SeaDataNet

The contribution of the SeaDataNet infrastructure in the Arctic studies

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EGU Conference, Vienna, Austria, 8-13 April 2018

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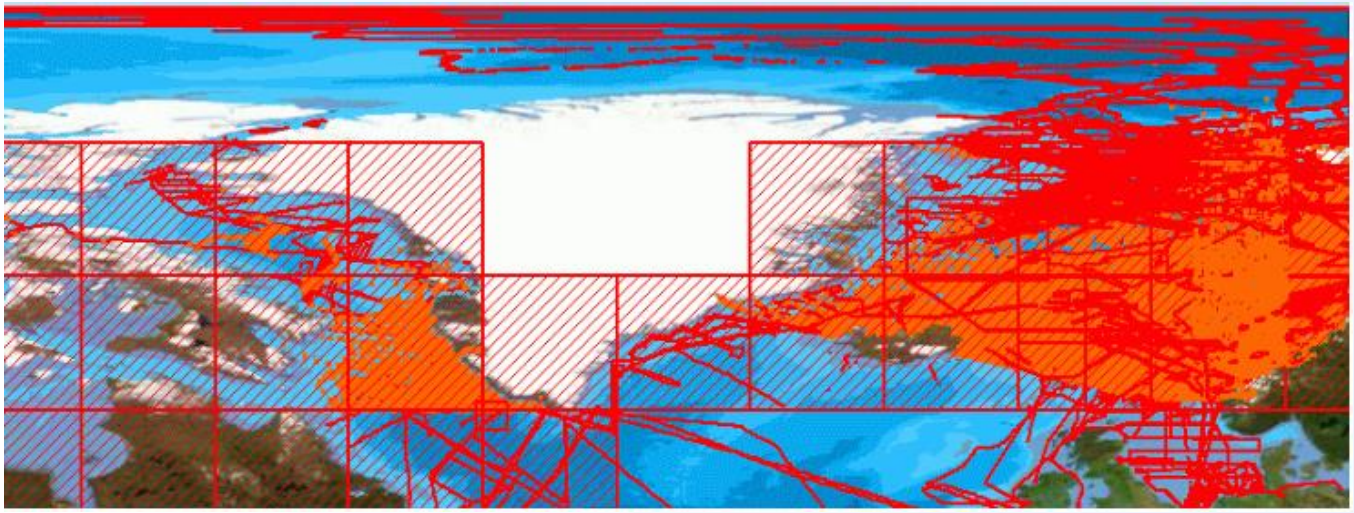
SeaDataNet is a comprehensive Pan-European semi-distributed marine data infrastructure, providing access to multidisciplinary, integrated marine and ocean data and products of standardised quality, services, as well as an overview of marine organisations, research and monitoring activities related to the sea.



Data in the Arctic region

- **Physical oceanography**
- **Chemistry**
- **Geophysics**
- **Marine Geology**
- **Biology**
- **Bathymetry**
- **Meteorology**

- Origins
- Architecture
- Data services
- Metadata services
- Data products
- Vocabulary services
- Software tools
- On going activities
- Challenges in the Arctic Ocean
- How SeaDataNet supports Arctic studies
- The highlights
- SeaDataNet standards and tools in other EU projects
- IMDIS conference

