Quantifying Unconstrained Scales in a Global Ocean Analysis

Ocean analysis and forecast systems have inherit long length-scales that are resolved by the model and constrained by the observations. At the other end of the spectrum, at some scale, short length-scales are no longer resolved by the model resolution and therefore not constrained by the system. In between, one has length-scales that are represented in the system and therefore resolved, but not constrained by observations. An example would be certain radius mesoscale eddies in an eddy resolving or eddy permitting system that are not constrained by the altimeter (or other) observations due to gaps in the observing network (separation and return times of altimeter tracks). We investigate this unconstrained variability using a ¼ degree global (eddy-permitting) ensemble ocean analysis, showing the ensemble mean is an effective tool to filter out this unconstrained variability and remove errors associated with them. This ensemble system is moving towards operations at Environment and Climate Canada. Progress to this end will also be documented.

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