



Generating validated and harmonized temperature and salinity historical data collections and climatologies

Simona Simoncelli

Istituto Nazionale di Geofisica e Vulcanologia (INGV)
Bologna, Italy

simona.simoncelli@ingv.it

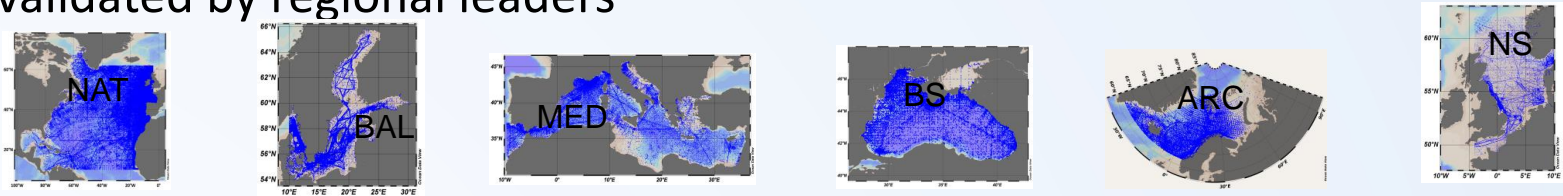
C. Coatanoan (Ifremer), V. Myroshnychenko (METU), N. Pinardi (UniBo), Ö. Bäck (SMHI), H. Sagen (IMR), S. Scory (RBINS), A. Barth (ULG), D. Schaap (MARIS), R. Schlitzer (AWI), M. Fichaut (Ifremer)

- Introduction → SeaDataCloud Data Products
- Objectives
- From SeaDataNet2 to SeaDataCloud
- SeaDataCloud Innovation
- How to access products
- SeaDataCloud products release and planned improvements
- **Product Information Document (PIDoc)**
- Conclusions

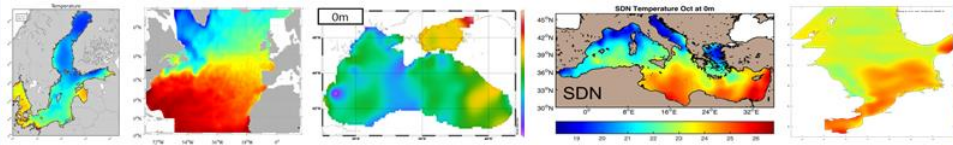
SeaDataCloud Data Products

SeaDataCloud aims at providing **data products** deriving from SeaDataNet infrastructure at **regional and global scale** to serve a diverse user community:

1. **Aggregated data sets for all the European marginal seas** → all historical temperature and salinity (1900 onwards) data harvested from the central CDI and validated by regional leaders



2. **Climatologies** → gridded fields obtained through a mapping technique (DIVA) and representing the climate of the ocean at both regional and global scale

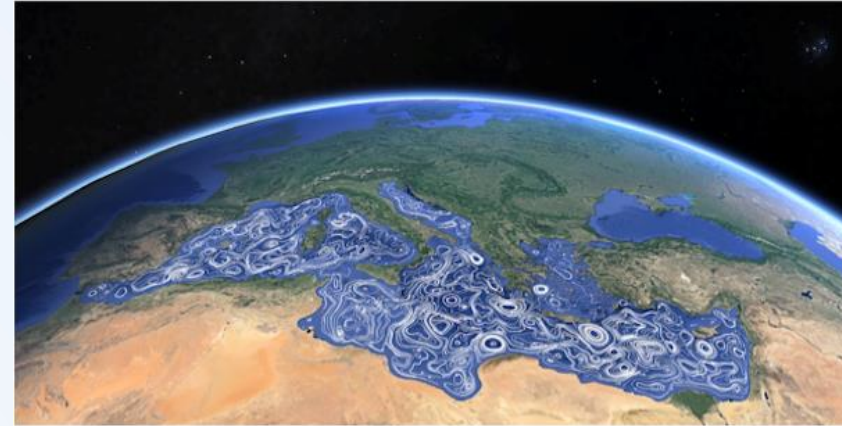
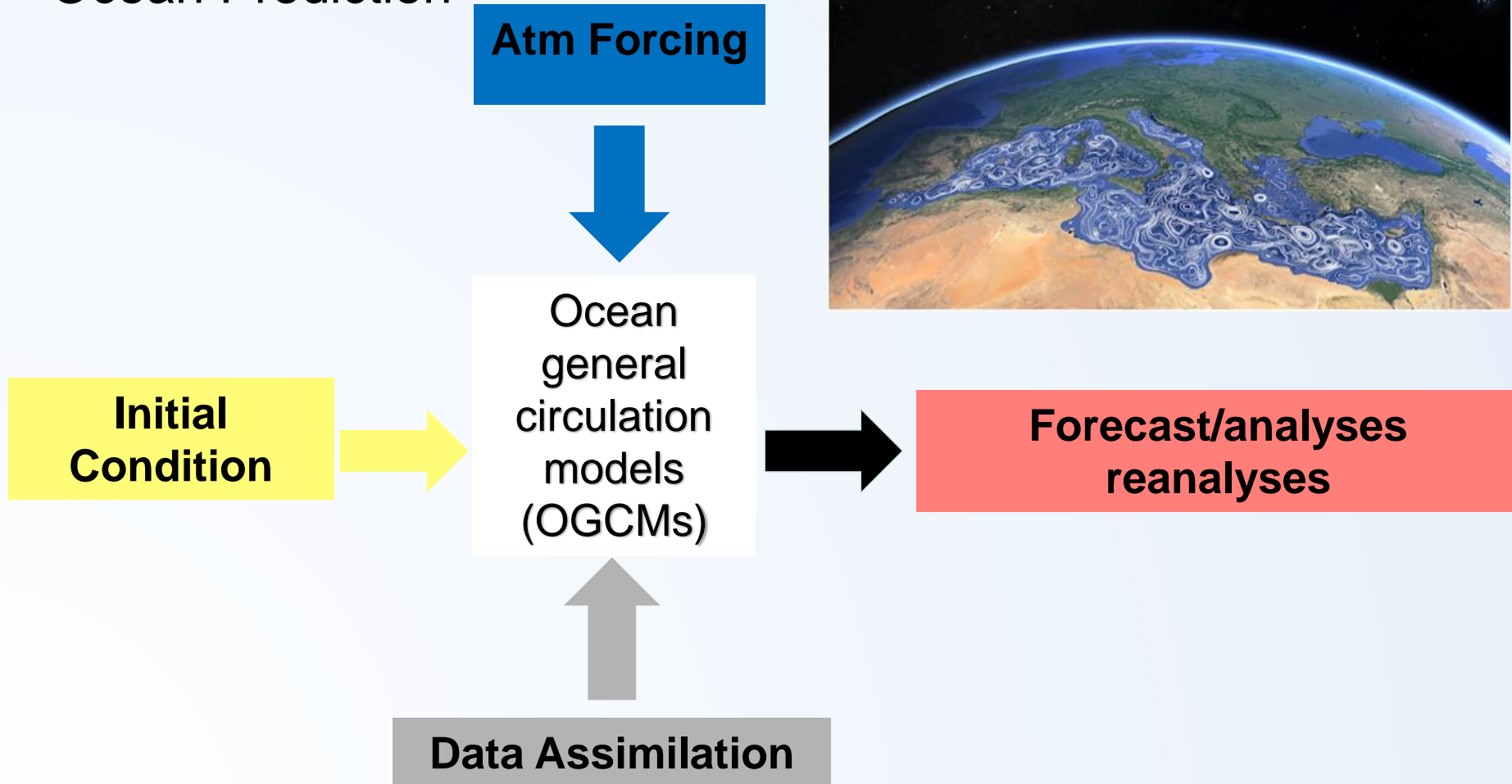


