

Abstract

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STORMS IN NORTHERN EUROPE – PUBLIC PERCEPTION, CHANGES, PERSPECTIVES, AND IMPACTS.

In the early 1990s concern was voiced that *storm activity in Northern Europe* would intensify in an alarming manner, and that a plausible explanation of this intensification would involve the anthropogenic greenhouse effect. Since then, and possibly supported by a cultural construction based on a quasi-religious preconception of sin and punishment (“nature strikes back”), this idea is a standard part of the public narrative of man-made climate change in northern Europe. Also, the argument was used that warmer conditions would lead to more water vapor and thus more “fuel” for mid-latitude storms – even if it would self-contradictory lead to the conclusion that Northern Europe should see more summer than winter storms (which is obviously not the case).

It became soon clear, however, that this conclusion was based on methodically flawed methodology, in particular by using too short time series and using inhomogeneous data (i.e., data, which statistics undergo changes in time not only because of changing wind conditions but also because of changing instrumentation, data density, observations practice and so forth); using appropriate *proxy data* (Schmidt and von Storch, 1993), for instance based on statistics of horizontal pressure gradients, allowed an analysis for much longer times – with the result that long-term variations prevailed in Northern Europe, and that since the early 1990s storminess ceased to some extent. Thus, a link of changing storm conditions in Northern Europe to the ever increasing greenhouse gas levels could not be established so far. Indeed, when comparing with projections of regional climate models mimicking global warming for the end of this century, such a link should not be detectable so far in the observational record.

Storminess has a number of relevant impacts, risk-wise and economically (Weisse et al., 2009). In coastal regions, the public is mostly concerned about the risk of storm surges; another important risk is related to ocean surface waves. In this talk, the risk of storm surges along the German North Sea coast in recent years and scenarios for the future are discussed; it turns out that the risk of storm surges has really changed, but mainly not because of changing storm conditions but because of rising sea level and water works in the estuaries (von Storch and Woth, 2008). While present coastal defense strategies seem to be sufficient for the coming few decades, innovative strategies may be needed in the middle of the 21st century and later – among them higher overtopping tolerances and more efficient building codes for houses in endangered regions “behind the dike”.

An example of economical impact is related to the wind energy, which can be harvested from off-shore wind parks – this potential has varied significantly in recent years – as opposed to a relatively smooth increase over the years as some may have expected. The recent consecutive three “cold” regional winters since 2008/2009 went along with significant losses by the industry.

Regional stakeholders are in need of understanding ongoing changes, expected future changes, the role of natural variability, of vulnerability, risks and potentials. Such an understanding may be generated by science, when being in a dialogue with stake-holders about needs and pre-

conceptions. To do so, regional climate service is needed (von Storch et al., 2011), which assesses scientifically legitimate knowledge about storminess, its variability and change, as well as impacts, provides data sets about past variations and scenarios of possible future changes, and establishes a dialogue between the very different cultures of science and of decision making in policymaking and economy. An important element is that such an exchange is openness for processes, which may be responsible for ongoing and possible future changes in impacts, without an a-priori bias towards explanations favoring the significance of man-made global warming.

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He is member of the advisory boards of, among others, Journal of Climate, Environmental Science and Policy, and Meteorologische Zeitschrift, and organizer of the GKSS School on Environmental Research. He is involved in the Fifth Assessment of the IPCC as a lead author in Working Group II, and as a contributing author in Working Group I. He chairs efforts for a climate change assessment for the Baltic Sea Catchment (BACC) and the metropolitan region of Hamburg.

Hans von Storch is frequently approached by media and various stakeholders for interviews and public presentations, as well as witness in parliamentary processes.

In 2008 he was awarded a honorary doctorate by the University of Göteborg, and in 2010 he received the award of the International Meeting of Statistical Climatology.

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