

WFD: Surface water monitoring for the classifications of water bodies and to facilitate source assessment

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Environmental Quality Research Group

Centre for Environmental Policy: Interdisciplinary centre that aims to have a global impact on energy and environmental security policy, the management of environmental quality, and sustainable transitions in environmental governance.



Group Focus: The integrated scientific study of contaminants in aquatic environments, soils and sediments, and implications for risk assessment, management and decision making.

Links: Environment Agency, DEFRA, Norfolk Broads Authority, Natural History Museum, Open Air Laboratories (OPAL), British Geological Survey, Yorkshire Water, Anglian Water



Contents

- ❑ Introduction
- ❑ Source assessment
 - Procedure
 - Benefits for the WFD
- ❑ Monitoring and the WFD
 - Classifications
 - Programmes of measures
- ❑ The link between monitoring and source assessment
- ❑ Discussion
- ❑ Conclusion

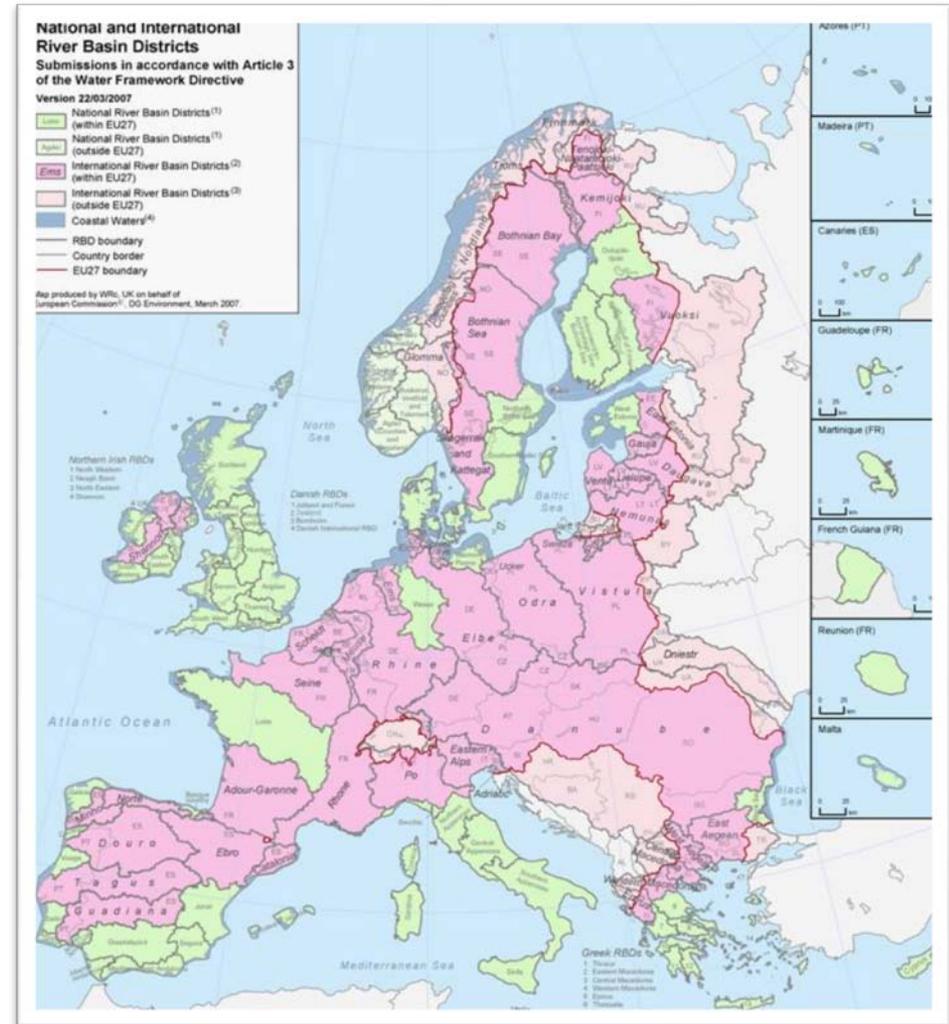


The Water Framework Directive (WFD)

