




EMODnet
European Marine
Observation and
Data Network

EMODNet Chemistry Lot
(MARE/2012/10)

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21° MODEG meeting, Oostende February 2014



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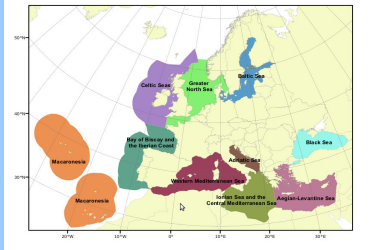
Chemistry Lot:

- **Where and what;**
- **Data collection and Metadata Compilation;**
- **Products;**
- **Recent updates/ open issues;**
- **Ongoing activities.**

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The portal should cover all European waters

- 1| Adriatic Sea
- 2| Aegean Levantine Sea
- 3| Baltic Sea
- 4| Black Sea
- 5| Celtic Seas
- 6| Greater North Sea
- 7| Iberian Coast and Bay of Biscay
- 8| Ionian Sea and Central Mediterranean
- 9| Macaronesia
- 10| Norwegian Sea
- 11| Western Mediterranean Sea



Note: This map is derived from the EU Tender document but lacks the Norwegian sea


The parameters:
In 3 matrices:
-water column;
-biota;
-sediment.

Group	Examples
pesticides and biocides	DDT, HCB
antifoulants	TBT, TPT
Pharmaceuticals	oxytetracycline
heavy metals	mercury, cadmium, lead
Hydrocarbons	anthracene, fluoroanthene
Radionuclides	Cs ¹³⁷ , Pu ²³⁹
fertilisers	nitrogen (DIN, TN), phosphorus (DIP, TP)
organic matter(e.g. from sewers or mariculture)	total carbon (TOC)
Chlorophyll	
Silicates	
partial pressures of dissolved gases	oxygen, carbon dioxide
Plastics	polyethylene, polypropylene
Acidity (from pH, pCO ₂ , Total Inorganic Carbon, alkalinity)	pH

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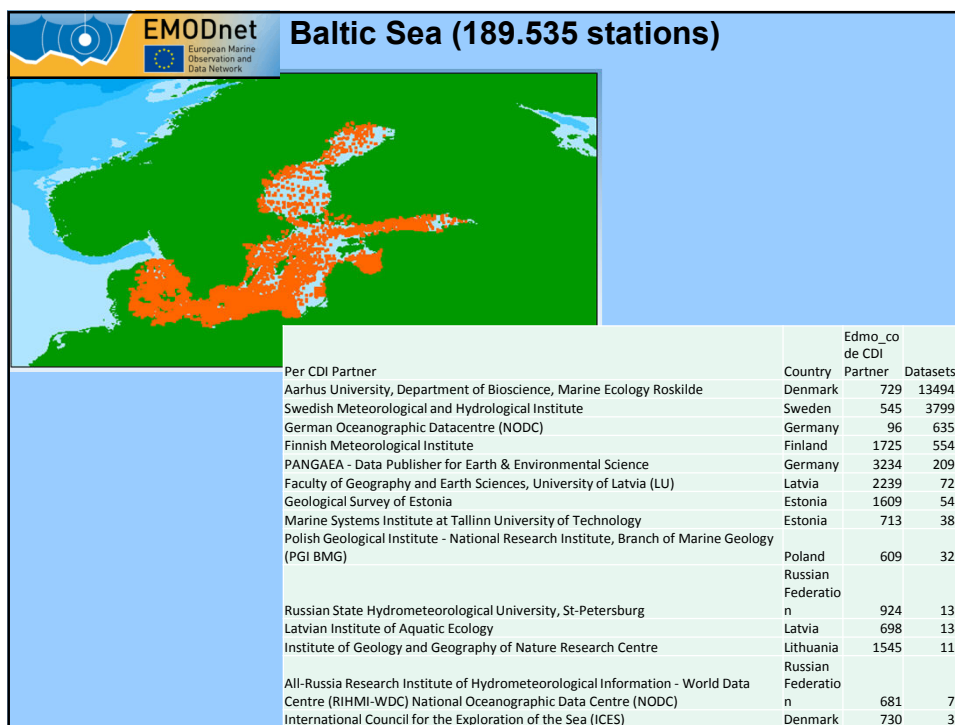
Data Collection and Metadata Compilation :

Sub-regional seas of Europe, as specified in the Marine Strategy Framework Directive (MSFD DIKE 5/12/08)



