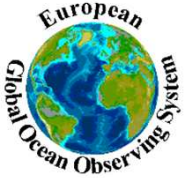
**Preparatory Actions for**
**European Marine Observation and Data Network**
MARE 2010/02 - Physical Parameters [SI2.579120**]**
**-**
**Knowledge base for growth and innovation in ocean economy: assembly and dissemination of marine data for seabed mapping**
MARE/2012/10 - Lot 6 Physics [SI2.656795]

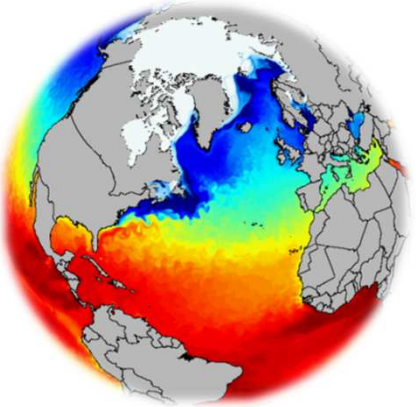



**A Novellino** G Manzella D Schaap S Pouliquen L Rickards P Gorringe

# Marine Knowledge 2020 and MSFD

**Bring together Marine Data from different sources with the aim of**:

- *helping industry, public authorities and researchers find the data and make more effective use of them to develop new products and services.*
- *improving our understanding of how the seas behave.*



## Why EU-level action?

- ***National data do not tell us all*** *we need to know about the seas* ***as a global system*** *connected by shifting winds, seasonal currents and migrating species; analysis at European level is essential.*

## Marine Strategy Framework Directive (MSFD)

- *Comprehensive compulsory monitoring of the Marine environment beyond geographical limits and borders*

http://ec.europa.eu/maritimeaffairs/policy/marine_knowledge_2020/
Marine Strategy Framework Directive (2008/56/EC)

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European Marine Observation and Data Network

EMODnet Physics background

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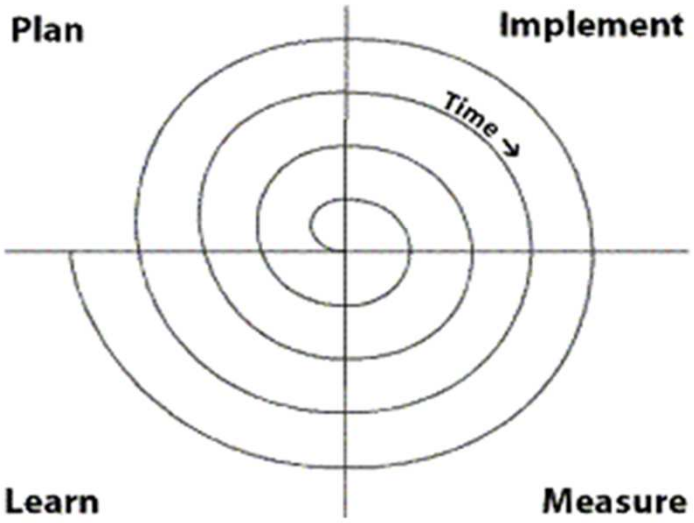
# prototype method

| 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase 1 – limited sea basins | | | | | | | | | | | |
| | | | | Phase 2 - low resolution | | | | | | | |
| | | | | | | Phase 3 - multi-resolution | | | | | |




allows users to assess and improve product by trying it out

European Commission

# EMODnet Physics – background

## EMODnet Physics objectives

- *Provides* ***free and open access to marine real-time and archived data*** *on* ***physical conditions*** *as monitored by:*
  - Fixed Stations[1], Ferrybox[1], (Euro)Argo[2], Gliders[2], HF Radars[2]
- *Parameters*:
  - Sea Temperature[1], Sea Level[1], Sea Salinity[1], Winds[1], Waves[1], Sea Currents[1], Light Attenuation[1], Ice Coverage[2], Sea Level trends[2]
- *Geoghraphical coverage*:
  - All the European Sea Basins
- *Make* ***layers of physical*** *data and metadata* ***available***
- ***Determine how well data meets the need of users***
- ***Contribute*** *towards the definition of an operational* ***European Marine Observation and Data Network***

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[1]MARE/2010/06 (2011-2013)
[2]MARE/2012/10 Lot 6 (2013 – 2016)

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# EMODnet Physics – background

## Marine Data Observation Infrastructures in Europe

**EuroGOOS**

Operational Oceanography community

DG ENTERPRISE & INDUSTRY

**GMES - Copernicus**

**MyOcean**

DG RESEARCH & INNOVATION

**FP7 SeaDataNet**

DG MARITIME AFFAIRS & FISHERIES

**Ur- EMODnet**

**EMODnet Physics**

EMODnet

European Marine Observation and Data Network

## Existing Infrastructures in Europe

**EuroGOOS**

Operational Oceanography community

### *EuroGOOS*

- *36 members from 16 European Countries*
- ***6 Regional operational oceanographic systems***
- *support and facilitate members cooperation to establish a **coordinated European Operational Oceanography** approach for:*
  - *Identifying **priorities** for operational oceanography*
  - *Defining **standards** and **recommendations***
  - *Promoting **integration** within the framework of GOOS*
  - *Contributing to national, regional and international implementation of recommendations*
- *The European Component of the **Global Ocean Observing System (GOOS)**, recognized by the **Intergovernmental Oceanographic Commission (IOC)***

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# Existing Infrastructures in Europe

**EuroGOOS**

Operational Oceanography community

## *ROOS*

- ***6 Regional Operational Oceanographic Systems***
- *The ROOSs are the operational arm(s) of EuroGOOS*
- *About **60 additional partners** in **ROOSs***
- *The ROOSs **cooperation focus on improved national and regional services and products***
- *ROOSs coordinate the **observations and the data transfer for internal use and to other users** i.e. acting as the regional data broker*

# Existing Infrastructures in Europe

**MyOcean**

## *MyOcean*

- *GMES/Copernicus - Marine Information Service*
- Provides **free and open access to real-time and delayed mode** «ocean monitoring and forecasting» information
- based on the combination of satellite, **in situ observations** and assimilative ocean models
- Covers global oceans and European seas
- Provides free and open access to products on
  - Currents, Temperature, Salinity, Sea Level, Sea Ice, Surface winds, Biogeochemistry)

**NRT products**

- within a few hours to a week
- homogeneous **automatic quality check** procedures

**Delayed products**

- updated on annual base
- scientifically validated data for reanalysis
- integrated historical T&S data (SeaDataNet, ROOSs et JCOMM)

