



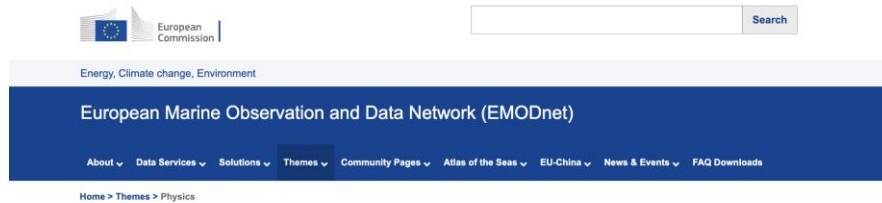
EMODnet-Copernicus Marine Service 8th Coordination meeting

EMODnet Physics

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20 October 2023

EMODnet Physics | State of Art



Physics

EMODnet Physics is an upstream ocean data integrating service. It builds on the discovery of data sources or providers and their connection to the EMODnet Physics infrastructure. It provides a single point of access to in situ ocean physics time-series data and vertical profiles, data products and metadata built with common standards, free of charge and no restrictions. The available parameters cover temperature, salinity and currents profiles, sea level trends, wave height and period, wind speed and direction, water turbidity (light attenuation), underwater noise, river flow, and sea-ice coverage.



Data on temperature, salinity and currents in the water column, sea level trends, wave height and period, wind speed and direction, water turbidity (light attenuation), underwater noise, river flow, and sea-ice coverage.

Objectives

Background

Approach

Products

Temperature & Salinity

Sea Surface Currents

Sea Level

Wave

River Runoff

Water Clarity

Noise Events

Ice

Reports

Media

Use Cases

News

Products

Temperature and Salinity in the water column

Temperature is a crucial component of the climate system and its variability in the water column. Sea-surface temperature (SST) has a significant impact on energy, momentum, and gas exchanges between the ocean and atmosphere. Daily variations in SST can exceed 3°C and can lead to changes of over 10 Wm⁻² in the surface energy budget in the tropics and subtropics.

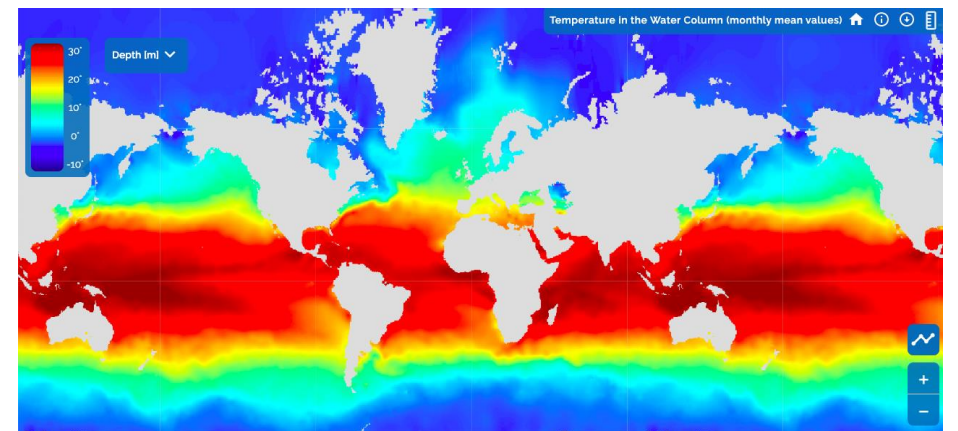
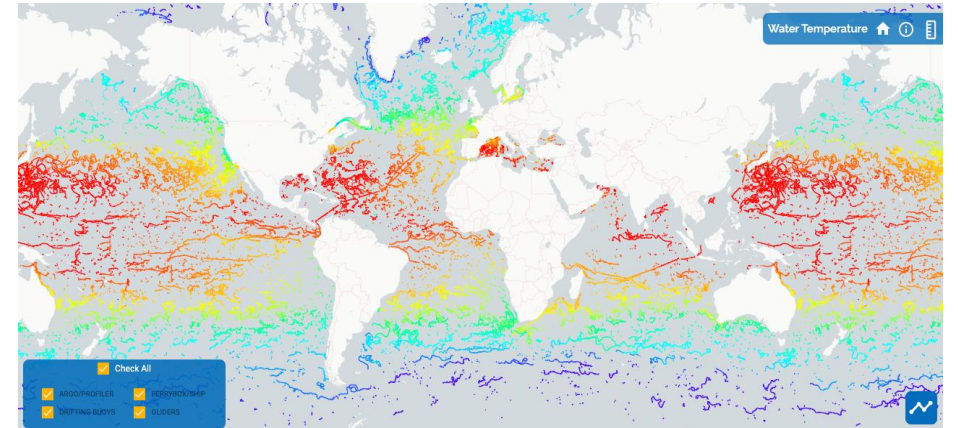
Subsurface ocean temperature is a fundamental observation for understanding various ocean phenomena that influence climate, including ocean stratification, circulation, mixed layer dynamics, water mass properties, and coastal shelf-open ocean exchange. Profiling subsurface temperature observation systems also contribute to in-situ validation of satellite observations of surface temperature. Changes in ocean temperature, for instance, can impact the growth rate of farmed fish, as well as the distribution and abundance of wild fish stocks and other economically and socially valuable marine species.