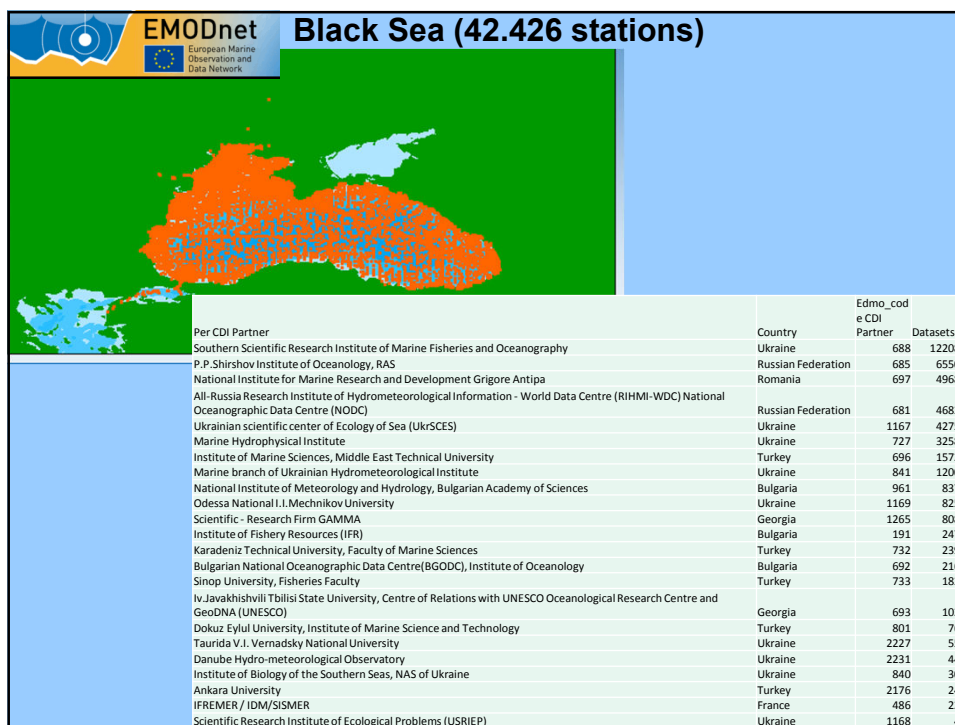
Data harvesting (WP1) and maps generation (WP2) is organized at Regional level. 5 sea regions have been defined as:

- **Greater North Sea** (including **Norwegian Sea** and **Celtic Sea**);
- **Atlantic Sea** (including **Atlantic Coast** and **Macaronesia**);
- **Baltic Sea**;
- **Black Sea**;
- **Mediterranean Sea**.



