

A European approach for assessing ongoing and future storm climate change.

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In Northern Europe, storms represent the major meteorological marine risk, as they relate to hazardous ocean waves and dangerous storm surges. Therefore, the question whether recently more frequent or more violent storms have formed and may continue to do so in future because of anthropogenic influences in the global climate play a major role in the public discussion. Stakeholders and the general public are seriously concerned about such perspectives.

We have developed a mix of dynamical and empirical methods to objectively assess this question for the case of Northern Europe, and we suggest that this methodology may be used for other parts of the world as well. For long time scales of a century and longer, it makes use of robust and homogeneous proxies, mainly derived from air pressure readings. For decadal time scales, reconstructions of past weather with regional climate models provide detailed histories of the more recent past, which can be related to expected future changes, derived with the same regional models from global climate change scenarios. These atmospheric reconstructions and scenarios are used to construct reconstructions and scenarios of storm surge and ocean wave statistics.