

Partitioning ocean dynamical patches using modeled added-value variables and data mining

V. Quilfen¹, M. Cachera¹, M. Boutet², E. Tew-Kai¹

¹SHOM, 13 rue de Châtellier, 29200 Brest, France

²CNRS, M2C, 24 rue des Tilleuls, 14000 Caen, France

In: EuroGOOS 9th Conference 2020, theme D. Meeting end-user needs and supporting marine development (topic: “New oceanographic products and services for users”)

Improving the knowledge of the ocean and its dynamics is a major step for enhancing its integrated management for a sustainable development. Operational Coastal Ocean (OCO) modeling thus appears as an important tool to generate data of coastal circulation at both spatial and temporal high-resolution. It then allows to calculate important oceanographic variables, including Essential Oceanic Variables (EOVs) as defined by the Global Ocean Observing System (GOOS), and complementary Derived Variables (DVs), particularly dynamics ones related to sea surface height, current velocities, temperature or salinity. OCO thus endorses the creation of a dynamic and reliable picture of the oceanic environment for users.

Within the context of the Marine Strategy Framework Directive (MSFD), the study aims at developing new oceanographic products in order to assess regional abiotic structure. It uses HYbrid Coordinate Ocean Model (HYCOM) outputs in the French Exclusive Economic Zone (EEZ) validated against in-situ and satellite data, to calculate EOVs and DVs, and delivers new dynamical products for environmental assessments. The selection of variables is based on oceanographic expertise but also on their implication for the biological component of the ecosystem. Using data mining, a partitioning method was then applied on variables in order to find dynamics regional structures and generate a dynamical mosaic of the EEZ's environmental conditions. An example of products used for the 2018 MSFD French assessment is presented, namely the definition of Geographic Units, generated by a selection of relevant EOVs and DVs, which may be used by stakeholders for better targeting specific management measures.