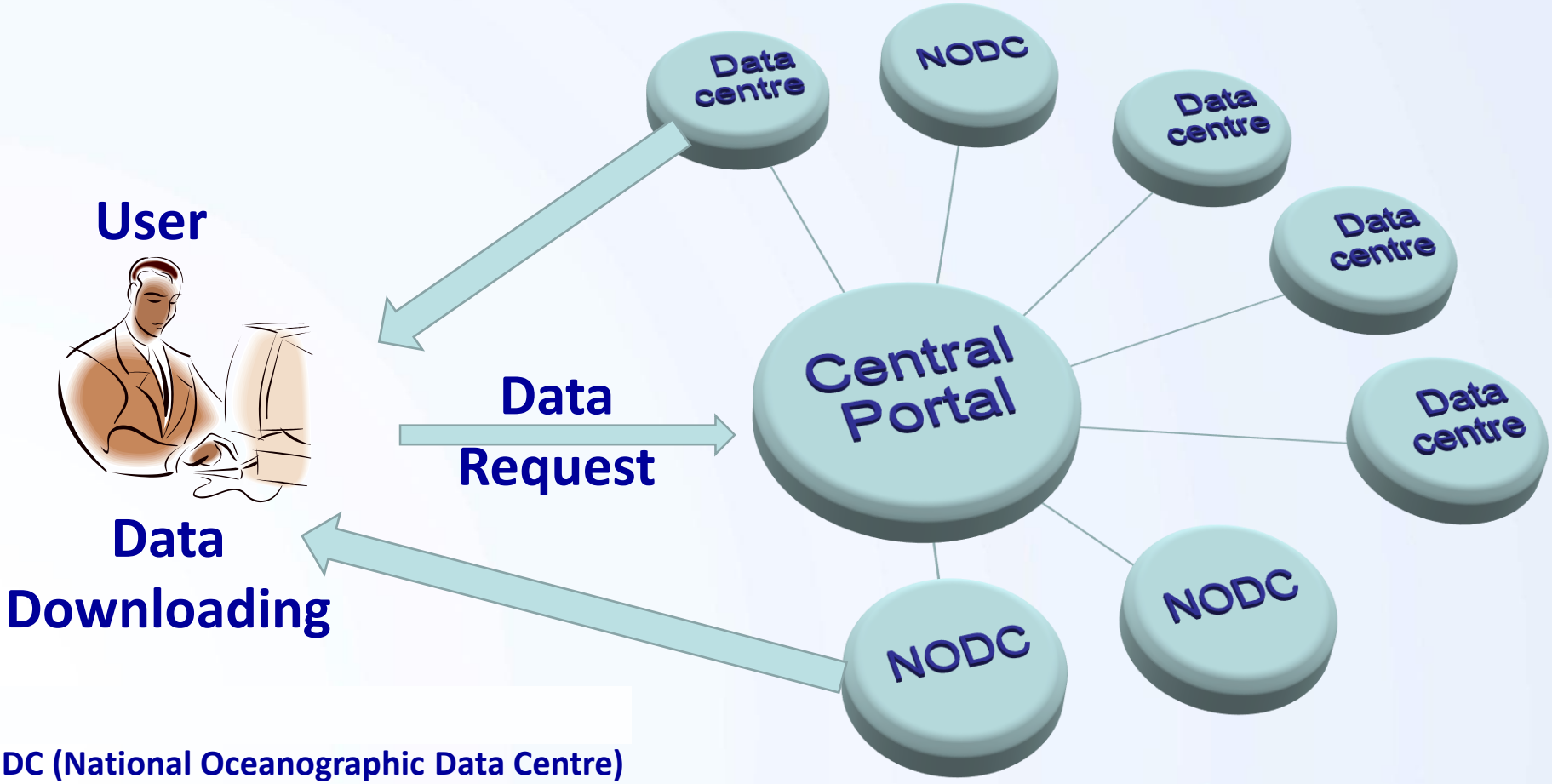
Origins

SeaDataNet started in the 1990s and has been developing over the years thanks to EU funded projects:

90	Metadata directories Medar/MedAtlas
2002-2005	Sea-Search (FP5)
2006-2011	SeaDataNet (FP6)
2011-2015	SeaDataNet II (FP7)
2016-2020	SeaDataCloud (H2020)

Architecture

→ a single access for a wide range of data of different types



NODC (National Oceanographic Data Centre)

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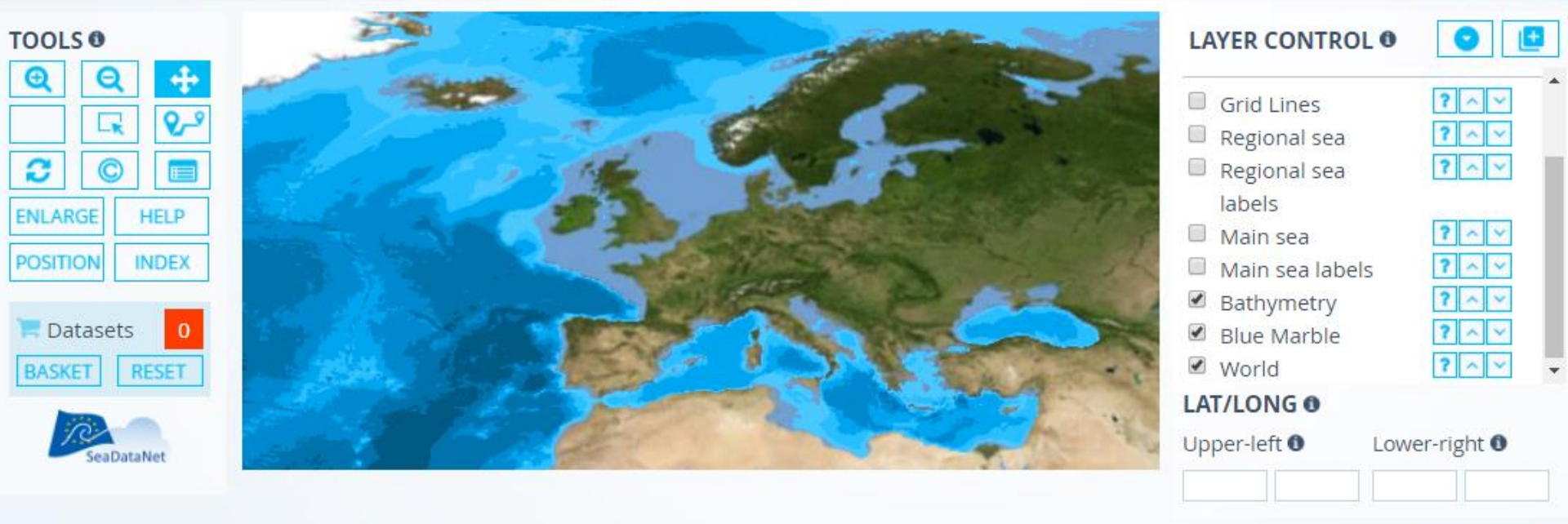
Data services

Discovery, visualization, access and download

PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

SEADATANET COMMON DATA INDEX (CDI) V3



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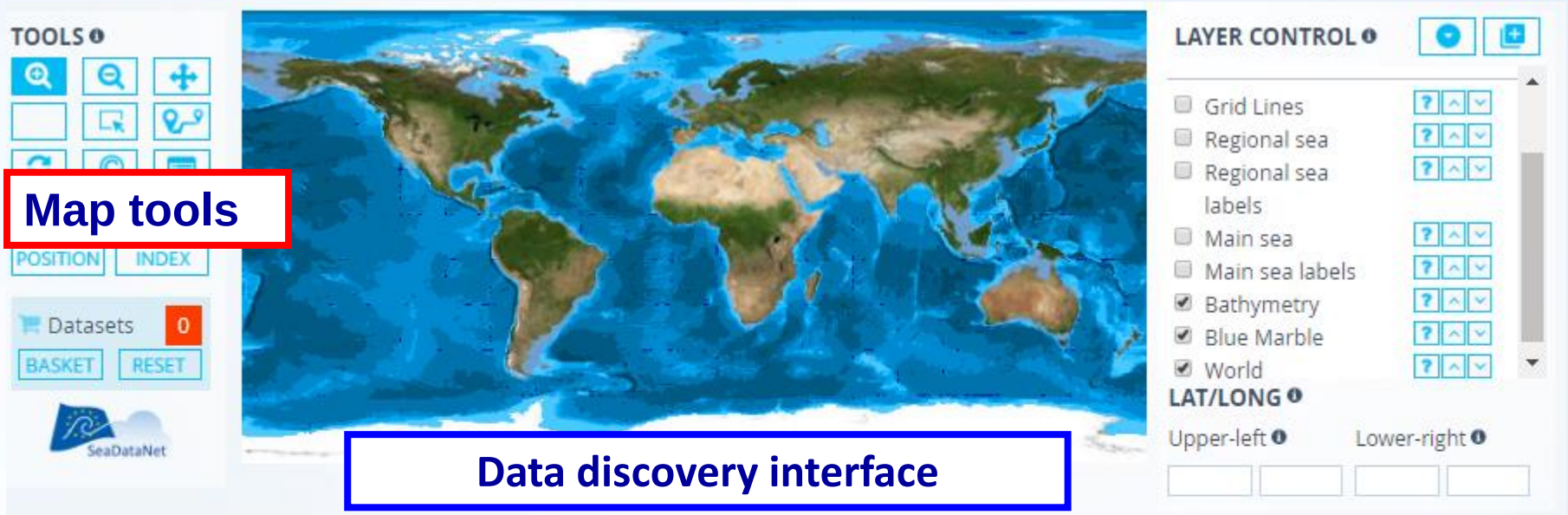
Data Services