- ❑ Aims to achieve good ecological status for all water bodies by 2015, except where exceptions apply
- ❑ Introduced new concepts to water management including:
 - Standards for all water bodies
 - Sets ecological targets
 - Recognises the right of the environment as a resource user
 - Public participation
 - Transparency
 - Polluter pays and precautionary principle
 - Economic principles-recovery of costs and cost effectiveness
 - Principles of integrated catchment management

Catchment-based water management

- ❑ Principles of integrated catchment management
- ❑ Administrative arrangements carried out at the river basin level (Article 3)
- ❑ Transfers management of water to the catchment level
- ❑ 110 river basins in EU27 (European Commission, 2007)



Priority substances (PSs)

- ❑ In 2001, 33 dangerous substances were classified as PSs (European Commission 2001).
- ❑ Substances that are toxic, persistent and liable to bio-accumulate, or other properties that are equally concerning
- ❑ The environmental quality standards (EQSs) for PSs determined by various assessment of risk to aquatic ecosystems (European Commission 2008).
- ❑ Priority substances:
 - Atrazine, benzene, diuron and the metals lead and nickel and their compounds
- ❑ Priority hazardous substances:
 - Anthracene, tributyltin and the metals cadmium and mercury and their compounds

Introduction to Source assessment

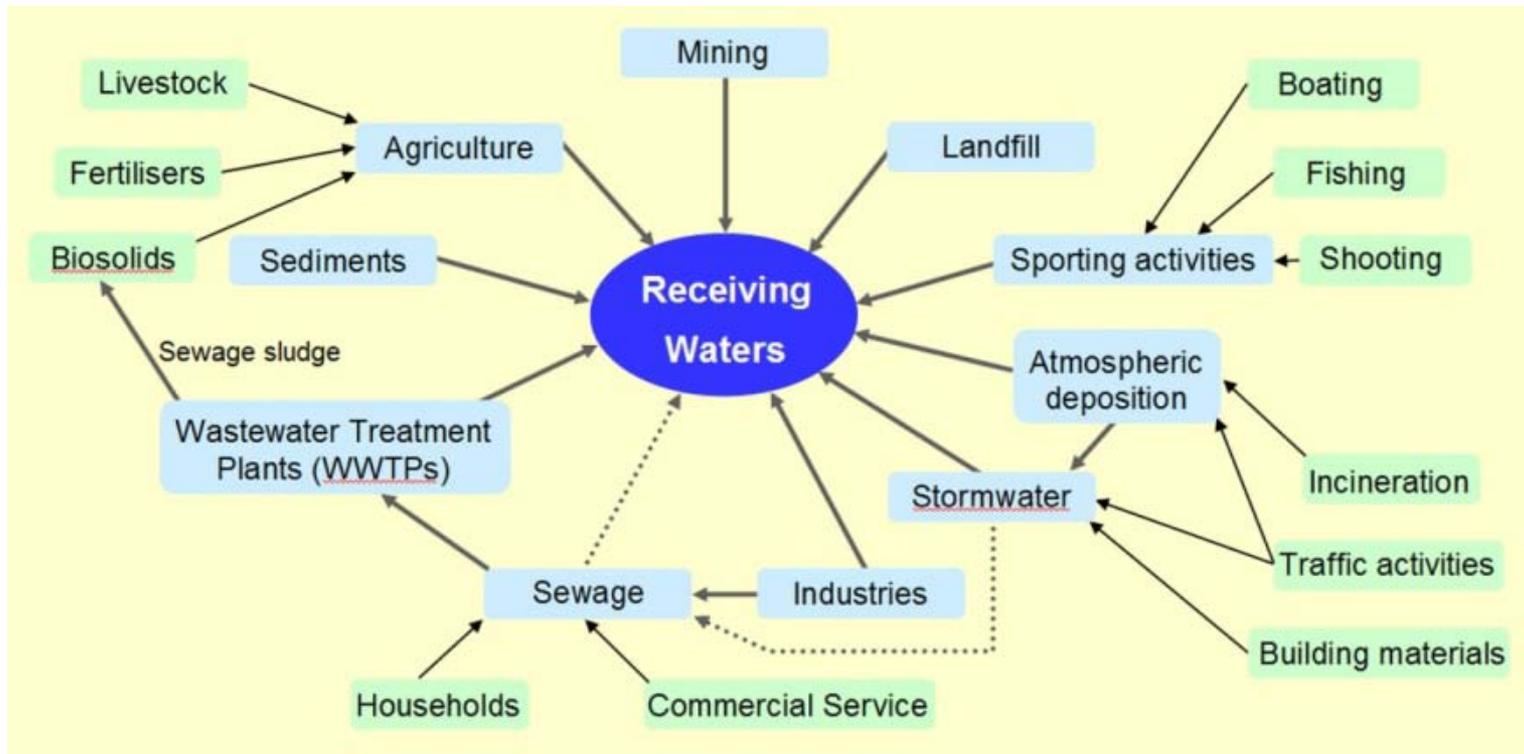
- ❑ To identify sources, pathways and fate of pollutants
- ❑ To estimate contributions of emission sources to the levels of pollutants in water bodies
- ❑ Particularly relevant for pollutants with numerous sources
- ❑ Results of source assessment are useful in informing management options to reduce pollutants in water bodies

