# The influence of large-scale metocean conditions on extreme wave heights in the Barents sea

SOPHIA GRONINGER[1,2], PATRIK BOHLINGER[1], ØYVIND BREIVIK[1,2]

[1] *Norwegian Meteorological Institute, Norway*

[2] *Geophysical Institute, University of Bergen, Norway*

Extreme wave events are a threat for the safety of marine operations like fishing, shipping or offshore energy production. For a more solid understanding of extreme wave events it is crucial to understand large-scale metocean drivers leading to those extreme events. Working towards this goal, we analyse and quantify the influence of large-scale metocean conditions on extreme wave events in the Barents sea. The analysis includes climate indices like the North Atlantic Oscillation (NAO), the Arctic Oscillation (AO) and the El Niño Southern oscillation (ENSO) as well as sea ice extent, direction and season as potential drivers for extreme wave events. We use the NORA3 hindcast for waves, sea ice and the atmosphere to extract monthly maxima in significant wave height and the conditions during the occurrence of the maxima. We compare the maxima with the corresponding values of the climate indices and with the sea ice and available fetch. Preliminary results indicate a strong seasonality in the annual maxima in significant wave height, as well as a main wind direction during which maxima in significant wave height occur. Further, they show a clear impact of AO and NAO on both the occurrence and the magnitude of monthly and annual maxima in significant wave height. There is a spatial variability across the Barents sea in the impact of the climate indices on the annual maxima in significant wave heights. The relationships found could be used for improving predictions of extreme wave events.