Map of the Week – Monthly drifting buoy trajectories

The map of the week is featuring the trajectories that drifting ocean observation buoys have completed in the last month.

Our ocean is changing faster than ever before with major impacts on marine ecosystems and humanity[1]. In order to monitor the state of the ocean and make predictions about the future, both in the short term (e.g. weather forecasts) as well as within coming decades (climate forecasts), scientists rely on large amounts of ocean observations.

Ocean observations can be grouped into remote sensing and in-situ observations. Remote sensing observations are collected by instruments mounted on earth-orbiting satellites (like those provided by the European Space Agency [1]). They measure the electromagnetic radiation (light) reflected or emitted by the earth's surface[2]. While these measurements allow us to derive several important ocean parameters (e.g. temperature, currents, etc.) over large areas, they are limited in resolution, the parameters that can be accurately observed and are restricted to the ocean surface. As such, to get a full picture of the ocean, remote sensing needs to be combined with in-situ observations, measurements taken by oceanographic instruments (e.g. thermometers) directly in the ocean water. As the ocean is so vast, it is no easy feat to collect in-situ observations at sufficient spatial and temporal resolution to make accurate weather and climate predictions. Nevertheless, several international programs have made significant progress in improving our Global Ocean Observing System (GOOS). [2]

One of these programs is the Data Buoy Cooperation Panel [3]. This program coordinates the data collection by a large number of free-drifting buoys that continuously measure oceanographic parameters like temperature, salinity, currents and in some cases, other parameters like turbidity, oxygen and chlorophyll fluorescence. These observations are relayed by satellite and are made available in near real-time through open marine data initiatives like EMODnet Physics [4]. They are then combined with remote sensing observations in models that allow to improve forecasts and as such, increase marine safety. These models and forecasts are made available through the Copernicus - Marine environment monitoring

service (CMEMS) [5]. To give you a sense of the scale of this in-situ ocean observation network, our map of the week is featuring the trajectories that these drifting buoys have completed in the last month.

Access the map [6]

The data in this map are provided by EMODnet Physics [4].

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[1] https://marine.copernicus.eu/wp-content/uploads/2020/06/OSR4_Summary_WEB_SinglePages.pdf [7]

[2] https://www.esa.int/About_Us/ECSL_European_Centre_for_Space_Law/Earth_Observation_Remote_Sensing [8]