Uncertainty characterization for high-resolution near-shore models

Unconstrained variability in numerical ocean modelling systems is driven by uncertainties in the inputs (e.g., forcing, assimilated data, model physics) and by chaotic internal variability. These unconstrained motions confound model performance evaluation (e.g., the double-penalty for a mis-positioned eddy) and can reduce the utility of the model in some contexts (e.g., drift prediction). Large ensemble simulations can mitigate some of the impact of the unconstrained motions but comes at high computational cost. Smoothing/filtering can also mitigate these motions at the expense of degrading the model results. We present an ongoing effort to quantify the uncertainty in high-resolution nearshore modelling systems (finer than 100 m). Forcing for these systems is drawn from larger-scale deterministic atmosphere and ocean models, which precludes running ensembles directly. We explore methods to derive "pseudo-ensemble" forcing (e.g. perturbed EOF modes) and show some early results.

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