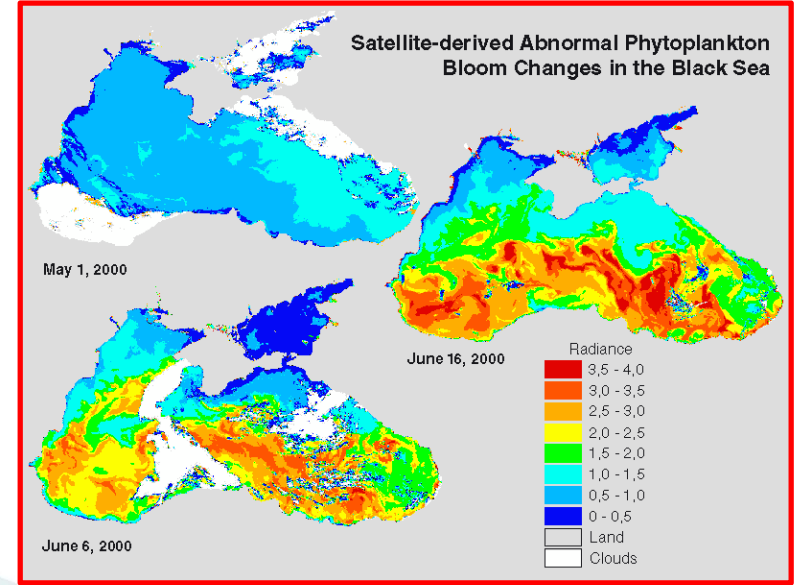




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D5: EUTROPHICATION



MARinTURK

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Eutrophication control

- Requires you to have knowledge of where the nutrients in your rivers and seas originate from – sources (pressures) and their relative importance

Rivers

	NITROGEN (%)	PHOSPHORUS (%)
Natural background emissions	<5	<10
Human populations	<30	40-50
Agriculture	60-70	<35
Atmospheric deposition	<5	<1
Industry	5-15	10-15

EU water/environmental legislation

- The MSFD wasn't developed in isolation
- Introduced 8 years after the WFD (1978)
- EU water legislation began in mid-1970s as a series of sector or subject-based Directives





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Supporting nutrient-control legislation

Principal Directives

● Urban Waste Water Treatment (UWWT) Directive

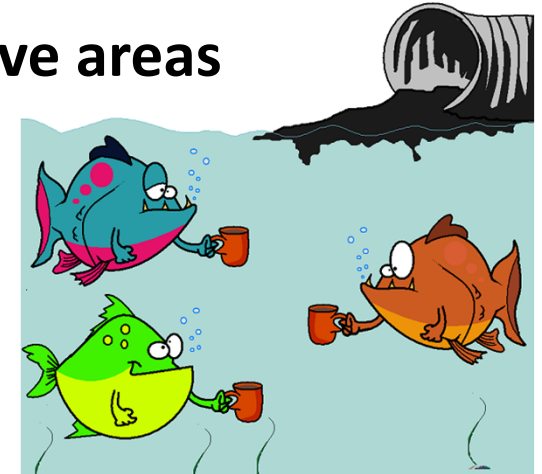
- ❖ Phosphorus, organic content – designation of sensitive areas

● Nitrates Directive

- ❖ Nitrate - designation of nitrate vulnerable zones

Minor Directives, e.g.:

- ❖ Waste Directive
- ❖ Industrial Emissions Directive
- ❖ Landfill Directive
- ❖ Groundwater Directive



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Commission Decision 2010/477/EU

- The MSFD is supported by Comm. Dec. 2010/477/EU, providing much greater insight into what has to be monitored. This is currently under revision
- Proposed changes:
 - ❖ Linking the required monitoring (in coastal waters) and thresholds more closely to those undertaken/developed for the WFD
 - ❖ Greater emphasis on (sub-)regional development of thresholds
- Proposed changes include the division of criteria into:
 - ❖ Primary criteria – monitored at all sites at a standard frequency
 - ❖ Secondary criteria – risk-based monitoring (resolution or frequency)



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Annex 3 elements – Pressures and impacts

- **Main pressures**
 - ❖ Annual and seasonal temperature regime and ice cover, current velocity, upwelling, wave exposure, mixing characteristics, turbidity, residence time
 - ❖ Spatial and temporal distribution of nutrients and oxygen
- **Biological features**
 - ❖ Biological communities of the predominant seabed and water column habitats. This includes phytoplankton and zooplankton communities - seasonal and spatial variability
 - ❖ angiosperms, macro-algae and invertebrate bottom fauna - species composition, biomass and annual/seasonal variability



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Annex 3 elements

● Pressures

Pressures	Activities	Vectors of input
<ul style="list-style-type: none">❖ Inputs of fertilizers and other N- and P-rich substances❖ Inputs of organic matter	<ul style="list-style-type: none">❖ Industry❖ Agriculture and forestry❖ Aquaculture❖ Municipal waste water treatment	<ul style="list-style-type: none">❖ River discharges❖ Direct discharges❖ Atmospheric deposition❖ Groundwater (submarine) inputs?



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How is eutrophication impact measured/assessed?

● Nutrient concentrations

● Direct effects

❖ Chlorophyll levels

❖ Water transparency

❖ "Opportunistic" seaweeds - abundance

❖ Phytoplankton community composition and abundance - HABs

● Indirect effects

❖ Perennial seaweeds & seagrasses

❖ Dissolved oxygen or macrozoobenthos status

(a) In coastal waters, the values set in accordance with the WFD

(b) Beyond coastal waters, values consistent with those above - established through regional or subregional cooperation



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Programmes of measures

● WFD KTMs – 8 are relevant

KTM	Description
1	Construction or upgrades of wastewater treatment plants
2	Reduce nutrient pollution from agriculture
13	Advisory services for agriculture
16	Upgrades or improvements of industrial wastewater treatment plants (including farms)
17	Measures to reduce sediment from soil erosion and surface run-off
21	Measures to prevent/control the input of pollution from urban areas, transport & built infrastructure
22	Measures to prevent or control the input of pollution from forestry
23	Natural water retention measures



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Programmes of measures

● MSFD KTMs – only 1 is relevant

KTM	Description
33	Measures to reduce nutrient and organic matter inputs to the marine environment from sea-based or air-based sources

PoMs include existing and new measures:

- Existing: implementation of relevant legislation – planned and actual
- New proposed measures: may be subject to a technical feasibility assessment, impact assessment (environmental, social and economic), cost-effectiveness analysis and cost-benefit analysis. Financing threshold may be applied.



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Sunumumuz sona ermiřtir, ilginiz iin teřekkr ederiz.
Our presentation is finished, thank you for listening.



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