



Systematic error analysis of a high resolution relocatable system for operational hydrodynamic coastal forecasting

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The Met Office Ocean Forecasting Research and Development group implements an operational, relocatable version of the Proudman Oceanographic Laboratory Coastal-Ocean Modelling System (POLCOMS) configured with constant temperature and salinity. The relocatable system was implemented at high resolution, 180m, for the Solent and waters surrounding the Isle of Wight. The location of the high resolution domain presented an opportunity for model assessment and evaluation against observations around the Isle of Wight. The high resolution domain is nested within a series of coarser domains, at 1 nautical mile, 4km and 12km resolution. The outer domain was forced at its open boundaries by elevations derived from FES99 tidal constituents.

To facilitate direct inter-model comparisons, the outer 12km domain was matched to that of the Met Office's operational Atlantic Margin Model (AMM). The model output for the inner most 180m resolution nest was evaluated against tide table predictions at Portsmouth and Southampton, the well-calibrated 2D operational surge model, U.K. Admiralty current observations at locations surrounding the Isle of Wight, and tide gauge sea level observations in the English Channel.

Several factors have been found to decrease the discrepancies between the relocatable model and observations (and the surge model). In particular, inclusion of all the 15 available tidal constituents to derive tidal boundary forcing of the outer 12km domain appears to improve performance close to the Isle of Wight. Inclusion of velocity components at the open boundary, (not available in FES99, but employed by the oper-

ational AMM) considerably improved both the phase and amplitudes of the modelled tidal currents in the Solent.

As an extension to the analysis of the relocatable system, a systematic approach to inter-model comparison and evaluation against observations has been initiated which aims to include assessment of coastal models within the National Centre for Ocean Forecasting. A variety of metrics for assessing the accuracy of simulated tides have been developed. The proposed standard inter-comparison locations and periods (where suitable observations for model evaluation exist) should also facilitate inter-comparison of models of the NW European shelf from the wider coastal ocean modelling community.