Metadata Services

SDN provides useful information to know which organisations operate in marine environment, what they do and where → chances for future collaborations in research or in the private sector

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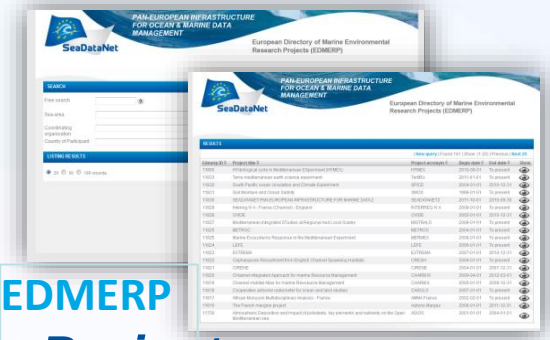
Metadata Services

EDMO *Organisations*

CSR *Research cruises*

EDMERP *Projects*



EDIOS *Observing programmes*

CDI *Data index*

EDMED *Data sets*

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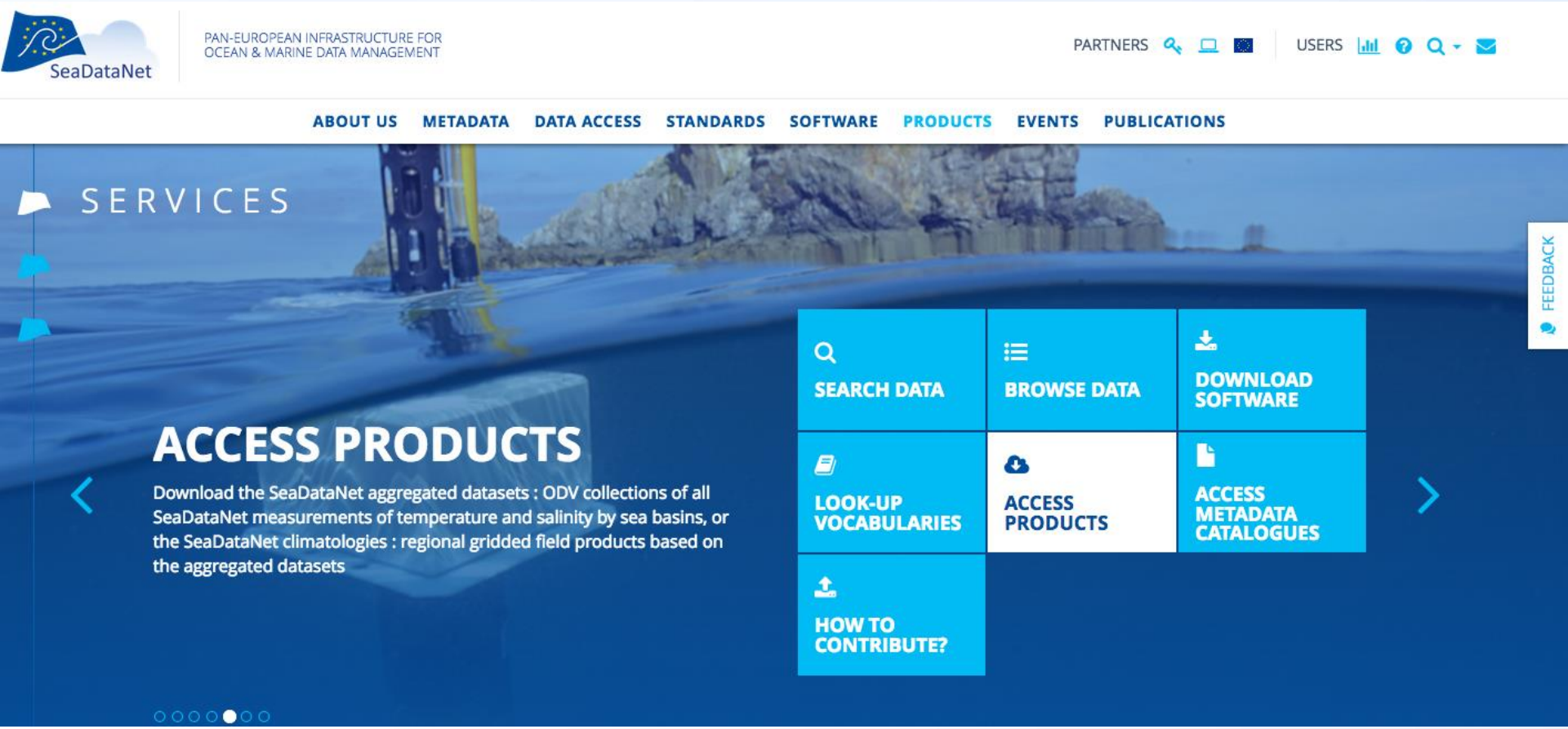
Data Products



