

On marine weather conditions

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Marine weather is as influenced by climate change as any other weather. Of particular interest is the effect the changes in large scale global climate may have on safety related weather conditions along ship routes. Much of the marine safety codes are built around extreme value distributions for sea states as historically described by the average (significant) wave height and direction during a storm period, and for the distribution of extreme individual events during an extreme storm. An important issue is then how these distributions change with changing climate. Global and regional climate models provide tools for Monte Carlo simulation also of non-linear effects that may affect not only location but also scale, and even shape parameters of the extreme value distributions.

The standard setup in marine weather and wave statistics is to model the sea surface as a time and space dependent Gaussian random field and to let correlation and spectral characteristics specify the sea state severity. However, the Gaussian model does not catch some of the real dangerous events that may occur on a ship's voyage, namely the rogue or freak waves. Such waves are larger than explained in the Gaussian model and it is largely unknown precisely under which conditions they are likely to appear.

The talk will give an overview of current statistical research on marine safety and on extensions of the Gaussian models to more realistic stochastic models.