

# Outline

- Marine Strategy Framework Directive
  - Introduction
  - Descriptors > Indicators > Parameters
  - Data flows
- European Marine Observation and Data network
  - Introduction
  - Themes



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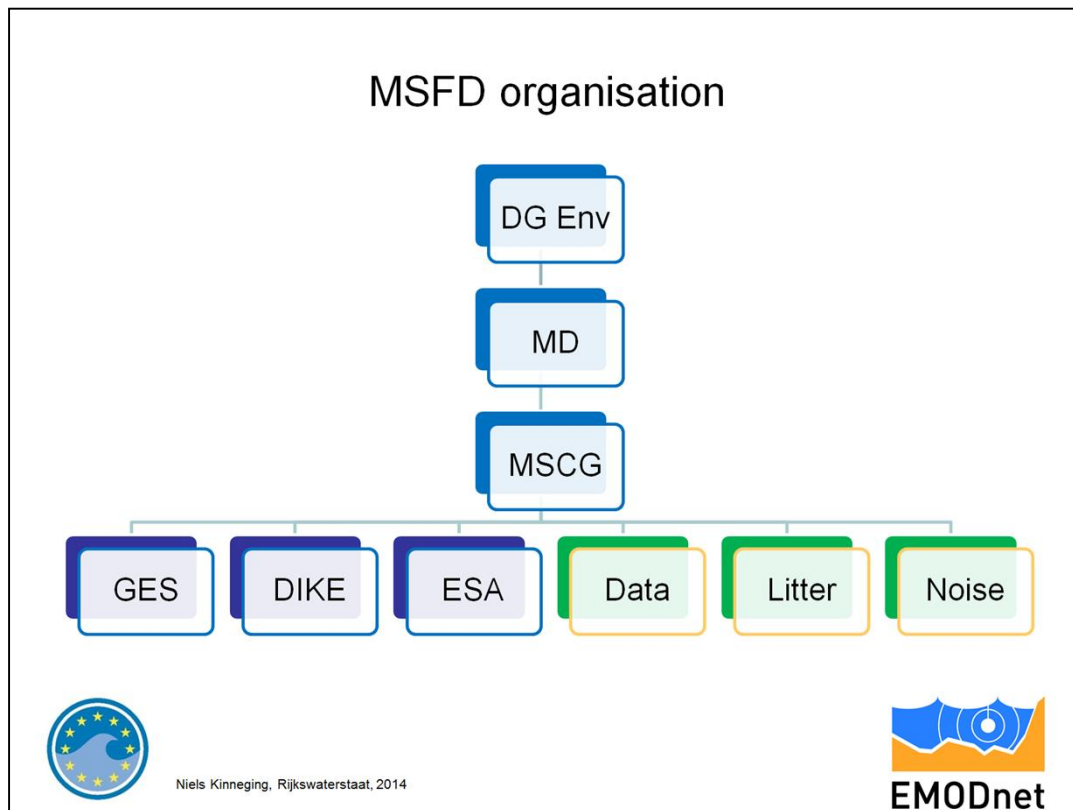
# Time line

- June 2008 MSFD adopted
- July 2010 National legislation
- Sept 2010 Descriptors and indicators
- July 2012 Initial assessment (+ GES + Targets)
- July 2014 Monitoring programme
- 2016 Program of measures
- 2018 First assessment



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#### Organisation of MSFD work:

MD – Marine directors

MSCG – Marine strategy Coordination Group

GES – Good Environmental Status

DIKE – Data, Information and Knowledge Exchange

ESA – Economic and Social Assessments

Data – Data (specific topic)

Litter – Litter (specific topic)

Noise – Underwater noise (specific topic)

# Descriptors

1. Biodiversity
2. Non-indigenous species
3. Commercial fish
4. Marine food webs
5. Eutrophication
6. Sea-floor integrity
7. Hydrographical conditions
8. Contaminants
9. Contaminants in fish
10. Marine litter
11. Energy, including underwater noise



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List of descriptor to be used to assessment the marine ecosystem (annex I of the MSFD).

For each descriptor number of indicators have been defined.

Descriptors and indicators must be addressed in the assessment.

Examples in the next slides.

Ref. COMMISSION DECISION of 1 September 2010

on criteria and methodological standards on good environmental status of marine waters

Descriptor

D5: Eutrofication

Indicators

5.1 Nutrients levels

- 5.1.1 Nutrients concentration in the water column
- 5.1.2 Nutrient ratios (silica, nitrogen and phosphorus), where appropriate

5.2 Direct effects of nutrient enrichment

- 5.2.1 Chlorophyll concentration in the water column
- 5.2.2 Water transparency related to increase in suspended algae, where relevant
- 5.2.3 Abundance of opportunistic macroalgae
- 5.2.4 Species shift in floristic composition such as diatom to flagellate ratio, benthic to pelagic shifts, as well as bloom events of nuisance/toxic algal blooms (e.g. cyanobacteria) caused by human activities

5.3 Indirect effects of nutrient enrichment

- 5.3.1 Abundance of perennial seaweeds and seagrasses (e.g. fucoids, eelgrass and Neptune grass) adversely impacted by decrease in water transparency
- 5.3.2 Dissolved oxygen, i.e. changes due to increased organic matter decomposition and size of the area concerned

Data

Monitoring (sub)program



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Descriptor

D8: Contaminants  
D9: Contaminants in fish

Indicators

8.1 Concentration of contaminants

8.1.1 Concentration of the contaminants mentioned above, measured in the relevant matrix (such as biota, sediment and water) in a way that ensures comparability with the assessments under Directive 2000/60/EC

8.2 Effects of contaminants

8.2.1 Levels of pollution effects on the ecosystem components concerned, having regard to the selected biological processes and taxonomic groups where a cause/effect relationship has been established and needs to be monitored

8.2.2 Occurrence, origin (where possible), extent of significant acute pollution events (e.g. slicks from oil and oil products) and their impact on biota physically affected by this pollution

9.1 Levels, number and frequency of contaminants

9.1.1 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels<sup>[1]</sup>

9.1.2 Frequency of regulatory levels being exceeded  
<sup>[1]</sup> Maximum levels for certain contaminants are set in Commission regulation No 1881/2006

