An Inner-Shelf Wave Forecasting System for the US Pacific Northwest

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An operational inner-shelf wave forecasting system was recently implemented using WAVEWATCH III v3.14 for the coasts of Oregon and southwest Washington. Wave forecasts have been produced daily since May 2011 at a 30 arc-second resolution for an 84 hour horizon. At this resolution we are able to quantify the wave transformations due to the major bathymetric features in the continental shelf by the processes of refraction and shoaling. By performing a series of hindcasts and comparing model results against *in situ* data we were able to validate our implementation. The resulting normalized root-mean-squared errors in significant wave height and first moment mean wave period range from 0.13 to 0.24 and 0.13 to 0.26, respectively. Visualization of the wave forecasts is available online at no cost[1]. These data is currently being used by the scientific and recreational user communities as well as boundary input for localized forecasting systems in the region. This model allowed us to evaluate the relative impact on long term model performance of bottom friction and wind generation over the relatively narrow Pacific Northwest shelf. Results indicate that metrics based on bulk wave parameters are not significantly affected by the inclusion of these physics in model simulations. In addition, the large-scale shelf-level wave behavior was evaluated and we found that the multiple banks and canyons are able to affect waves generating gradients in the wave field that are present at least at the 20 meter isobath.

[1] http://www2.nanoos.org/nvs/nvs.php?section=NVS-Products-Maritime_Operations, http://www.nanoos.org/nvs/nvs.php?section=NVS-Assets