Decadal and interannual variability of wind fields

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We know from daily experience that winds are highly variable, both in strength and direction. But how does this variability play out on longer time scales? Long term data sets reveal that wind fields show a lot of variability: wind directions that are dominant in one year may be weak in another year, for example. Also on decadal time scales, variations are observed, illustrated by the different trends between summer and winter half-years. All these kinds of variability have a direct impact on annual mean sea level and also on the pathways of transports in the coastal zone and neighbouring seas, which is of importance for species living there. Unfortunately, reliable long term wind data are scarce. In this project, we propose to analyse long term meteorological measurements collected on board of the lightship Westhinder. These data are available in digital form as of the 1950s onward and will provide insight in the interannual variability as well as decadal trends of wind data. For more recent decades, a comparison with re-analysis data will be made. Finally, the connection with annual mean sea level at the Belgian coast will be examined. This project is a collaboration between VLIZ and NIOZ (Dr. Theo Gerkema). Because of the nature of this project, some proficiency in computational packages like Matlab, R, or Python is essential.

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