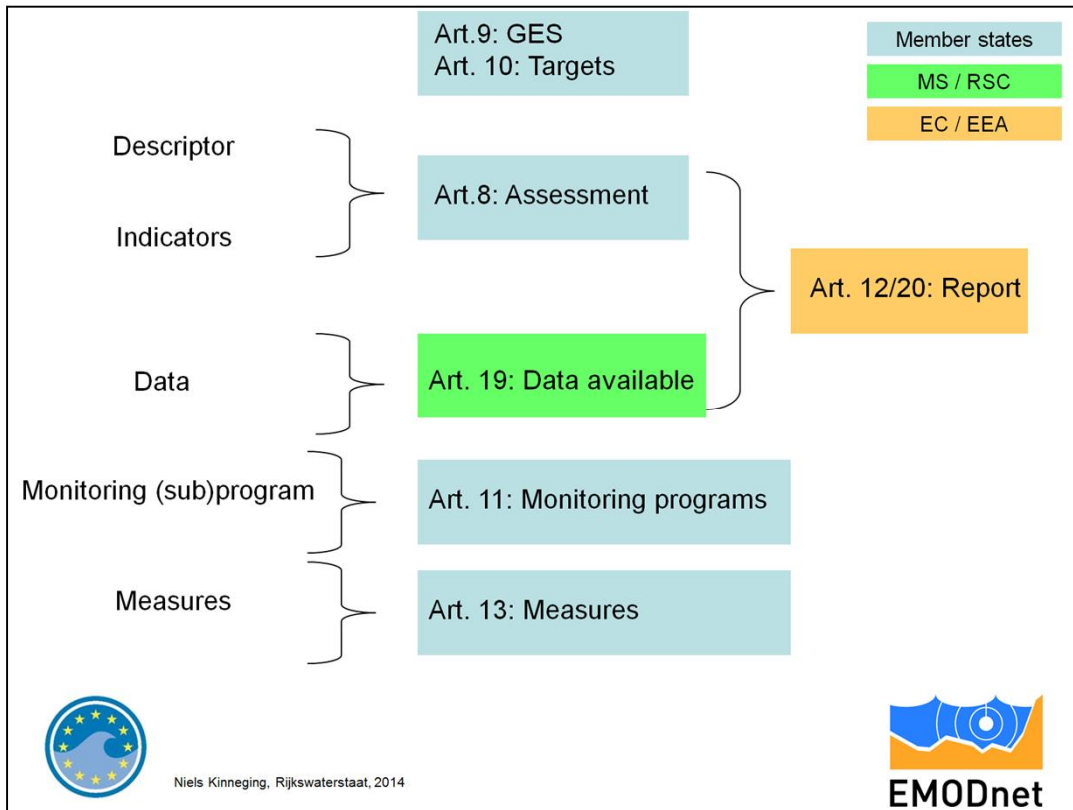
Data

Monitoring (sub)program

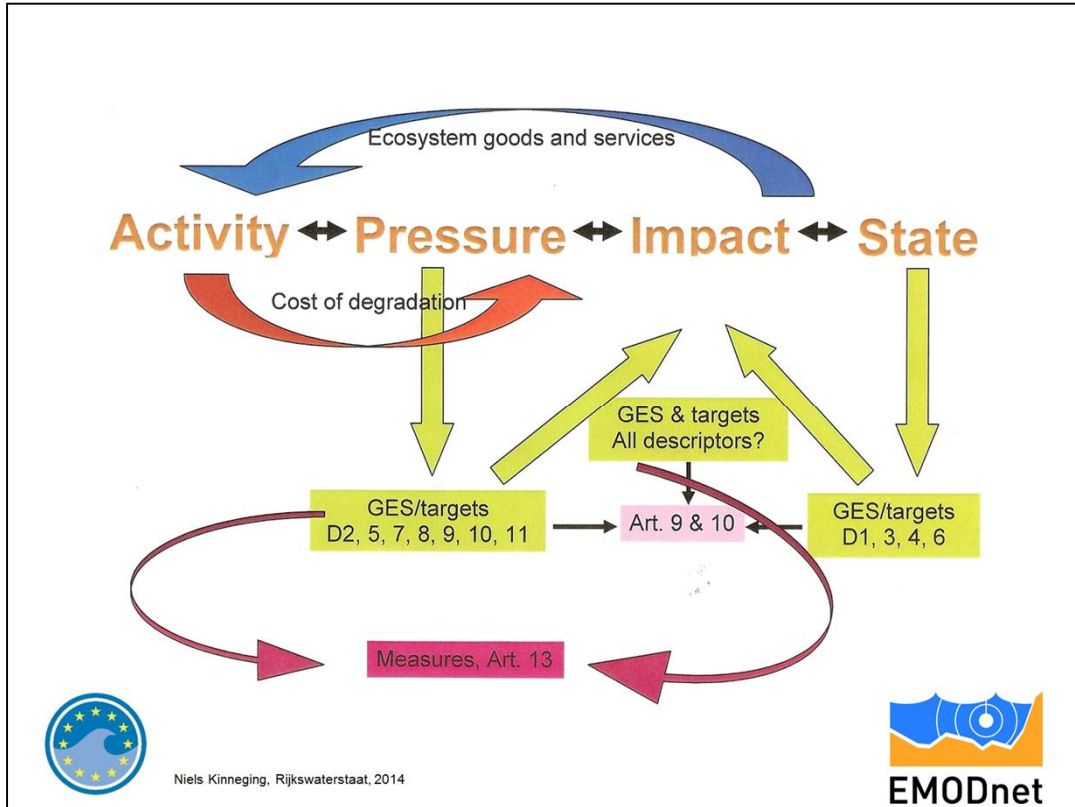


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Relevant articles in relation to data.



Indicators can be either pressure, impact or state indicators.

Good knowledge on the impact of activities (either general activities or measures) on the ecosystem is essential to the MSFD.



## Annex III: Indicative lists of characteristics, pressures and impacts

- Tabel 1: Characteristics
  
- Physical and chemical features
  - Topography and bathymetry of the seabed
  - annual and seasonal temperature regime and ice cover, current velocity, upwelling, wave
  - exposure, mixing characteristics, turbidity, residence time,
  - spatial and temporal distribution of salinity,
  - spatial and temporal distribution of nutrients (DIN, TN, DIP, TP, TOC) and oxygen,
  - pH, pCO<sub>2</sub> profiles or equivalent information used to measure marine acidification.
  
- Habitat types
  - The predominant seabed and water column habitat type(s) with a description of the characteristic physical and chemical features, such as depth, water temperature regime, currents and other water movements, salinity, structure and substrata composition of the seabed,
  - identification and mapping of special habitat types, especially those recognised or identified under Community legislation (the Habitats Directive and the Birds Directive) or international conventions as being of special scientific or biodiversity interest,
  - habitats in areas which by virtue of their characteristics, location or strategic importance merit a particular reference. This may include areas subject to intense or specific pressures or areas which merit a specific protection regime.