Salinity observations play a role in monitoring the global water cycle, ocean density, mass, and more. These in-situ data are essential inputs for many ocean models, for validating and calibrating remote sensing observations, and for understanding the ocean's role in the global climate system.

EMODnet Physics provides in-situ observations from various catalogues, both European (such as SeaDataNet, CMS, ICES DB, etc.) and international (including MEOP, SOOS, DOOS, IOOS, etc.), linking different platforms with a wide range of spatial and temporal scales.

The EMODnet Physics data collection includes moorings, which offer high temporal resolution at specific locations but have limited spatial resolution due to array density; gliders and tagged animals that provide higher spatial resolution depending on endurance and instrument characteristics; profiling floats (ARGO) that deliver temperature profiles typically from 0-2,000 meters; casts from ship-based Conductivity-Temperature-Depth (CTD) observations along research voyage tracks, providing temperature observations throughout the water column; Expendable probes (XBT) dropped from a network of volunteer commercial vessels along major shipping routes, observing temperature to several hundred meters depth on a roughly seasonal repeat schedule; and surface loads and ferrybox repeated transects, which offer high-resolution sea surface temperature datasets.

Using these *in situ* data, it is possible to analyze trends, create maps, and generate gridded data products. Examples include the [CORA](#) (Coriolis Ocean Dataset for Reanalysis), developed by IFREMER for the Copernicus Marine Service and regularly updated (annually), and the SeaDataNet Regional Climatology products, developed by SeaDataNet partners using DIVA software and periodically updated.



EMODnet Physics | State of Art

The screenshot displays the EMODnet Map Viewer interface. At the top, the European Commission logo and the text 'EMODnet Map Viewer' are visible, along with a language selector set to 'English'. The main interface is divided into a left sidebar and a central map area. The sidebar contains a 'Layers' panel with a close button (X), a menu icon, a download icon, and a settings icon. A large blue arrow points to the settings icon. The 'Layers' panel is expanded to show 'EMODnet Physics' with a dropdown arrow. Below it, several sub-layers are listed: '.In situ data', 'Alkalinity', 'Noise', 'Optical properties', 'River outflow', and 'Salinity', each with a right-pointing arrow. At the bottom of the sidebar, there are sections for 'Marine regions' with a search input and a dropdown, and 'Change basemap' with a dropdown menu showing 'EMODNET World Base Layer'. The central map area shows a global bathymetric map. On the right side of the map, there is a vertical toolbar with icons for zooming, home, full screen, pan, center, 3D, and other map controls. The EMODnet logo is located in the bottom right corner of the map area.

