



EMODnet
European Marine
Observation and
Data Network

EMODnet Chemistry products and tools relevant for MSFD

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EMODnet Chemistry spatial distribution

Data harvesting and
products generation are
organized at **Regional**
level



| Sea regions | Greater North Sea - Celtic Sea - Norwegian Sea | Baltic Sea | Iberian peninsula - Macaronesia | Mediterranean Sea | Black Sea - Sea of Azov |
|-------------------------|---|------------|---------------------------------------|----------------------|-------------------------------|
| Acidity | ■ | ■ | ■ | ■ | ■ |
| Antifoulants | ■ | ■ | ■ | ■ | ■ |
| Chlorophyll | ■ | ■ | ■ | ■ | ■ |
| Fertilisers | ■ | ■ | ■ | ■ | ■ |
| Hydrocarbons | ■ | ■ | ■ | ■ | ■ |
| Heavy metals | ■ | ■ | ■ | ■ | ■ |
| Organic matter | ■ | ■ | ■ | ■ | ■ |
| Pesticides and biocides | ■ | ■ | ■ | ■ | ■ |
| Pharmaceuticals | ■ | ■ | ■ | ■ | ■ |
| Radionuclides | ■ | ■ | ■ | ■ | ■ |
| Silicates | ■ | ■ | ■ | ■ | ■ |

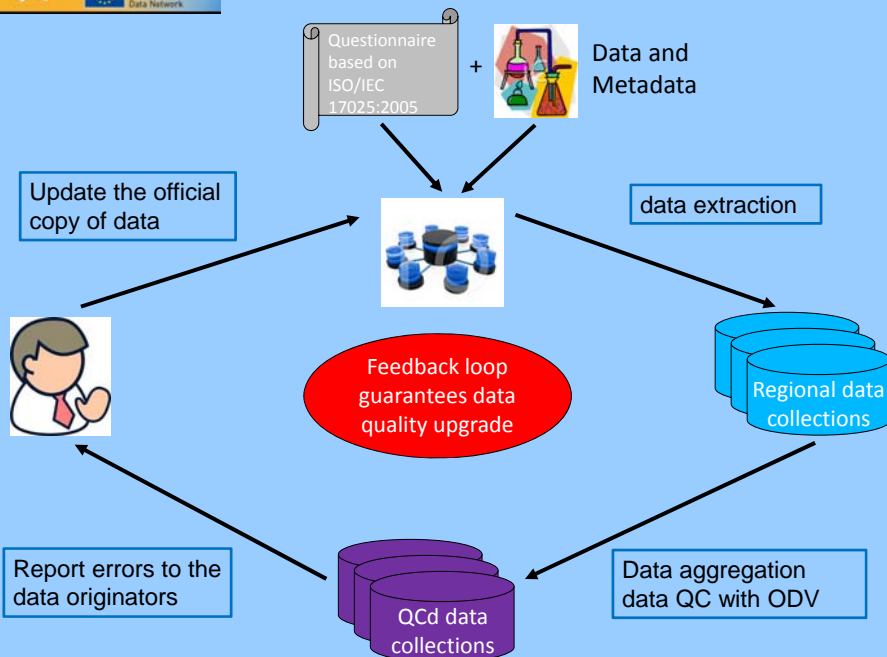
Parameters and matrices

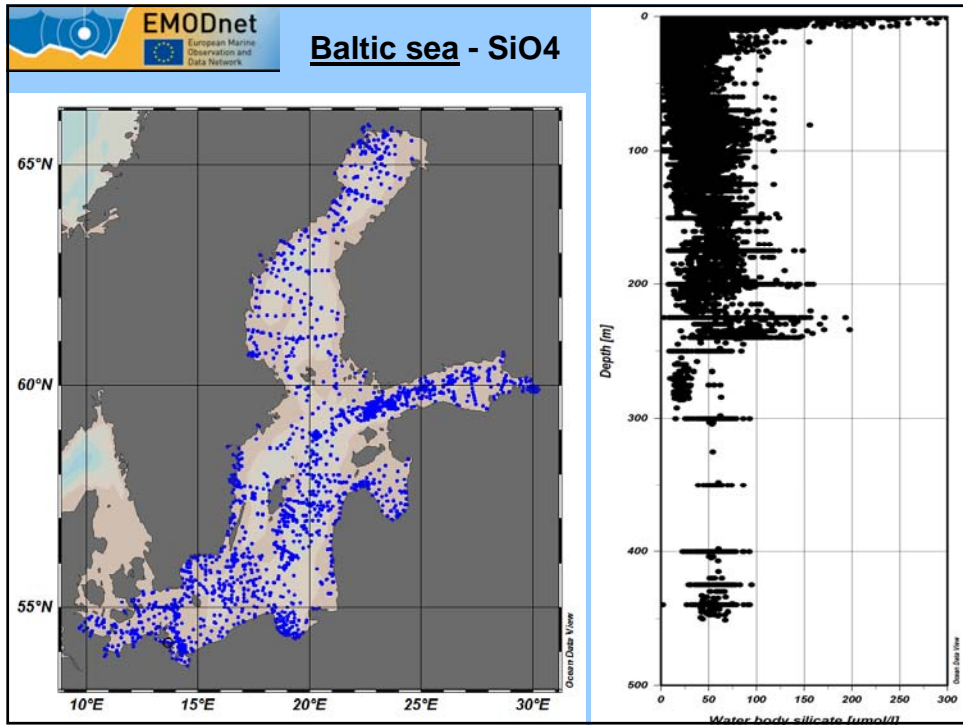
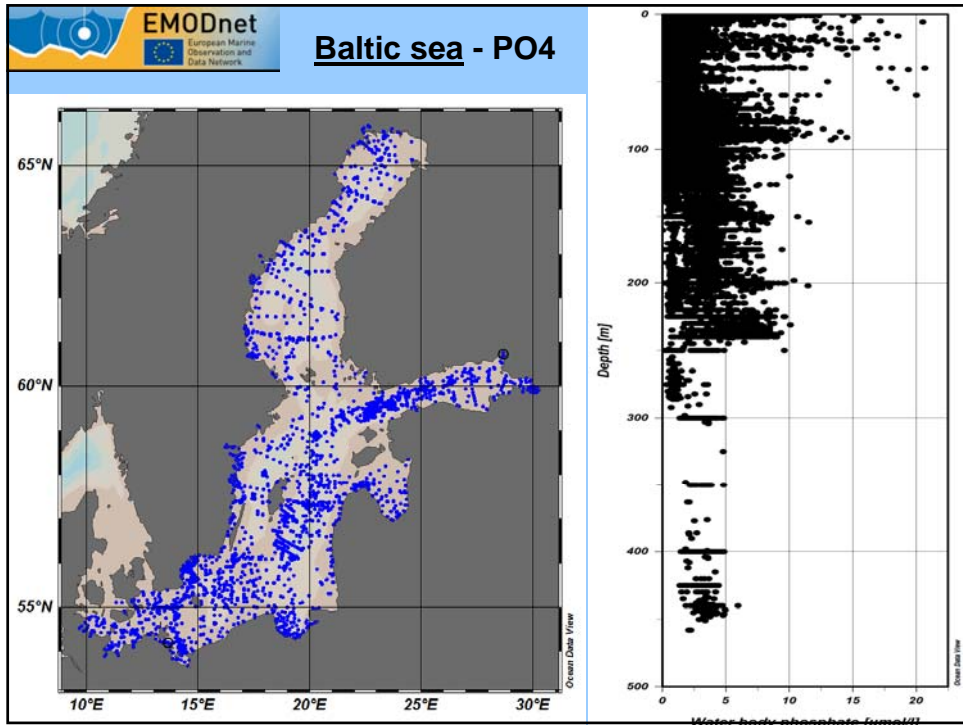
Data are provided for 3 matrices: **water column**, **sediment**, **biota**