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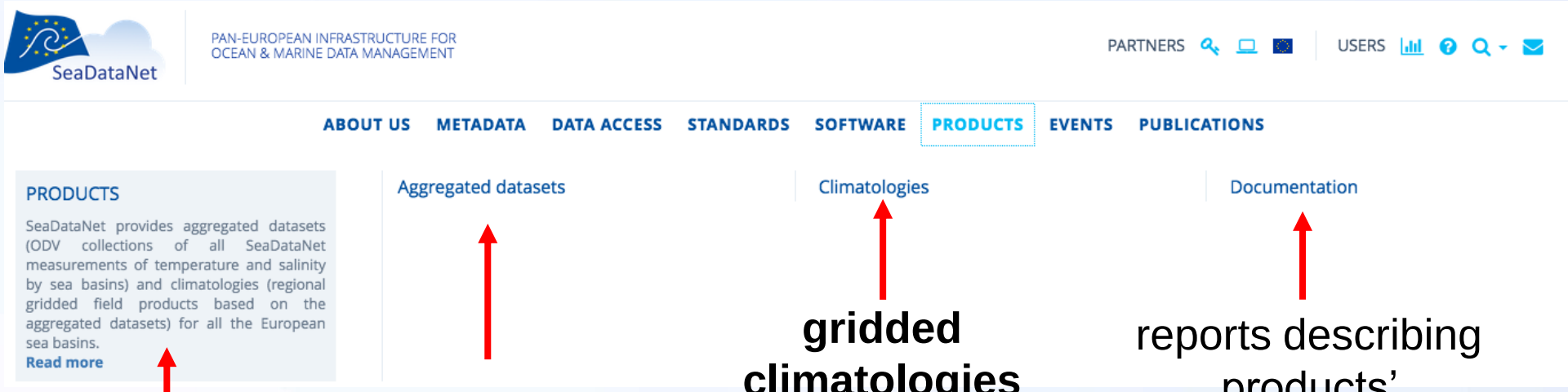
Data Products



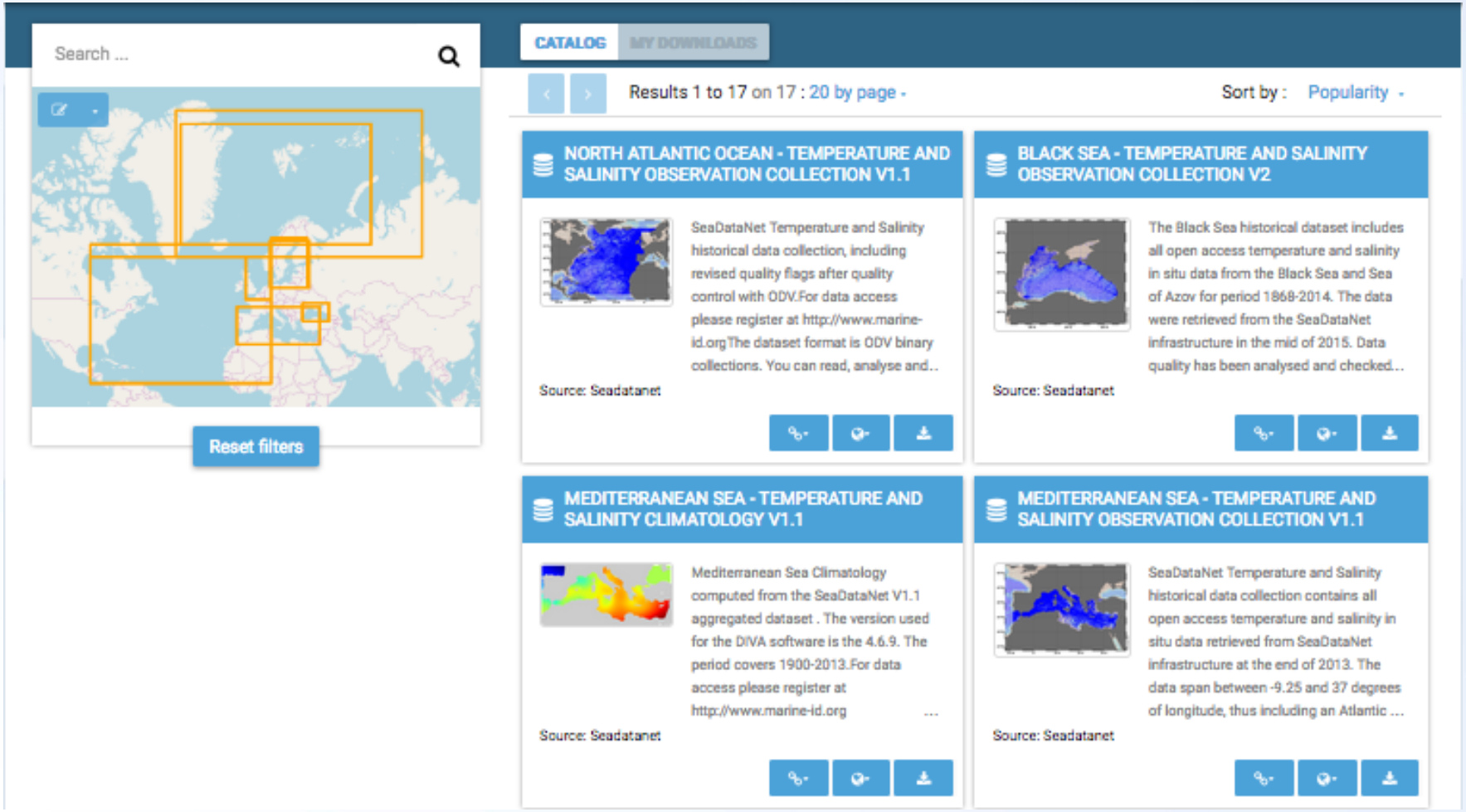
Catalogue

Historical data collections of all T and S measurements within SeaDataNet covering all EU sea basins (DOI)

