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Erosional-denudational valleys on the Wolin Island cliff coast (Southern Baltic) and their impact on the morphological development of the coast

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A characteristic feature of the contemporary cliff morphology of the Southern Baltic are erosional-denudational valleys, which are an important element of the contemporary morphogenetic system. Detailed observations combined with the use of GIS methods were carried out on the Wolin Island. Over a length of about 4 km, several landforms have been distinguished, which are clearly marked in the relief. These forms show the course of NW-SE and are characterized by various morphometric features. Within the studied area, types of valleys with postglacial assumptions as well as fresh erosive cuts were identified. At the turn of the Pleistocene / Holocene, forms of late-glacial genesis were transformed by flushing and erosion processes. Progressive abrasion (cliff top recession rate of 0.22 m / year) has an impact on the further development of the valleys, whose bottoms are currently suspended in relation to the foot of the cliff.

The aim of the study is to present detailed morphometry, lithology of sediments as well as the genesis of separated erosion and denudation valleys.

Based on the research on a selected experimental catchment (recognized as a representative form) located in the edge zone of the cliff, detailed morphological and lithological studies were carried out. In the longitudinal profile of the analyzed valleys, landslides were found in the lower part, which is an effect of an increased dynamics of abrasive processes, while the upper part of the valleys has erosive and denudative character.

Based on the conducted experimental research, it is possible to separate in the longitudinal profile of the valleys the zone of impact of coastal processes from the zone which is shaping by erosion and denudation processes.

Separated erosion and denudation valleys affect both the morphology of the coast and modify the contemporary morphogenetic system of the cliff coast of the Southern Baltic.