

## **Abstract**

Research was conducted based on the example of the Kołobrzeg region (328-338 km of the Polish shoreline, according to the mileage of the Maritime Office in Słupsk). The thesis contain four main research tasks and the synthesis all of the obtained results. Two tasks concern submarine part of the coastal zone and two tasks relate to the shore.

The geological structure and the state of the nearshore seafloor were recognized. The base of the study were archival materials obtained from the Department of Operational Oceanography of the Maritime Institute in Gdansk. Data from the bathymetric surveys performed by means of a multibeam echosounder in 2006 was used to generate the digital seafloor model. Side-scan sonar images were interpreted. Lithological data from the core and the grab samples were analyzed. The seismoacoustic profiles were read. The analysis of the relief and the seafloor surface were performed, additionally the inner structure of the seabed was recognized. The map of the surficial sediments and the thickness of the seabed sandy cover was drawn. The volume of the dynamic layer was estimated. Geological cross-cuts were shown.

The shoreline location changes in the period of 1889-2012 were analyzed based on the comparison of archival maps. The observed changes were measured using the Digital Shoreline Analysis System. Based on the obtained results of long- and medium-term shoreline changes, the followings shore sections were delineated: erosive, stable, accumulative and erosive, but stabilized by human activity.

Moreover, the detailed study on the recent shore morphodynamic was conducted. The research task was performed using the high-resolution remote sensing data from the period of 2005-2016. Based on airborne laser scanning data and the aerial photos, landforms changes of the beach and dunes were analyzed. Net changes of shore sediments in 2012-2016 were counted. The effectiveness of the used coastal protection structures was evaluated.

The observed shore changes were correlated with the nearshore geological conditions and the evidence on geomorphological processes. Spatial relations between nearshore geomorphology and shore abrasion hot-spots were recognized. Nearshore geomorphological conditions and human activity were pointed out as the main factors affecting shore changes. In the light of the obtained results, the nearshore state is the indicator of the shore abrasion threat.