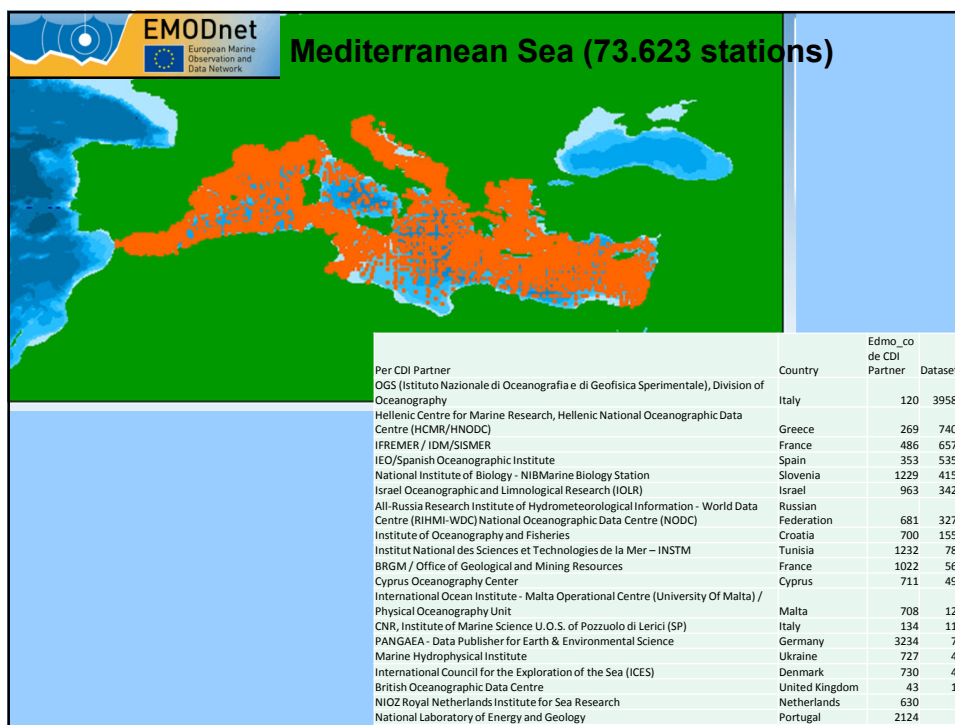
Baltic Sea

Per Discovery Parameter	Datasets	Per Discovery Parameter	Datasets
Dissolved oxygen parameters in the water column	165745	Sediment water content, porosity and surface area	281
Temperature of the water column	114931	Dissolved inorganic nitrogen concentration in the water column	277
Salinity of the water column	114914	Concentration of polycyclic aromatic hydrocarbons (PAHs) in sediment samples	272
Phosphate concentration parameters in the water column	93135	Organometallic species concentration parameters in sediments	175
Nitrate concentration parameters in the water column	87511	Geological sample radioactivity	167
Ammonium concentration parameters in the water column	78058	Concentration of other organic contaminants in the water column	154
Silicate concentration parameters in the water column	70276	Concentration of polychlorobiphenyls (PCBs) in sediment samples	148
Chlorophyll pigment concentrations in the water column	70241	Pesticide concentrations in sediment	127
Particulate total and organic nitrogen concentrations in the water column	57756	Reference numbers	122
Particulate total and organic phosphorus concentrations in the water column	54233	Metal concentrations in biota	121
Nitrite concentration parameters in the water column	37144	Pesticide concentrations in biota	121
Dissolved total or organic phosphorus concentration in the water column	34441	Density of the water column	111
Dissolved total and organic nitrogen concentrations in the water column	29373	Concentration of polychlorobiphenyls (PCBs) in the water column	94
Alkalinity, acidity and pH of the water column	13336	Radioactivity in the water column	86
Particulate total and organic carbon concentrations in the water column	11625	Moored instrument depth	75
Dissolved organic carbon concentration in the water column	7846	Fish morphology, age and physiology	74
Vertical spatial coordinates	3490	Pesticide concentrations in water bodies	74
Concentration of inorganic sulphur species in the water column	2810	Carbon concentrations in sediment	73
Inorganic chemical composition of sediment or rocks	1935	Concentration of inorganic sulphur species in sediment	66
Variable fluorescence parameters	1708	Concentration of polycyclic aromatic hydrocarbons (PAHs) in biota	47
Sediment grain size parameters	1355	Metadata parameters	47
Secchi disk depth	1139	Organometallic species concentration parameters in biota	47
Lithology	542	Shellfish morphology, age and physiology	47
Phaeopigment concentrations in the water column	539	Zooplankton and zoobenthos morphological parameters	47
Concentration of other organic contaminants in sediment samples	509	Particulate metal concentrations in the water column	33
Dissolved metal concentrations in the water column	410	Concentration of polycyclic aromatic hydrocarbons (PAHs) in the water column	16
Dissolved concentration parameters for other gases in the water column	285	Mineralogical composition	12