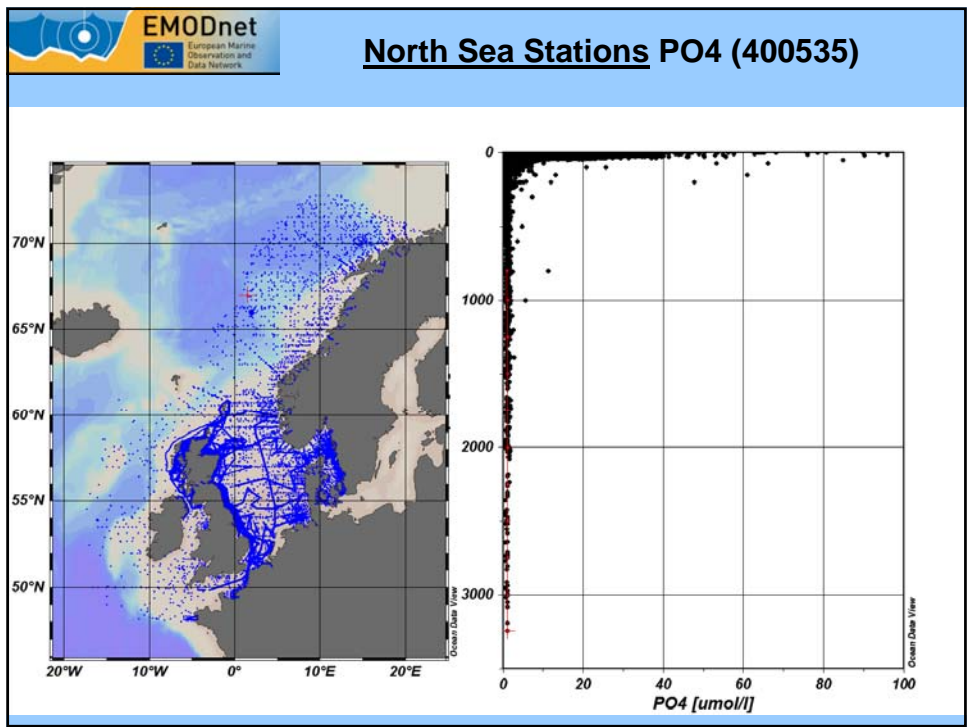
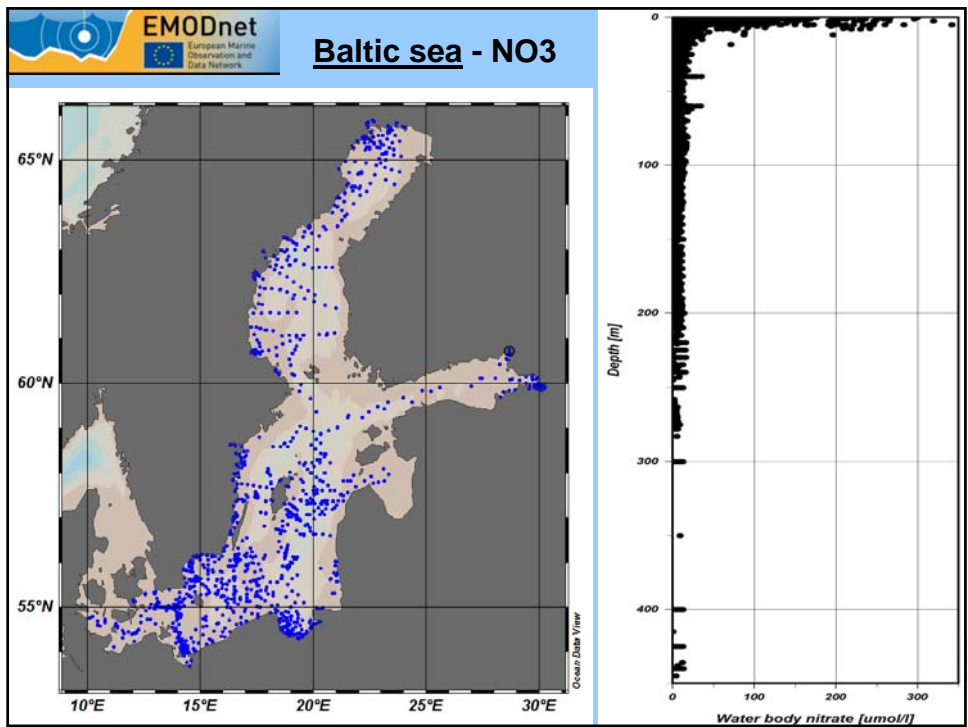


| Group of Variables | Greater North Sea - Celtic Sea - Norwegian Sea | Baltic Sea | Iberian peninsula - Macaronesia | Mediterranean Sea | Black Sea - Sea of Azov |
|-------------------------|--|------------|---------------------------------|-------------------|-------------------------|
| Acidity | ■ | ■ | ■ | ■ | ■ |
| Antifoulants | ■ | ■ | ■ | ■ | ■ |
| Chlorophyll | ■ | ■ | ■ | ■ | ■ |
| Fertilisers | ■ | ■ | ■ | ■ | ■ |
| Hydrocarbons | ■ | ■ | ■ | ■ | ■ |
| Heavy metals | ■ | ■ | ■ | ■ | ■ |
| Organic matter | ■ | ■ | ■ | ■ | ■ |
| Pesticides and biocides | ■ | ■ | ■ | ■ | ■ |
| Pharmaceuticals | ■ | ■ | ■ | ■ | ■ |
| Radionuclides | ■ | ■ | ■ | ■ | ■ |
| Silicates | ■ | ■ | ■ | ■ | ■ |