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## Annex III: Indicative lists of characteristics, pressures and impacts

- Tabel 1: Characteristics (cont'd)
  
- Biological features
  - A description of the biological communities associated with the predominant seabed and water column habitats. This would include information on the phytoplankton and zooplankton communities, including the species and seasonal and geographical variability,
  - information on angiosperms, macro-algae and invertebrate bottom fauna, including species composition, biomass and annual/seasonal variability,
  - information on the structure of fish populations, including the abundance, distribution and age/size structure of the populations,
  - a description of the population dynamics, natural and actual range and status of species of marine mammals and reptiles occurring in the marine region or subregion,
  - a description of the population dynamics, natural and actual range and status of species of seabirds occurring in the marine region or subregion,
  - a description of the population dynamics, natural and actual range and status of other species occurring in the marine region or subregion which are the subject of Community legislation or international agreements,
  - an inventory of the temporal occurrence, abundance and spatial distribution of nonindigenous, exotic species or, where relevant, genetically distinct forms of native species, which are present in the marine region or subregion.
  
- Other features
  - A description of the situation with regard to chemicals, including chemicals giving rise to concern, sediment contamination, hotspots, health issues and contamination of biota (especially biota meant for human consumption),
  - a description of any other features or characteristics typical of or specific to the marine region or subregion.



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## Annex III: Indicative lists of characteristics, pressures and impacts

- Tabel 2: Pressures and impacts
- Physical loss
  - Smothering (e.g. by man-made structures, disposal of dredge spoil),
  - sealing (e.g. by permanent constructions).
- Physical damage
  - Changes in siltation (e.g. by outfalls, increased run-off, dredging/disposal of dredge spoil),
  - abrasion (e.g. impact on the seabed of commercial fishing, boating, anchoring),
  - selective extraction (e.g. exploration and exploitation of living and non-living resources on seabed and subsoil).
- Other physical disturbance
  - Underwater noise (e.g. from shipping, underwater acoustic equipment),
  - marine litter.
- Interference with hydrological processes
  - Significant changes in thermal regime (e.g. by outfalls from power stations),
  - significant changes in salinity regime (e.g. by constructions impeding water movements, water abstraction).



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## Annex III: Indicative lists of characteristics, pressures and impacts

- Tabel 2: Pressures and impacts (cont'd)
  
- Contamination by hazardous substances
  - Introduction of synthetic compounds (e.g. priority substances under Directive 2000/60/EC which are relevant for the marine environment such as pesticides, antifoulants, pharmaceuticals, resulting, for example, from losses from diffuse sources, pollution by ships, atmospheric deposition and biologically active substances),
  - introduction of non-synthetic substances and compounds (e.g. heavy metals, hydrocarbons, resulting, for example, from pollution by ships and oil, gas and mineral exploration and exploitation, atmospheric deposition, riverine inputs),
  - introduction of radio-nuclides.
  
- Systematic and/or intentional release of substances
  - Introduction of other substances, whether solid, liquid or gas, in marine waters, resulting from their systematic and/or intentional release into the marine environment, as permitted in accordance with other Community legislation and/or international conventions.
  
- Nutrient and organic matter enrichment
  - Inputs of fertilisers and other nitrogen — and phosphorus-rich substances (e.g. from point and diffuse sources, including agriculture, aquaculture, atmospheric deposition),
  - inputs of organic matter (e.g. sewers, mariculture, riverine inputs).
  
- Biological disturbance
  - Introduction of microbial pathogens,
  - introduction of non-indigenous species and translocations,
  - selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing).



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# EMODnet

- European Marine Observation and Data network
  - unlock fragmented and hidden marine data resources
  - make these available to individuals and organisations (public and private)
  - to facilitate investment
  - quality-assured, standardised and harmonised marine data



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# EMODnet projects

- Bathymetry
- Geology
- Habitat mapping
- Chemistry
- Biology
- Physics
- Human activities



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# Partners

- About 118 organisations
  - Government (46)
  - Institutes (61)
  - Companies (11)



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Not all relevant organisation are connected to EMODNET.  
How to improve this process?  
What is needed for an organisation to get connected?

# Secretariat

- InnovOcean site in Oostende, Belgium
- 4 staff members
  - Jan-Bart Calewaert
  - Liesbeth Renders
  - Phil Weaver
  - Vikki Gunn
- Steering committee
- Advisory board
- User groups (thematic, under development)



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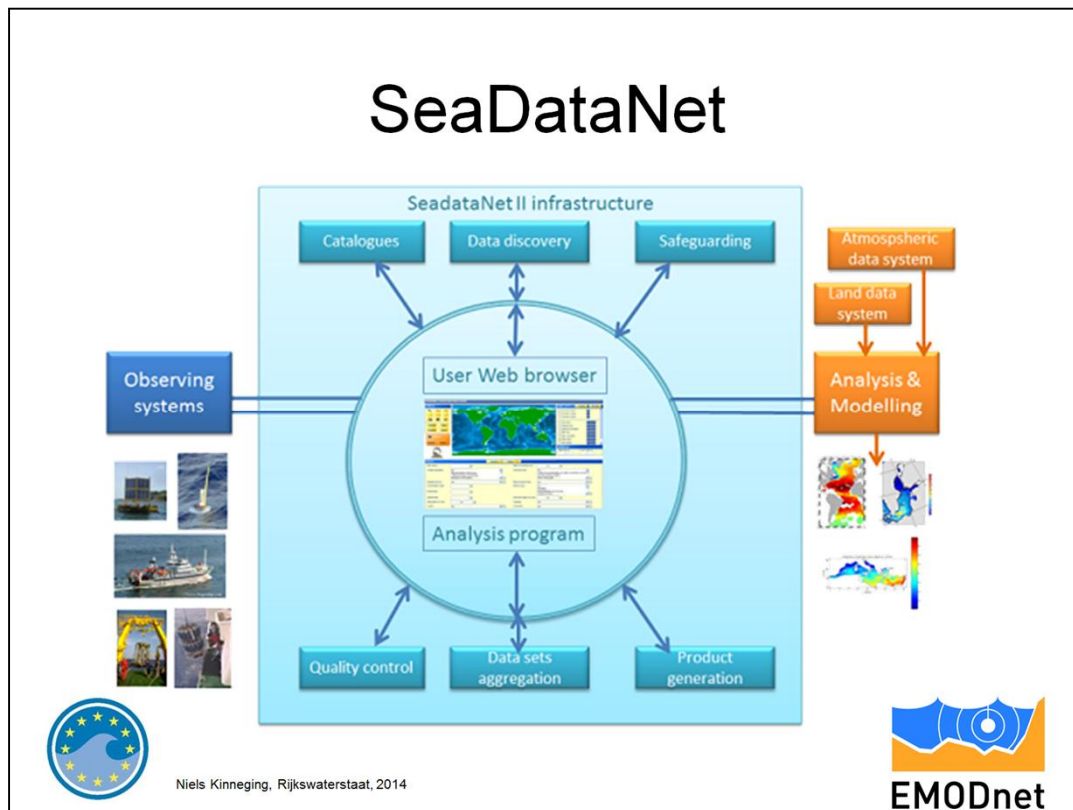
# Role Secretariat

- EMODNET programme
  - Transparency/visibility
  - Trust
  - Coherency
- Facilitate processes
  - Meetings
  - Training courses
- Policy consultant



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For most EMODNET themes SeaDataNet is the engine.