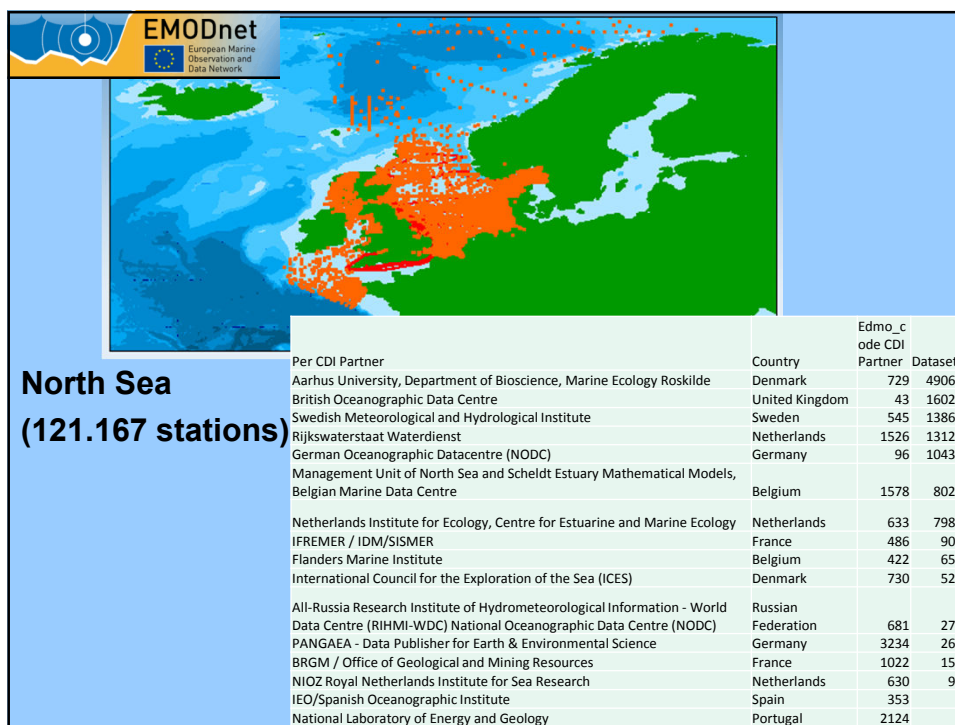


EMODnet Black Sea

Per Discovery Parameter	Datasets	Per Discovery Parameter	Datasets
Dissolved oxygen parameters in the water column	32160	Secchi disk depth	837
Temperature of the water column	25759	Dissolved concentration parameters for other gases in the water column	713
Salinity of the water column	25511	Inorganic chemical composition of sediment or rocks	588
Phosphate concentration parameters in the water column	21306	Total metal concentrations in water bodies	582
Density of the water column	15788	Dissolved metal concentrations in the water column	498
Silicate concentration parameters in the water column	15699	Primary production in the water column	395
Nitrate concentration parameters in the water column	9777	Electrical conductivity of the water column	379
Nitrite concentration parameters in the water column	9385	Concentration of polychlorobiphenyls (PCBs) in the water column	372
Vertical spatial coordinates	7783	Dissolved organic carbon concentration in the water column	238
Ammonium concentration parameters in the water column	5182	Pesticide concentrations in sediment	233
Alkalinity, acidity and pH of the water column	4339	Concentration of other organic contaminants in sediment samples	177
Moored instrument depth	3853	Concentration of alkanes in the water column	122
Concentration of other organic contaminants in the water column	2168	Concentration of inorganic halogens in water bodies	121
Unspecified	2113	Dissolved inorganic nitrogen concentration in the water column	65
Dissolved total and organic nitrogen concentrations in the water column	1523	Concentration of dissolved organic matter in the water column	44
Chlorophyll pigment concentrations in the water column	1369	Total dissolved inorganic carbon (TCO2) concentration in the water column	25
Particulate total and organic phosphorus concentrations in the water column	1286	Light absorption in the water column	24
Radioactivity in the water column	1228	Particulate total and organic carbon concentrations in the water column	20
Particulate total and organic nitrogen concentrations in the water column	1220	Phytoplankton taxonomic abundance in water bodies	14
Concentration of inorganic sulphur species in the water column	1153	Dissolved trace metalloid concentrations in the water column	4
Concentration of other hydrocarbons in the water column	1090	Temperature variation in the water column	2
Concentration of suspended particulate material in the water column	1055	Air pressure	1
Dissolved total or organic phosphorus concentration in the water column	938	Engineering parameters	1
Pesticide concentrations in water bodies	921	Sediment lipid concentrations	1



Per Discovery Parameter	Datasets	Per Discovery Parameter	Datasets
Dissolved oxygen parameters in the water column	66048	Electrical conductivity of the water column	573
Salinity of the water column	64531	Sediment grain size parameters	559
Temperature of the water column	63156	Lithology	308
Vertical spatial coordinates	62663	Phosphorus concentrations in suspended particulate material	270
Alkalinity, acidity and pH of the water column	29756	Primary production in the water column	159
Phosphate concentration parameters in the water column	24025	Regenerated production in water bodies	141
Nitrate concentration parameters in the water column	22605	New production in water bodies	139
Nitrite concentration parameters in the water column	20711	Total dissolved inorganic carbon (TCO2) concentration in the water column	135
Silicate concentration parameters in the water column	18961	Suspended particulate material grain size parameters	71
Chlorophyll pigment concentrations in the water column	14272	Urea concentration parameters in the water column	70
Ammonium concentration parameters in the water column	13849	Shellfish morphology, age and physiology	66
Redox potential in sediment	10092	Excretion rate parameters in the water column	55
Raw fluorometer output	7825	Nitrification rate in the water column	54
Transmittance and attenuation of the water column	7287	Concentration of inorganic halogens in water bodies	47
Particulate total and organic nitrogen concentrations in the water column	6080	Radioactivity in the water column	41
Dissolved total or organic phosphorus concentration in the water column	3689	Concentration of polycyclic aromatic hydrocarbons (PAHs) in biota	38
Particulate total and organic phosphorus concentrations in the water column	3529	Metal concentrations in biota	38
Moored instrument depth	3276	Concentration of polychlorobiphenyls (PCBs) in biota	33
Particulate total and organic carbon concentrations in the water column	2958	Pesticide concentrations in biota	33
Phaeopigment concentrations in the water column	2901	Trace metalloid concentrations in biota	33
Density of the water column	2419	Mineralogical composition	26
Unspecified	2212	Carbon concentrations in sediment	21
Concentration of suspended particulate material in the water column	2164	Concentration of carbohydrates, phenols, alkanols (alcohols), aldehydes and ketones in water bodies	17
Dissolved inorganic nitrogen concentration in the water column	1721	Concentration of proteins in the water column	17
Reference numbers	1626	Dissolved organic carbon concentrations in sediment pore waters	16
Dissolved organic carbon concentration in the water column	1402	Nitrogen concentrations in sediment	16
Date and time	1213	Nutrient concentrations in sediment pore waters	16
Dissolved total and organic nitrogen concentrations in the water column	948	Temperature variation in the water column	8
Variable fluorescence parameters	933	Concentration of organic matter in sediments	5
Visible waveband radiance and irradiance measurements in the water column	717	Phytoplankton taxonomic abundance in water bodies	5
Inorganic chemical composition of sediment or rocks	654	Acoustic backscatter in the water column	2
Optical backscatter	643	Platform or instrument orientation	2
Horizontal velocity of the water column (currents)	632	Visible waveband radiance and irradiance measurements in the atmosphere	2