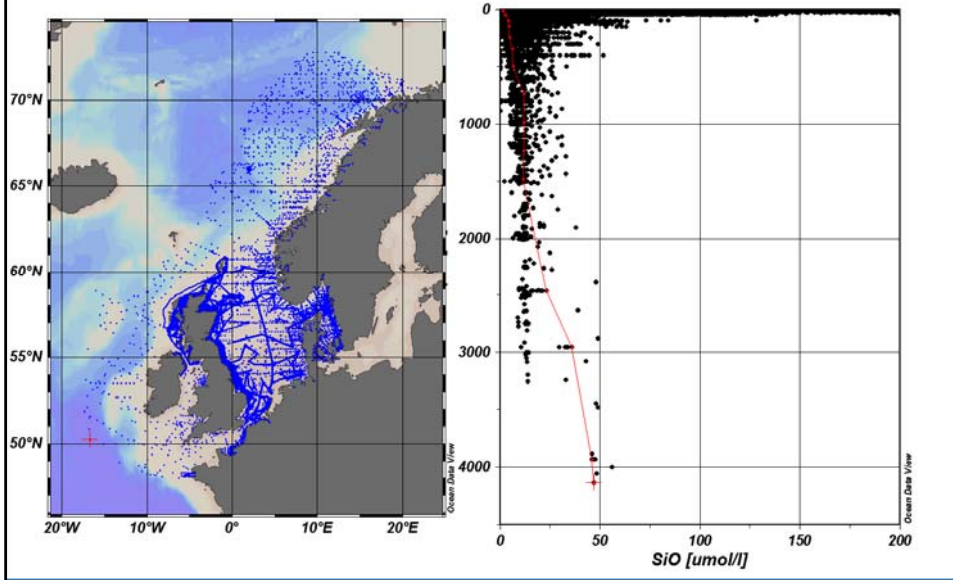
Data Validation Loop



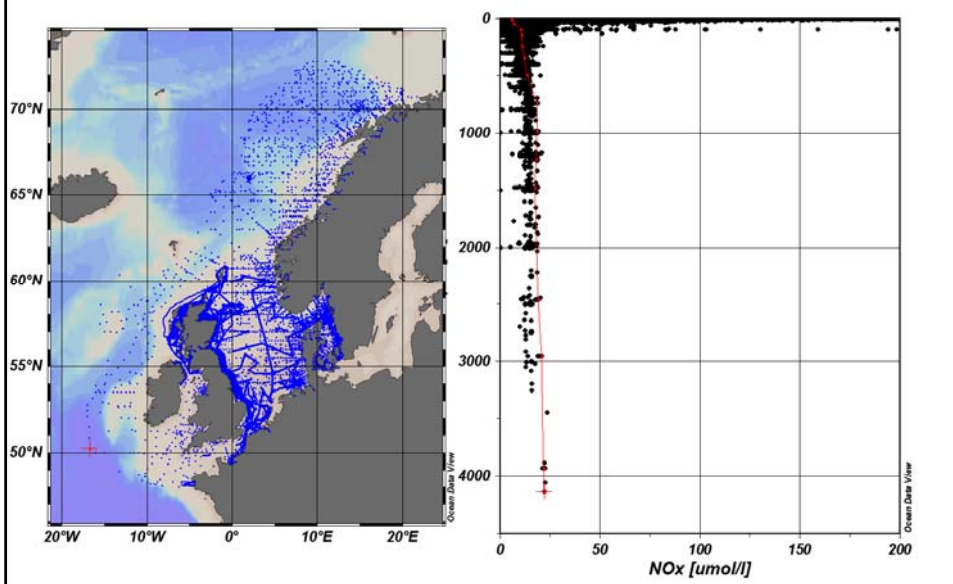




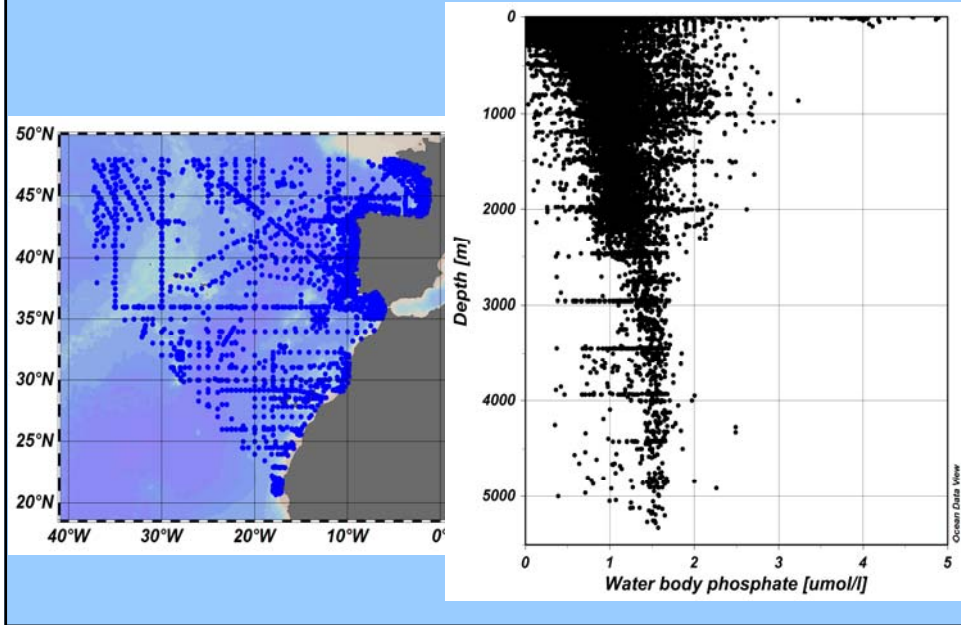
North Sea Stations SiO (309421)



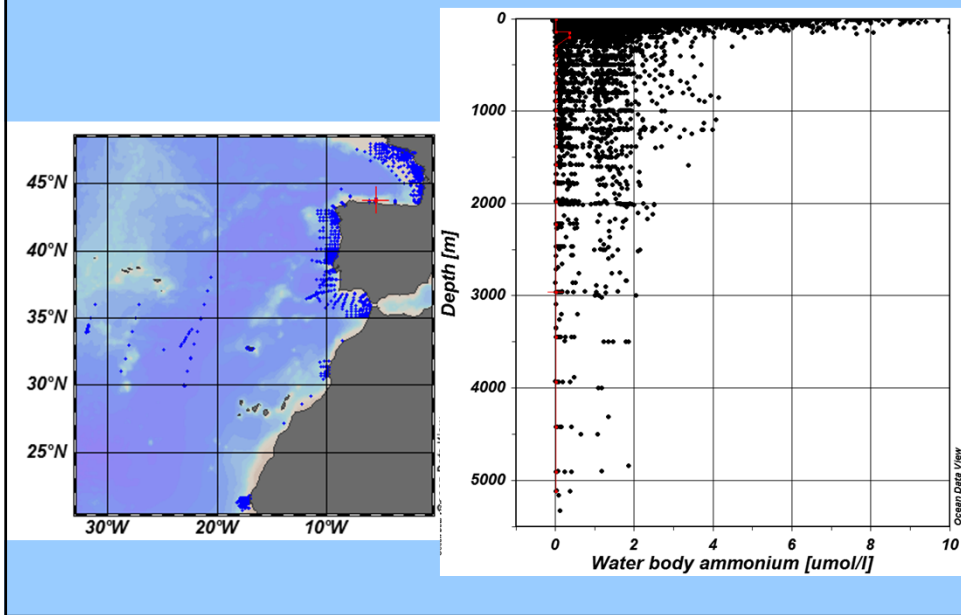
North Sea Stations NOx (346555)

