

## Changing coastal environment

Hardly any area in the whole world is undergoing such dynamical environmental and social change as the coastal regions of the world. In these regions, the majority of people live and the majority of economic activity is going on. The coastal waters are used for transport, for the deposition of unwanted substances, as a framework for tourism and for the aesthetic consumption of a culturally constructed nature. On the other hand, morphodynamics are inevitably changing the coastal landscape, while storms, storm surges, and extreme waves put the safety of the coastal population at risk and threaten shoreline and off-shore activities.

Thus, coastal research will play an increasingly relevant role in advising the society and economy in the efficient use of the resource, coast, and, in particular, in avoiding unnecessary risks. It takes a close link between social, economic and cultural sciences, to understand the social conditioning of coastal use and risk management, but also to help changing public perception allowing the introduction of adequate mitigation and adaptation measures.

Special emphasis has to be put on upcoming challenges related to expected anthropogenic climate change. Natural variability, in particular with respect to weather-related extremes, like storm surges, extreme waves and hinterland flooding needs to be determined by reconstructing and analyzing the historical weather records. Regionally disaggregated scenarios for plausible future developments need to be derived from global climate change scenarios.

This talk offers first a general discussion of the challenges of regional coastal research, and then exemplifies ways to constructively address the problem of detailed reconstruction of past coastal extremes and scenarios of future characteristics of extremes. Examples for the case of the North Sea coast in Europe are given.