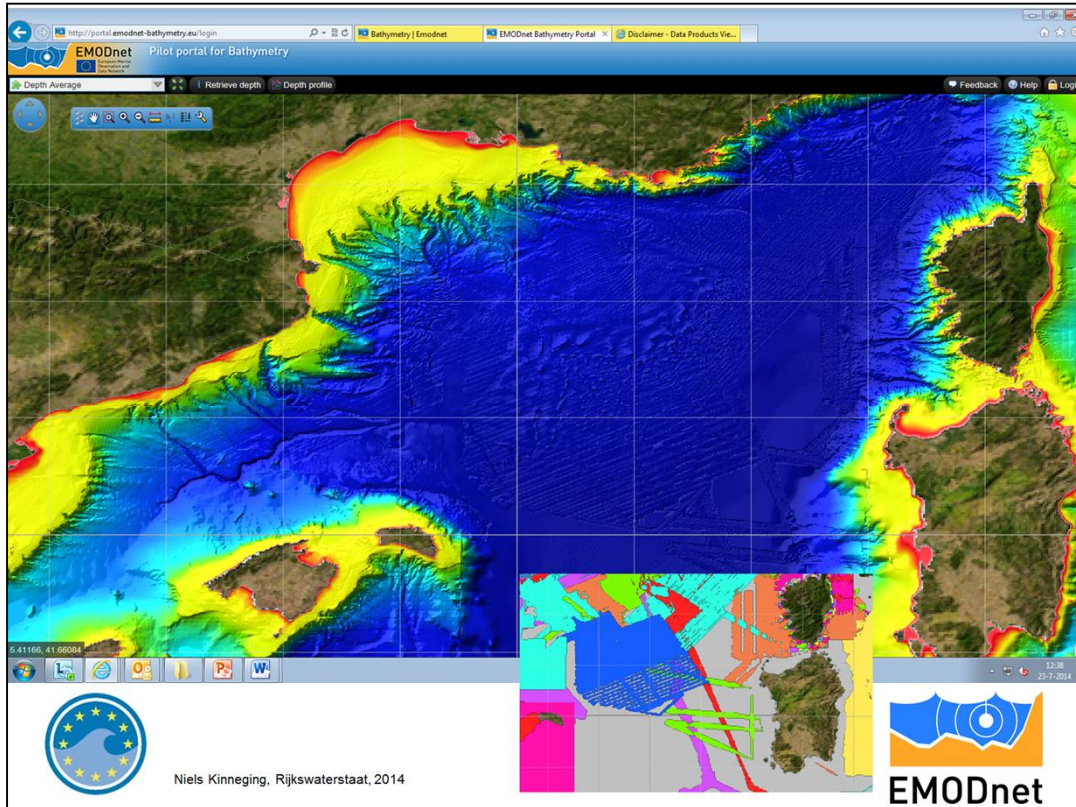
SeaDataNet is a project.

EMODNET makes no choice for the underlying technology.

Technology is developing faster than SDN.

Essential is:

- Standardisation (semantic and formats)
- Connectivity (is all data for MSFD connected to EMODNET?)
- Selectivity (is all data for MSFD labelled?)
- Avoid double data flows

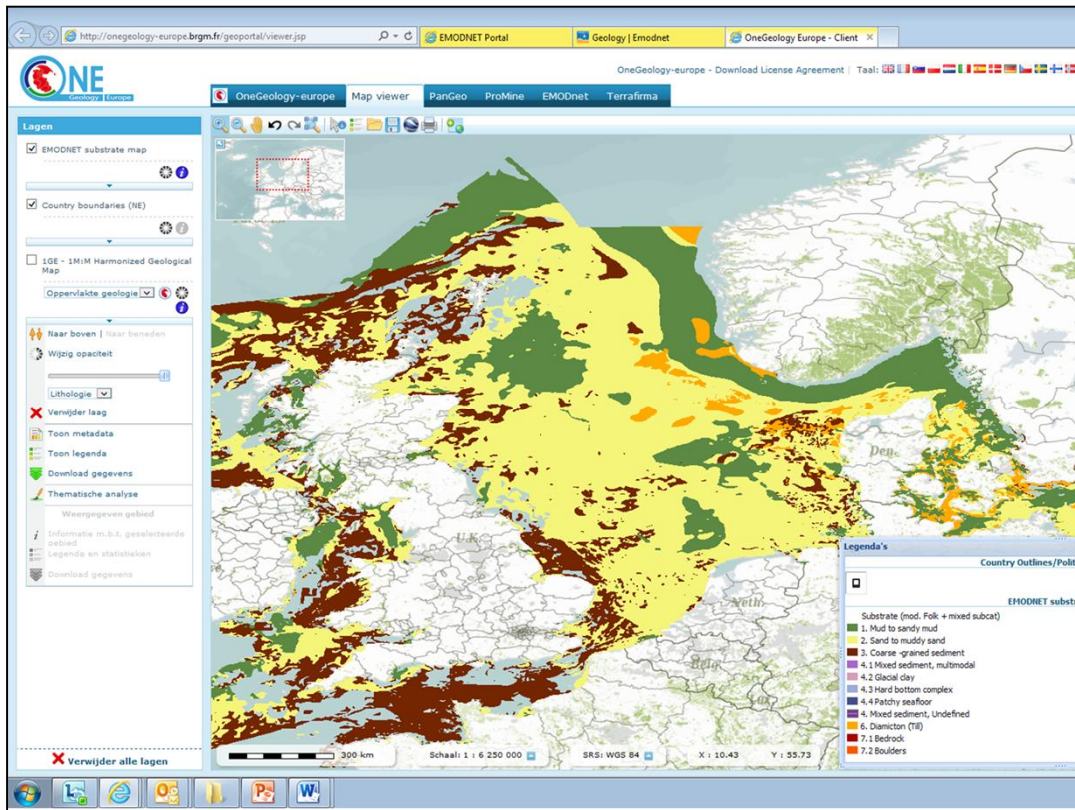


## Bathymetry.

Most favourite portal.

Different layers of information, also on metadata.