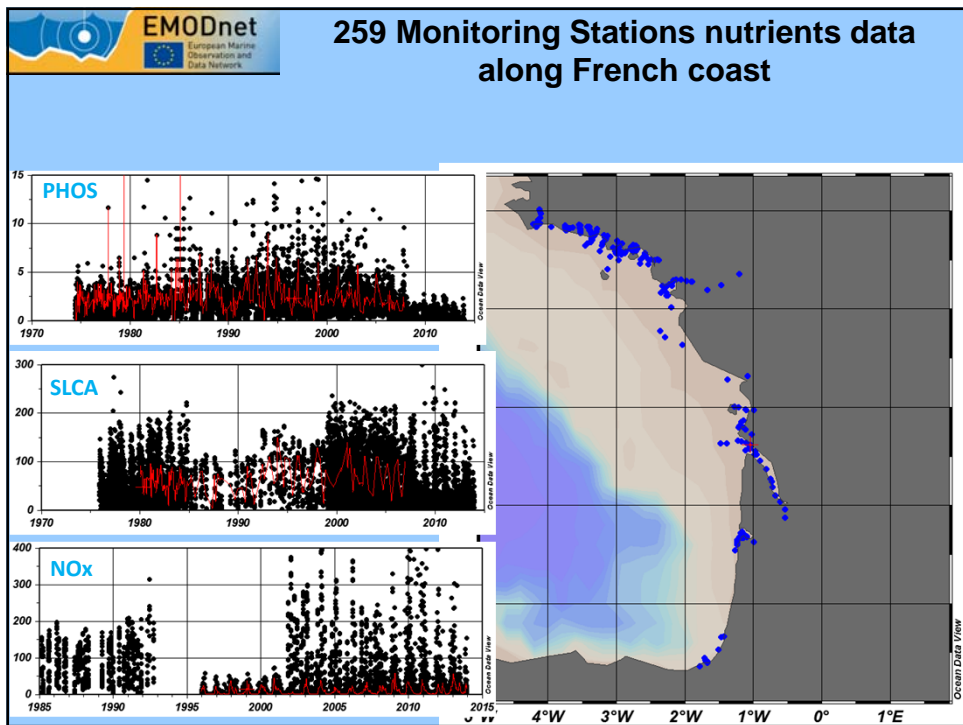
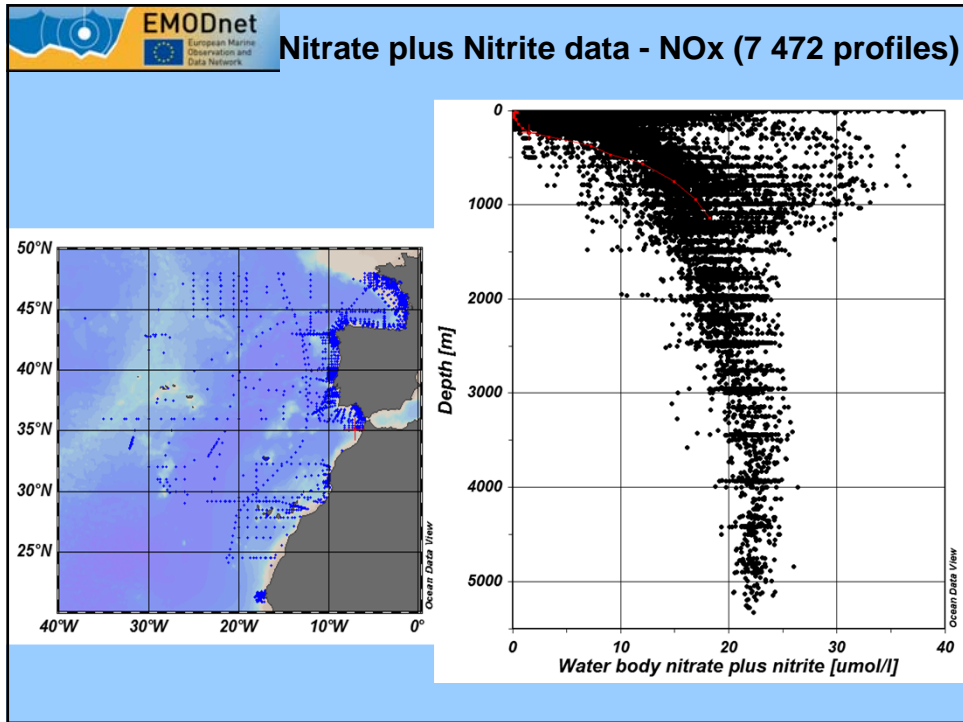


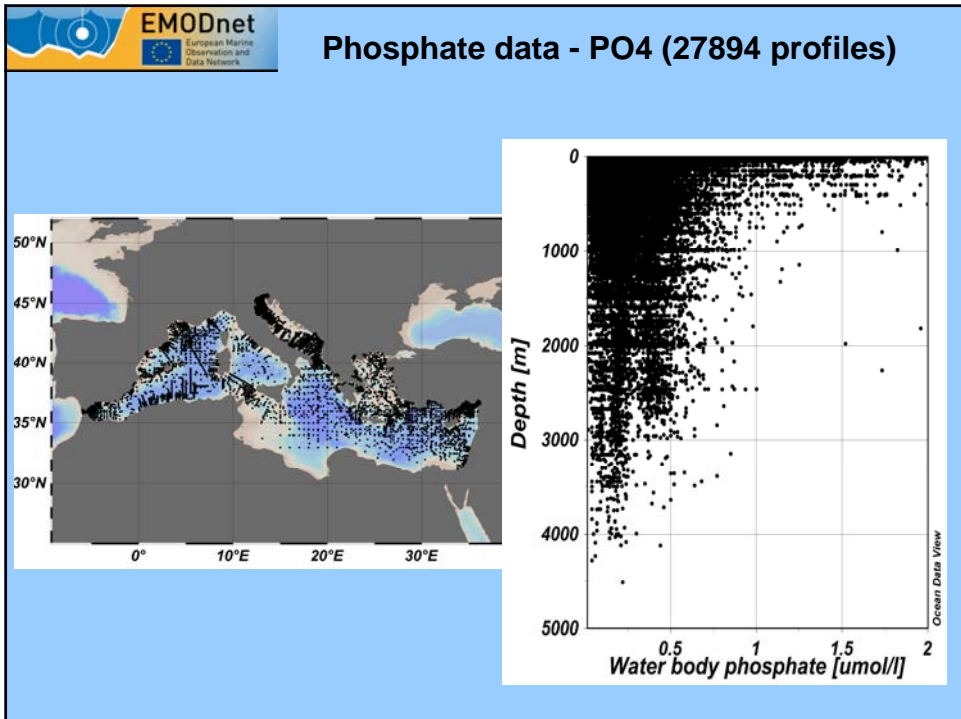
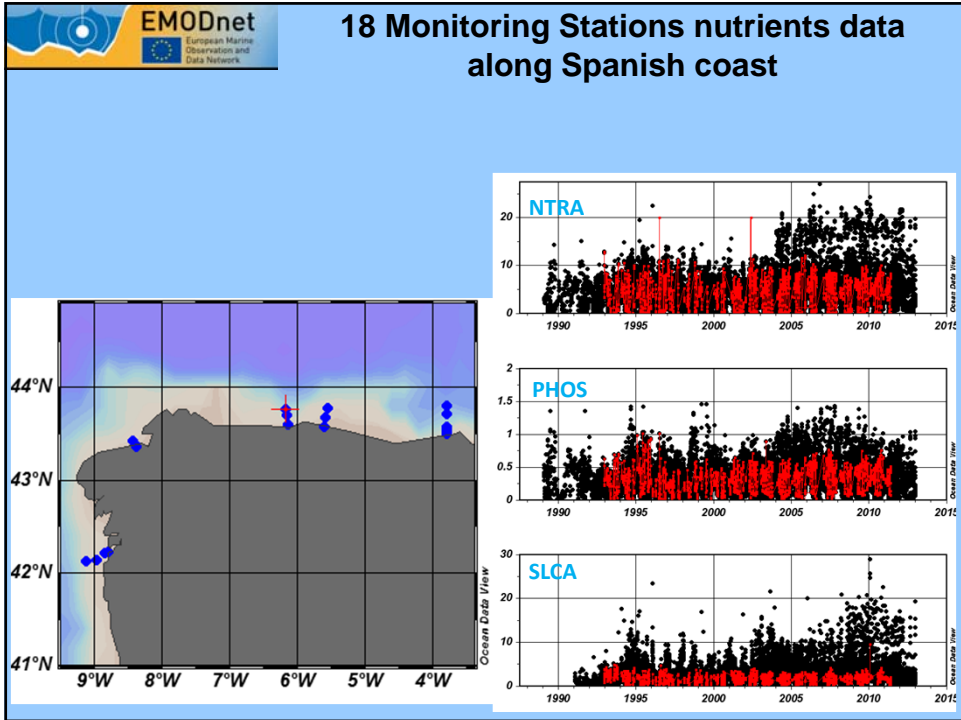
Phosphate data - PO4 (11 319 profiles)