3. **New data products** → multi-platform and multi-disciplinary approach combining both in situ (e.g. gliders, Argo, ships, drifters, fixed platforms) and remote sensed observations, Ocean Monitoring Indicators for tracking ocean mechanisms and/or climate modes and trends

- Improve the quality of the overall infrastructure content through systematic quality assessment (every 2 years)
- develop new methods to ensure quality, homogeneity and robust uncertainty measures in long-term time-series of data
- Integrate external datasets (Copernicus Marine Environment Monitoring Service, World Ocean Database) to increase temporal and spatial resolution and further improve products' quality
- Generate the best data products to serve **different user groups** (operational oceanography, climate, marine environment, institutional, academia) adopting the most advanced methodologies
- Increase user uptake providing reliable information of the full product generation process and its quality

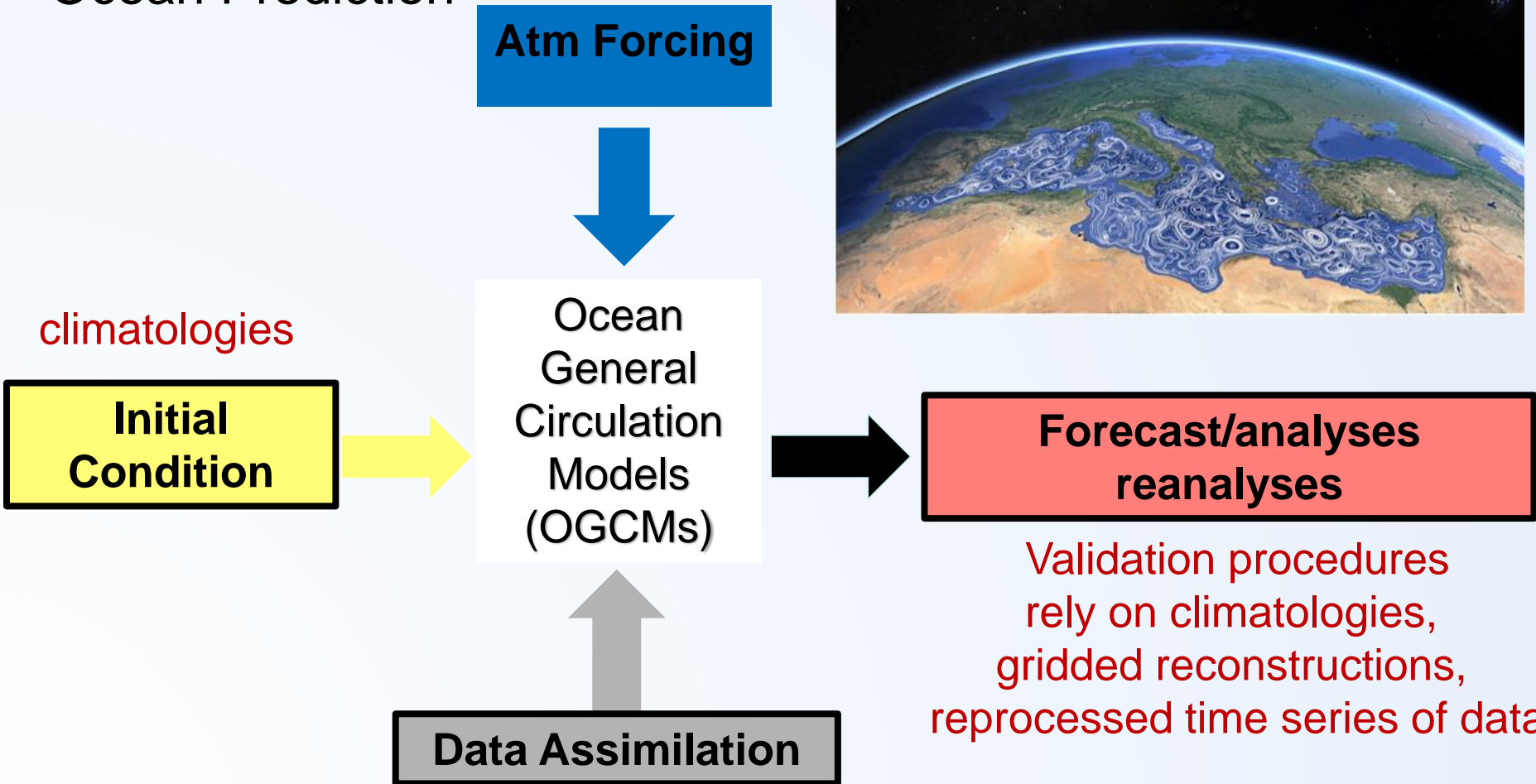
Example application

Ocean Prediction



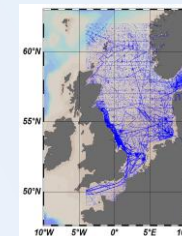
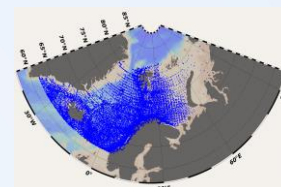
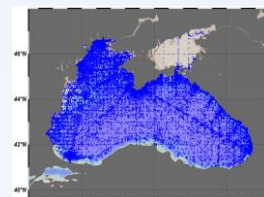
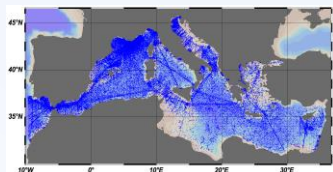
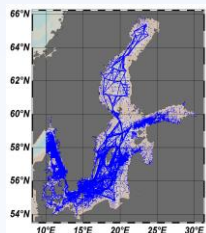
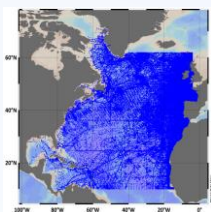
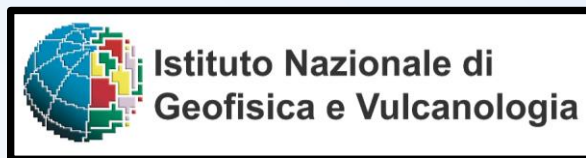
Example application

Ocean Prediction



Validation procedures rely on climatologies, gridded reconstructions, reprocessed time series of data