# Existing Infrastructures in Europe

EU.FP5 2002-05

EU.FP6 2006-11

EU.FP7 2011-15

**SeaDataNet**

## *SeaDataNet*

- *DGRTD - Marine Information System*
- *Connects the National Oceanographic Data Centres – **NODCs***
  - **EDMO**: European Directory of Marine Organisations (>2200 entries)
  - **EDMED**: European Directory of Marine Environmental Data sets (>3000 entries)
  - **EDMERP**: European Directory of Marine Environmental Research Projects (>2500 entries)
  - **CSR**: Cruise Summary Reports (>31500 entries)
  - **EDIOS**: European Directory of Ocean-observing Systems
- *Develops **CDI** – Common Data Index (ISO19115) – and gives access to **quality controlled and long time series** of ocean observations*

*i.e. physical observations from fixed stations for winds, temperature, pressure, waves, currents, and sea level, etc. **complimentary** to the NRT*

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# EMODnet Physics

**EMODnet Physics** approach

**EMODnet Physics**

Reinforce

Interoperability

WMS
WFS
Web services
…
socials

Sustain

*MARE/2012/10 Lot 6 (2013 – 2016)

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# EMODnet Physics

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# EMODnet Physics

**EMODnet Physics** is a Marine Observation and Data Information System

- *Provide a **single point of access** to marine near real time and achieved data*
- *Build up on **existing infrastructures** by adding value – no unless complexity*
- *Provide a **System of Systems** to **ensure data access to any user***
- *Facilitate integration and interoperability with further systems*
  *(INSPIRE compliant, WMS, WFS, etc)*
- *Bring together the main European Marine Observation and Data Communities*
  *(EuroGOOS, MyOcean and SeaDataNet)*
- ***Attract new and better data** and **new data owners/providers,***
- ***Attract new users and stakeholders***
- ***Full engagement of the EuroGOOS ROOSs and ROOSs Chairs****
  *(50% of the budget to empower ROOSs data interoperability infrastructure)*

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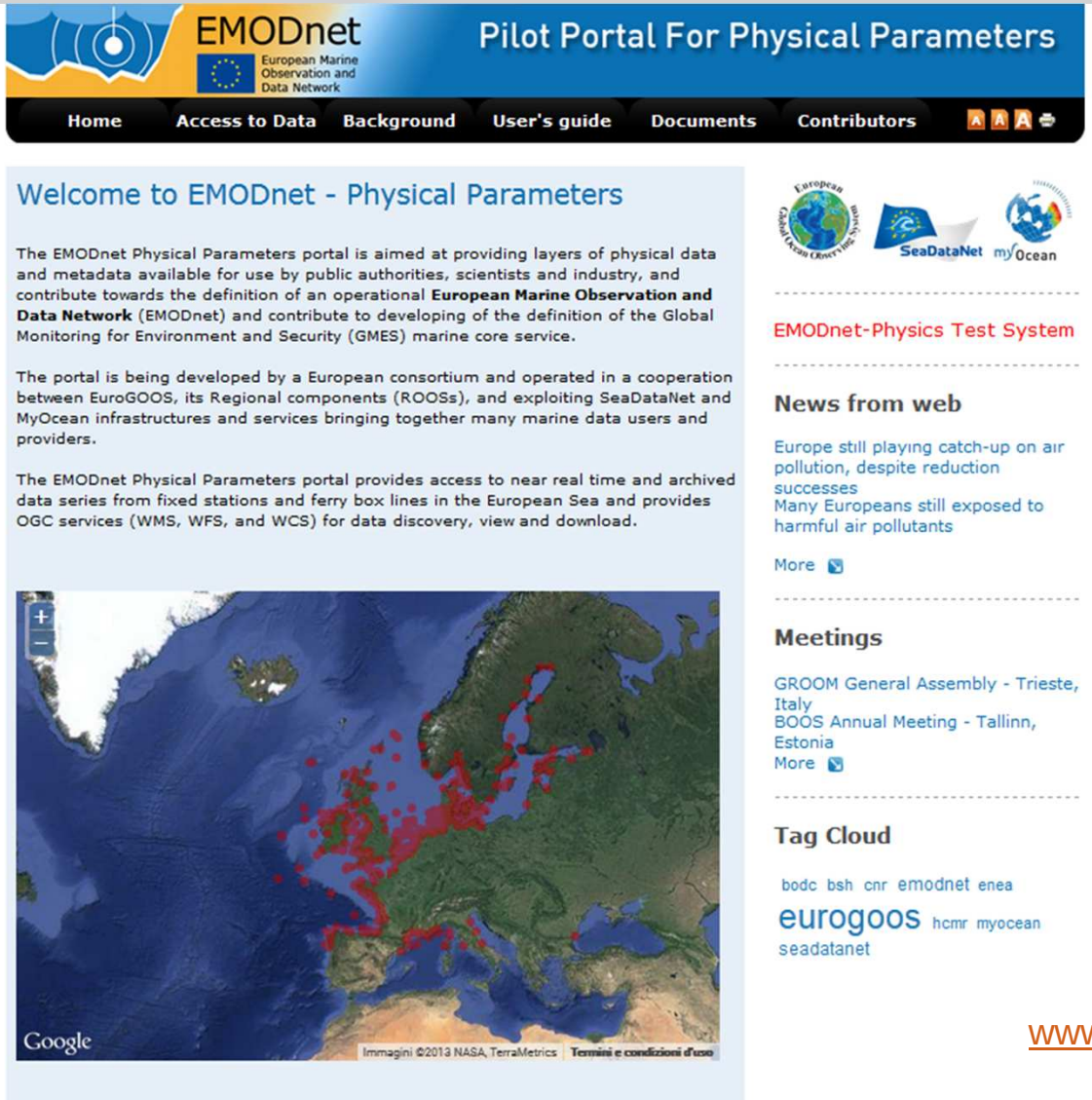
# EMODnet Physics




