



## **30-year hindcast of wind waves in the North Atlantic using WAVEWATCH III and WRF**

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The long-term hindcast of wind wave characteristics over the North Atlantic is performed using the third generation spectral wave model WAVEWATCH III in conjunction with non-hydrostatic mesoscale numerical weather prediction system WRF (Weather Research and Forecasting). The hindcast covers 32-year time period from 1979 to 2010. WAVEWATCH III used for the reconstruction of wind wave fields was ran on horizontal resolution of  $0.1^\circ$  and spectral resolution with 40 frequencies and 36 directions. The model setting included the latest developments for parametrization scheme of wind input and whitecapping dissipation BYDRZ (Babanin/Young/Donelan/Rogers/Zieger) that allowed for accurate simulation of waves under severe wind conditions. Wind forcing was provided by WRF model ran at 15 km spatial resolution and assimilating lateral boundary conditions from ERA-Interim reanalysis. Output of the hindcast consists of basic statistics of wind waves, including characteristics of extreme waves. The results were verified by comparisons with NDBC buoys data, satellite altimetry data from the GlobWave project and VOS measurements. Further the solution obtained with WRF forcing has been compared with that obtained using reanalysis wind forcing. For selected case studies associated with extreme storms very high resolution short-term runs are performed. The post-processing of results includes analysis of interannual variability of mean and extreme wave characteristics as well as their association with atmospheric dynamics over the North Atlantic region during the last several decades.