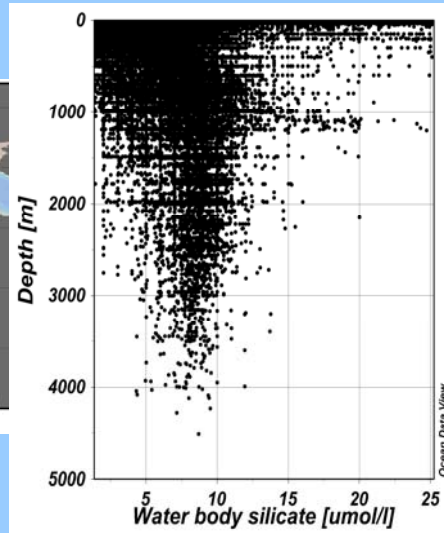
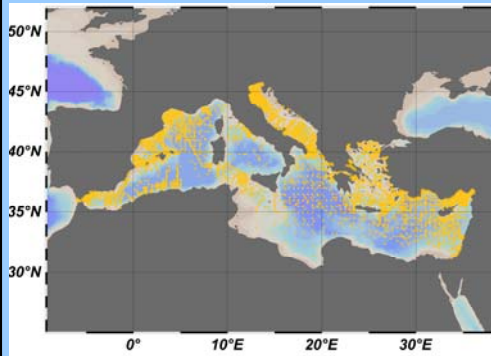
Ammonium data - AMON (5 001 profiles)



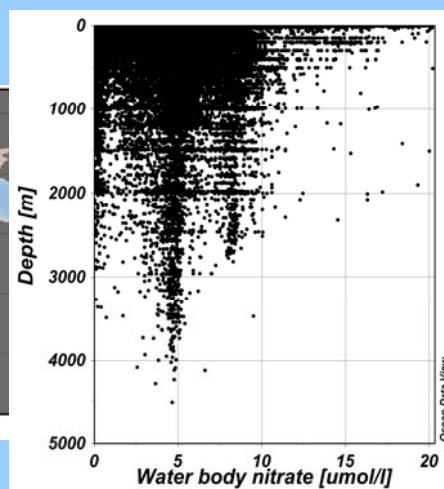
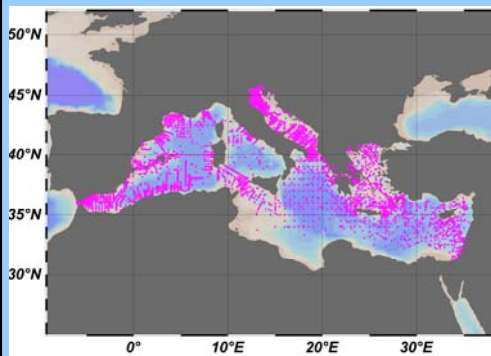


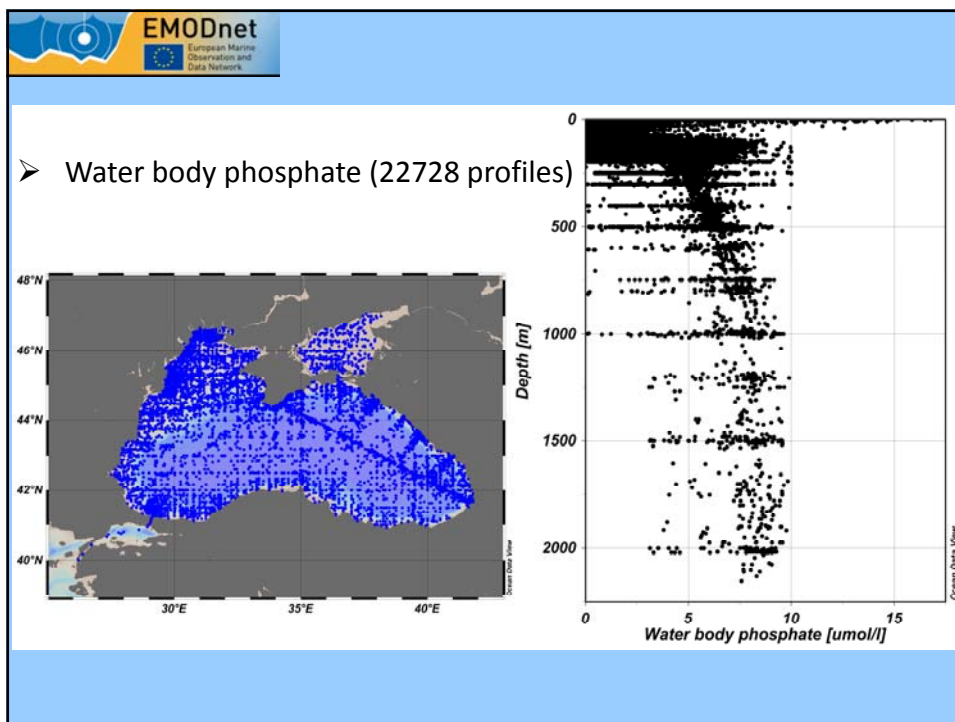
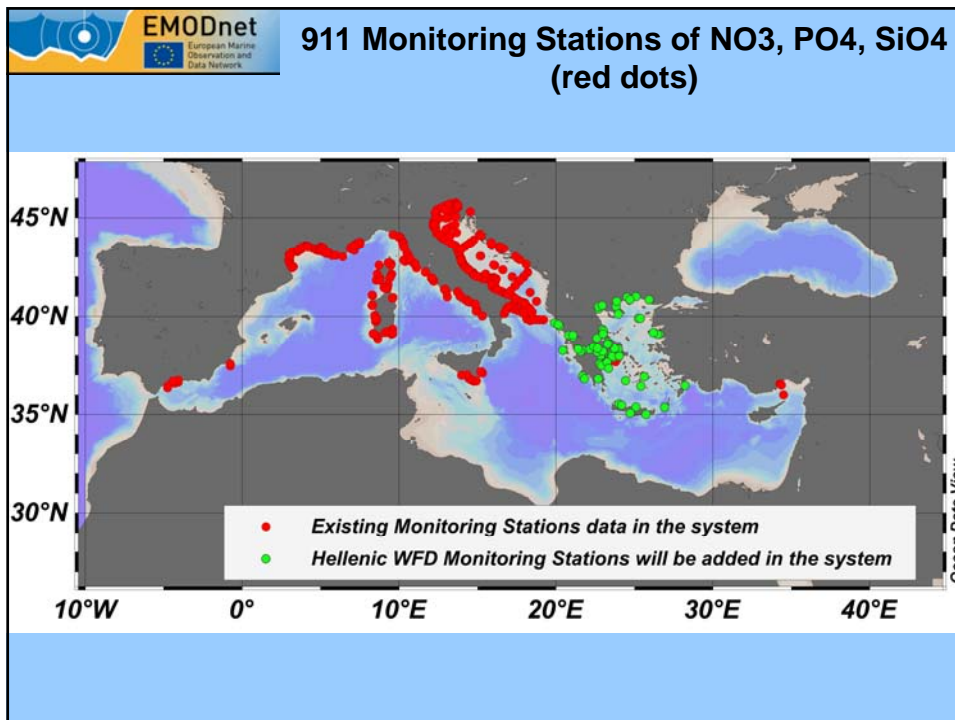