***INSPIRE Services***

DISCOVER

VIEW

DOWNLOAD

WMS/WFS

***Data Policy***

**Open & Free**

www.emodnet-physics.eu

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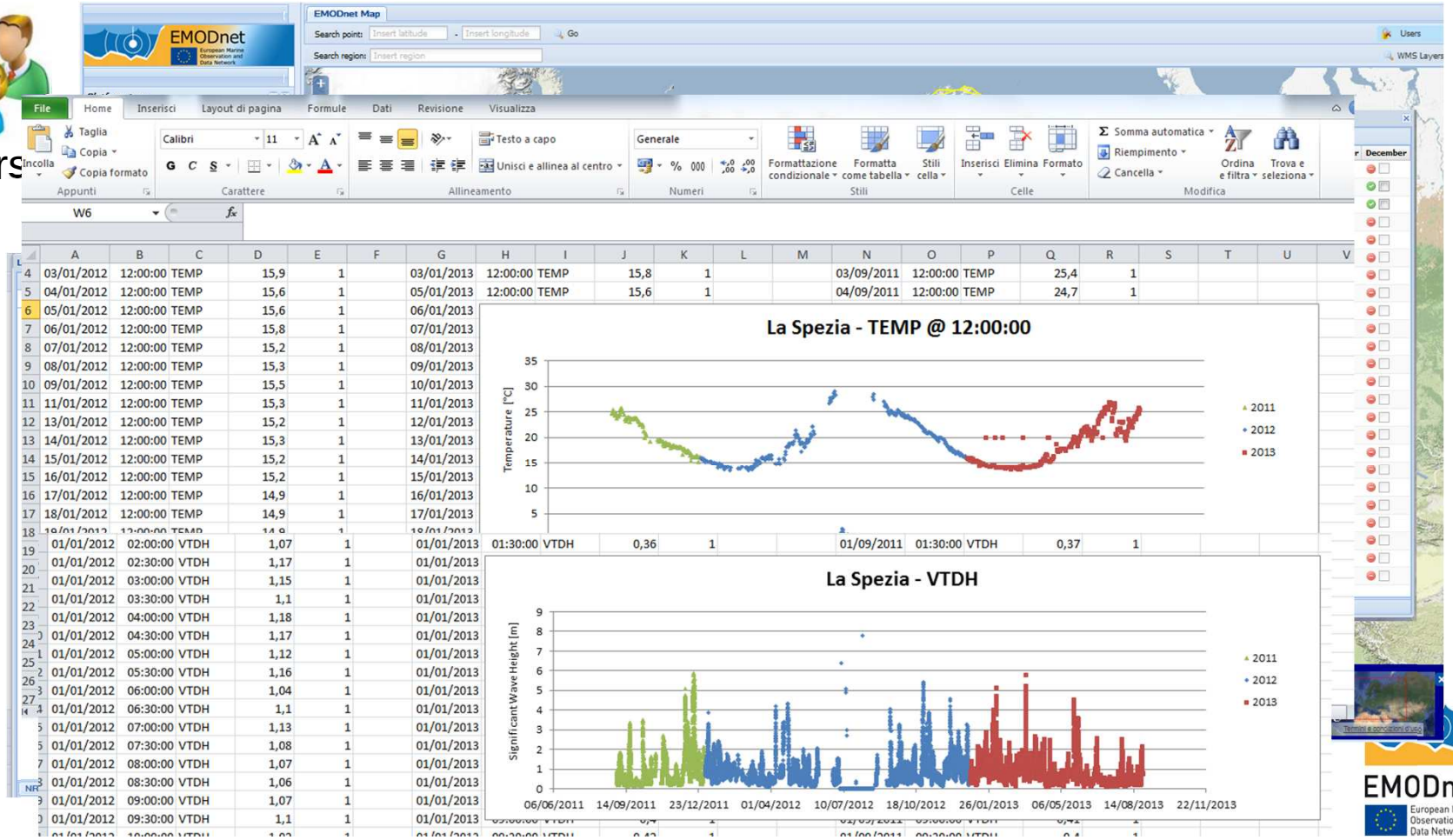
# Discover, View, Download

DOWNLOAD

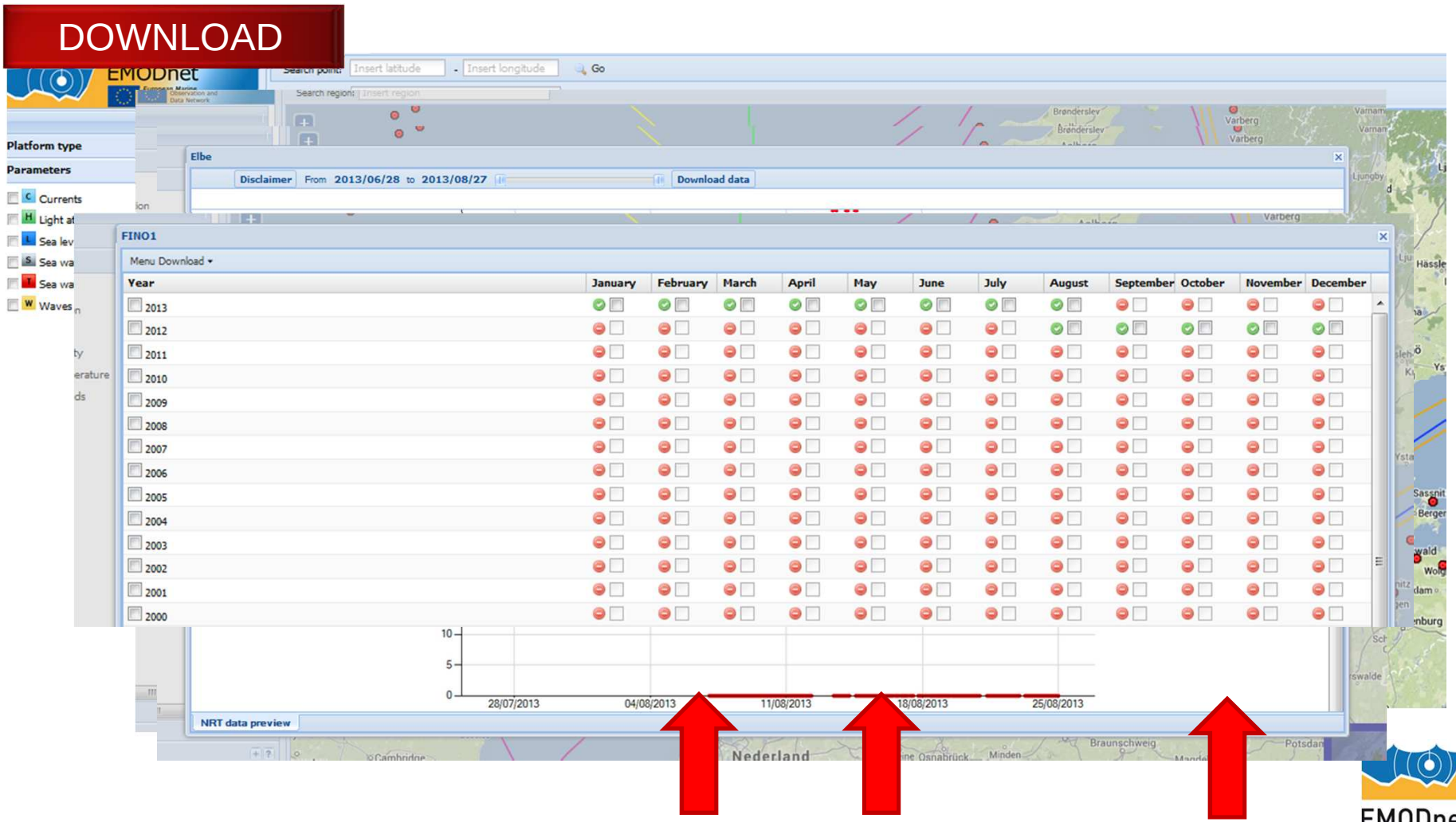
Near Real Time data from a **single station**

