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## The use of submerged breakwaters in Poland

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Submerged breakwaters are one of the coastal structures used to reduce the amount of energy reaching the shore, by forcing waves to break and by extending the residence time of sediments in a sheltered area. Because of the number of aesthetic and environmental advantages the use of submerged breakwaters is gaining popularity in many locations around the world, particularly in Poland where submerged breakwaters have been used in the vicinity of Kołobrzeg and in Gdynia Orłowo. The first location is a popular tourist resort at the Baltic Sea coast, where those constructions were erected in the years 2010-2012. The second one is located in the region of cliff coast, part of Nature Reserve where breakwaters were built in 2006. Both of those cases deserve a special attention due to variety of conditions overlapping at one location, making it a most interesting case study. Among the most important, one can point out specific geological conditions, especially in the nearshore zone, along with an intensive abrasion and lack of sediment supply. Those natural phenomena are followed by a series of manmade shore protection systems, composing of breakwaters, groins and beach nourishment. Based on conducted research the influence of structures on the shore zone morphodynamics has been determined and their effectiveness in coastal protection assessed.

### Biography

Agnieszka Kubowicz-Grajewska has completed her PhD in 2012 at the Institute of Oceanography, University of Gdansk. She is an Assistant Professor in Department of Marine Geology. She is an Author of 3 papers in reputed journals and 4 book chapters. Her areas of research are morpholithodynamics of the coastal zone, and coastal zone protection.

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