Reanalyses → harmonized historical data collections



SMHI



INGV



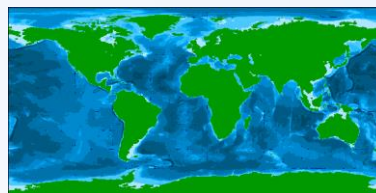
METU-IMS



IMR



RBINS

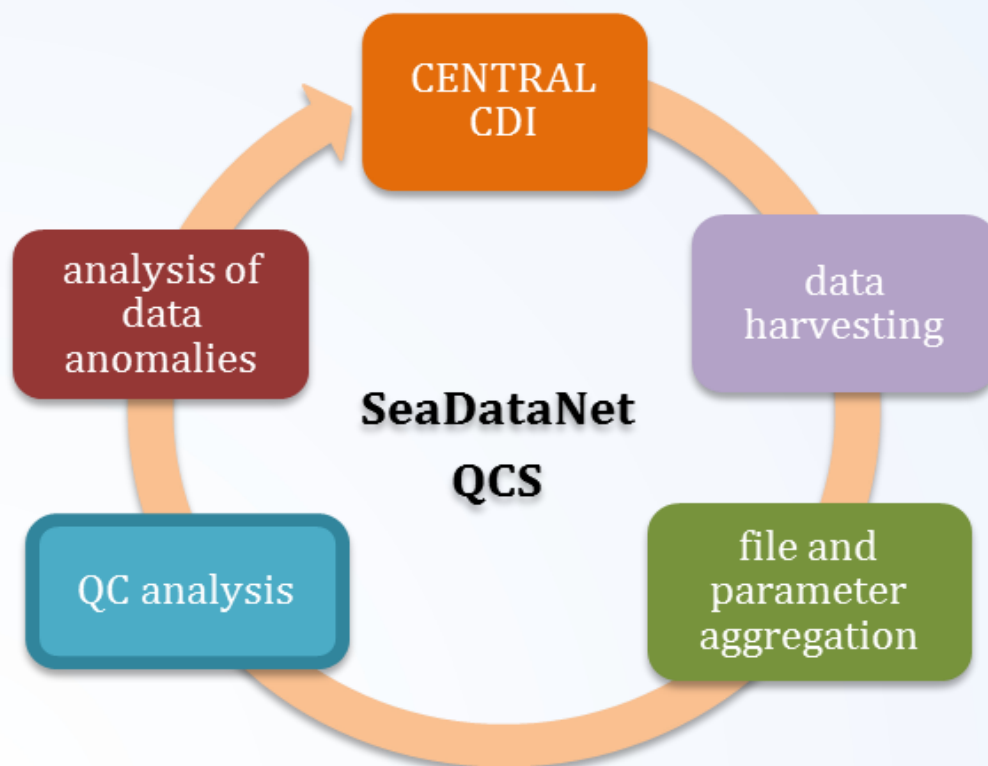


DIVA



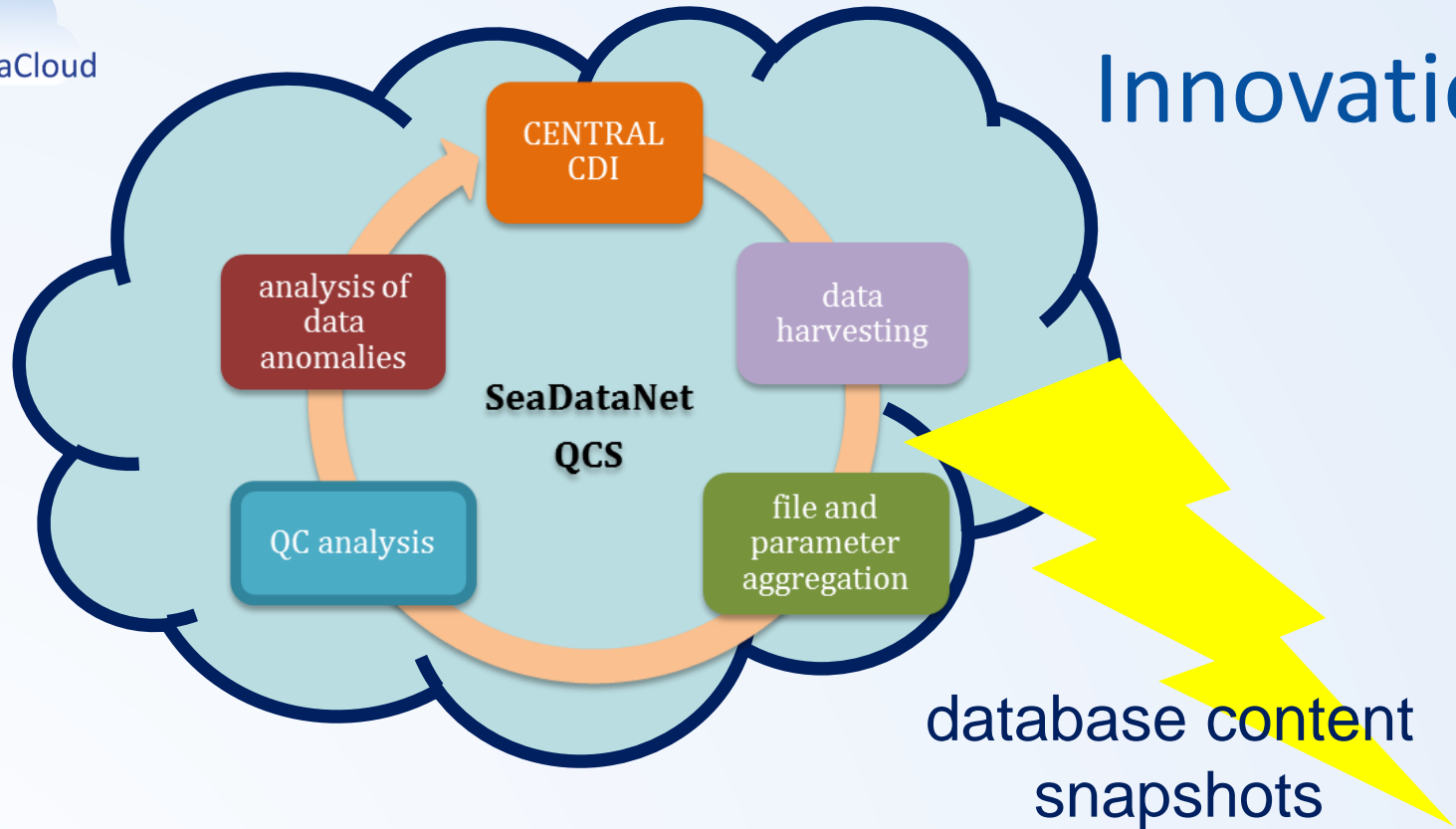
ODV 7

SDN2 project implemented and continuously refined