users



# Discover, View, Download

DOWNLOAD




Near Real Time data from a **stations list**

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# BackOffice Infrastructure

***Near Real Time Data***
***Discovery and Access***

***Federative standardized Infrastructure***

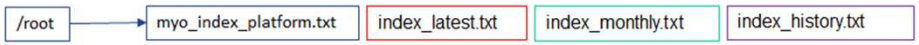
users

view

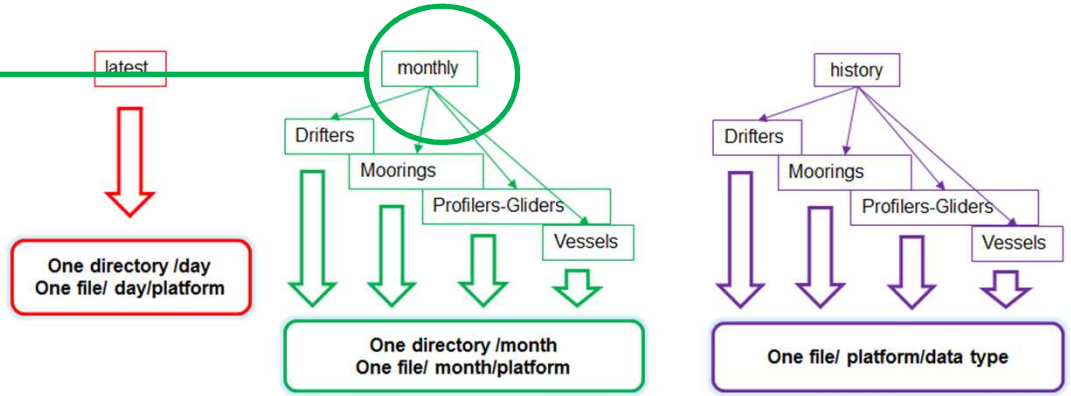
download

authentication

***Folders and info files***




Free discovery, access and download of NRT (myo users)




