

# German Baltic coastal zone under Climate Change – new challenges for ecosystem and human environment

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## Climate Change and socio-economy: affected uses in the coastal zone of Mecklenburg – Western Pomerania, Germany

### Introduction

The German coastline of Mecklenburg-Western Pomerania is an economic centre with tourism as a primary pillar and therefore action and adaptation strategies due to Climate Change are of great importance.

For a sustainable multiple-use of the coastal zone the support of sustainable ecological, social and economic development is necessary. The integration of all relevant stakeholders and the cooperation between political institutions, science and spatial planning sectors is required.



graphic by Matthias Mossbauer  
symbols courtesy of the Integration and Application Network ([ian.umces.edu/symbols/](http://ian.umces.edu/symbols/)),  
University of Maryland Center for Environmental Science

### Phd Thesis “Impact of Climate Change on the coastal zone of the German Baltic Sea”

Investigation of affected marine and coastal uses and the **interactions between ecosystem, socio-economy and infrastructures**.

To estimate the **sensitivity**, significant changes which will appear in general and/or on a monthly scale in future shall be compared to the present situation: comparison of the current situation with a long scale scenario simulated with the ecological model ERGOM with a zoom from the long scale model scenario to a monthly scale.

The extent of affection of different coastal waters and their sensitive towards Climate Change shall lead to “concernment index” shall be developed and the results presented in **vulnerability maps**.

### Which factors in the natural system are going to change?

**direct:** changed wind speed and direction, increased temperature, changed distribution of precipitation

**indirect:** decreased salinity, rising sea level, changed nutrient input via river runoff, erosion

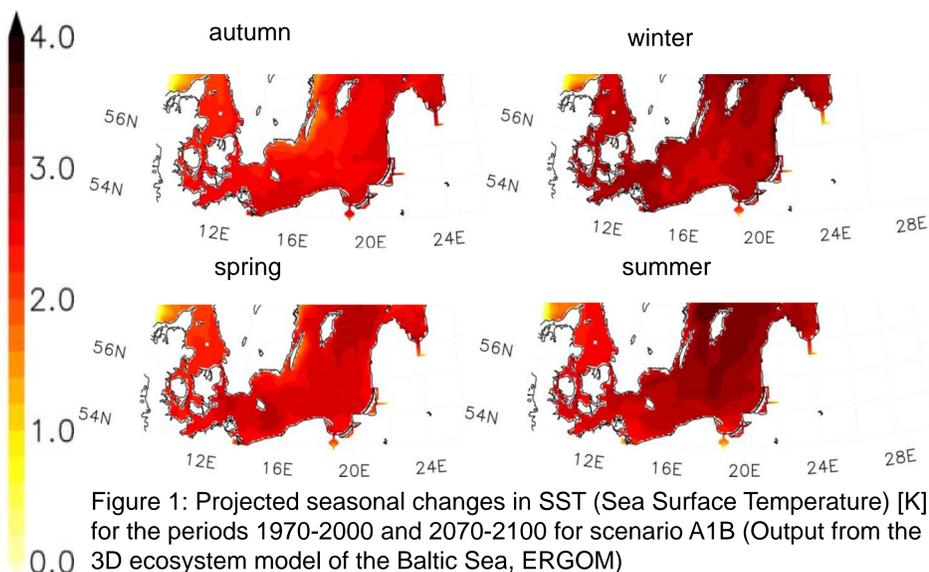
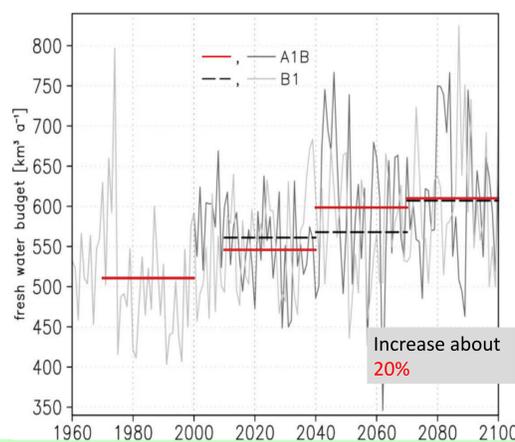


Figure 1: Projected seasonal changes in SST (Sea Surface Temperature) [K] for the periods 1970-2000 and 2070-2100 for scenario A1B (Output from the 3D ecosystem model of the Baltic Sea, ERGOM)

[K]

Figure 2: Freshwater budget /riverine runoff and precipitation minus evaporation) for the two greenhouse gas emission scenarios A1B (black and red) and B1 (grey and thick dashed). The black and grey lines show the annual means, the red and black dashed lines the 30-year mean. (Output from the 3D ecosystem model of the Baltic Sea, ERGOM)



erosion



Birte Wehnsen 2009

overflowing



Matthias Mossbauer 2009

algal bloom



Schernewski

coastal protection measures



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New conflicts are likely and direct and fast solutions are needed but current instruments of spatial planning are unflexible and take too much time. The impacts of climate change on terrestrial coastal zones are known as well as the sensitivity of the regions BUT: coastal waters are not included!

**Therefore, new, more flexible, instruments are needed as well as a „concernment index“ for german coastal waters, shown in vulnerability maps as planned as main deliverable from the phd thesis.**

Literature:

Meier, H. E. (2006): Baltic Sea climate in the late twenty-first century: a dynamical downscaling approach using two global models and two emission scenarios. *Climate dynamics* 27: 39 – 68.  
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