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EMODnet Physics | State of Art

The screenshot displays the EMODnet Map Viewer interface. At the top left, the European Commission logo is visible. The title "EMODnet Map Viewer" is centered, and "English" is selected in the top right. The main map area shows a satellite-style view of the Indian Ocean with numerous colored dots representing data points. A white arrow points from a cluster of dots to a "Platforms" popup window.

The "Platforms" popup window has a dark blue header and contains the following information:

- Platform counts: 3848 (selected) and 3716
- Logo: Coriolis
- Table with columns: Platform ID, Platform Name, Data Center/Producer, Last date, Latitude, Longitude
- Line graph: NRT - sea temperature - degree_Celsius
- Buttons: "Load more data"

Platform ID	Platform Name	Data Center/Producer
3848	41960	

Last date	Latitude	Longitude
01/12/2013	38.422	-17.419

The line graph shows sea temperature in degrees Celsius from Dec '12 to Dec '13. The temperature starts at approximately 17°C in Dec '12, drops to a minimum of about 13°C in Mar '13, and then rises to a peak of about 20°C in Oct '13 before ending at approximately 18°C in Dec '13.

At the bottom left of the map, a scale bar shows "km" and coordinates "-133.84347, 42.81384". The EMODnet logo and "European Marine Observation and Data Network" text are in the bottom right corner.

EMODnet Physics | *In situ* data flows

○ **Does your thematic receive/publish data from CMEMS?**

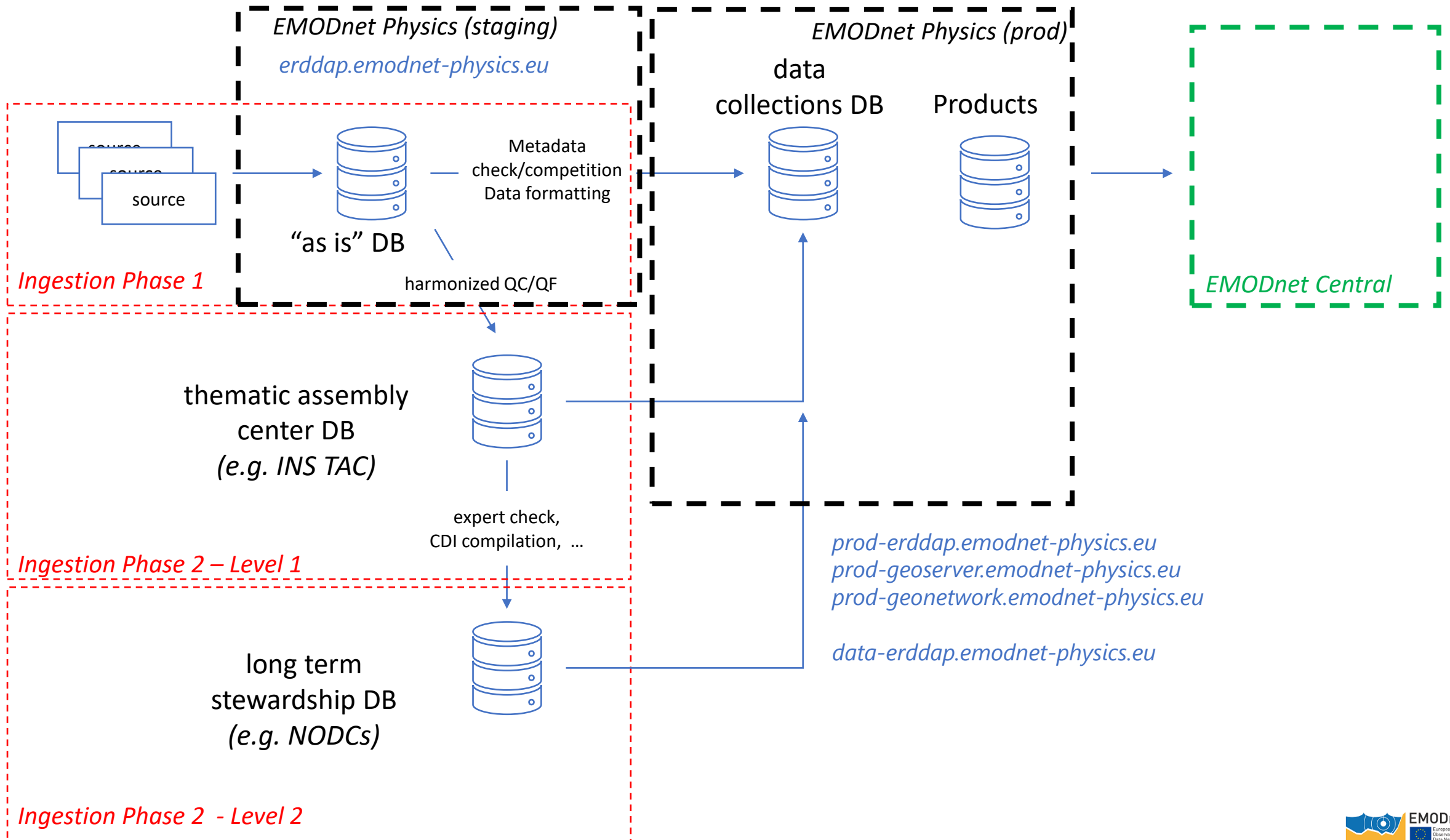
- In general all the INS TAC is also visible in Physics
- Physics usually integrates (Ingestion) new data faster than INS TAC
- Physics and INS TAC work to have the two DBs as close as possible
 - some differences on time granularity (e.g. PSMSL)
 - lately special focus on sea level and autonomous vehicles
- As soon as a new data source is identified, it triggers a joint action
- Physics covers some themes that are not covered by INS TAC
 - e.g. underwater noise, riverine inputs

