fact an embayment of the Szczecin Lagoon. An interesting character of the sediment cores, derived by preliminary geological recognition, encourages to further comprehensive study which is planned in framework of this proposed project.

The main objective of the project is to reconstruct the natural development of Lake Nowowarpieńskie and its adjacent land areas. The research will be focused on determination of the water body origin, then on specifying the subsequent stages of its further evolution. Explaining in detail, the study will reveal the factors that initiated the existence of the lake and it will allow to determine reasons, directions and consequences of the further transformation of its environment, especially the elements such as climate, physical, chemical and biological conditions of water and the character of the local vegetation. Furthermore, there will be made the attempt to indicate the pace, intensity and special extent of these changes. Information on the reasons and directions of the environmental transformation of lake Nowowarpieńskie allow to relate them with the results of previous research conducted in the area of the Baltic Sea southern shore.

The impulse to undertake research in the area of Lake Nowowarpieńskie comes from previous geological drilling carried out by a team of scientists from the University of Szczecin in the framework of the project “Lithogenesis and geochemistry of the bottom sediments and coastal areas of the Szczecin Lagoon”. Due to the fact that those sediment samples were intended for other analysis, the core could not serve as a material for palaeoenvironmental reconstruction. Nevertheless, the type of collected sediments gave grounds for further research. As a particularly promising element of those sediments is thick layer of lacustrine chalk, which may indicate that at least in the early stage, Lake Nowowarpieńskie functioned as an independent water reservoir.

Palaeogeographical studies are usually of interdisciplinary character and pursuing goals listed above, a wide range of research methods will be applied. Basically, the deposits will be analysed using a number of geochemical analyses. In order to correct interpretation of obtained results, there will be necessary to carry out various additional methods using bioindication properties of organisms which remains are preserved in collected sedimentary material, e.g. fragments of plants, *Cladocera* and diatom assemblages.

The association between acquired information and results coming from radiocarbon dating will allow to construct a timeline model consisted of the most important events in the history of natural development of the lake. Moreover, it will give a possibility to link them with the most important stages of the Szczecin lagoon and the Baltic Sea evolution.