

Störmer, O. (2011): Climate Change Impacts on Coastal Waters of the Baltic Sea. In: Schernewski, G., Hofstede, J., Neumann, T. (eds): Global Change and Baltic Coastal Zones, Coastal Research Library-Series, Springer, Dordrecht, Vol. 1, pp 51-69

Global Change and Baltic Coastal Zones

Chapter 4: Climate Change Impacts on Coastal Waters of the Baltic Sea

Störmer, O.¹

(1) Leibniz Institute for Baltic Sea Research Warnemünde

Abstract

Coastal regions are particularly sensitive towards environmental changes. Climate Change is likely to cause changes in main determining environmental factors in coastal waters of the Baltic Sea. Several model studies indicate an increasing water temperature (in average about 3.0°C in sea surface temperature), a decrease in salinity (in the range of 2–3 g kg⁻¹ in sea surface salinity) as well as changes in source and distribution of nutrient discharge via river runoff. Changes in the ecosystem of coastal waters in the southern Baltic Sea area occur mainly during the summer season due to decreased river runoff and hence, decreased nutrient input. This may result in reduced algae growth in coastal waters but also carries the risk of potentially toxic cyanobacteria blooms caused by N-limitation. Cyanobacteria growth is also supported by higher water temperatures.

Additionally, changes in species composition and distribution, the occurrence of pathogens as well as the introduction of non-indigenous species could be expected due to warmer water temperatures and/or a decrease in salinity. Those changes in the ecosystem are likely to have an effect on anthropogenic uses in coastal waters like bathing tourism (health problems) and fisheries (changes in coastal fish communities). On the other hand, the anthropogenic uses themselves affect the ecosystem considerably (e.g. pollution, overfishing, noise). The impact of Climate Change has to be seen as one of many interacting factors. Also changes in land use patterns and agricultural management will have a main influence on nutrient loads from the catchment area. Further, social developments like the increasing attractiveness of coastal regions in the southern Baltic Sea area for tourists and migrants will influence the impact on the local ecosystem of coastal waters. For coastal adaptation strategies knowledge about the regional vulnerability towards Climate Change is essential but lacking for Baltic coastal waters recently.