



Renewable energy and accessibility aspects in the Baltic Sea region

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Wave energy potential of the Baltic Sea have recently been estimated and characterized using third-generation wave modeling at unprecedented one-kilometer-scale horizontal resolution for the years 1998 to 2013 (Nilsson et al. 2019). The study was carried out to provide a detailed assessment of the potential of waves as a renewable energy resource for the region and wave resource site characterization. The wave energy potential was shown to be largely controlled by the distance from the coast and the fetch associated with the prevailing dominant wave direction.

In this talk, we will focus on ongoing efforts to study aspects influencing the accessibility of sites for renewable energy and the effects of high-impact weather causing extreme wave conditions with high spatial variability related to bathymetry, fetch and duration of events. The results illustrate that seasonal sea-ice in the Baltic Sea had a negative impact not only on the wave energy potential, but also on the number of weather windows and length of waiting periods. Assessment of the accessibility of a site for the deployment, maintenance and removal of equipment is, apart from resource assessment, a very important initial step at the planning stage of any marine energy project. Human safety is key in the regulations of safe operations of marine vessels in any near-shore or offshore region and the current work aims to improve the understanding of causes for extreme wind and wave events in the Baltic Sea region.

Reference:

Nilsson, E.; Rutgersson, A.; Dingwell, A.; Björkqvist, J.-V.; Pettersson, H.; Axell, L.; Nyberg, J.; Strömstedt, E. Characterization of Wave Energy Potential for the Baltic Sea with Focus on the Swedish Exclusive Economic Zone. *Energies* 2019, 12, 793.