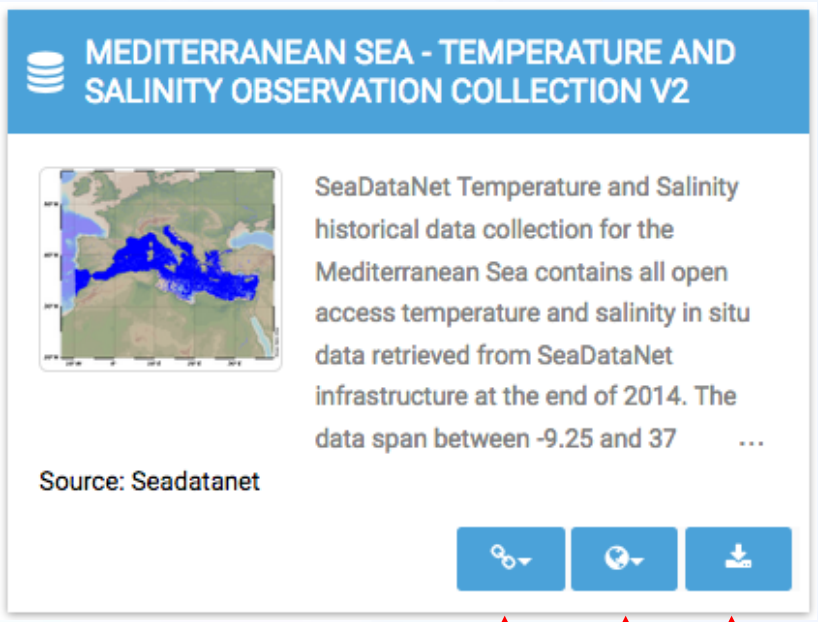
gridded climatologies (DOI)

reports describing products' characteristics and quality (DOI)

Product Catalogue



Product Catalogue



Download

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

Metadata record (DOI)

Vocabulary services

Controlled vocabularies used in all metadatabases and data formats (interoperability) organised with international governance, user interfaces and web services

BODC WEBSERVICES V2 (LIBRARIES) CL12

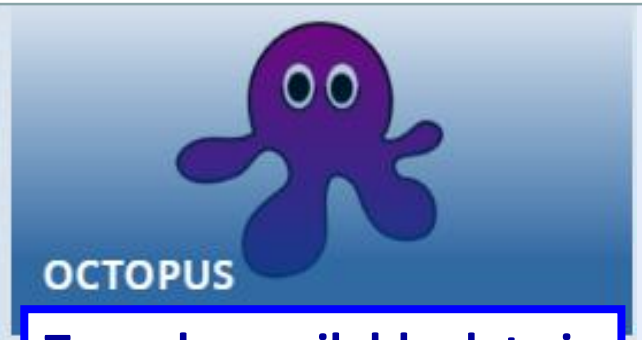
Library	Thesaurus	Title	Alt Title	Version	Members	Modified
C16		SeaDataNet sea areas	SDN sea areas	9	127	11/7/2012 2:00:06 AM
C17		ICES Platform Codes	ICES Platforms	709	5571	3/13/2018 2:00:03 AM
C19		SeaVoX salt and fresh water body gazetteer	SeaVoX water bodies	17	263	2/21/2018 2:00:03 AM
C32		International Standards Organisation countries	ISO countries	7	251	1/14/2016 2:00:02 AM
C34		Activity purpose categories	Purpose categories	4	22	8/27/2011 3:00:05 AM
C35		European Nature Information System Level 3 Habitats	EUNIS3 Habitats	1	56	2/19/2010 2:01:37 AM
C36		Monitoring activity legislative drivers	Monitoring drivers	8	91	6/21/2017 3:00:03 AM
C37		Ten-degree Marsden Squares	Marsden-10	3	612	1/9/2009 2:00:05 AM
C38		SeaDataNet Ports Gazetteer	SeaDataNet Ports	61	4912	12/5/2017 2:00:02 AM
C39		World Meteorological Organisation sea	WMO sea states	1	10	9/30/2009 3:01:08 AM

Software Tools

To create metadata CDI, CSR, EDMO, EDIOS, EDMERP

To convert data file

To convert to the internal formats



To present and analyse data

To make available data in data centres

To generate the spatial objects for CDI files

SeaDataCloud project activities

This project has received funding from the European Union's Horizon 2020 Research Infrastructures programme, under the grant agreement No 730960".

Upgrading and innovating existing services for users and data providers:

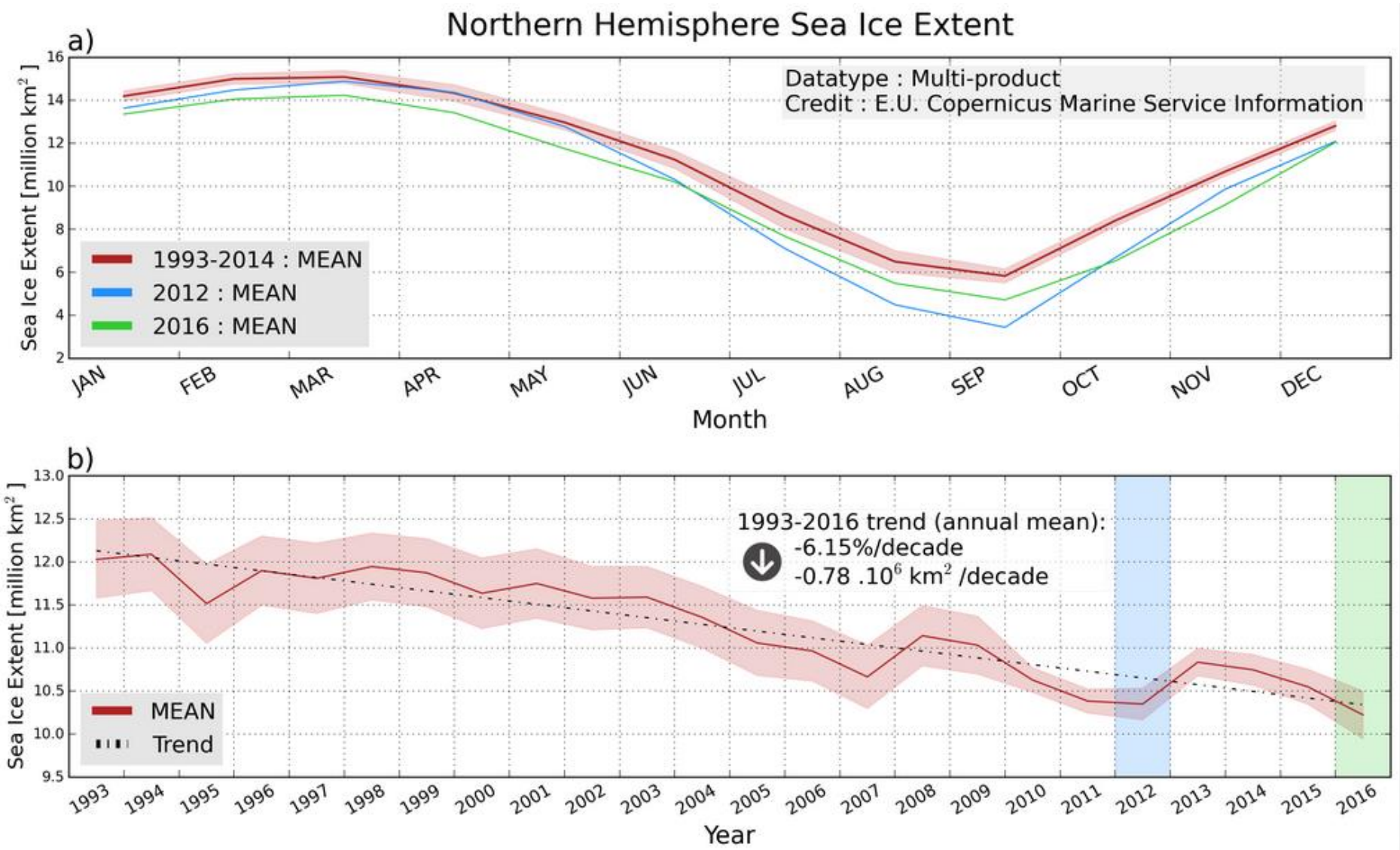
- Advancing the CDI service by adopting cloud
- Introducing 'Linked Data principle' to catalogues for semantic web
- Adding transformation facility for INSPIRE compliance

