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Understanding current and future wind and wave risks: The WINDSURFER project

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Extreme winds pose major risks to life, property and forestry, while extreme ocean waves can impact on offshore infrastructures and coastal communities. For example, the three windstorms (Anatol, Lothar, Martin) that struck in Dec 1999 inflicted €8 billion of insured losses to property and infrastructure across Europe. In Jan 2005 Windstorm Gudrun inflicted substantial damage to forestry. Gudrun felled approximately 75 million cubic metres of trees in Sweden alone, which is equivalent to the annual Swedish forestry harvest. Extreme waves driven by strong winds can also have substantial impacts on the energy sector and offshore infrastructures. For example, a windstorm in March 1980 generated individual waves up to 12m in height in the North Sea, which resulted in the collapse of the Alexander L. Kielland oil and gas platform and the loss of 123 lives.

WINDSURFER is a 3-year project that brings together eight leading research institutions across Europe to co-develop new methods, tools and assessments of extreme wind and wave risk with a focus on the Insurance, Forestry and Energy sectors. There are major gaps in our scientific understanding of extreme wind and wave risk, namely i) Present-day risks from extreme winds and waves are poorly constrained; ii) The impact of climate change on future wind and wave risk is uncertain; and iii) Substantial improvements are required in modelling the socioeconomic impacts of wind and waves.

The poster will describe some of the activities and first results from the WINDSURFER project to address the above knowledge gaps:

1. Developing new methods and tools to better quantify current extreme wind and wave risk, in particular new reanalysis datasets of observed wind and wave extremes.

2. Improve understanding of how wind and wave risk might change in the future including analysis of the HiResMIP and MED-CORDEX climate model projections.

WINDSURFER is one of the funded projects in the ERA4CS ERA-NET.