a **Quality Control Strategy (QCS)** aiming at improving the quality of the database content and creating the best data products



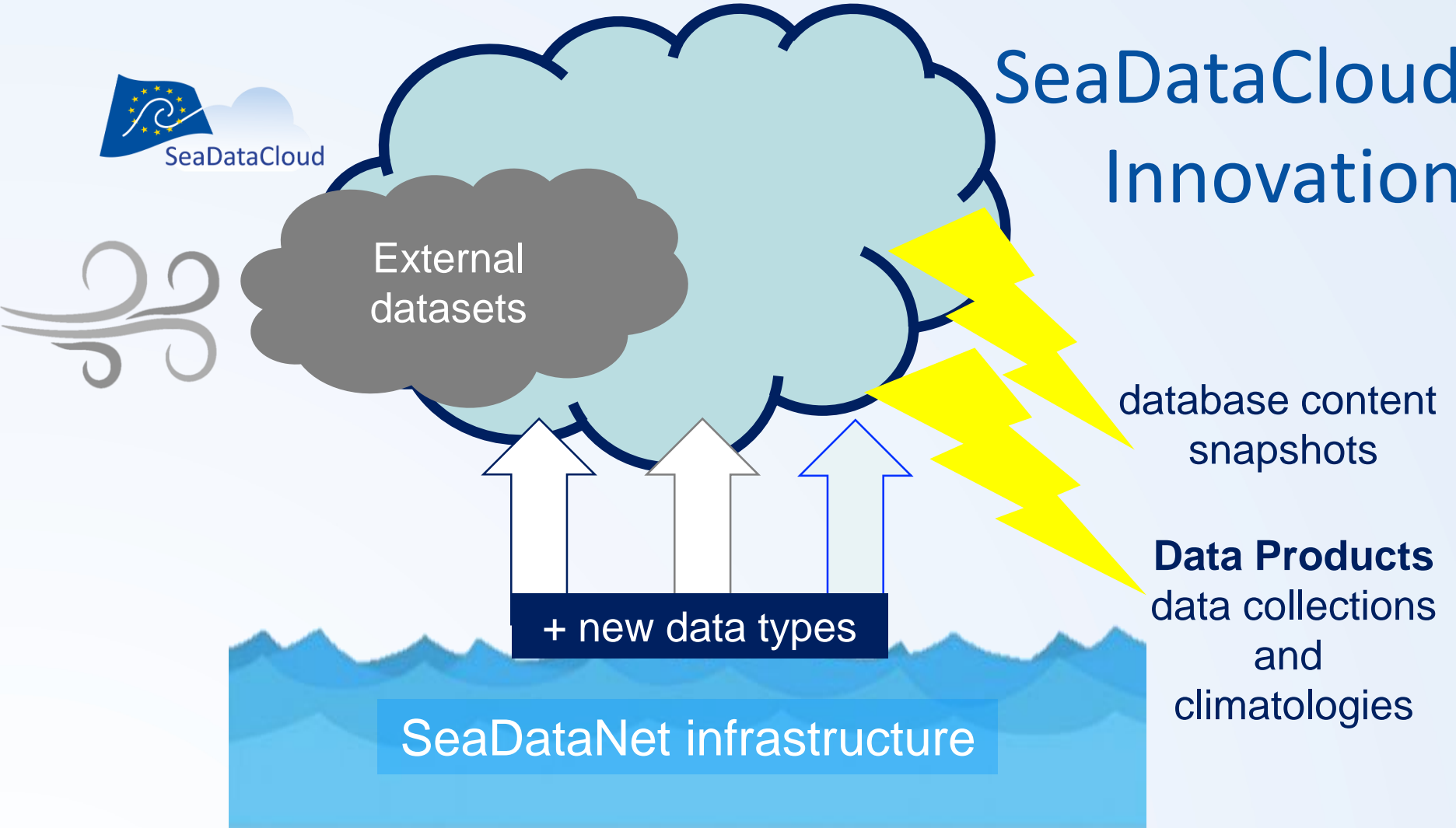
Iterative approach to facilitate the **upgrade** of the database and **versioning** of data products through:

- the release of new data collections at the end of each QCS loop
- the generation of derived climatological products after a certain time lag dedicated to data processing



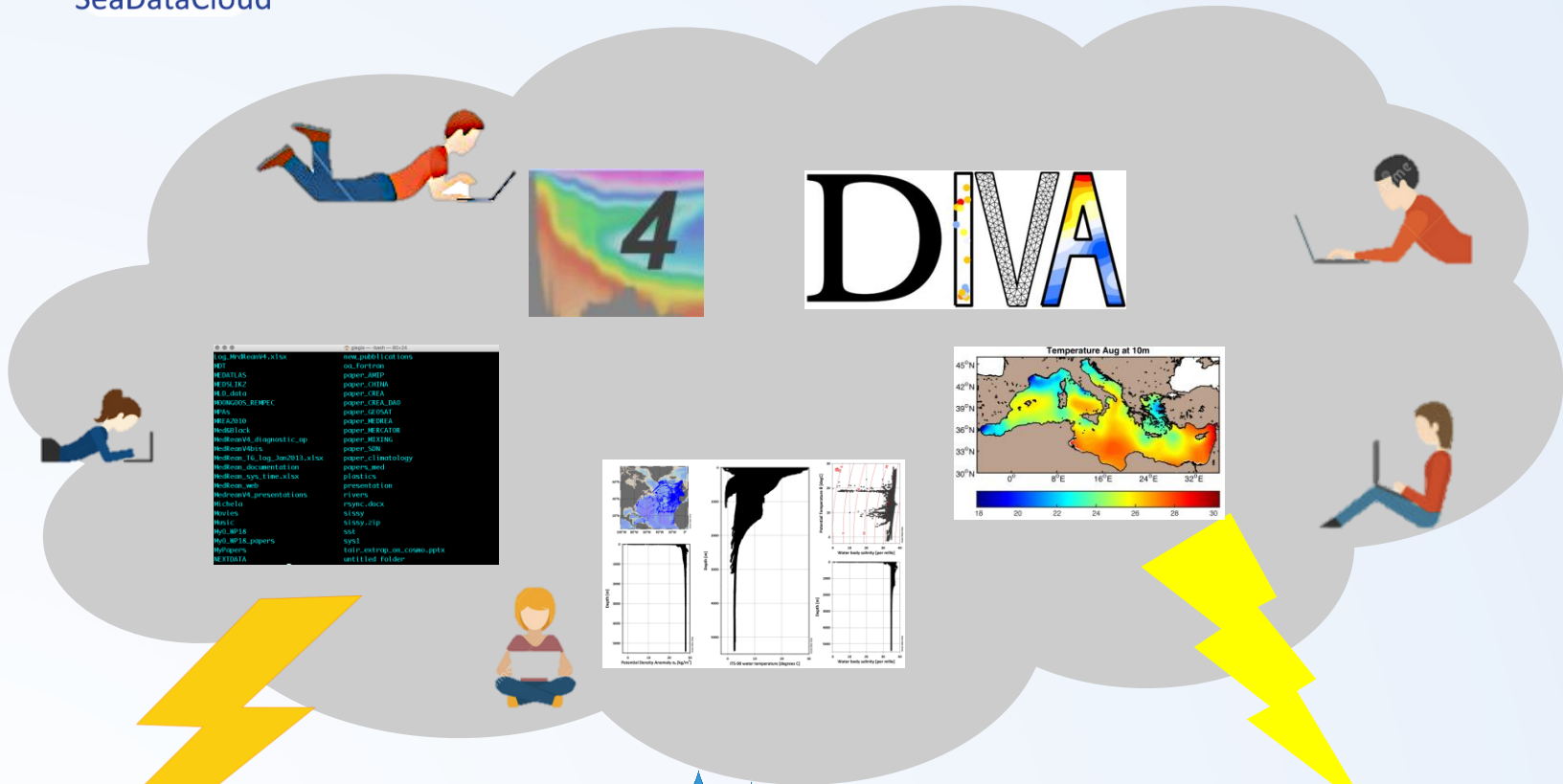
The **implementation of the cloud environment** will optimize and automate the QCS at the central level assuring a continuous monitoring of the database content and quality, together with the possibility of generating database snapshots on a regular basis and allowing data products versioning

SeaDataCloud Innovation



The **ingestion of new data types** (HF radar, glider data) and the **integration of external data sets** are fundamental actions for the creation of appropriate observational data products as demanded by the user community

Virtual Research Environment



New Data Products



data subsets



Standard Data Products
 historical data collections
 climatologies



SERVICES

ACCESS PRODUCTS

Download the SeaDataNet aggregated datasets : ODV collections of all SeaDataNet measurements of temperature and salinity by sea basins, or the SeaDataNet climatologies : regional gridded field products based on the aggregated datasets



SEARCH DATA



BROWSE DATA



DOWNLOAD SOFTWARE



LOOK-UP VOCABULARIES



ACCESS PRODUCTS



ACCESS METADATA CATALOGUES



HOW TO CONTRIBUTE?

PRODUCTS

SeaDataNet provides aggregated datasets (ODV collections of all SeaDataNet measurements of temperature and salinity by sea basins) and climatologies (regional gridded field products based on the aggregated datasets) for all the European sea basins.

[Read more](#)

Aggregated datasets



ODV collections of all T and S measurements contained within SeaDataNet database covering all the European sea basins:

- V1.1 → Jan 2014
- V2 → Mar 2015 (DOI)

Climatologies



gridded climatologies are based on the aggregated datasets V1.1 (DOI)

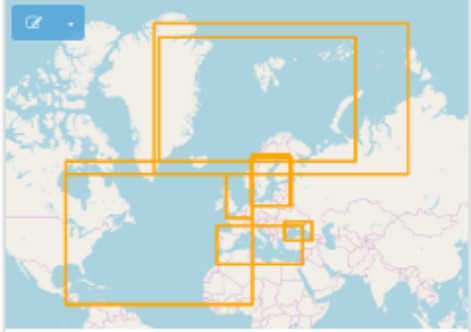
Documentation



3 reports describing products' characteristics and quality (DOI)


Catalogue

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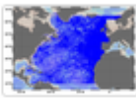
CATALOG

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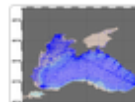
NORTH ATLANTIC OCEAN - TEMPERATURE AND SALINITY OBSERVATION COLLECTION V1.1



SeaDataNet Temperature and Salinity historical data collection, including revised quality flags after quality control with ODV. For data access please register at <http://www.marine-id.org>. The dataset format is ODV binary collections. You can read, analyse and...