Developing new services for users and data providers:

- SWE Ingestion service for Real Time data streams
- Brokerage service for mutual exchange with international data networks
- Virtual Research Environment (VRE) with advanced services: subsetting, online ODV, DIVA, and visualisation

EUDAT consortium of e-infrastructure service providers

Challenges for the Arctic regions



Climate Change

T increase and SI extent reduction

Copernicus Marine Service

Challenges for the Arctic regions

In 2016, the Commission and the High Representative for Foreign Affairs and Security Policy of the EU have updated the policy on Arctic, defining the following "priority areas":

- Climate change and safeguarding the Arctic environment
- Sustainable development in and around the Arctic
- International cooperation on Arctic issues

EUROPEAN COMMISSION

HIGH REPRESENTATIVE OF THE UNION FOR FOREIGN AFFAIRS AND SECURITY POLICY

Brussels, 27.4.2016
JOIN(2016) 21 final

JOINT COMMUNICATION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

An integrated European Union policy for the Arctic

How SeaDataNet supports arctic studies

EGU Conference, Vienna, Austria, 8-13 April 2018

Credit: ENEA

Arctic → "engine" of the planet's climate and crucial for understanding the climate evolution and its impact on the planet and the global economy.
To get data in the Arctic's extreme conditions it is really challenging.

Credit: ENEA

SeaDataNet contribution:

- data, metadata, T/S climatologies
- information about projects and institutions involved in on that regions

High quality data is available because of contributors specialised in monitoring the Arctic regions

Data Summary in the Arctic by instruments

- **140.000 data sets taken in the Arctic over 1851-2018**
- **Data is mainly ditributed in the following fields:**

SUMMARY

PER INSTRUMENT/TYPE	DATASETS	DURATION IN HOURS	DURATION IN DAYS	DURATION IN YEARS
CTD	71598	1.493.252	62.219	170,46
discrete water samplers	57726	1.106	46	0,13
salinity sensor	8917	1.171	49	0,13
water temperature sensor	8904	13.381	558	1,53
bathythermographs	3747	62	3	0,01
1000 Hz top-bandwidth single-channel seismic reflection systems		0	0	0,00
dissolved gas sensors		148	6	0,02
fluorometers		52	2	0,01
unconsolidated sediment corers	1297	23	1	0,00
multi-beam echosounders	1120	9.257.396	385.725	1.056,78
sediment grabs		1	0	0,00
meteorological packages		3.600	992.025	2.717,88
transmissometers		28	1	0,00
airgun array	308	18.828	785	2,15
multi-channel seismic reflection systems	308	18.828	785	2,15
Boomer		0	0	0,00
>2000 Hz top-bandwidth sub-bottom penetrator and mud profiler systems		0	0	0,00
airgun		0	0	0,00
current meters		3.180	7.841	21,48
Sparker	223	0	0	0,00
optical backscatter sensors	193	10	0	0,00

