



European Union's
Horizon 2020 research
and innovation



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Brief for stakeholders on "Services based on ecosystem data assimilation: essential science and solutions":

The "SEAMLESS" project

What will SEAMLESS give to you?

Better ocean model data to: 1) monitor and assess marine ecosystem health in policy frameworks, 2) implement marine spatial planning, 3) operate aquaculture and fisheries, 4) investigate climate change impacts on ocean ecosystems.

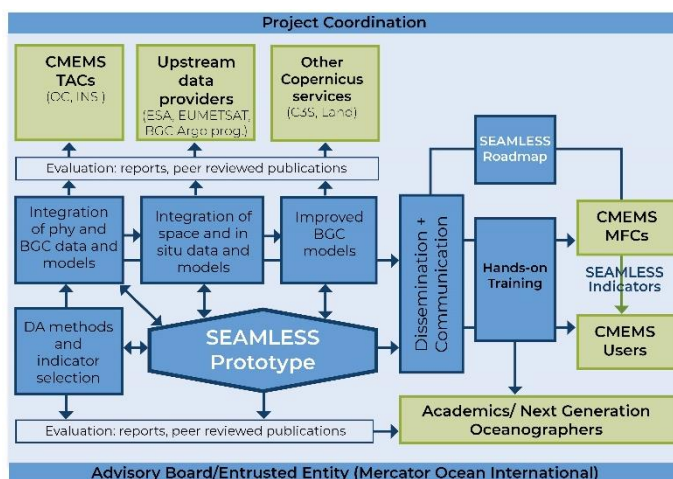
Improved ocean ecosystem models and new data assimilation methods that advance the understanding, reanalysis and predictions of marine environments. They can be implemented in all the EU Copernicus Marine Service operational systems.

SEAMLESS is a European Horizon2020 three-year project (2021-2023) delivered by an international consortium of six marine institutes and enterprises. SEAMLESS offers tools and methods to improve the European Copernicus Marine Service (CMEMS) capability to deliver better simulations of the past ("reanalysis") and better predictions of the future ("forecasts") of the state of the ocean, thus **providing CMEMS users with more advanced ocean products**.

The project focuses on seven state indicators that are linked to the ocean "**health**" (indicators: oxygen concentration, pH, phytoplankton type concentrations and phenology), "**services**" (primary production, trophic efficiency) and "**response**" to climate change (particulate organic carbon).

Currently, these indicators are monitored and/or simulated routinely by observatories and models of the CMEMS. SEAMLESS will **advance the current CMEMS methods** that integrate the information from monitored and simulated indicators, i.e. "data assimilation" methods. We will assimilate biogeochemical and physical data from both satellites and in situ platforms (e.g. gliders and biogeochemical-Argo floats) across the CMEMS ecosystem models.

The SEAMLESS **new ocean indicator datasets** and **novel methods** can be used by a large range of stakeholders, including policymakers, coastal planners, institutional monitoring, aquaculture farmers and climate-change scientists. SEAMLESS will also develop an **open-source, user-friendly assimilative modelling tool ("prototype")** and will train stakeholders on how to use it.



SEAMLESS Roadmap

The flow chart shows the direct path from SEAMLESS work programme, with the prototype as core output, to planned engagement with stakeholders. Through the SEAMLESS Road map, the prototype will be delivered directly to CMEMS Monitoring and Forecasting Centres (MFCs), who will then be able to provide their users with the SEAMLESS indicators.

Training

Hands-on training sessions on the use of the prototype will be offered to CMEMS users and the next generation of ocean scientists.

SEAMLESS is led by the Plymouth Marine Laboratory (PML, UK) and includes the Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (AWI, Germany), Institut des Géosciences de l'Environnement - Université Grenoble Alpes (IGE-UGA, France), Stiftelsen Nansensenteret for Miljø og Fjernmåling (NERSC, Norway), Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS, Italy) and Bolding & Bruggeman ApS (BB, Denmark).

SEAMLESS has a budget of €1.5 million, start date 1 January 2021. For information: Jessica Heard, jessh@pml.ac.uk