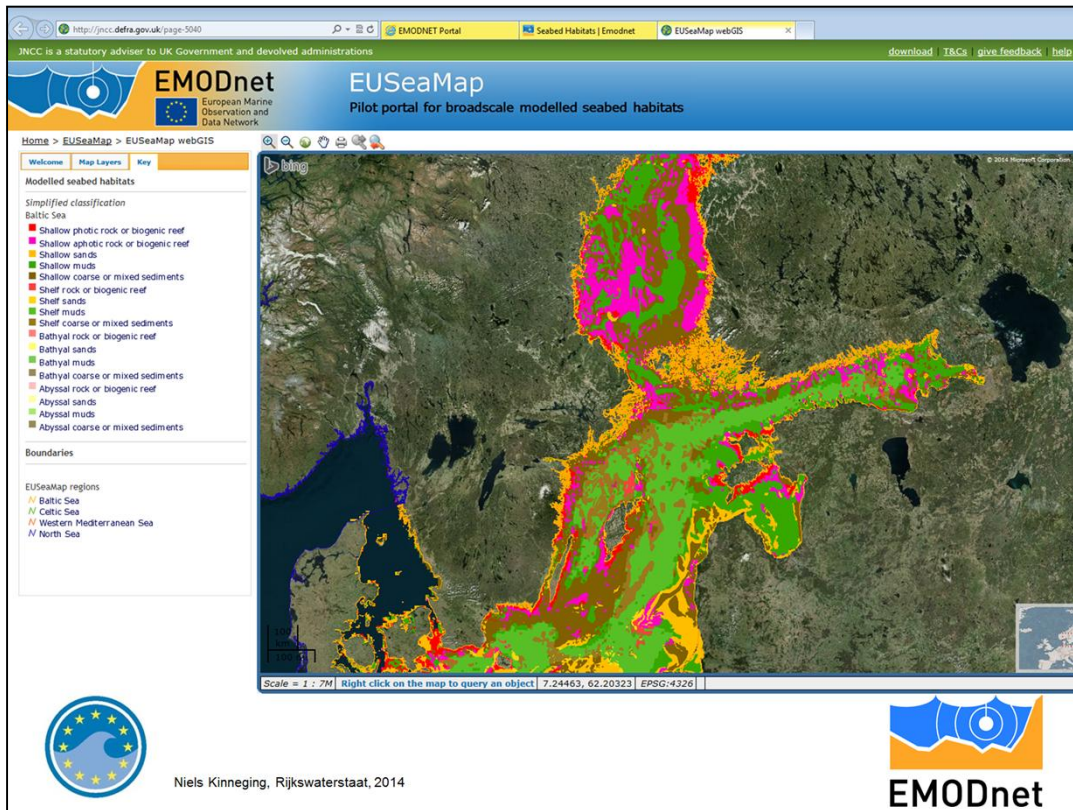
Still a problem with harmonisation. Surveys are still recognizable



## Geology

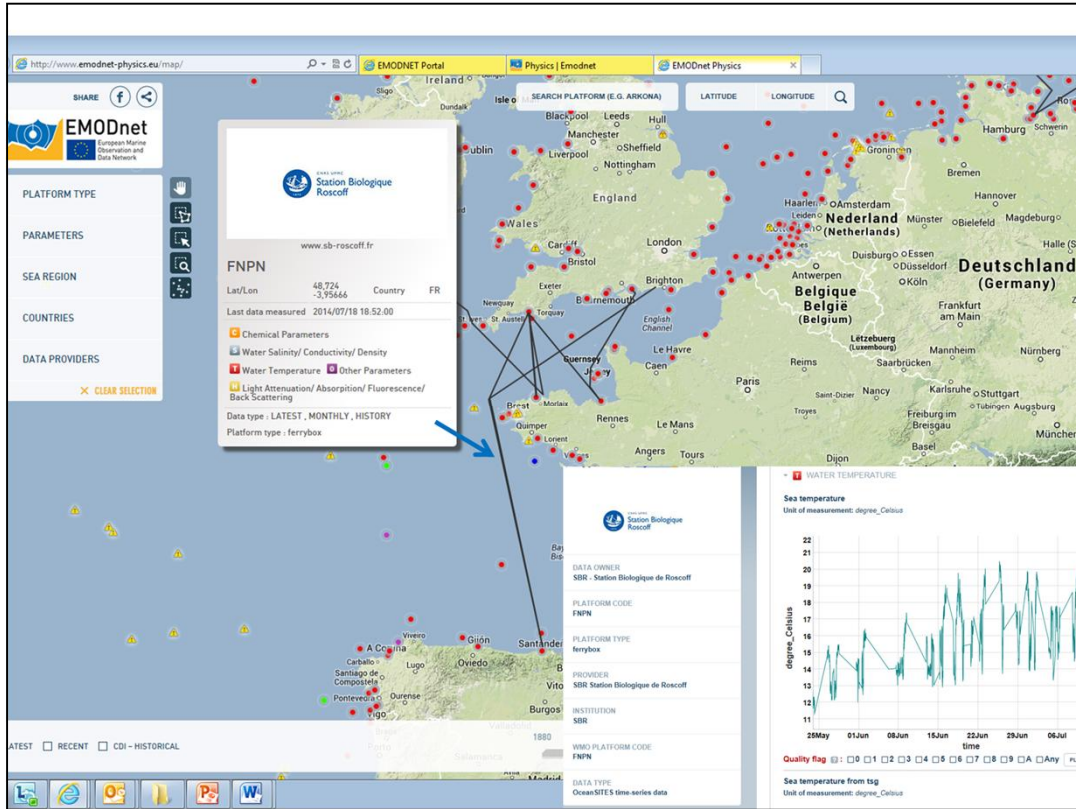
Based on existing geology portals for land.

Less intuitive than bathymetry, but much information available.



### Habitat mapping

Could (in my opinion) be more integrated with geology and bathymetry.  
 Geology and bathymetry are basemaps for habitats.



## Physics

Very different type of portal from the rest.

Based mainly on monitoring stations and ship tracks.

Underlying data can be retrieved and metadata viewed.

Lacks higher products like maps.

EMODnet  
European Marine Observation and Data Network

Pilot Portal For Biology  
Data Discovery and Access Service

Lat: 52.1 Lon: 6.24

Search Legend Feedback Help

EMODnet Bathymetry

Seabed substrate (North Sea and Baltic Sea)

Administrative boundaries

Reference grids

Seabed habitats

Mammals

Harbour porpoise - incidental sightings

Taxa(66) Parameters(0) Datasets(62) Layers(0)