Physical oceanography

Geophysics

Marine Geology

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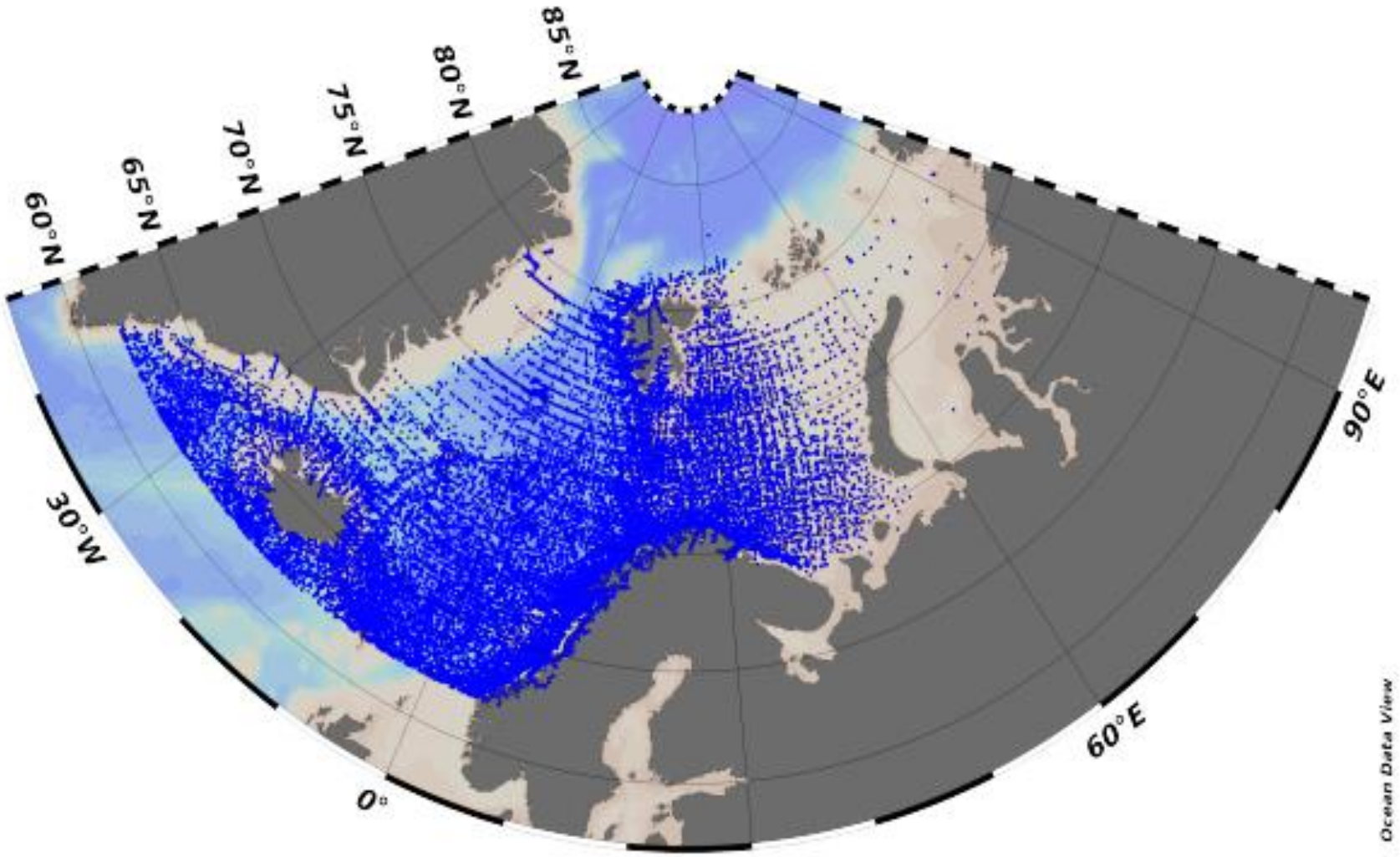
Arctic aggregated dataset 1900-2014



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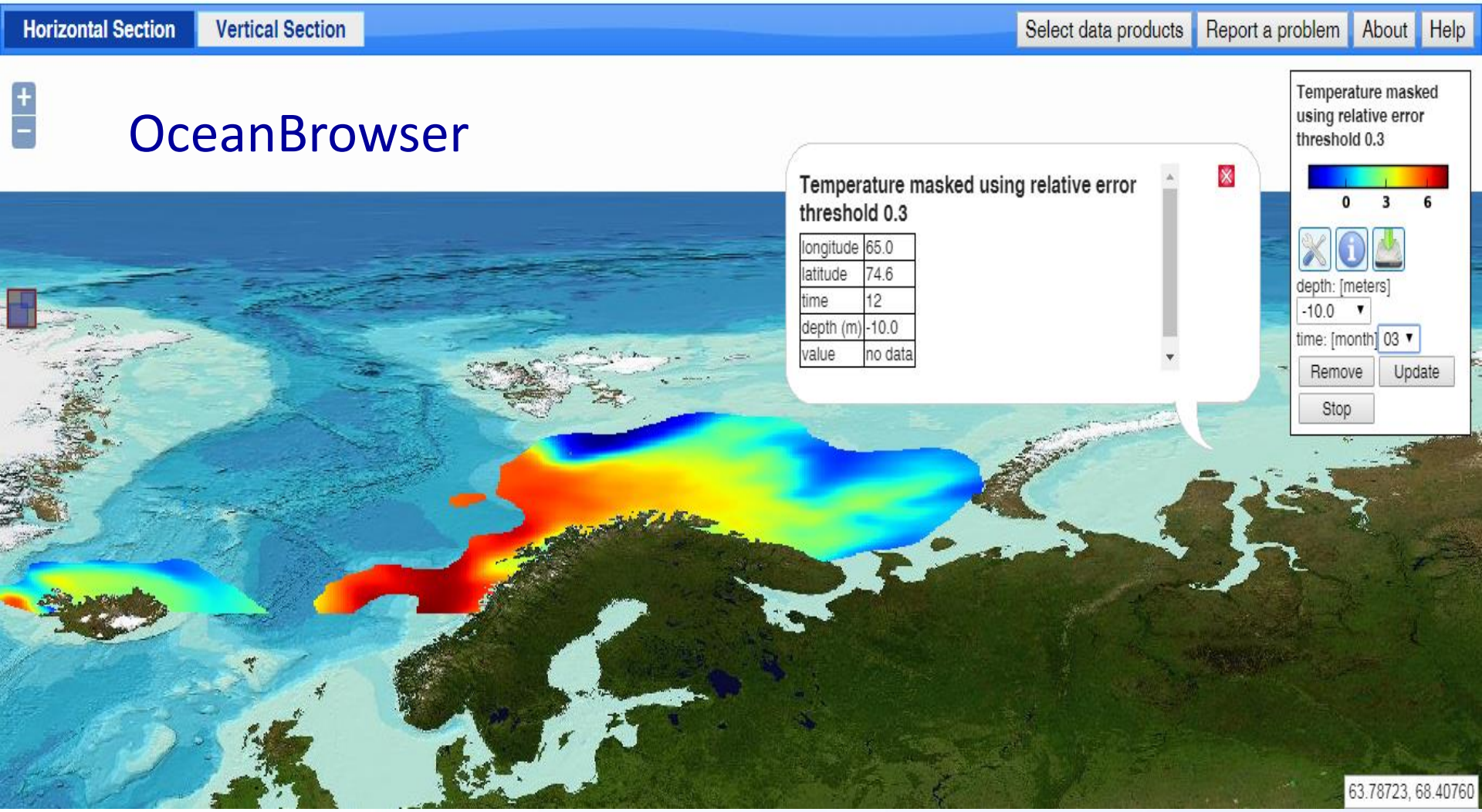
Arctic Climatology