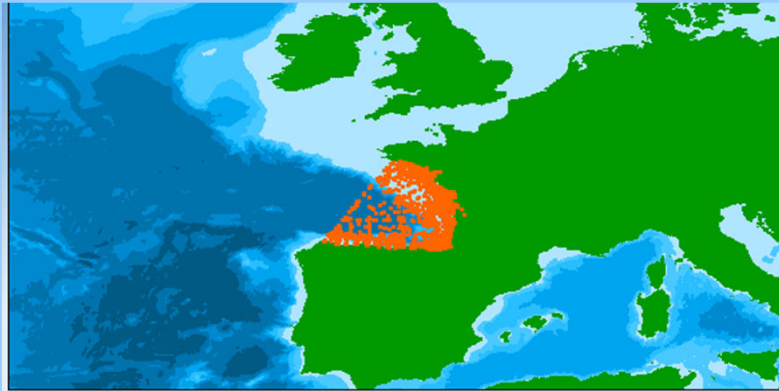


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North Sea

Per Discovery Parameter	Datasets	Per Discovery Parameter	Datasets
Dissolved oxygen parameters in the water column	81146	Concentration of polychlorobiphenyls (PCBs) in sediment samples	1211
Salinity of the water column	65235	Concentration of polycyclic aromatic hydrocarbons (PAHs) in suspended particulate material	1051
Temperature of the water column	64564	Pesticide concentrations in sediment	947
Phosphate concentration parameters in the water column	50449	Particulate metal concentrations in the water column	946
Nitrate concentration parameters in the water column	44290	Pesticide concentrations in biota	927
Ammonium concentration parameters in the water column	38861	Concentration of polycyclic aromatic hydrocarbons (PAHs) in biota	864
Silicate concentration parameters in the water column	35734	Radioactivity in the water column	725
Chlorophyll pigment concentrations in the water column	31308	Concentration of other organic contaminants in suspended particulate material	636
Nitrite concentration parameters in the water column	28512	Total metal concentrations in water bodies	634
Dissolved total or organic phosphorus concentration in the water column	21286	Organometallic species concentration parameters in sediments	502
Particulate total and organic nitrogen concentrations in the water column	18152	Nitrogen concentrations in sediment	484
Particulate total and organic phosphorus concentrations in the water column	15384	Carotenoid pigment concentrations in the water column	473
Dissolved total and organic nitrogen concentrations in the water column	12023	Unclassified pigment concentrations in the water column	473
Alkalinity, acidity and pH of the water column	11187	Concentration of polycyclic aromatic hydrocarbons (PAHs) in the water column	445
Concentration of suspended particulate material in the water column	9581	Pesticide concentrations in water bodies	426
Dissolved organic carbon concentration in the water column	8027	Urea concentration parameters in the water column	408
Secchi disk depth	5655	Sediment water content, porosity and surface area	367
Particulate total and organic carbon concentrations in the water column	5560	Concentration of polychlorobiphenyls (PCBs) in the water column	329
Raw temperature and/or salinity instrument output	5261	Terrestrial detritus in the water column suspended particulate material	322
Raw oxygen sensor output	5151	Acoustic backscatter in the water column	281
Raw fluorometer output	5149	Moored instrument depth	277
Concentration of polycyclic aromatic hydrocarbons (PAHs) in sediment samples	4709	Geological sample radioactivity	218
Phaeopigment concentrations in the water column	4609	Concentration of other hydrocarbons in the water column	205
Transmittance and attenuation of the water column	4449	Suspended particulate material aggregates	176
Concentration of inorganic sulphur species in the water column	4236	Concentration of polychlorobiphenyls (PCBs) in suspended particulate material	163
Nitrogen concentrations in suspended particulate material	3752	Oxygen production and respiration in the water column	136
Dissolved metal concentrations in the water column	3727	Phaeopigment concentrations in sediment	108
Metal concentrations in biota	3621	Other physical and chemical properties of suspended particulate material	105
Carbon concentrations in sediment	3524	Raw in-situ nutrient analyser output	105
Raw light meter output	3409	Temperature variation in the water column	99
Optical backscatter	3330	Reference numbers	95
Sea level	3290	Organometallic species concentration parameters in biota	82
Density of the water column	3212	Organosulphur species concentration parameters in the water column	76
Carbon concentrations in suspended particulate material	3159	Concentration of other organic contaminants in biota	59
Dissolved inorganic nitrogen concentration in the water column	2987	Lithology	57
Visible waveband radiance and irradiance measurements in the water column	2640	Metadata parameters	50
Vertical spatial coordinates	2524	Shellfish morphology, age and physiology	50
Electrical conductivity of the water column	2155	Zooplankton and zoobenthos morphological parameters	50
Concentration of other organic contaminants in sediment samples	1729	Fish morphology, age and physiology	43
Concentration of other organic contaminants in the water column	1616	Concentration of organic matter in sediments	30
Inorganic chemical composition of sediment or rocks	1274	Bacteria generic abundance in water bodies	13
Raw suspended particulate material concentration sensor output	1257	Phytoplankton taxonomic abundance in water bodies	8
Sediment grain size parameters	1245	Air temperature	2