Source: Seadatanet

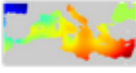
BLACK SEA - TEMPERATURE AND SALINITY OBSERVATION COLLECTION V2



The Black Sea historical dataset includes all open access temperature and salinity in situ data from the Black Sea and Sea of Azov for period 1969-2014. The data were retrieved from the SeaDataNet infrastructure in the mid of 2015. Data quality has been analysed and checked...

Source: Seadatanet

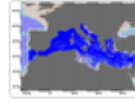
MEDITERRANEAN SEA - TEMPERATURE AND SALINITY CLIMATOLOGY V1.1



Mediterranean Sea Climatology computed from the SeaDataNet V1.1 aggregated dataset. The version used for the DIVA software is the 4.6.9. The period covers 1900-2013. For data access please register at <http://www.marine-id.org> ...

Source: Seadatanet

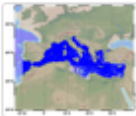
MEDITERRANEAN SEA - TEMPERATURE AND SALINITY OBSERVATION COLLECTION V1.1



SeaDataNet Temperature and Salinity historical data collection contains all open access temperature and salinity in situ data retrieved from SeaDataNet infrastructure at the end of 2013. The data span between -9.25 and 37 degrees of longitude, thus including an Atlantic ...

Source: Seadatanet

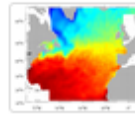
MEDITERRANEAN SEA - TEMPERATURE AND SALINITY OBSERVATION COLLECTION V2



SeaDataNet Temperature and Salinity historical data collection for the Mediterranean Sea contains all open access temperature and salinity in situ data retrieved from SeaDataNet infrastructure at the end of 2014. The data span between -9.25 and 37 ...

Source: Seadatanet


NORTH ATLANTIC OCEAN - TEMPERATURE AND SALINITY CLIMATOLOGY V1.1

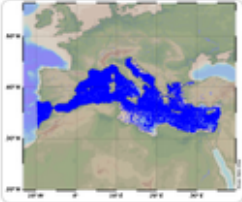


Climatology done from the SeaDataNet aggregated dataset v1.1 for the North Atlantic Ocean. The version used for the DIVA software is the 4.6.9. The period covers 1900-2013. For data access please register at <http://www.marine-id.org> ...

Source: Seadatanet




Products Catalogue

 **MEDITERRANEAN SEA - TEMPERATURE AND SALINITY OBSERVATION COLLECTION V2**



SeaDataNet Temperature and Salinity historical data collection for the Mediterranean Sea contains all open access temperature and salinity in situ data retrieved from SeaDataNet infrastructure at the end of 2014. The data span between -9.25 and 37 ...

Source: Seadatanet

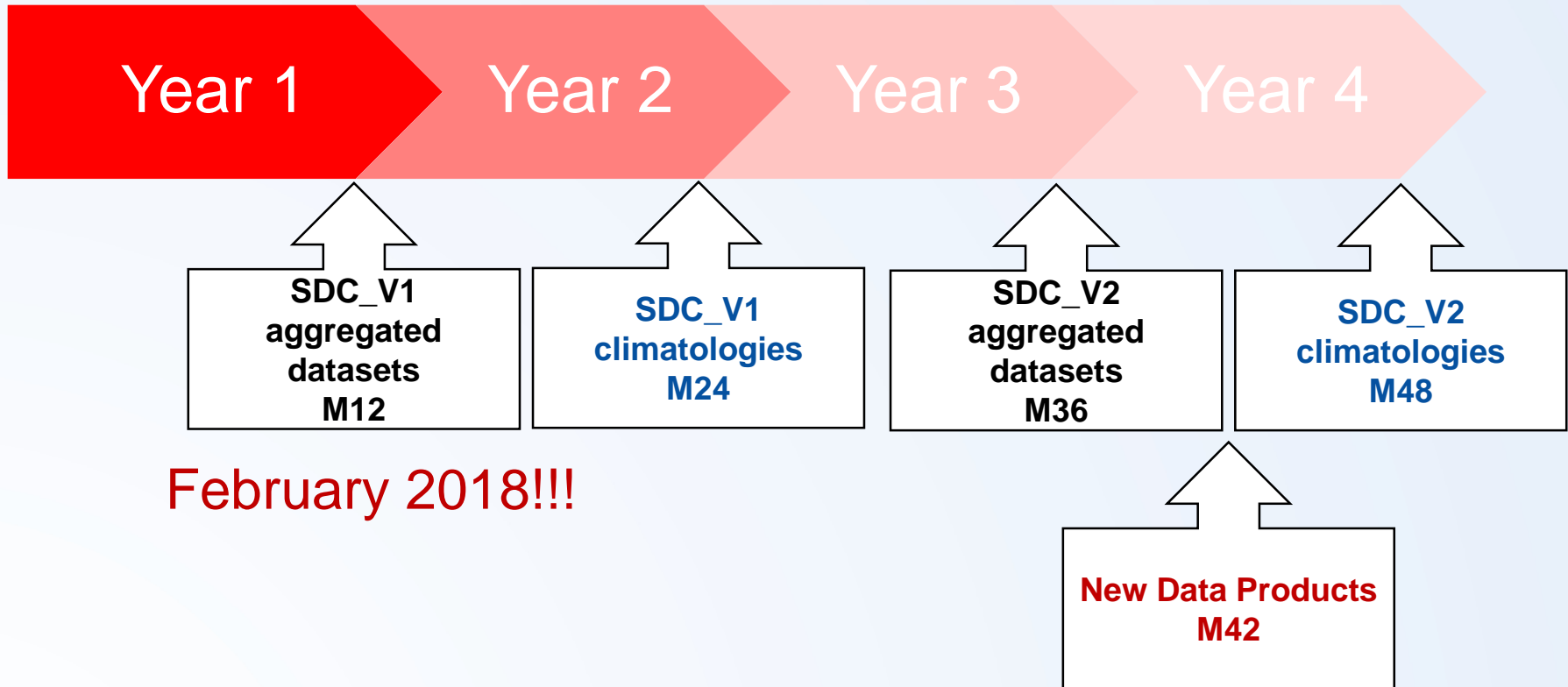
  

Metadata record (DOI)

