

## **“Workshop on Eutrophication Reduction Measures under EU Directives in the Domain of Water ”**

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ECRAN 62260

**Assessment methodologies and  
criteria used for water quality status  
classification for coastal water**



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## **Structure of the presentation**

- Main pressures on costal waters
- Main impact on coastal waters
- Assessment methodologies and criteria
- Impact and pressures criteria
- Examples of development of new WFD-compliant assessment systems



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## Main pressures on coastal areas

Coastal zones fulfill many functions, with limited space and resources.

Many similarities exist between coastal sites in spite of widely different physical, environmental, social and economic conditions.

### Main pressures:

- Eutrophication due to the agricultural practices.
- Urban development – the extension of cities, industries, railways, airports
- Insufficient treatment of urban and industrial effluents
- Land contamination
- Fisheries
- Tourism
- Shipping



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## Main impacts on coastal areas

- Eutrophication
- Loss of habitats
- Flooding
- Coastal erosion
- Invasive species
- Degradation of ecosystems
- Water shortage



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## Assessment methodologies and criteria used for water quality status classification (1)

### Causes of eutrophication of coastal ecosystems

- the nutrient sources on the coastal line
- the land based sources or from rivers that bring nutrients from their catchments, via sea current transport from distant coastal and marine waters
- from the atmosphere.

### Effects of the eutrophication of coastal ecosystems

- excessive accumulation of phytoplankton biomass
- depletion of oxygen in bottom waters
- increased frequency of noxious algal blooms
- increased turbidity
- deterioration of coastal food webs and
- reduction of biodiversity.



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## Assessment methodologies and criteria used for water quality status classification (2)

Coastal eutrophication - an international problem that needs to be tackled by co-ordinated national and international efforts.

Regional Seas Conventions have initiated strategies to combat eutrophication recognising the need for a harmonised way of assessing the eutrophication status of the nations 'common' waters.

Procedures for assessing eutrophication are different in the different Conventions.

In the last years, the methodologies were adjusted to be compatible with the WFD assessment systems.



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## Assessment methodologies and criteria used for water quality status classification (3)

Differences in the eutrophication assessment are at least partially explained by the characteristics of the coastal ecosystems.

The extent to which nutrient loads have an affect on coastal ecosystems depend largely on their physical characteristics:

- regions of vertical stratification
- restricted water exchange and long residence time



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## Assessment methodologies and criteria used for water quality status classification (4)

The Regional Seas Conventions procedures for the assessment of eutrophication of coastal waters, typically include:

- the measurement of nutrient enrichment,
- the measurement of direct effects of nutrient enrichment (phytoplankton chlorophyll a, macrophyte vegetation, and other biological elements)
- the measurement of indirect effects of nutrient enrichment (dissolved oxygen, algal toxins, macrozoobenthos kills, etc.)

National methods for assessing eutrophication in coastal water bodies have been developed based on the assessment of both biological and physico-chemical quality elements.



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## Impact and pressure criteria used in WFD Article 5 risk assessment

From available information for Article 5 the pressure criteria for coastal waters were reported based mainly on the presence of surface point sources (sewage) of nutrients loads and surface water run-off.

The impact criteria for coastal waters were based mainly on nutrient concentrations and chlorophyll a (direct effect) and occasionally on dissolved oxygen, macrovegetation, etc (indirect effects).



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## Examples of development of new WFD- compliant assessment systems

New eutrophication assessment methodologies and criteria have been developed in relation to the implementation of the WFD and the intercalibration exercise.

The boundaries are set based on definitions of reference criteria and the application of the Boundary Setting Protocol (BSP) to set the high-good and good-moderate boundaries in line with the normative definitions for status class boundaries for each quality specified in the WFD.



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## Examples of development of new WFD-compliant assessment systems (2)

Environment and Climate  
Regional Accession Agreement

ECRAN

The Coastal intercalibration exercise was carried out within four Geographical Intercalibration Groups (GIGs):

- the Baltic Sea
- the Black Sea
- the Mediterranean Sea
- the North-East Atlantic.

Common intercalibration types shared by MS within each GIG were defined for the intercalibration exercise.



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## Examples of development of new WFD-compliant assessment systems (3)

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The eutrophication related biological metrics that were subject to intercalibration for coastal types are:

- benthic invertebrate fauna quality element (all GIGs),
- metrics and boundaries representing the phytoplankton quality element (chlorophyll a in all GIGs),
- metrics representing the macroalgae and angiosperms quality elements (Baltic, Mediterranean and NE Atlantic GIGs).

There is also work on eutrophication related to supporting physico-chemical determinands including nutrient concentrations, transparency and dissolved oxygen concentrations.



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