

Past and future changes of wind storms - latest achievements and current activities at HZG

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For more than 10 years now wind storms have been subject of research at the Institute of Coastal Research of the Helmholtz-Centre Geesthacht (HZG), Germany. In the centre of interest are the most extreme storms in various regions, ranging from polar lows in the Arctic, medicanes over the Mediterranean, typhoons or hurricanes in the tropics to even the large scale cyclonic weather systems in the extra-tropics.

Several of our recent studies have applied Regional Climate Models to dynamically downscale coarse global data and post-process them to high resolution information of the atmosphere. These data are capable of representing even the smaller types of storm, which makes them detectable by automated tracking procedures. For the past, analysis of the tracking outcomes generally reveals a high inter-decadal variability of the storm numbers, but no systematic change in their frequency, whereas most of our future studies resulted in a decline in their annual occurrences.

Analogous to the regional studies we currently implement our technique to a global model of the atmosphere and dynamically downscale NCEP/NCAR re-analyses. This will result in a high-resolution long-term data set of the entire atmosphere. Current activities investigate the representation quality of typhoons and other storms in these data. Their statistics, impacts, links between occurrences in different regions and links to prevailing driving conditions for these storms will be investigated and first results will be discussed.