Viewing tools **Ocean Browser**
and **Oceanotron**

Download

SeaDataCloud Products Releases





SeaDataCloud Climatologies

Goal → to feed operational oceanography, climate, ecosystem and academic communities together with institutional stakeholders providing multiple products at different resolutions and spanning different time periods

- Temperature and Salinity monthly and seasonal climatologies with **increased horizontal and vertical resolution** (WOA standard depth) covering the time period 1955-2017
- **Integration** of SeaDataCloud data collections **with external data sets** to increase data coverage (CMEMS, WOD, ICES)
- Analysis of space/time data distribution, consistency and long term variability to compute climatologies on a decadal basis (sliding decades when possible)
- Product validation through the consistency analysis of climatologies with World Ocean Atlas and available CMEMS products like climatologies computed by satellite reprocessed data sets and reanalysis products

New Data Products

New types of products will be explored by the partners in collaboration with the **Scientific Committee**:

- products oriented towards other discipline like biogeographical maps;
- surface current climatologies in a coastal area based on HF radar data and possibly ADCP and altimetry data;
- in situ based reconstruction of monthly time series of gridded temperature and salinity;
- derived quantities such as Mixed Layer Depth;
- Ocean Monitoring Indicators such as ocean heat content and steric height;
- improved statistics fundamental for data quality control methods like horizontal and vertical correlations

Product Information Document

Goal: to associate to each product a **PIDoc** containing all the specifications about its:

- General characteristics (format, space-time coverage, resolution)
- Quality (validation methodology and results)
- Usability

PIDoc will have a DOI as well as the data products and both will be available through the SDC product catalogue

→ This would increase user confidence and uptake of SDC products

→ It would also provide details on how to reproduce the products in the VRE where data and tools will be available

SeaDataCloud work plan on data products is very ambitious and our success is dependent from **data availability** and **technical developments** related to the cloud virtual research environment

- More data → highest product quality and increased knowledge
- VRE will allow a fastest access to the data and the tools that will be shared

EMODnet Data Ingestion

WAKE UP YOUR DATA

Set them free for Blue Society

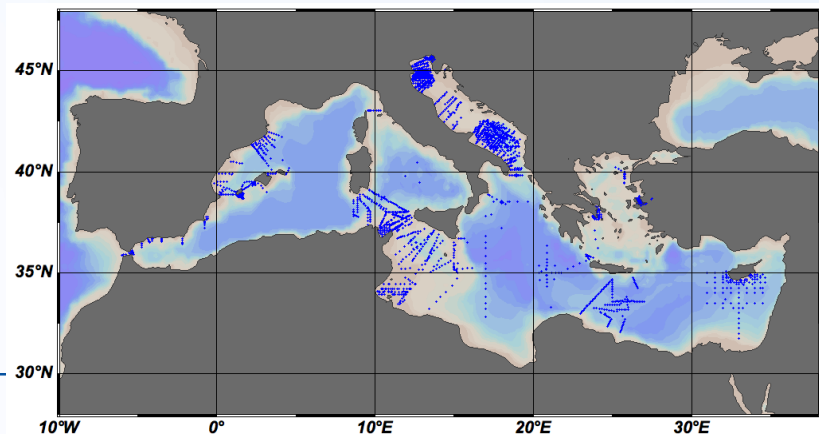
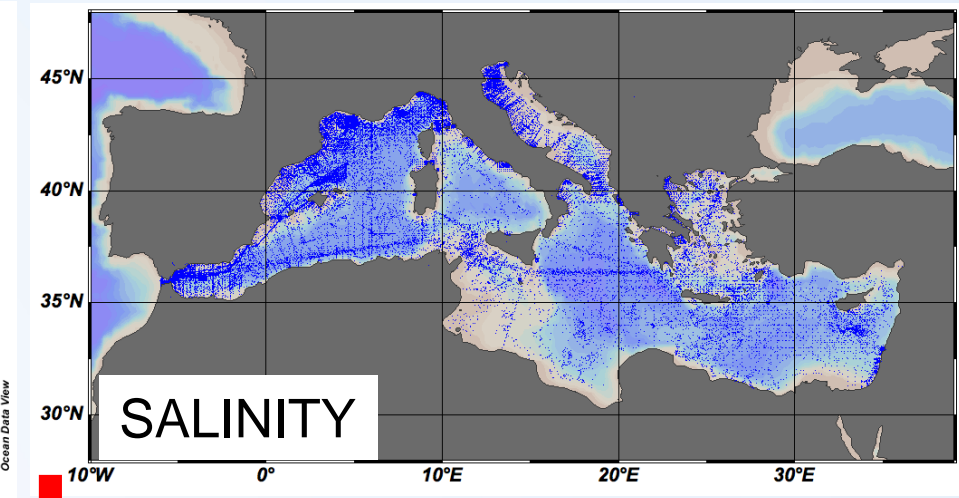
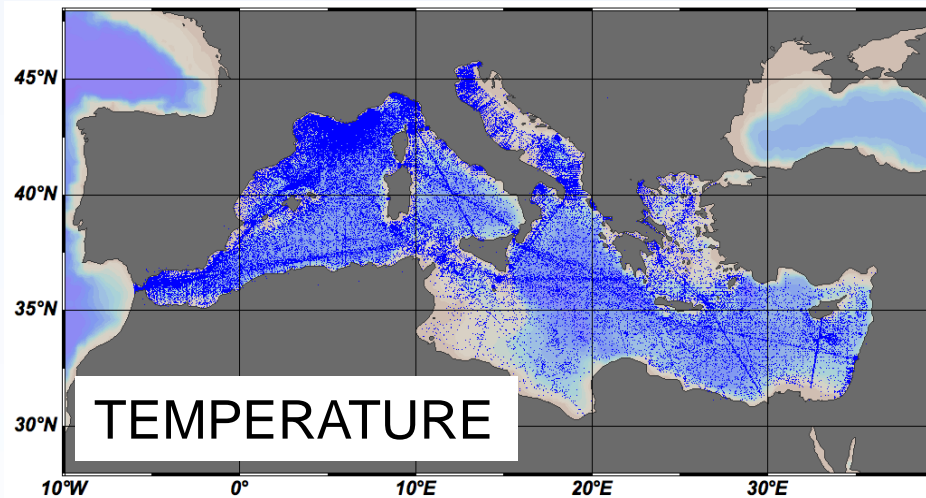
The **Data Ingestion Portal** facilitates submitting marine datasets for further processing, Open Data publishing and contributing to applications for society.

