Contribution ID: **9** Type: **Oral presentation**

# Invited talk: Requirements on Ocean Data Assimilation Methods to meet Seamless Predictions needs

*Wednesday, 19 May 2021 11:00 (30 minutes)*

A priority for ocean data assimilation methods is the appropriate initialization of the ocean for seamless forecasts of weather and climate, from days to decades. The relevant ocean processes span a wide range of spatial and time scales, and their correct initialization poses a major challenge for the data assimilation methodology. Thus, at the time range of days to weeks, assimilation methods targeting the accurate and balanced initialization of sharp SST fronts and ocean mixed layer are required. As we move to seasonal time scales, the balanced initialization of the thermal structure in the upper few hundred meters and equatorial waves becomes important. Decadal forecasts require initialization of the deeper parts of the ocean and associated transports. Methods for consistent and efficient assimilation of sea-ice information are also needed. Extended-range, seasonal and decadal prediction require historical reforecasts spanning several decades, which are initialized from ocean or coupled reanalyses. Consistency between the historical reanalysis and real time ocean initial conditions is essential. Reliable multi-decadal ocean reanalyses need methods for dealing with model error, as to prevent spurious climate signals arising from the changing ocean observing systems. This methodology should be robust across a variety of climate regimes. This presentation illustrates these different aspects from experiments with the ECMWF extended and seasonal forecasting systems. It also discusses the need of evaluation methodology for development of multi-scale data assimilation methods.

## Which theme does your abstract refer to?

Development and assessment of data assimilation in forecasting applications (global and regional)

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**Session Classification:** Theme 8: Development and assessment of data assimilation in forecasting applications

**Track Classification:** Joint ECMWF/OceanPredict workshop on Advances in Ocean Data Assimilation