

Nordenskjold lecture, Göteborg
13. November 2015

Recent climate change in the Baltic Sea region - manifestation, detection and attribution.

Key questions in the analysis of ongoing climate change are: **Manifestation** - how big and how robust is the change in the well-defined recent period such as 1981-2010? **Detection** - is this change in the range of natural variations, or does an explanation of this change require been external cause? **Attribution** - if an explanation requires external drivers, which set of drivers is most plausibly responsible for the change? Within the IPCC- process this set of questions has high significance and has been answered satisfactory: the global change is real, cannot be explained without reference to external drivers, can be explained at this time only by assuming it dominant contribution by elevated atmospheric greenhouse gas concentrations. The result of the BACC-process, latest published in 2015, indicates that so far these questions have not received the needed attention for the Baltic Sea region.

Here we show first systematic results on the change in terms of at temperature and precipitation amounts in the **Baltic Sea region**. The found trends seem to be robust; and most seasons the trends are stronger than what would be expected from purely internal variability; the expected changes, if only elevated greenhouse gas concentrations would act as drivers, are partly inconsistent with the observed changes, so that other factors must be at work as well. One explanation may involve the strong regional reduction of emissions of substances related to the formation of atmospheric aerosols. However, this hypothesis needs to be contested, for instance with regional climate model generated quantifications of the expected responses to regionally decreased atmospheric aerosols presence.

Manuscript: Barkhordarian, A.; H. von Storch, E. Zorita, J. Gómez-Navarro: An attempt to deconstruct recent climate change in the Baltic Sea Basin, submitted

Hans von Storch was director of Institute of Coastal Research of the Helmholtz Zentrum Geesthacht (HZG) until 2015, is professor at the University of Hamburg, and a guest professor at the Ocean University of China. From 1987 - 1995, he was Senior Scientist and leader of the "Statistical Analysis and Modelling" group at the Max Planck-Institute for Meteorology. His research interests are climate diagnostics and statistical climatology, regional climate change and its transdisciplinary context. He has published twenty books, among them "Statistical Analysis in Climate Research" with Francis Zwiers, and numerous articles. He contributed in different roles to the last four IPCC-reports. He chaired the two efforts for assessing the state of knowledge about the climate change Baltic Sea Catchment (BACCI and II). In 2014, he received the Award of the Baltic Sea Fond, and in 2008 a honorary doctorate of Göteborg University.

hvonstorch@web.de, <http://www.hvonstorch.de/klima>