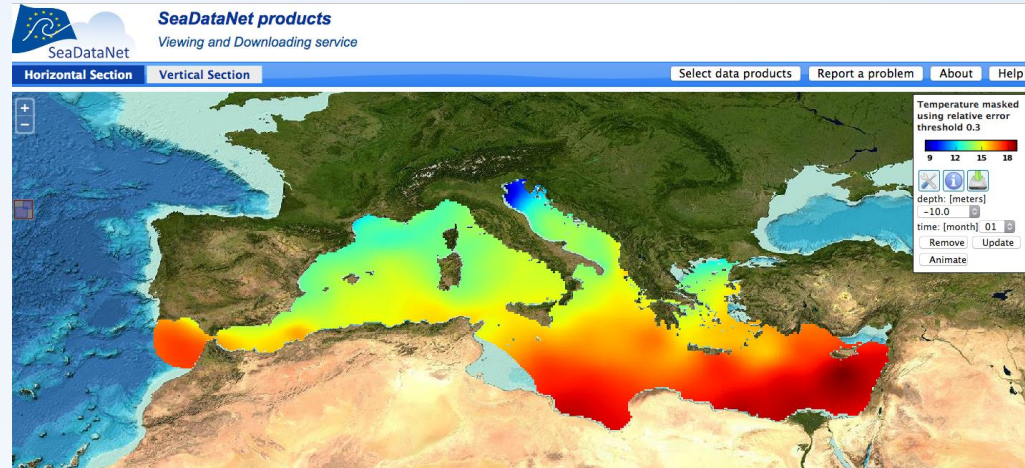
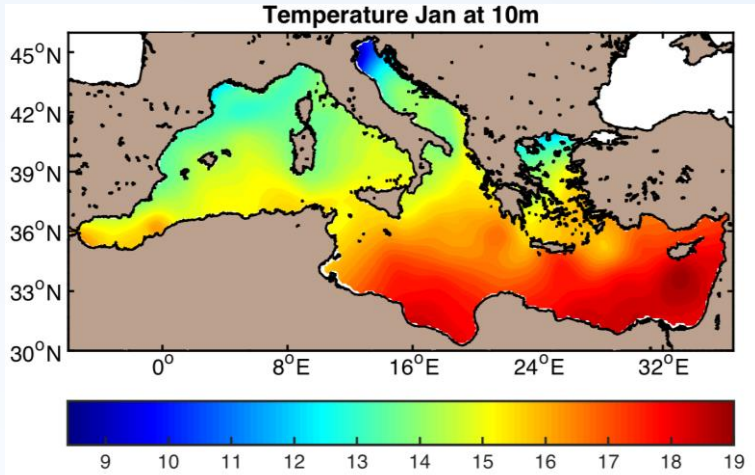
emodnet-ingestion.eu



Mediterranean Sea Products

V1.1 climatologies are based on the V1.1 historical data collection of all available temperature and salinity in situ profiles spanning the time period 1900-2013

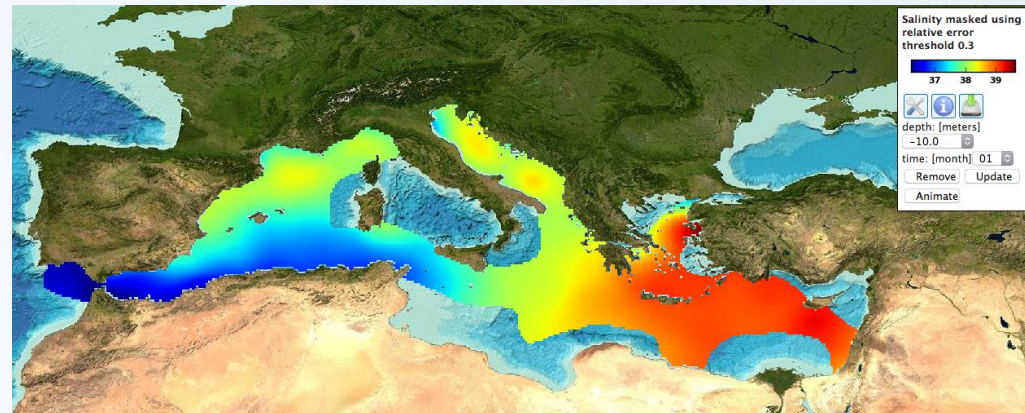
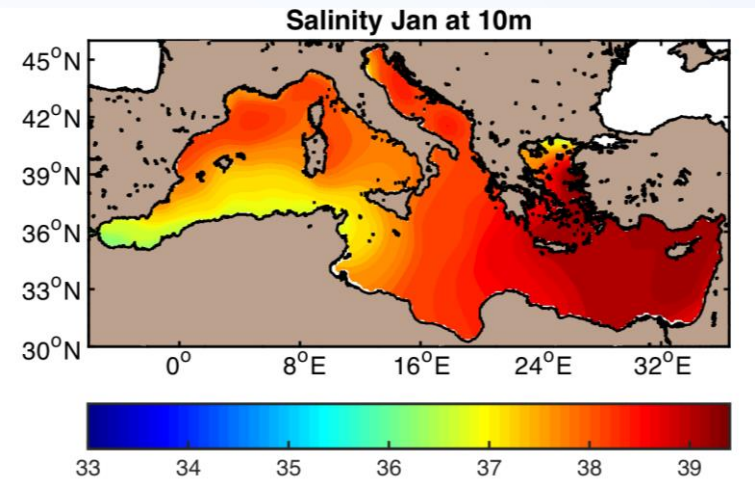




Ocean Browser

30% error masking → DATA GAPS

1/8° and 33 IODE standard levels



CONSISTENCY ANALYSIS