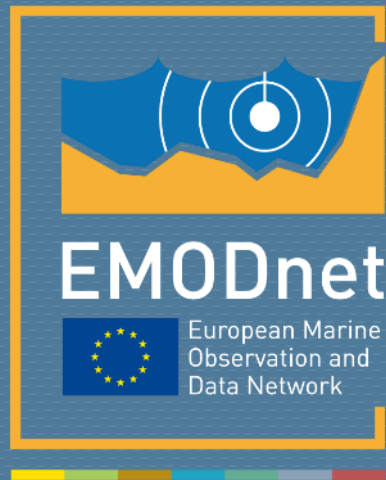
○ **Products**

- Physics also integrates the CORA (IFREMER for CMEMS) – Physics, INS TAC and SDN channels are used to update the DB for the CORA production

○ **Other ongoing interactions with Copernicus Marine Service**

- MIC – Marine In situ Collaboration, DATAMEQ, H2020/HE



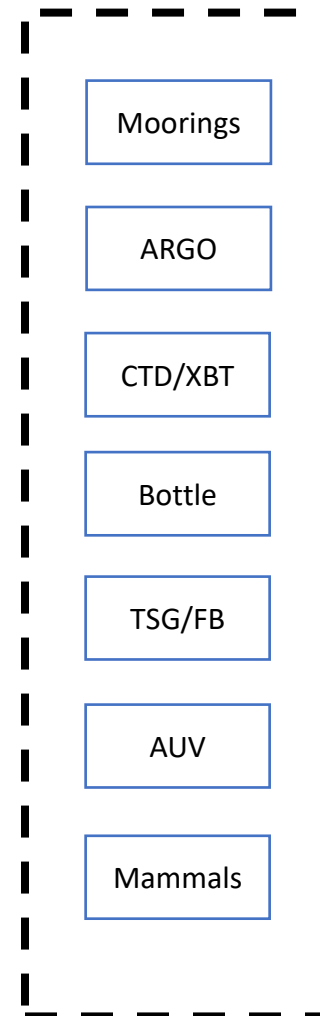
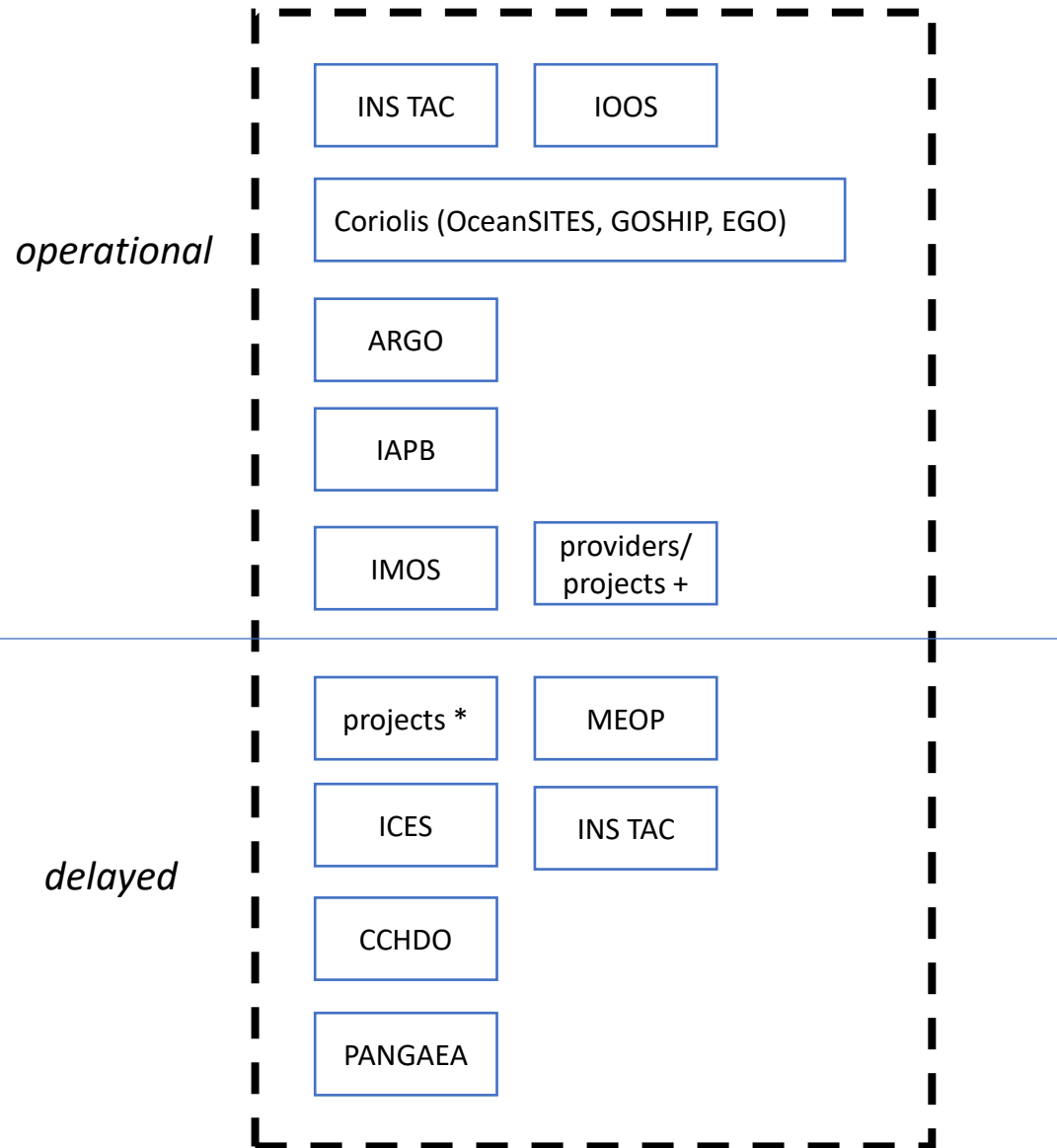