Silicate data - SiO₄ (23102 profiles)

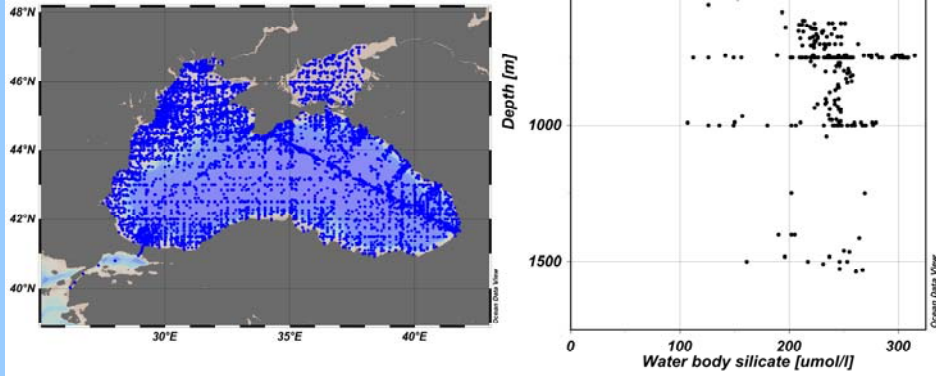


Nitrate data-NO₃ (21875 profiles)

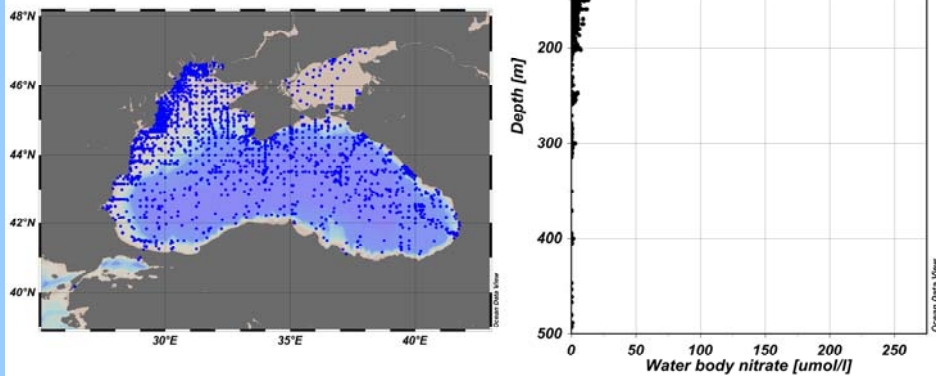


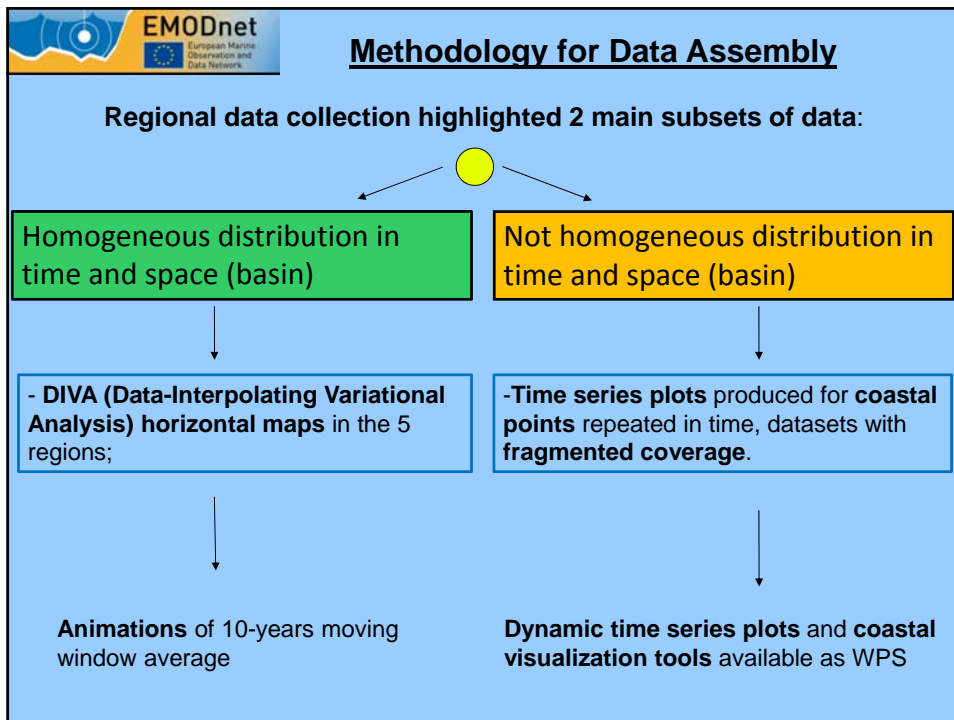


➤ Water body silicate (18998 profiles)



➤ Water body nitrate (8274 profiles)





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DIVA horizontal maps

Parameters: **NO3**, NOx, Total Nitrogen, **PO4**, Total Phosphorus, **SiO4**, NH4
+ Alkalinity, pH, Dissolved Oxygen and Chlorophyll-a

Time period: 10 year periods with yearly step from 1960 to 2014 (46 periods of 10 year), by seasons