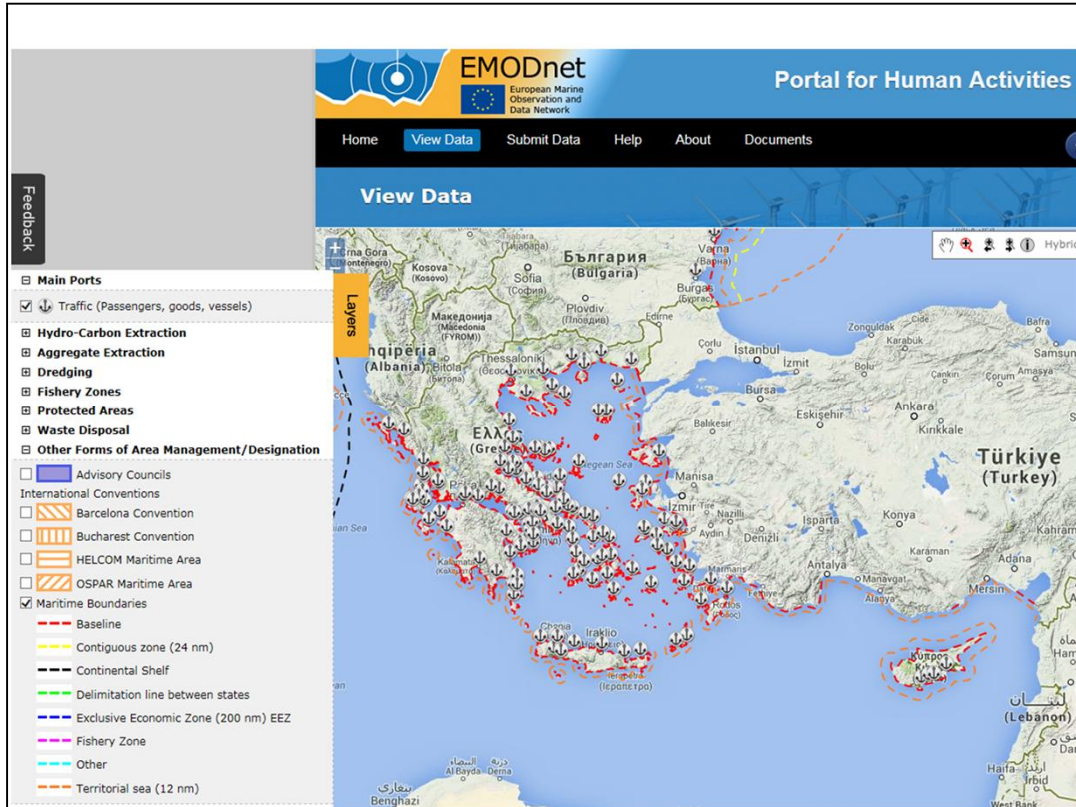
Topic	Layer	Source
Mammals	FAO distribution prediction of Arctocephalus pu...	FAO

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EMODnet

## Biology

Nice is that layers from bathymetry can be viewed in this portal.



## Human activities

Portal only few weeks active.

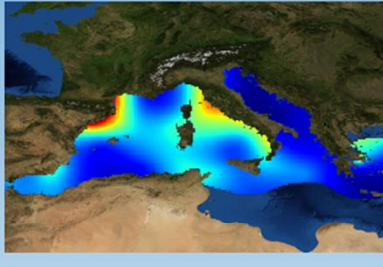
Nice insight of what might be coming and type of information.

Looking forward to more data.




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[Partners](#)
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**aDataNet** consortium, waters with data input chemical lot. The same and has developed and already an impressive collated from national




to achieve an almost stry data possible. New atic Sea, and the Black ltitic Sea, North Atlantic ther developing a Pan-sets and data products.

Leading Partner 

Total no. 46



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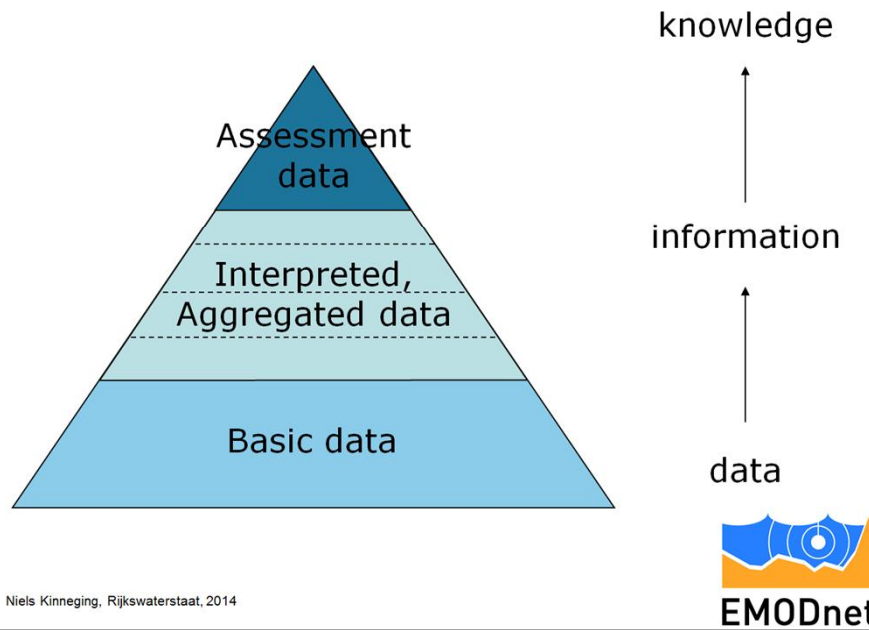
Chemistry

Example on the portal website.

Cannot reproduce this myself.

Lots of problems with this portal. Disappointing.

# Data/information types



General model for data aggregation.

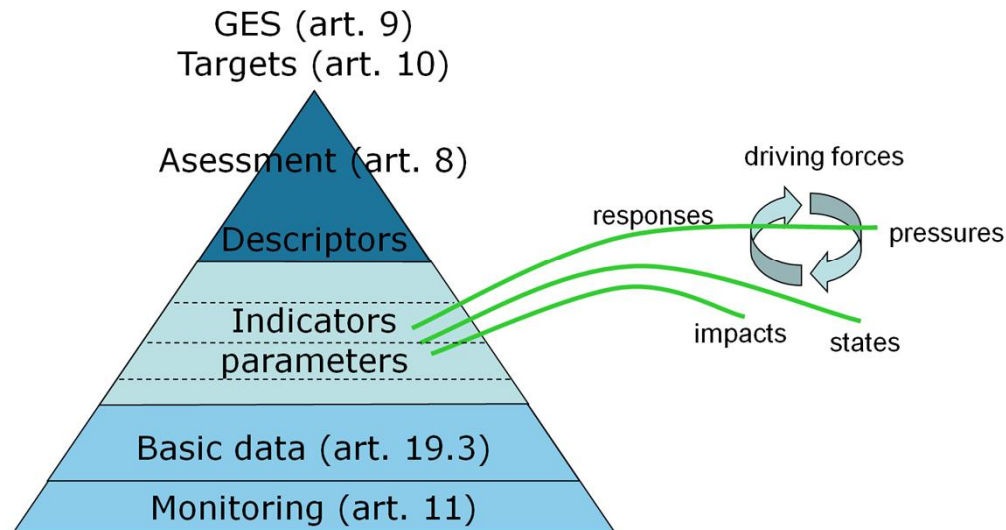
Basic data is the lowest level considered.

