MER-EP: a Marine Environment Reanalysis Evaluation initiative fostering synergies with observation-based approaches for enhanced ocean monitoring

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Abstract

The Marine Environment Reanalysis Evaluation Project (MER-EP: https://oceanpredict.org/un-decade-of-ocean-science/mer-ep-un-decade-project/), endorsed by the UN Ocean Decade, is an international initiative dedicated to the systematic evaluation of ocean and marine environment reanalyses. Building on previous intercomparison efforts, MER-EP develops a new coordinated and traceable framework to assess the performance, consistency, uncertainty, and fitness-for-purpose of next-generation reanalysis products across multiple components, including physical ocean variables, sea ice, waves, and biogeochemistry. It addresses a wide range of applications, from ocean monitoring and climate studies to operational forecasting and emerging AI-based systems, while promoting common metrics and methodologies for robust intercomparison.

Previous intercomparison exercises of ocean reanalyses have targeted specific variables to assess the consistency and discrepancies among various ocean reanalysis products. MER-EP will complement this approach, based on new generation of ocean reanalyses, including more systematic to evaluate differences to determine their quality and fitness-for-purpose for specific applications (e.g. initial conditions for seasonal to decadal predictions). The outcome of the process based, or case study based could be used as well for evaluating ocean forecasts system in particular AI based forecast model.

Therefore, in this presentation, we first introduce the MER-EP initiative and its organization based on targeted use cases, and then present initial results from the intercomparison exercise (e.g., ocean heat content, transports). Finally, we discuss how strengthening the synergy between these approaches is critical to improving our understanding and monitoring of the ocean with evaluating of the ocean forecasts system.