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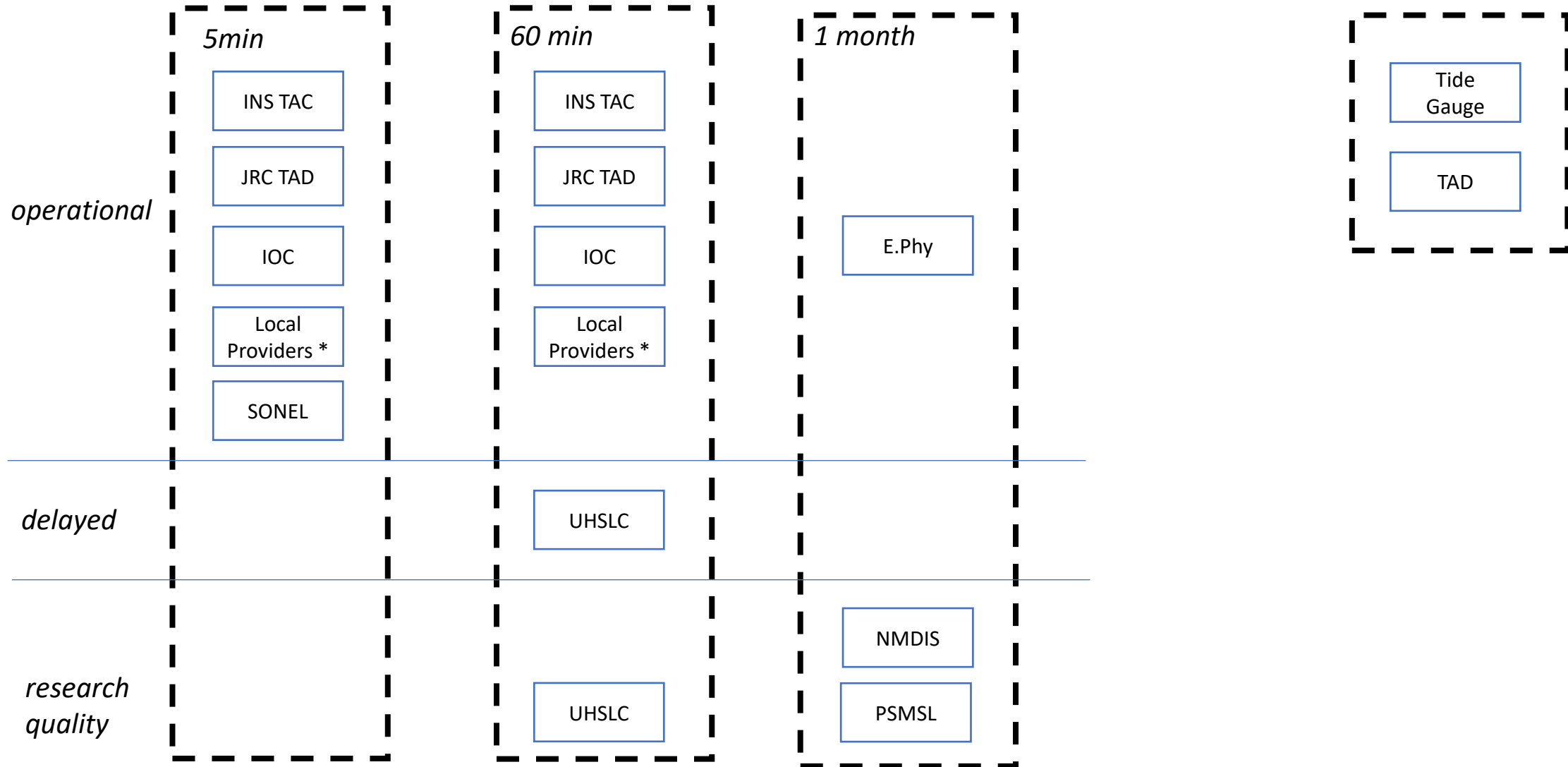
Your gateway to marine data in Europe