Raw data is data that is generally generated by the monitoring systems.

Raw data is discarded here, because it can be instrument specific and often needs expert knowledge to use.

Several levels of information products can be defined.

# MSFD & DPSIR



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General aggregation model for data applied to the MSFD.

Basic data results from the monitoring (reported under art. 11).

Basic data must be made available under art. 193. of the MSFD.

Parameters are derived from the basic data and are used to define the indicators.

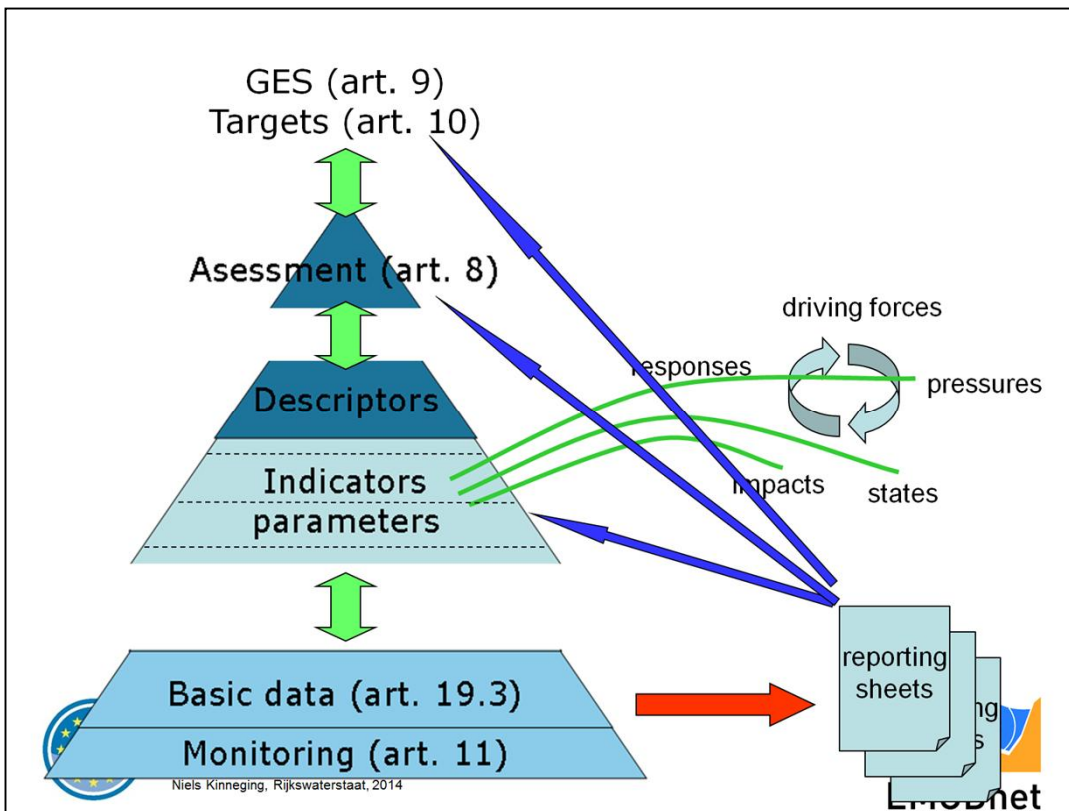
MS have a freedom to select parameters.

Indicators can be either pressure, impact or state indicators (relate to DPSIR-cycle).

Using the indicators an assessment is derived for the obligation under art. 8.

Final aim is to reach a good environmental status.

MS must define targets under art. 10 of the MSFD.

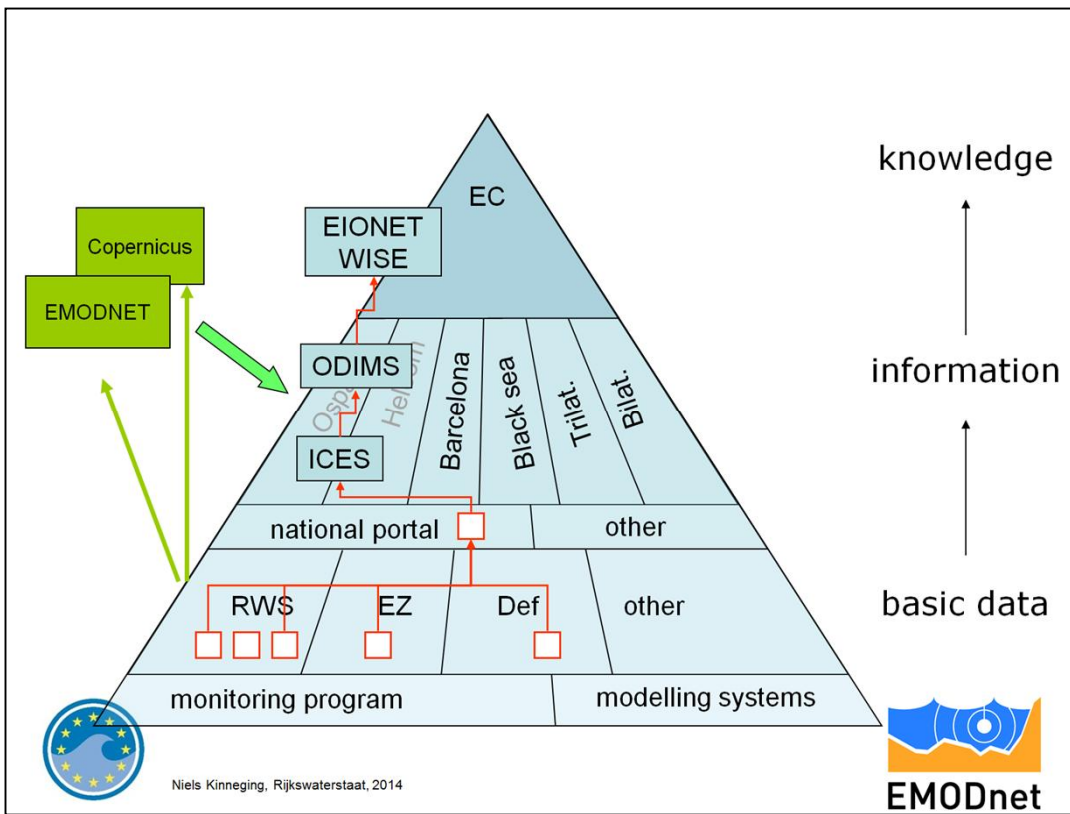


Reporting sheets are the official mechanism for reporting obligations under MSFD.

