



New wave systems in the “ice-free” future of the Arctic Ocean

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Near “ice-free” future of the Arctic Ocean offers new possibilities for maritime activities. Retreat of the sea ice projected in the climate change scenarios in the coming decades will open new ship routes, which potentially can be much more efficient compared to the present days. Nevertheless, it is currently unknown what kind of wave systems will develop under new ice conditions. We investigate the near future of the Arctic wave climate using new projections of wind and ice conditions from the CMIP5 set of experiments. We use the output (wind and ice data) of an Earth system model (EC-Earth) to force a high-resolution Arctic setup of the wave model WAM. The grid of the WAM was rotated ensuring a free propagation of waves over the North Pole. Model results from the historical (spanning the years 1850-2010) and future projections (for the period of 2010-2100) of Earth’s climate will be presented. We investigate the changes in the wave systems of the Arctic Ocean under future sea ice conditions. We show that the region will develop new patterns in wave regimes including the generation of the Arctic swell and the new surfing zones along the coastal line.