A renanalysis of the PREDEM campaign with a coupled atmospheric-wave modeling system.

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The Weather Research and Forecasting (WRF) model was applied to dynamically downscale global analyses from the Climate Forecast System Reanalysis over a 200kmx200km domain centered on Toulon, France; on the East coast of the occidental Mediterranean, for the month of February and June over 10 years. To insure accuracy, observational data from the NCAR ADP historical database were used in combination with the Four-Dimensional Data Assimilation (FDDA) techniques to constantly nudge the model analysis toward observations. The horizontal grid increment was 3.3km and the first 6 model vertical levels were in the first 60m layer (2, 6, 10, 18, 36 and 58m AGL). The wave model WaveWatchIII was applied over the same domain and time period, forced by the fine scale winds from the WRF model.

WRF model outputs were validated against the observations taken during the PREDEM campaign (June 2005). Comparisons between modified refractivity profiles directly computed from WRF output temperature and moisture profiles on one-hand and refractivity profiles generated from point measurements by the PIRAM bulk model on the other hand are conducted. The sensitivity of the bulk model to wave height variability, as depicted by the wave model output, is assessed.