EMODnet: Temperature and Salinity

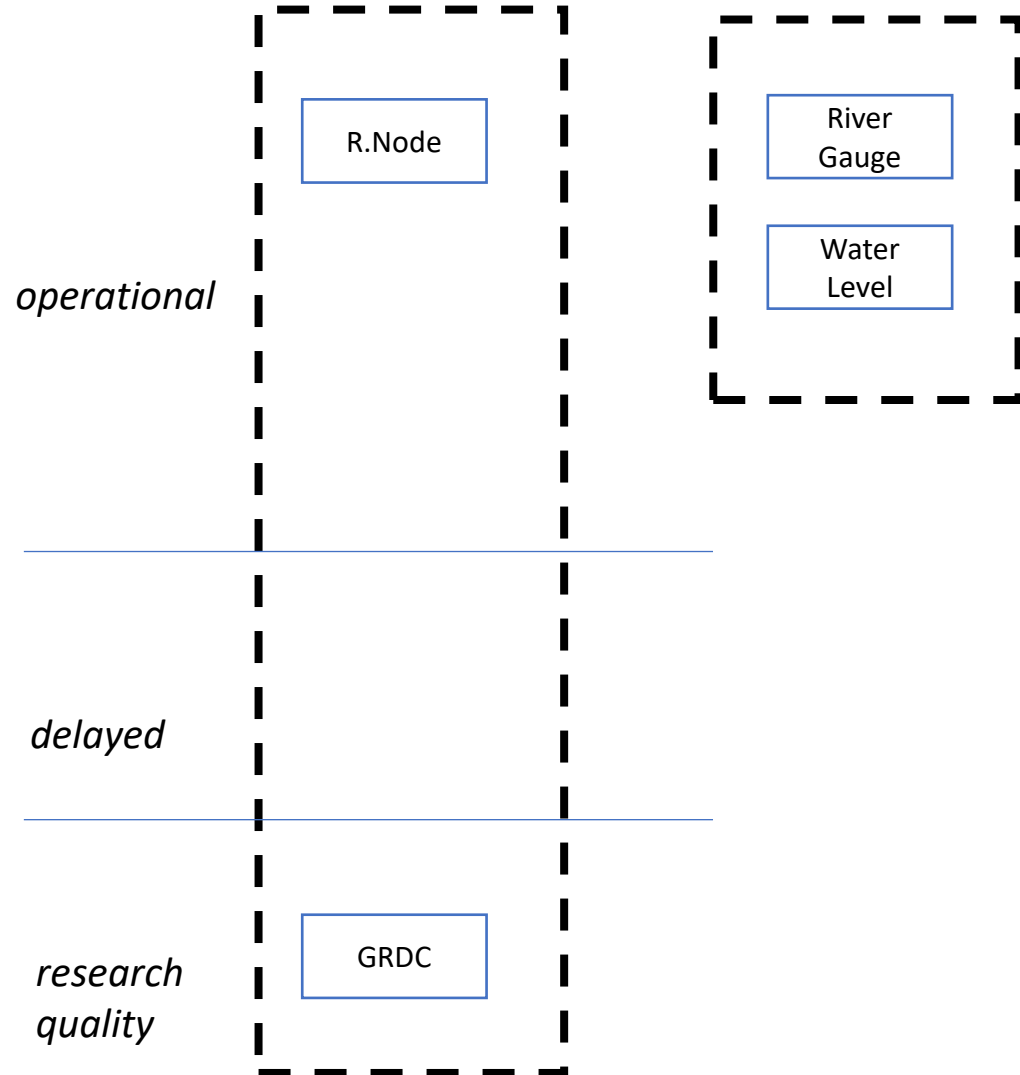


EMODnet: Sea Level



EMODnet

River Outflow



Currents

