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Wave climatology for the western Mozambique Channel

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Background

The main wave characteristic necessary for decision-making is by far the significant wave height, which can be affected by wind speed, duration, and fetch. Some of the variables are included in a standard wave-buoy measurement, which can be challenging to obtain or use it for large areas. The global model wavewatch provides an alternative mean to obtain the most accurate possible wave fields for the global ocean. Although data from the most recent wavewatch model is freely available online, the general wave regime in the Mozambique Channel has not been described yet, and this study seeks to provide such a description, emphasizing the climatology of the significant wave height and mean propagation direction.

Methods

The approach employed consists of extraction of wave data from the ESA's Globwave dataset for further processing and statistical analyses. The data made available from the C-RISe project (http://www.satoc.eu/projects/c-rise) comprises timeseries of significant wave height and wind field subsetted for the area bounded by latitudes 9º-38ºS and longitudes 12º-62ºE covering the whole Mozambique Channel. The data spatial resolution is 1 degree spanning the period 1992-2013 (for significant wave height) and 2007-2017 (for wind field). The statistical analyses were simply the identification of annual and seasonal cycles.

Results

The analysis of three control stations located in the south-western part of the channel revealed that maximum significant wave height occurs in January reaching a maximum of 3.5±1.5 metres in the three stations, whilst the seasonal cycle has a maximum amplitude of 2 ±0.81 metres occurring around May and July July. The longer time series showed significant degree of inter-annual variability although without a clear pattern in the period 2007-2017.

Conclusions

We concluded that the wave field along the coast of Mozambique is dominated by a seasonal cycle with amplitude 2m and phase lag of 91 days.