Seasons: 4 defined per region

Vertical layers: standard defined per region

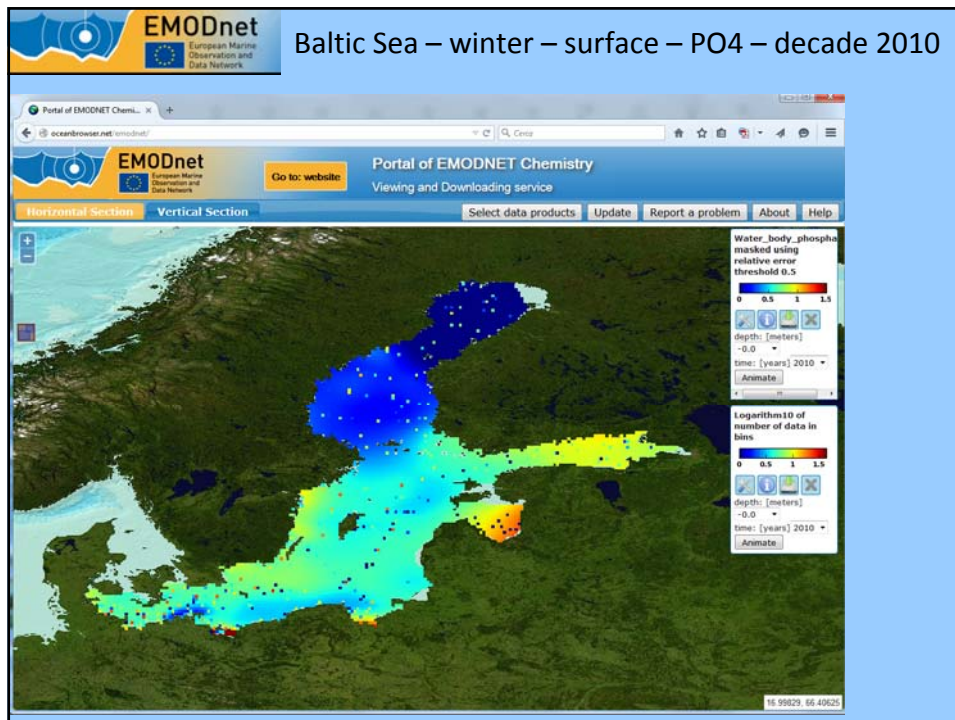
10 years moving windows to reveal long term variabilities (trends)
Centered in the middle of the decade

- 1961 until 1970 as 1965
-

Reference field

- Climatic seasonal mean from all available years (with detrending for removal of uneven spatial distribution in time)

Without detrending



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Dynamic plots

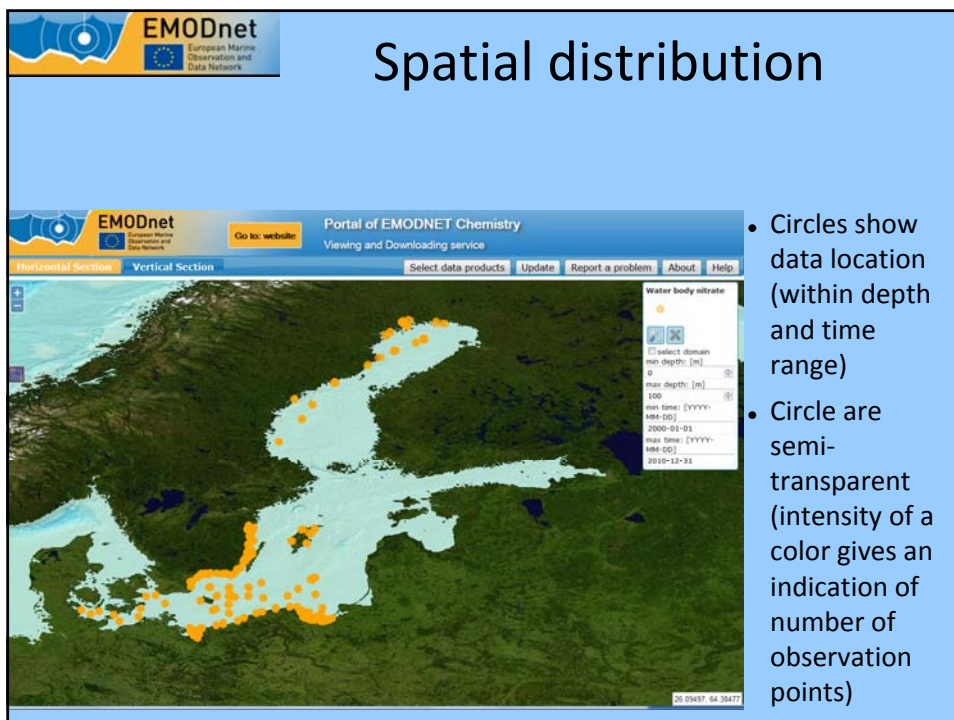
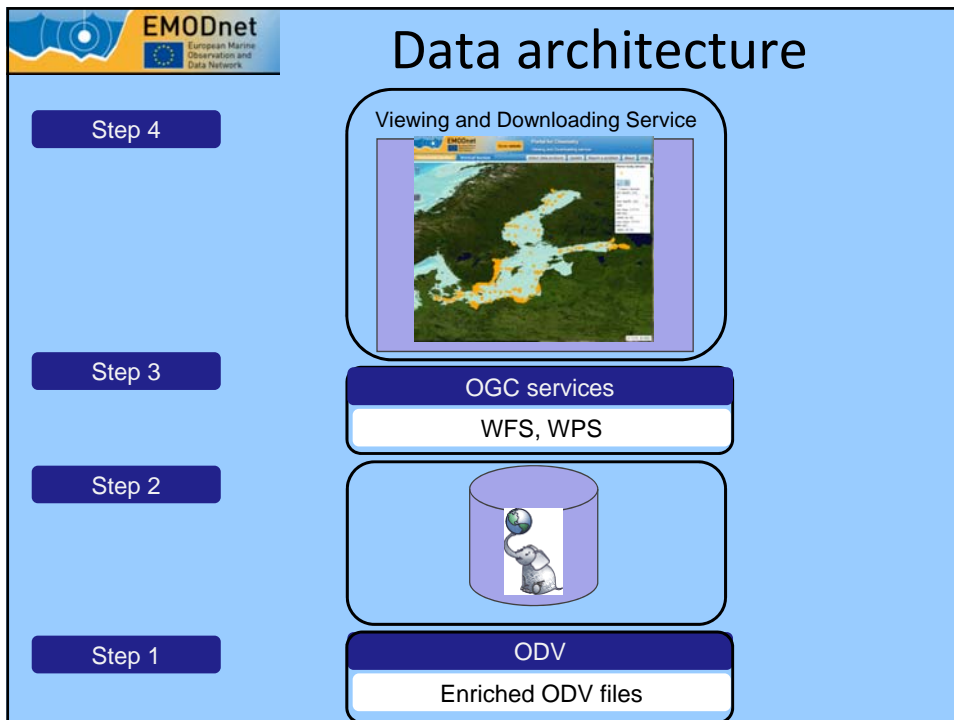
Parameters: NO₃, NO_x, Total Nitrogen, PO₄, Total Phosphorus, SiO₄, NH₄
+ Alkalinity, pH, Dissolved Oxygen and Chlorophyll-a

Time period: defined by the user (default is 2000-2001)

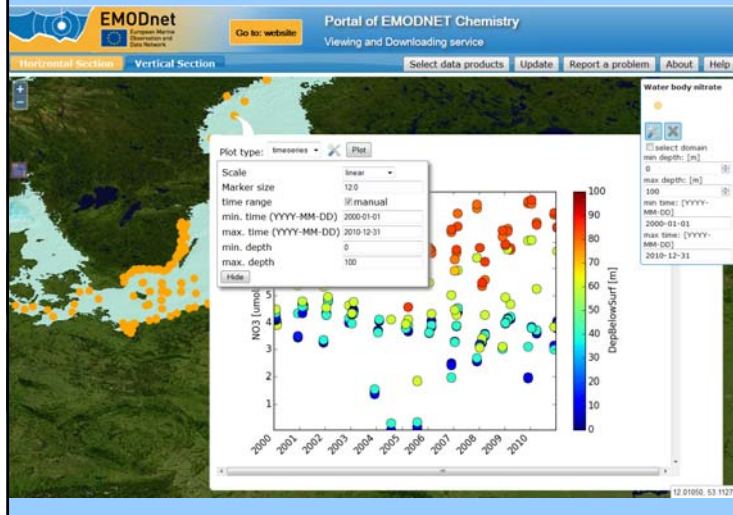
Vertical layers: defined by the user (default is 0-10m)