Temperature, Salinity
Current, Sea Level,
O2,Chl , Nutrients

# BackOffice Infrastructure

***Near Real Time Data Discovery and Access***

users

view

download

EMODnet

authentication

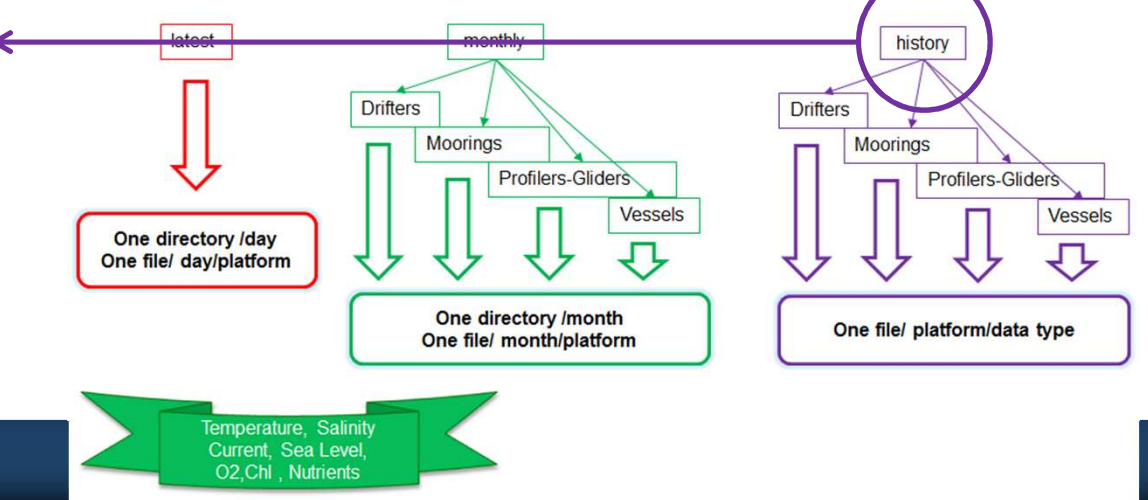
myOcean

***Federative standardized Infrastructure***

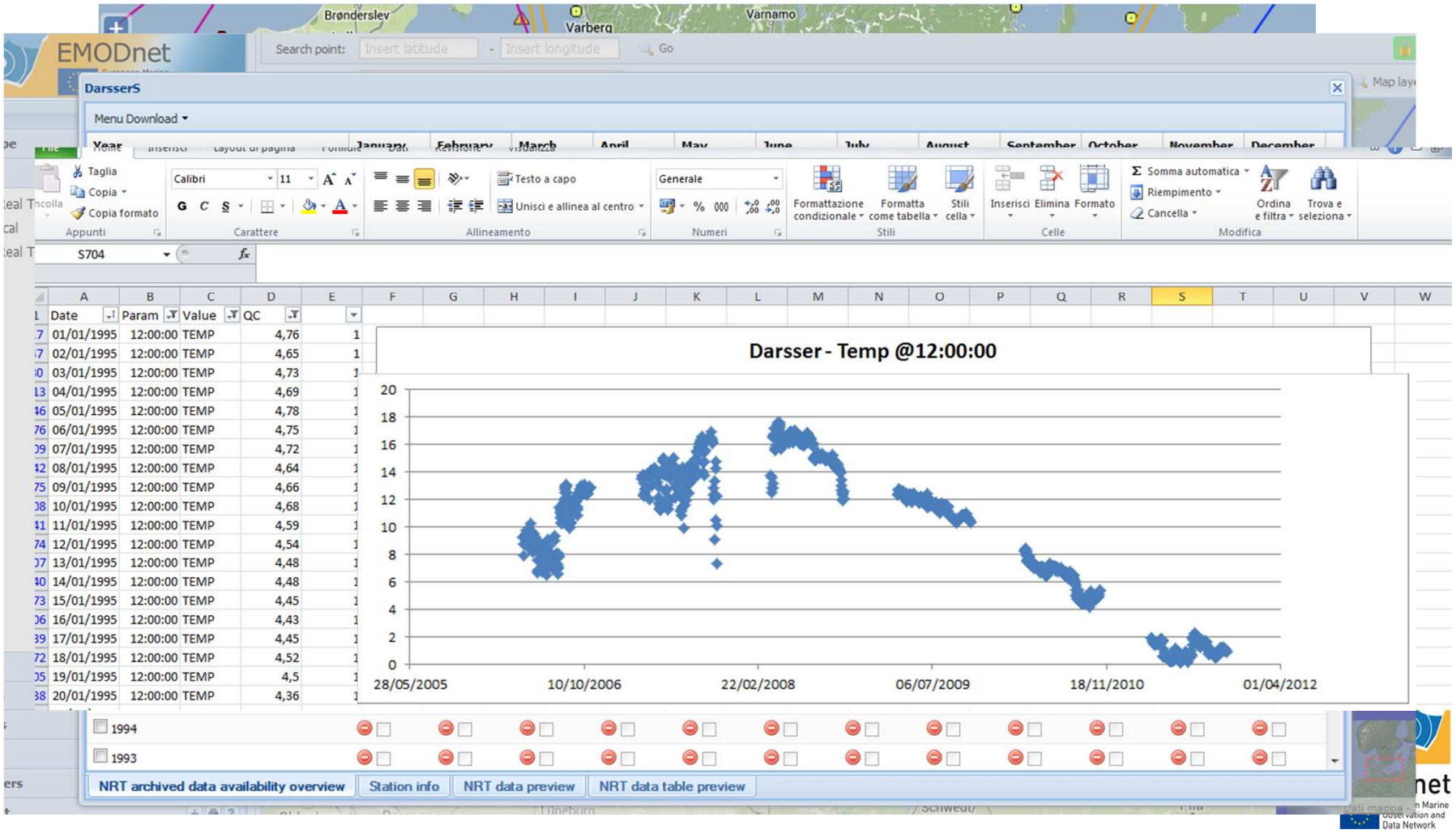
***Folders and info files***

joint MyO+SDN collaboration - result

available under EMODnet **only for internal use**
i.e. facilitate NRT data towards CDIs archives



# Discover, View, Download




e.g. Darsser

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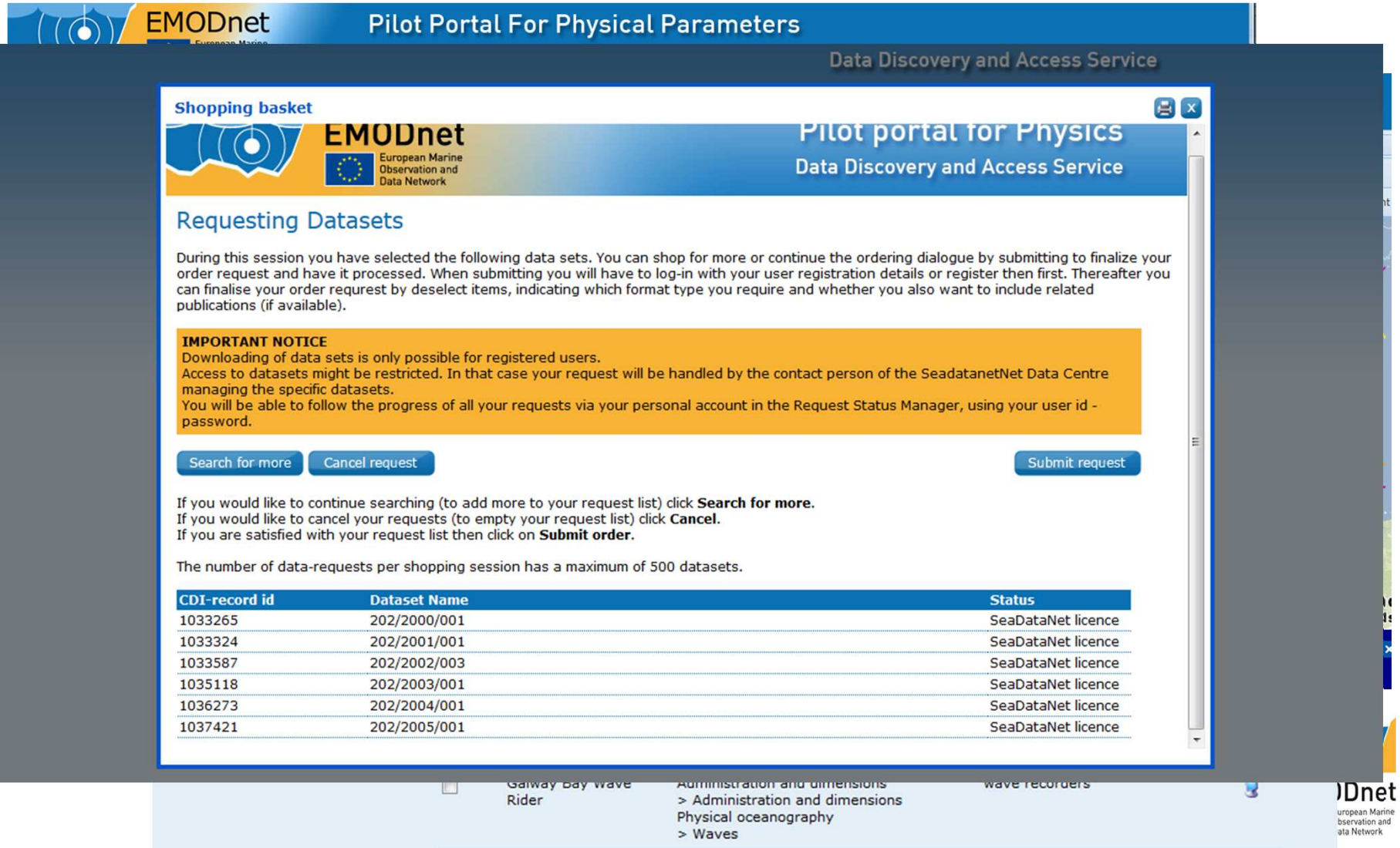
# CDI discover, view and data request






contacts@emodnet-physics.eu

# BackOffice Infrastructure

***Near Real Time Data Discovery and Access***

users

view

download

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***Federative standardized Infrastructure***

myOcean

***Folders and info files***

/root → myo_index_platform.txt | index_latest.txt | index_monthly.txt | index_history.txt

Free discovery, access and download of NRT for latest 60 days (any)

latest

One directory /day
One file/ day/platform

monthly

Drifters
Moorings
Profilers-Gliders
Vessels

One directory /month
One file/ month/platform

history

Drifters
Moorings
Profilers-Gliders
Vessels

One file/ platform/data type

Temperature, Salinity
Current, Sea Level,
O2,Chl , Nutrients

# BackOffice Infrastructure

***Historical Data Discovery and Access***

NODCs

EDMO

***CDI Data Discovery***

Users
(SDN users)

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European Marine Observation and Data Network

SeaDataNet

view

***CDI Data Access Service***

authentication

***Request Status Manager***

download

**Data Owner**

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# Back Office

***Data Discovery, View, Access, Download***

Users

NRT data - latest 60days (any)
NRT monthly files (myo users)
CDI historical data (sdn users)

***NRT data component***

myOcean

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***CDI and Historical data***

