

## **Coupling WRF with WaveWatchIII: method, validation and applications.**

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The Weather Research and Forecasting (WRF) model was coupled to the NOAA community wave height model WaveWatchIII (WWIII). In this one way coupling system, WRF hourly surface wind and sea ice fields are used to drive the wave model, on each embedded domain with a resolution that is consistent with the physics of the interaction wind/wave. In the absence, of publicly available global wave analyses, the largest WWIII domain is global and forced by winds from the global analysis used to initialize WRF; sub-domains are subsequently forced by WRF. The coarse resolution of global analysis is, however, insufficient in enclosed sea and a 30-year wind climatology over the entire Mediterranean basin has been generated with the WRF model at 30km grid increment.

The coupled system was validated with in-situ wind and wave observations collected off the East coast during the SHOWEX field campaign. It is now routinely applied in coastal areas allowing downscaling of NCEP-NCAR Reanalysis Program (NNRP) data at the kilometer resolution. Climatologies of 30 years of fine scale wind and wave gridded data have been assembled for the support of naval operations, off-shore drilling, and wind energy prospection.