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# Forecasting from the Deep Ocean to the Coast: Predictability of shelf circulation impacted by a Western Boundary Current

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While demand increases for forecasts that resolve finer scale features in coastal regions, the predictability of the coastal ocean is not yet well understood. Operational ocean forecasts typically resolve the slowly evolving mesoscale circulation (with model resolutions of ~10km). With increased model resolution, model error increases more rapidly. Coastal scale prediction presents additional challenges as the circulation is more rapidly decoupled from the initial state and depends more strongly on surface and boundary forcing, model configuration and parameters.

We have developed a high resolution (~1km) 4D-Var data assimilative ROMS configuration for the coastal ocean off SE Australia (30$^{o}$S, Coffs Harbour), assimilating observations for satellites (SSH and SST), shelf moorings, ocean gliders, and the HF radar array. Nesting this within our comprehensive (3-5km resolution) data assimilative model of the East Australian Current (EAC-ROMS) and using atmospheric forcing from the BOM's newly available BARRA reanalysis, we assess the predictive skill of the coastal model based on a variety of metrics from both assimilated and independent observations. The results are a first step towards understanding the predictability of fine-scale processes in a dynamic continental shelf and slope region impacted by an intense western boundary current.