How CMEMS INSTAC contributes to the monitoring of the ocean?

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CMEMS IN SITU TAC (INSTAC) collects \textit{in situ} observations from various platforms (e.g. Argo floats, gliders, drifters, ships, fixed stations, marine mammals, high-frequency radar). It provides free, open and quality-controlled physical and biogeochemical ocean data in both delayed mode and near-real time, in support to the operational oceanography, the ocean health and the climate change. Monitoring the 4-dimensional ocean at various spatial and temporal scales, the INSTAC multi-year products provide an essential information on the ocean state, variability and changes. Hence, the INSTAC group contributes substantially to the elaboration of the annual CMEMS Ocean State Report (\textit{Von Schuckmann et al.}, 2016, 2018, 2019, 2020), in collaboration with internal and external scientific experts, as well as with other CMEMS TACs and MFCs.

A general overview of the INSTAC contributions to the CMEMS Ocean State Report is presented, highlighting its capacity to describe, analyze and understand the ocean state and variability of both physical and biogeochemical components from the sea surface to the deep ocean, from the coastal to open sea waters at both short-term (event) and long-term temporal scales. The INSTAC team contributes to the CMEMS Ocean Monitoring Indicators (e.g. temperature, salinity, ocean heat content, water mass and heat exchange, extreme event detection), investigates the ocean circulation variability (e.g. cold and fresh blob in North Atlantic, mesoscale eddy anomaly), analyses the impacts of climate change on marine ecosystem and ocean circulation (e.g. water mass responses to climate warming, cyclones), and develops operational applications and services (pollution risk, search-and-rescue, storm and wave alerts, river discharges).