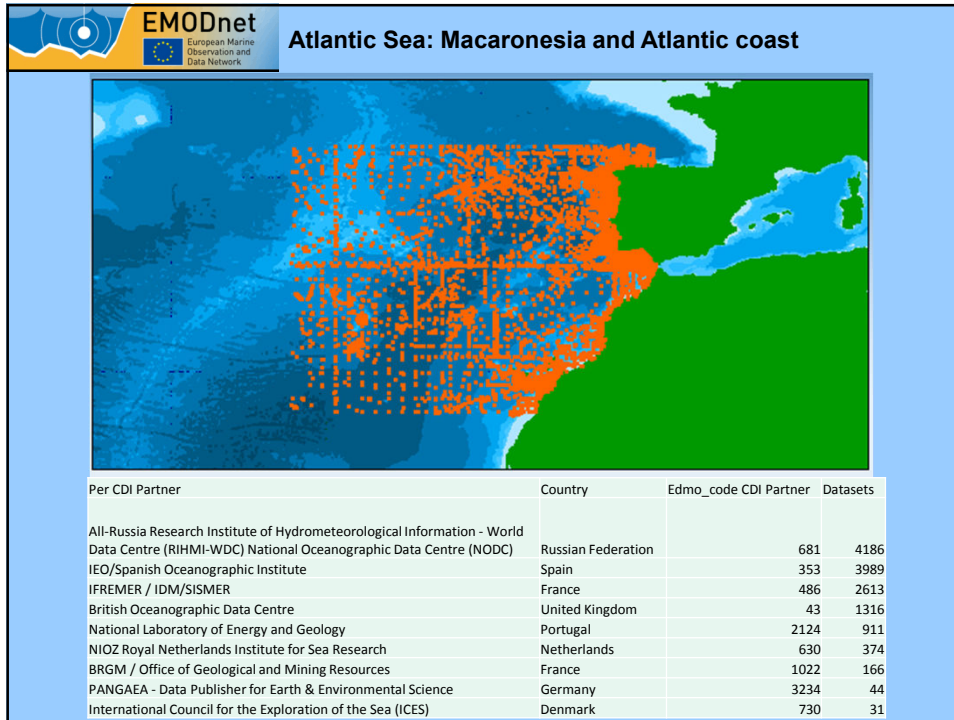
Atlantic Sea: Bay of Biscay



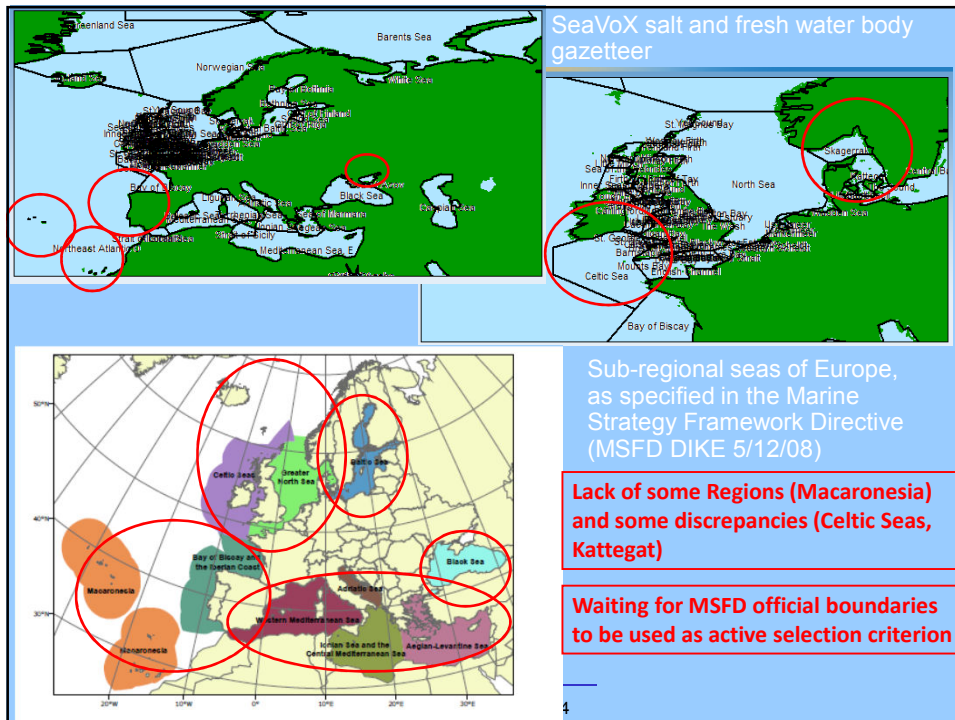
Per CDI Partner	Country	Edmo_co de CDI Partner	Datasets
IEO/Spanish Oceanographic Institute	Spain	353	2895
IFREMER / IDM/SISMER	France	486	2115
BRGM / Office of Geological and Mining Resources	France	1022	180
All-Russia Research Institute of Hydrometeorological Information - World Data Centre (RIHMI-WDC) National Oceanographic Data Centre (NODC)	Russian Federation	681	34
British Oceanographic Data Centre	United Kingdom	43	13
International Council for the Exploration of the Sea (ICES)	Denmark	730	2


Atlantic Sea: Bay of Biscay

Per Discovery Parameter	Datasets	Per Discovery Parameter	Datasets
Vertical spatial coordinates	5009	Alkalinity, acidity and pH of the water column	268
Salinity of the water column	3399	Phytoplankton taxonomic abundance in water bodies	260
Temperature of the water column	3289	Bacteria generic abundance in water bodies	244
Dissolved oxygen parameters in the water column	3204	Inorganic chemical composition of sediment or rocks	182
Phosphate concentration parameters in the water column	2391	Primary production in the water column	180
Nitrate concentration parameters in the water column	2339	Lithology	177
Nitrite concentration parameters in the water column	2265	Sediment grain size parameters	176
Silicate concentration parameters in the water column	2226	Particulate total and organic phosphorus concentrations in the water column	120
Ammonium concentration parameters in the water column	1978	Visible waveband radiance and irradiance measurements in the atmosphere	98
Chlorophyll pigment concentrations in the water column	1942	Dissolved organic carbon concentration in the water column	83
Visible waveband radiance and irradiance measurements in the water column	1509	Raw suspended particulate material concentration sensor output	39
Raw fluorometer output	1377	Moored instrument depth	34
Concentration of suspended particulate material in the water column	674	Dissolved total or organic phosphorus concentration in the water column	12
Phaeopigment concentrations in the water column	672	Density of the water column	9
Particulate total and organic carbon concentrations in the water column	452	Electrical conductivity of the water column	5
Transmittance and attenuation of the water column	340	Carbon concentrations in sediment	1
Particulate total and organic nitrogen concentrations in the water column	302	Date and time	1
Urea concentration parameters in the water column	273	Horizontal spatial co-ordinates	1