Selecting a parameter you get dynamically (WFS, WPS OGC services):

- Spatial distributions
- Time series plots
- Vertical profiles

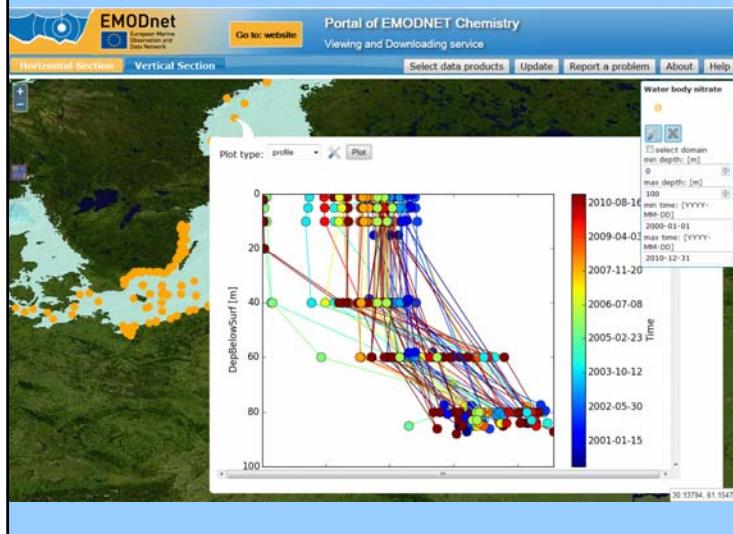


Time series

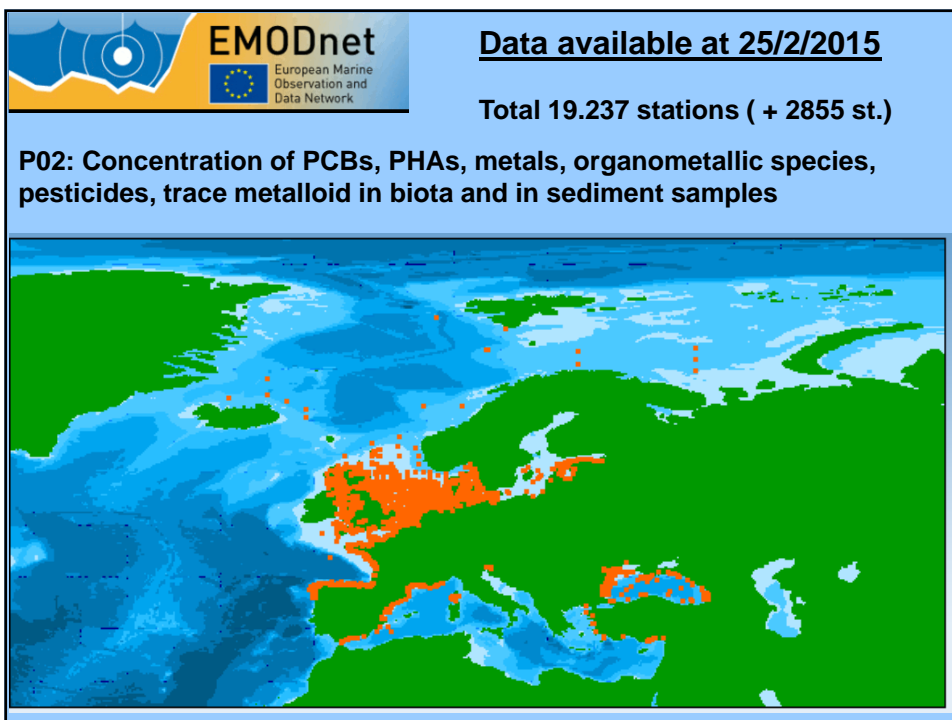
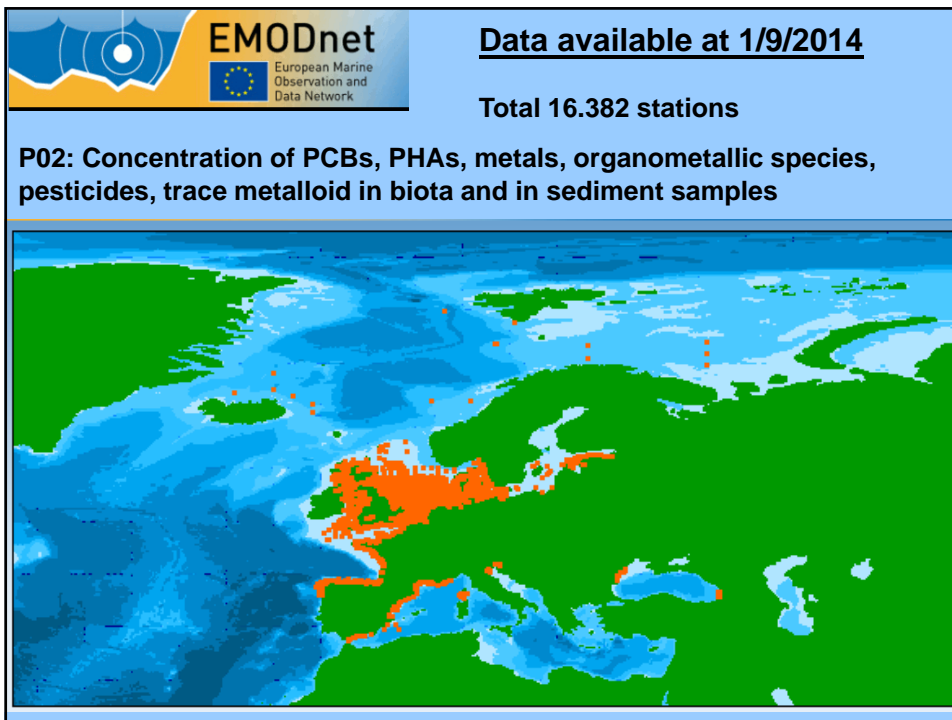


- Clicking on a circle
- Time series plots (x-axis: time; y-axis: parameter)
- Depth is represented by color

Profiles



- One can switch between time series and profile view
- For profiles (x-axis: parameter and; y-axis: depth)
- Time is represented by color



Future planning

2015:

- Complete **DIVA maps** for nutrients and silicates with 10-year moving window, seasons, vertical layers
- Optimisation of **performances** for dynamic plots with data from 5 regions
- Start regional data collections for **contaminants**, including the data validation loop
- Expert workshop, 21.10.2015, Oostende (as part of EMODnet Jamboree)

2016:

- Compute **DIVA maps** for dissolved oxygen, acidity and chlorophyll with 10-year moving window, seasons, vertical layers
- Depending on the data distribution, local/coastal horizontal maps of **contaminants** in the sediments