SeaDataNet

**NODCs**

**EDMO**

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# Milestones

## EMODnet Physics

- ***December 2010*** *– formal start of EMODnet Physics preparatory action*
- ***June 2011*** *– first EMODnet Physics workshop (Tallinn)*
- ***December 2011*** *– EMODnet Physics provides access to about **40** stations*

  *(Baltic, Celtic Sea, North West Shelf)*
- ***February 2012*** *– second and third EMODnet Physics workshops (Rome, Istanbul)*
- ***June 2012*** *- EMODnet Physics provides access to about **350** unique stations*

  *working on: Baltic – Poland, in Mediterranean – Italy, Malta, Slovenia, Croatia, Cyprus, Black Sea*

  *found about 50 of duplicates in the back office infrastructure*
- ***November 2012*** *– fourth EMODnet Physics workshop (Sopot)*
- ***December 2012*** *– ISPRA (Italy) stations available under EMODnet Physics portal*
- ***June 2013*** *– EMODnet Physics provides access to about **460** stations*

  *Italian Stations connected,*

  *Slovenian, Croatian, Malta and Cypriot data connection ongoing*

  *working on: Baltic – Poland; Black Sea*

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# Milestones

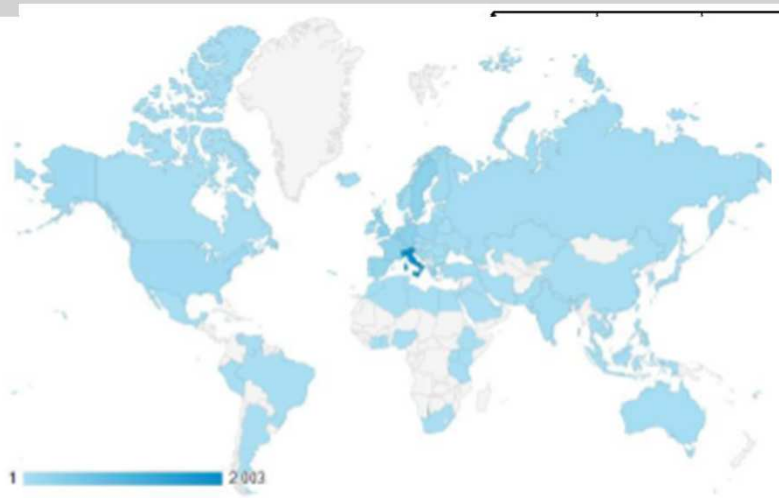



Fig. 31. Google analytics @ 31/7/2013

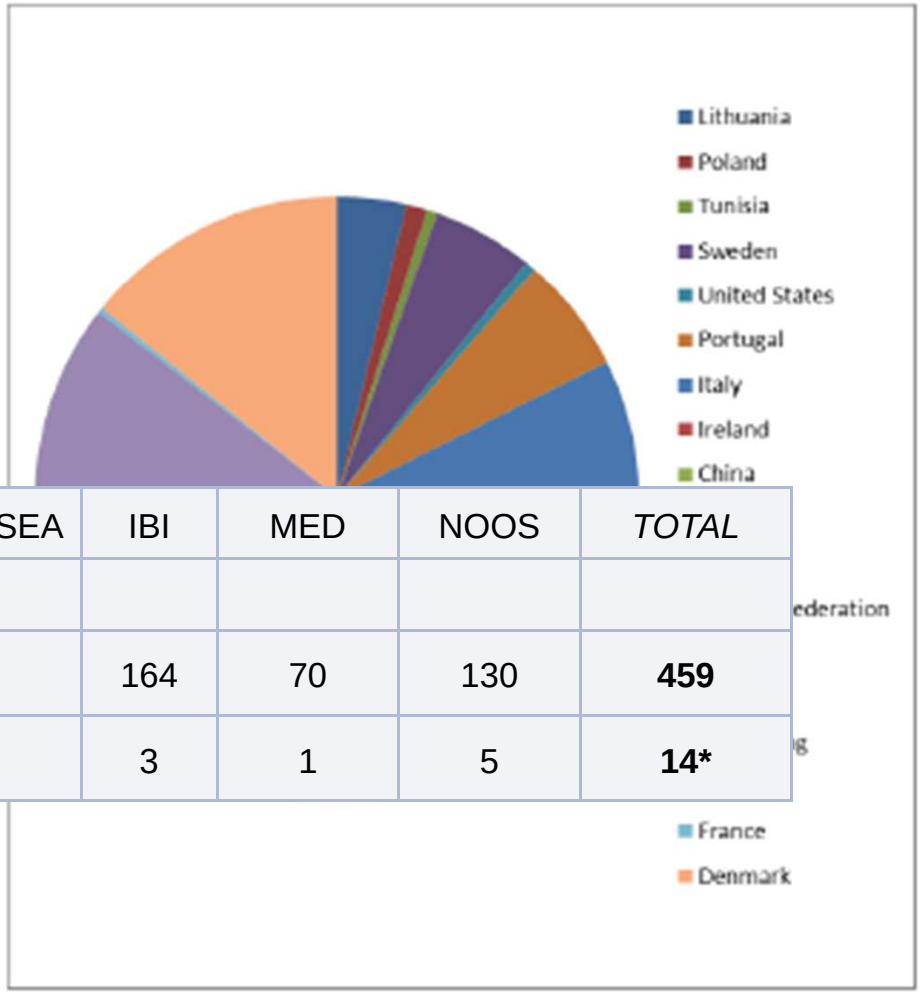
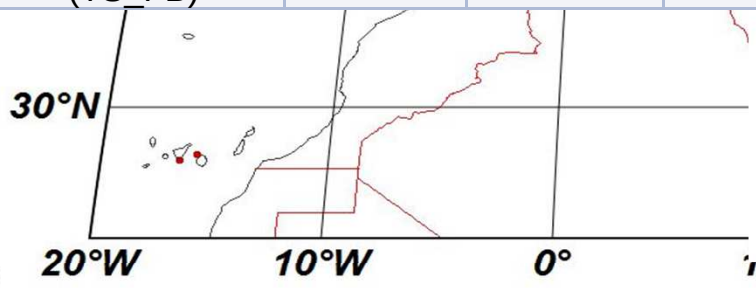
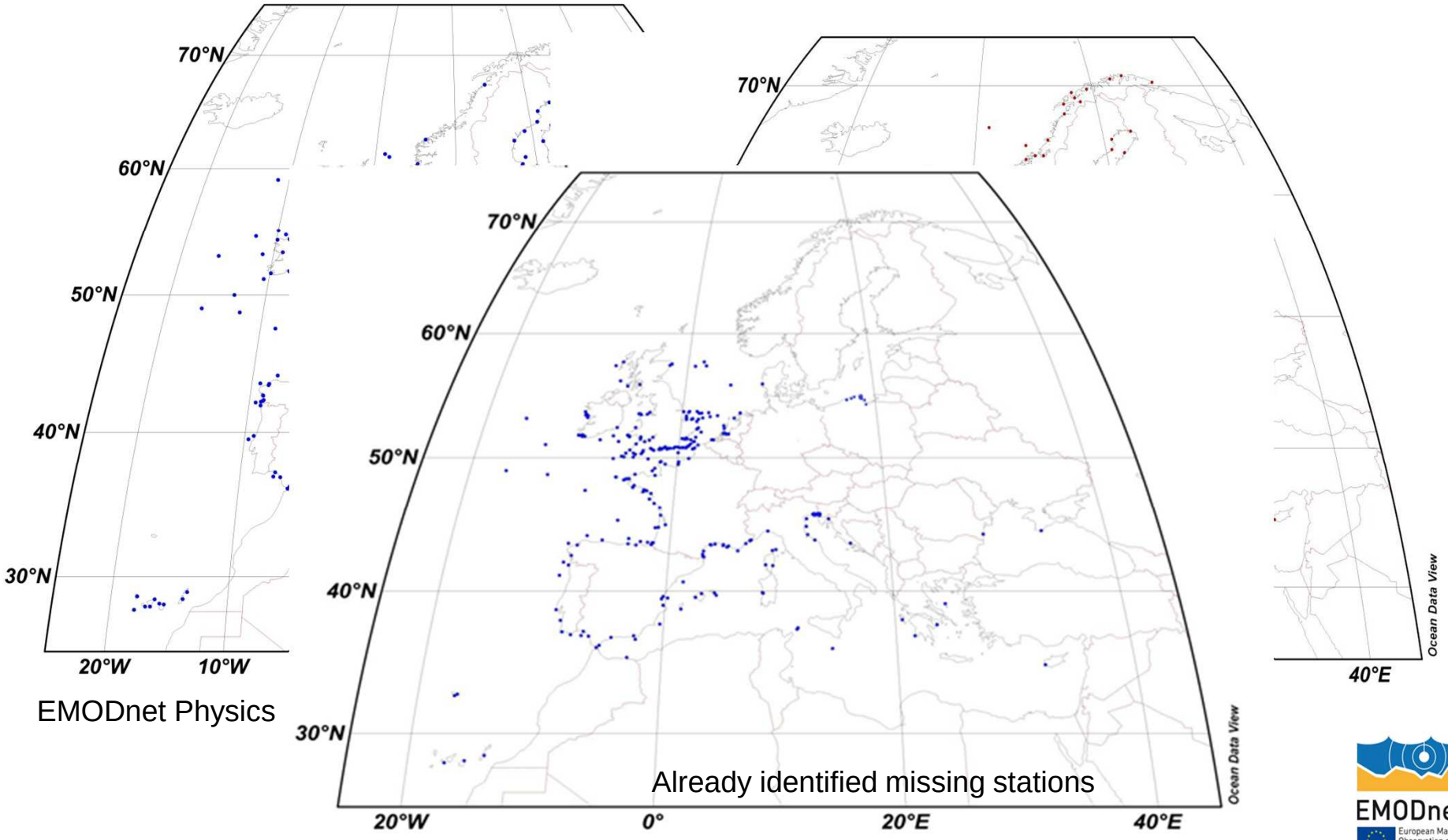