		Mineralogical composition	1



Per Discovery Parameter	Datasets	Per Discovery Parameter	Datasets
Dissolved oxygen parameters in the water column	10614	Electrical conductivity of the water column	258
Salinity of the water column	10521	Particulate total and organic carbon concentrations in the water column	242
Temperature of the water column	10364	Particulate total and organic nitrogen concentrations in the water column	235
Vertical spatial coordinates	6619	Raw light meter output	167
Phosphate concentration parameters in the water column	6129	Unspecified	150
Moored instrument depth	4186	Sediment grain size parameters	133
Alkalinity, acidity and pH of the water column	3416	Phaeopigment concentrations in the water column	119
Nitrate concentration parameters in the water column	3209	Concentration of carbohydrates, phenols, alkanols (alcohols), aldehydes and ketones in water bodies	87
Silicate concentration parameters in the water column	3102	Concentration of proteins in the water column	87
Nitrite concentration parameters in the water column	2628	Geological sample density	78
Chlorophyll pigment concentrations in the water column	2350	Dissolved organic carbon concentration in the water column	77
Ammonium concentration parameters in the water column	2118	Nitrogen concentrations in sediment	48
Density of the water column	1255	Phosphorus concentrations in suspended particulate material	48
Transmittance and attenuation of the water column	950	Sediment water content, porosity and surface area	32
Raw fluorometer output	943	Water body lipid concentrations	32
Carbon concentrations in sediment	911	Total dissolved inorganic carbon (TCO2) concentration in the water column	25
Concentration of organic matter in sediments	884	Dissolved total or organic phosphorus concentration in the water column	21
Visible waveband radiance and irradiance measurements in the water column	714	Geological sample magnetic, electrical and acoustic properties	21
Inorganic chemical composition of sediment or rocks	590	Dissolved total and organic nitrogen concentrations in the water column	17
Suspended particulate material grain size parameters	582	Mineralogical composition	17
Primary production in the water column	572	Concentration of adenylates in the water column	2
Concentration of suspended particulate material in the water column	463	Lithology	2
Temperature variation in the water column	285	Date and time	1
Raw suspended particulate material concentration sensor output	283	Horizontal velocity of the water column (currents)	1