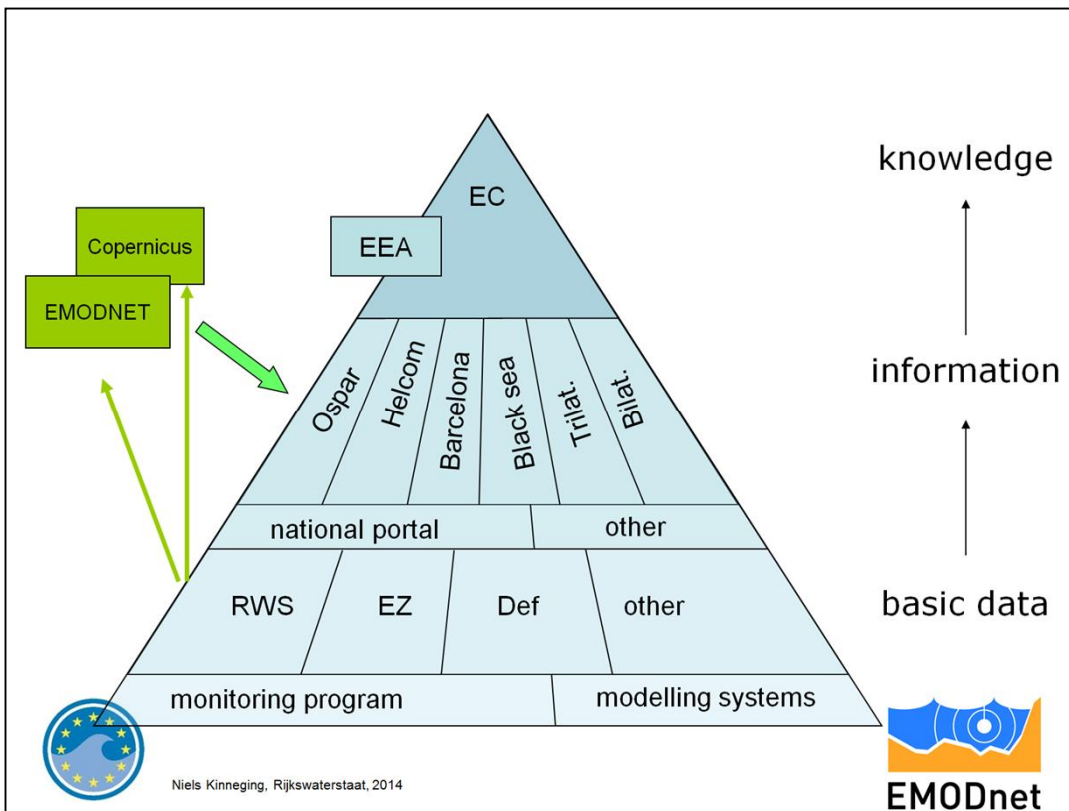
Information should be supplied as XML-files, but up to now the EC has provided webforms to fill these.

Ideally reporting information would be stored in a database and XML should be generated automatically.

In the reporting sheets relations have to be given to Indicators, Descriptors, GES and targets.



Data flows from bottom to top in the assessment process.  
 The data flow can differ for different descriptors and indicators.  
 Possible routing of information between information systems.



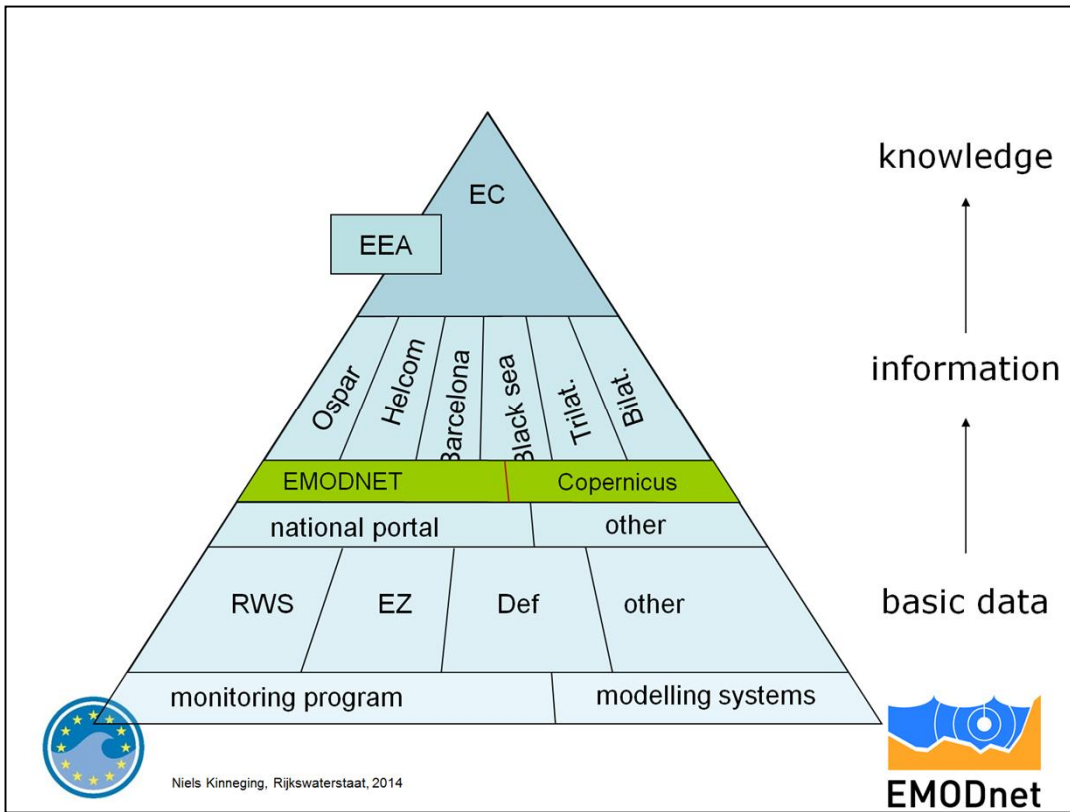
Data flows from bottom to top in the assessment process.

The data flow can differ for different descriptors and indicators.

Use of the RSC's is encouraged. E.g. OSPAR common indicators are used.

EMODNET and Copernicus are now located outside the MSFD data flows.

ICES plays an important role as central database for OSPAR and Helcom.



EMODNET and Copernicus can also be a part of the assessment process.

It can be a data collecting mechanism and produce intermediate information products.

# Ambition levels

1. EMODNET part of assessment process
2. EMODNET delivers information products for characteristics, pressures & impacts
3. EMODNET provides mechanism for art.19.3



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# Issues

- Quality of EMODNET products
- Harmonisation
- Information products for MSFD
- Completeness of EMODNET data
- Non-MSFD data in EMODNET
- Double data sets
- Level of detail needed for art. 19.3
- Where is the data origin



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