Fig. 34. Demographic pie chart for data downloads

| EuroGOOS area | ARTIC | BOOS | BLACK SEA | IBI | MED | NOOS | *TOTAL* |
|---|---|---|---|---|---|---|---|
| Platform | | | | | | | |
| Fixed station (TS_MO) | 3 | 91 | 1 | 164 | 70 | 130 | **459** |
| Ferrybox (TS_FB) | 1 | 5 | | 3 | 1 | 5 | **14*** |



# EMODnet Physics work in progress




EMODnet Physics

Already identified missing stations

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# EMODnet Physics, Interoperability OGC

## EMODnet Physics WMS/WFS/WCS

WMS specifies a number of different request types, two of which are required by any WMS server:

- GetCapabilities - returns information about the WMS
- GetMap - returns a map image
  http://151.1.25.219:8080/gisclient/services/ows.php?project=ett&map=stazioni&request=getcapabilities&service=WMS
  http://www.emodnet-physics.eu/test.wms.getfeatureinfo.html

WFS provides an interface allowing requests for geographical features across the web using platform-independent calls

- GetCapabilities - this queries the WFS service to determine available options
  http://151.1.25.219:8080/gisclient/services/ows.php?project=ett&map=stazioni&request=getcapabilities&service=WFS
- GetFeature
  http://www.emodnet-physics.eu/test.wfs.html

Web Services
http://www.emodnet-physics.eu/arh/wsemodnet.aspx

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# EMODnet Physics work in progress

## EMODnet Physics – End Users

- *Meteo Group France*
- *Regione Liguria (IT)*
  - *Distretto Ligure delle Tecnologie del Mare*
  - *Consorzio Tecnomar*
- *Swedish ECDS (Environment Climate Data Sweden)*
- *EMODnet central portal*

*Working on*

- *GOOS*
- *IODE – ODP*
- *Regione Marche*

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# EMODnet Physics – Conclusions

- An impressive effort made by key technical players in MyOcean, Seadatanet, EMODnet and EuroGOOS to **reduce unnecessary redundancies and develop common approaches** towards users
  - e.g. MoU signed between Seadatanet and MyOcean to share efforts, and discussion to improve user access to databases

- A clear and convincing move towards **open& free access to data**, a strong **involvement at the community level** in IT tools and methods to offer modern data information services to users

- EuroGOOS, MyOcean, SeaDataNet and **EMODnet-Physics** have developped a strategy of **active cooperation**, cross-cutting DG ENTR, RTD and MARE initiatives to achieve a **wider coverage of data sources and overall interoperability**.