The Chemistry Lot Classic Data Products

• 2 main substets from the available data :

Homogeneous ditribution
In time and space (basins)

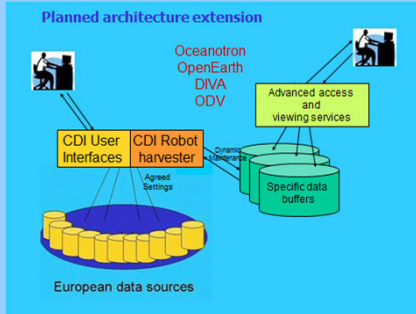
Not homogeneous ditribution
In time and space (basins)

Products generation:

- Standard Diva Interpolated maps produced for parameters with homogeneous data coverage, measured on basin scale;
- Time series plots showing stations distribution linked to plots of measured data for not homogeneous data (coastal points repeated in time, datasets with fragmented coverage.)

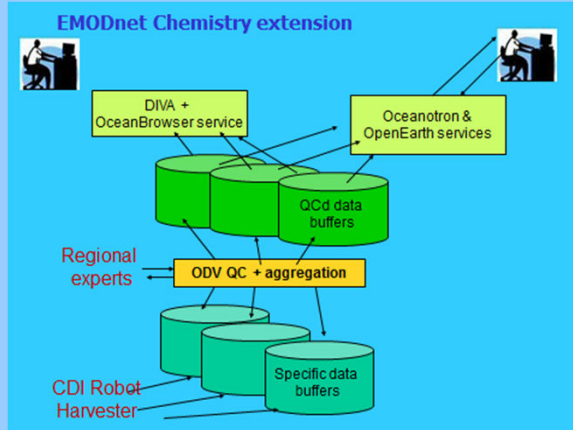
The Chemistry Lot Data Products updates

- New dynamic time series plots thanks to the new architecture under development;



- New Coastal visualization tools underdevelopment for Data Search and Products viewing interface;
- A Case Study for an Assessment Tool (Chase) → Pilot Area North Sea;

The Chemistry Lot Data Products



Products generation workflow:



Available Upgrades:

- **P02 vocab** for more detail on **parameters discovery** (linked to Disciplines);
- **C19 polygons** for Sea Regions selection;

The Chemistry Lot

EMODnet CDI V3 interface Pilot portal for Chemistry
Data Discovery and Access Service

Search

Free search:

Disciplines - Parameter groups: Administration and dimensions, Administration and dimensions, Atmosphere

Discovery parameters (circled in red): Acoustic backscatter in the water column, Air pressure, Air temperature

Sea regions (circled in red): All, World, > Arctic Ocean, > Baffin Bay

SeaVoX salt and fresh water body gazetteer (red text annotation)

P02 vocab for more detail on parameters discovery (red text annotation)

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Ongoing activities

- Data Collection and Metadata compilation (end of February).
- Regional datasets aggregation (Robot harvester);
- Regional QA/QC (mid April);
- Data products generation: DIVA maps (end of April);
- Regional (internal) validation (end of April);
- New data products: dynamic time series + new visualization (end of May).
- Collecting a list of best practices for data quality control (QC) and data quality assurances (QA) on EMODNet Chemical Parameters.
- Technical upgrade on the vocabularies:
 - factoring P01 code → for more flexible handling of parameters description;
 - new P35 vocab for “scientific validated aggregation” of homogeneous parameters.

Ongoing activities

- Waiting for MSFD Sea Areas official boundaries for data harvesting and product generation, data discovery and reporting.
- At month 12:
 - Plenary Meeting (17-18/6/2014, Split, Croatia)
 - Expert Workshop (19/6/2014, Split, Croatia) engaging MSFD experts, representatives of the RSCs, EEA, DG-MARE...
 - to evaluate the products quality and usefulness,
 - to review the results of the first year, gaps and next steps.

Thanks!
Questions?