The highlights

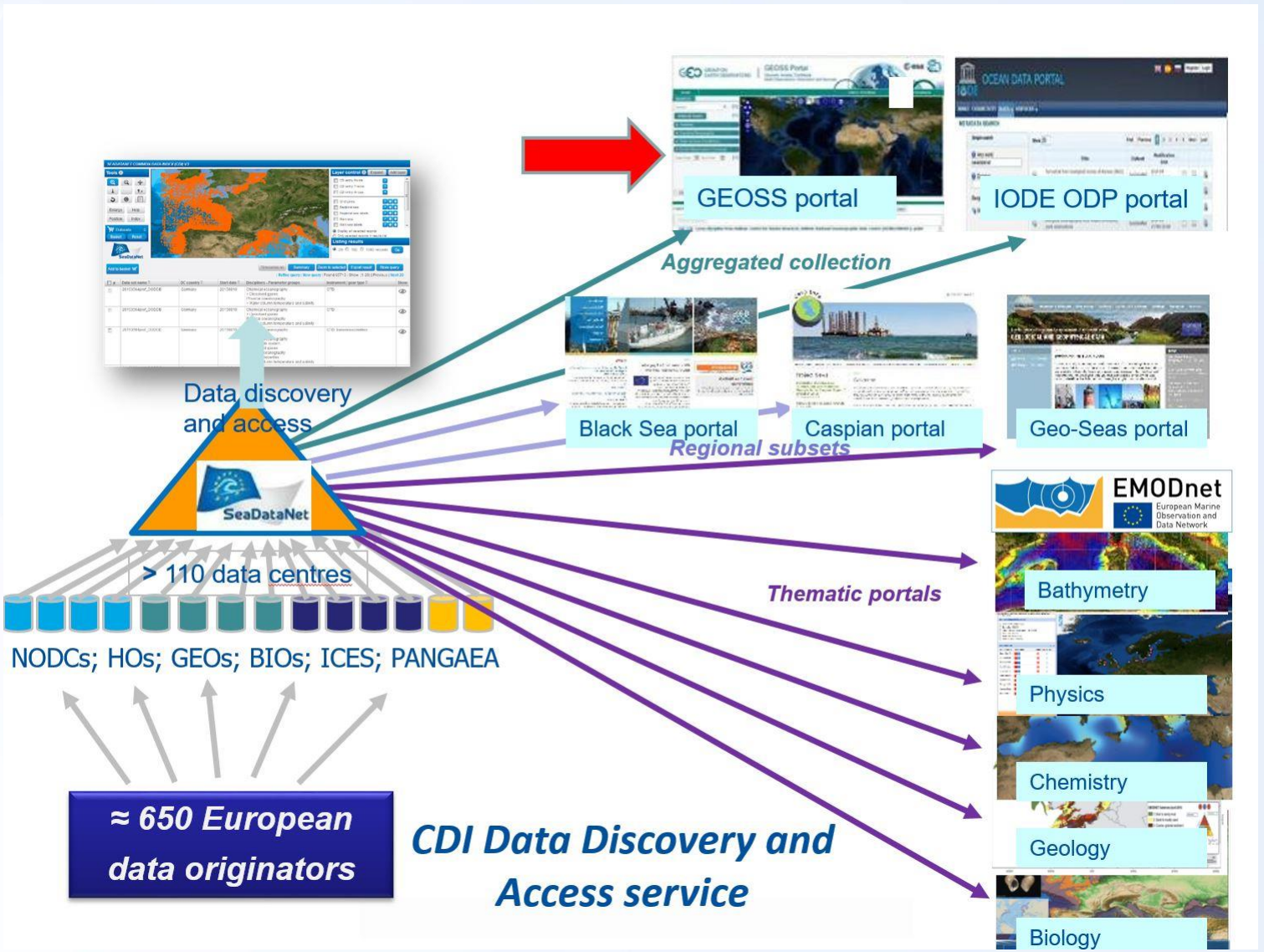
- Easy to use for end-users and data providers
- 110 Data centres providing data and metadata
- More than 2.100.000 ocean data sets available
- Vocabulary governance and services
- Standard QA-QC procedures, method for checking possible duplicates
- Standards and interoperability solutions widely recognized by the international community, beyond European borders.

SeaDataNet is present in the ODIP project and it collaborates with the existing global infrastructures such as the IOC-IODE – Ocean Data Portal (ODP), GEOSS and the International Council for Science World Data System (ICSUWDS).

Cooperation and involvement

- **Copernicus Marine Environmental Monitoring Services (CMEMS):** providing long-term archives and standards
- **Marine Strategy Framework Directive (MSFD):** providing infrastructure, standards and data collections for several indicators
- **Large ocean monitoring systems (EuroGOOS, AtlantOS, Euro-ARGO, JERICO-Next, EuroFleets, ..):** providing standards and validation + long-term archiving services
- **Ocean Data Interoperability Platform (ODIP):** exploring and demonstrating common standards and interoperability with leading data management infrastructures in USA and Australia
- **GEOSS - EuroGEOSS:** feeding GEOSS portal with SeaDataNet in-situ data collections from large community of European data holders (> 100 data centres; >600 data originators)
- **European Open Science Cloud (EOSC)**: shaping the pilot Blue Cloud
- **European Marine Observation and Data Network (EMODnet):** driving and serving many EMODnet thematic portals

CDI service driving and serving many portals and communities



imdis International Conference on Marine Data and Information Systems

Barcelona, 5-7 November, 2018

imdis.seadatanet.org

Organised in the frame of SeaDataCloud project funded by the EU Horizon 2020 Research Infrastructures programme

4 plenary sessions :

1. Data services and tools in ocean science
2. Technical developments for marine information and data management
3. Marine environmental infrastructures for observation data (data management and access)
4. Data products, information and knowledge

Submit your abstract before **30th April 2018**

SeaDataCloud UTM CSIC Ifremer OGS IODE