



Assessment of Climate Change for the Baltic Sea Basin - The BACC Project - 22-23 May 2006, Göteborg, Sweden



Summary

Past and current climate change

- Air temperature increased at 0.7 °C per 100 years since the late 19th century, a somewhat stronger trend compared to the globe
- Most pronounced warming in spring
- Related observed changes in winter runoff, ice duration and snow, although few of them are statistically significant
- More precipitation in the 2nd half of the 20th century with major regional variations
- Associated changes in terrestrial ecosystems include an earlier spring phenological phase, northward species shift, and increased growth and vigour of vegetation
- No century-long state trends in the Baltic Sea, but changes at decadal time scale
- Assessments of marine ecosystem changes need to discriminate between climate change and other anthropogenic drivers such as over-fishing, eutrophication, air pollution and land use changes
- Link to raising greenhouse gas concentrations is plausible, but no robust attribution has been established
- Many conclusions relate to different time periods studied, changes occur at different time scales: Variability versus trend problem
- Only few observational records span the entire recent 150 to 200 years
- Changing observational techniques influence data homogeneity
- Detection and attribution studies at the regional scale are urgently needed
- Observed recent changes in climatic state widely consistent with projections of climate models for the future



The Baltic Sea basin is about 4 times the size of the Sea itself, it is inhabited by 85 Million people, most of which are living in the southern areas, where the coasts are sandy, while northern coasts are mostly rocky.



In Baltic Sea, soft sediment bottom plants may form underwater meadows. Here, a marine medusa (*Aurelia aurita*) is swaying over a freshwater weed (*Myriophyllum sp.*). Photo: Jukka Nurminen

Projections of future climate

- Increasing air temperatures very likely during the entire 21st century, but size of the trend depends considerably on model
- Projected warming up to 0.9 °C larger compared to projections for the entire globe
- Projected mean precipitation increases, largest increase in winter throughout the basin and decrease in summer in the southern basin
- No clear projection for wind speed and storms
- Possible Baltic Sea salinity decrease may have major effect on marine fauna
- Expected changes in precipitation and river runoff may have additional detrimental effects on the problem of eutrophication
- The warming will be associated with earlier spring phenological phases, northward species shifts and increased growth and vigour of vegetation
- Regional climate models tend to reproduce current general climate, however differences exist between observations and model results for some key variables such as energy and water budgets



Decreasing winter ice extent is expected in the Baltic Sea due to warmer winters as a consequence of climate change. Photo: Janne Gröning, (<http://www.saaristomeri2006.fi/>)



The Baltic Sea basin as seen from space on 1 April 2004 (SeaWiFS, NASA/Goddard Space Flight Center, GeoEye)