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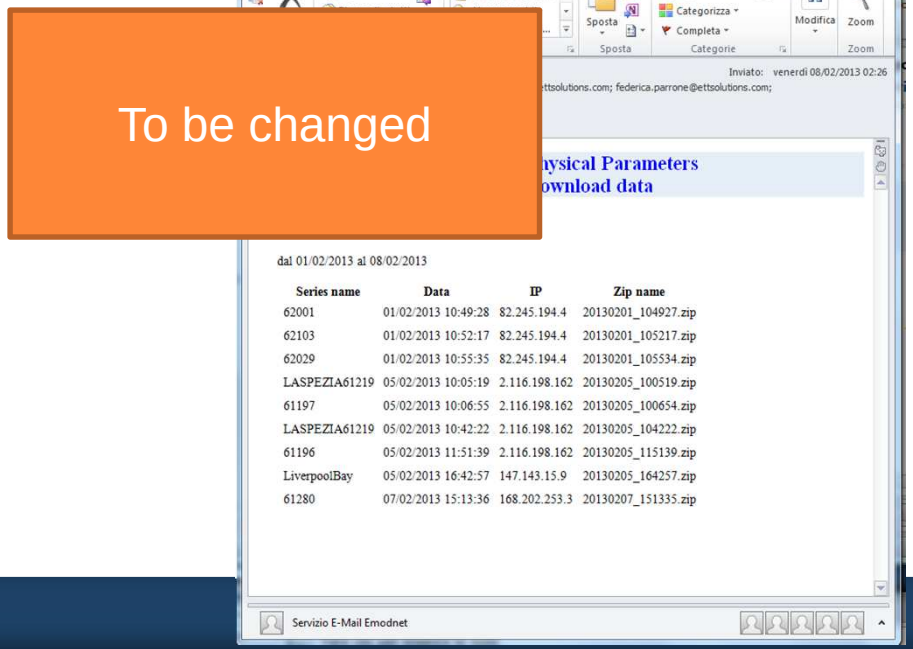
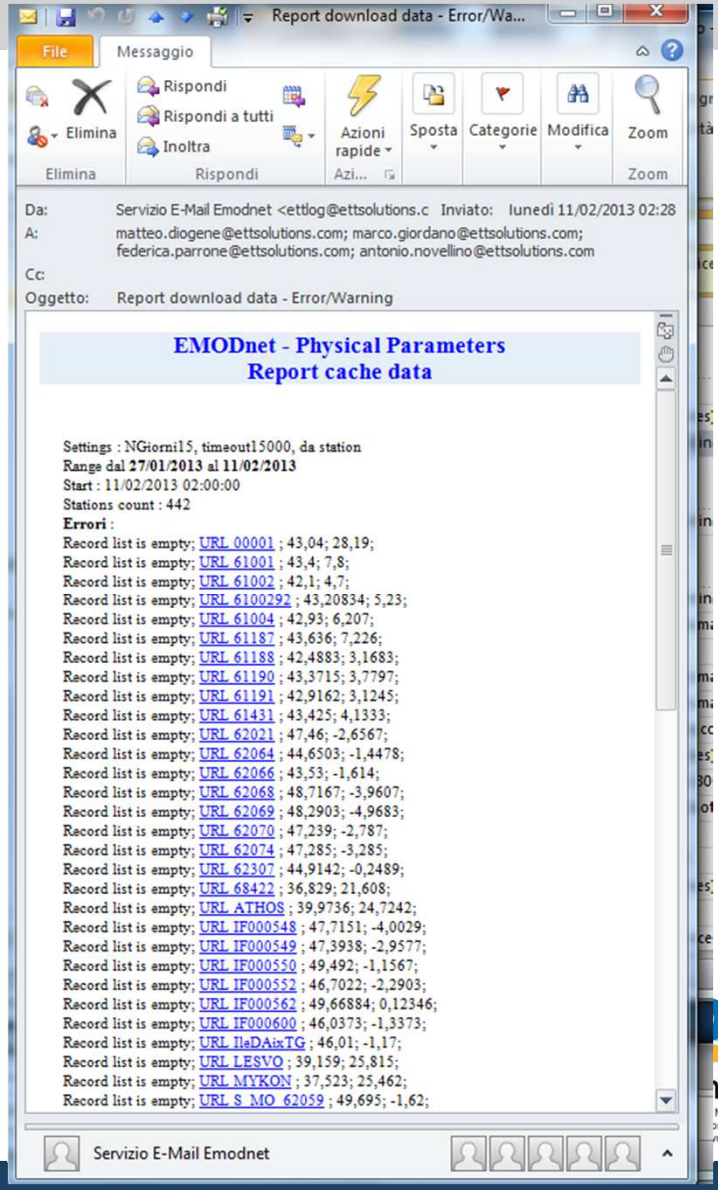
# Lesson learnt and future strategy

- Support to ROOSs/MyO/SDN
  - Automatic mail services
  - Daily notification about station status
  - Weekly notification about downloads
  - On demand Google analytics



# EMODnet Physics – Conclusions

- Results show technical success, common vision, and positive response of users.
- It builds a convincing marine community contribution to the overall aim of EMODnet with respect to pan-European marine data management and data access.
- It brings to the fore the critical need for sustained marine observation networks.

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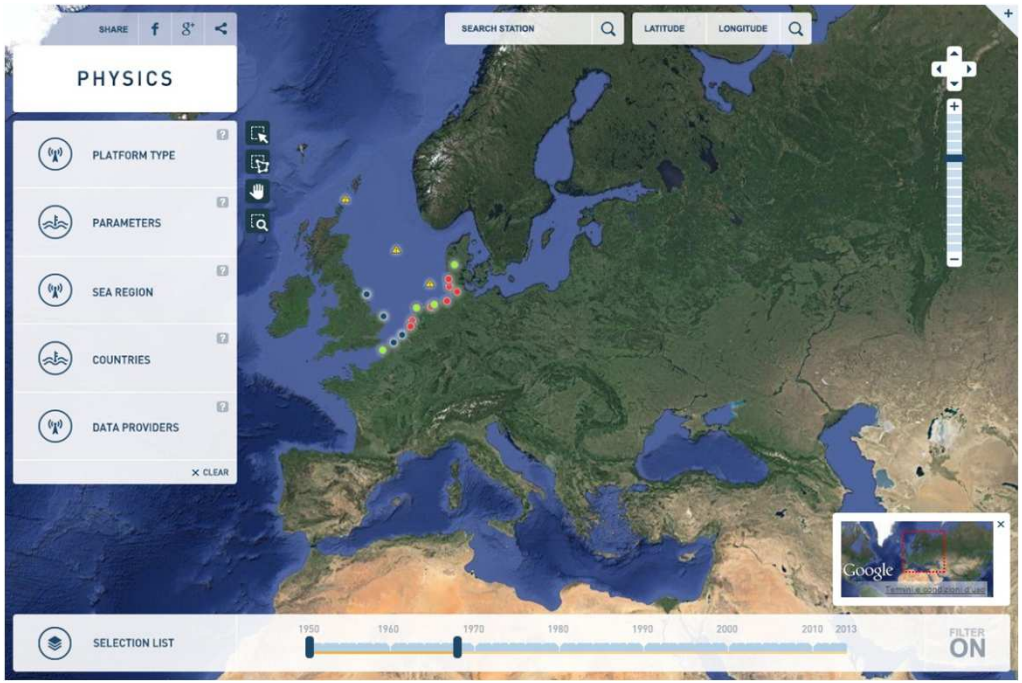
# EMODnet Physics

***NRT data provider, Historical data provider, end user willing to contribute?***




*Contact us!*

***contacts@emodnet-physics.eu***

**Thank you**

**www.emodnet-physics.eu**

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