Considerations for effective source assessment

- ❑ Source assessment should be carried out on a case by case basis for each catchment.
- ❑ Each river basin district and catchment have specific social and environmental conditions.
- ❑ Geographical and environmental characteristics (e.g. land-use, the extent of hard surface and industry) cause the temporal and spatial variation in source contributions and the distribution of pollutants in surface water.
- ❑ Misunderstanding of such characteristics could cause errors for the source assessment and potentially management decisions.

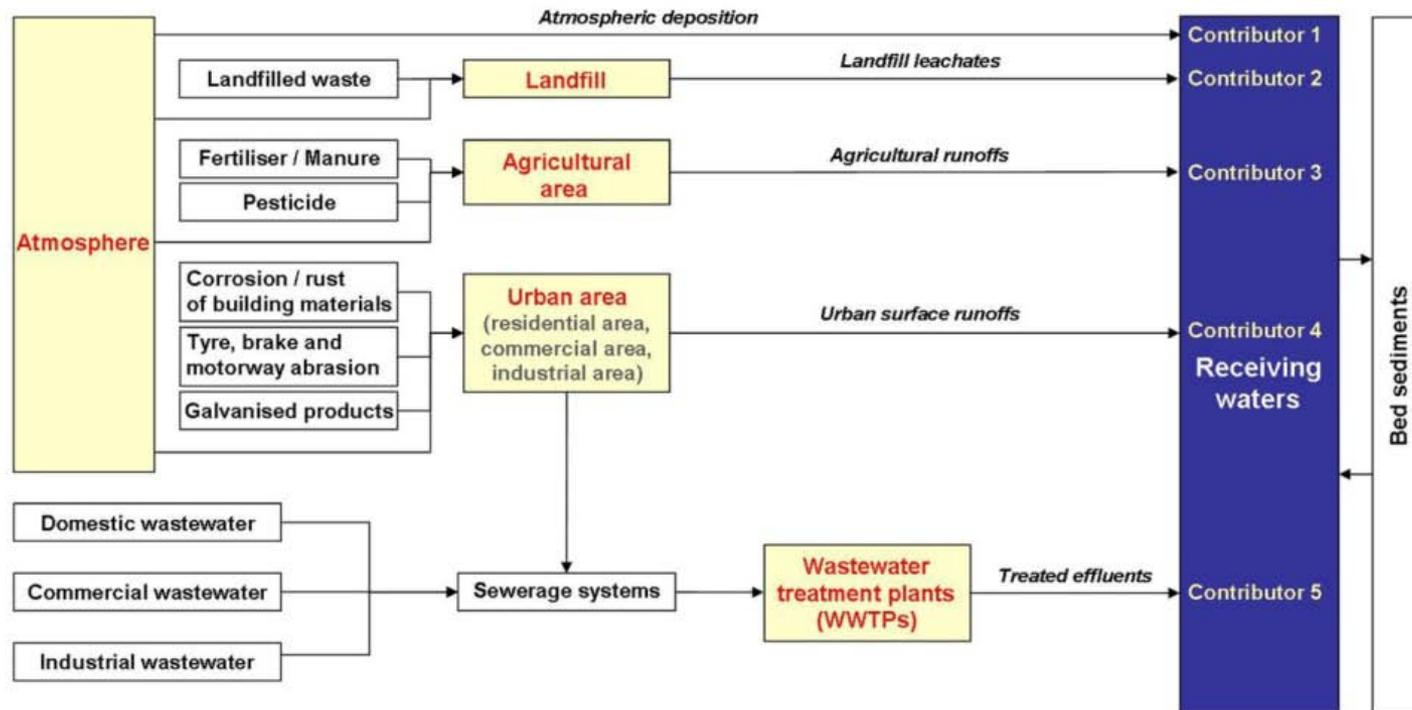
Procedure of the source assessment

Source Identification



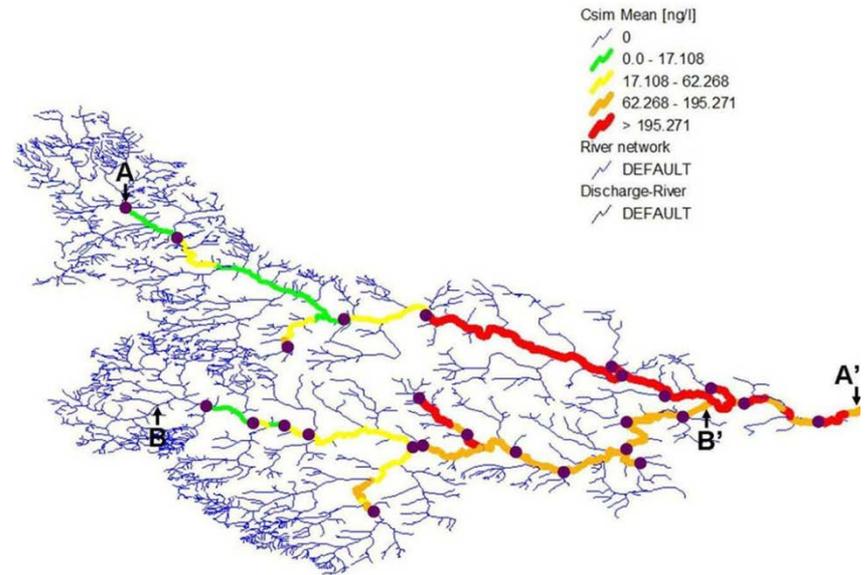
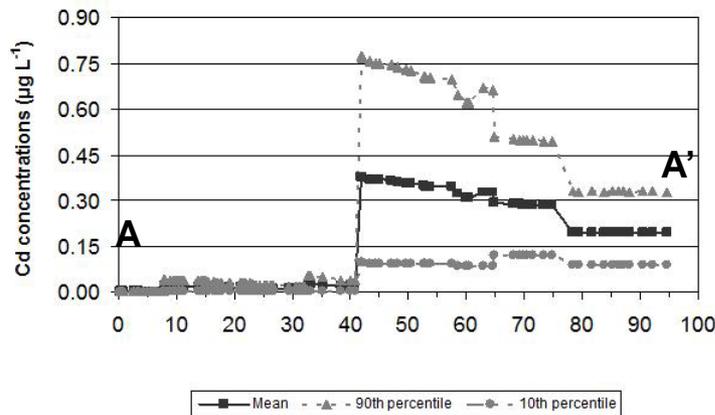
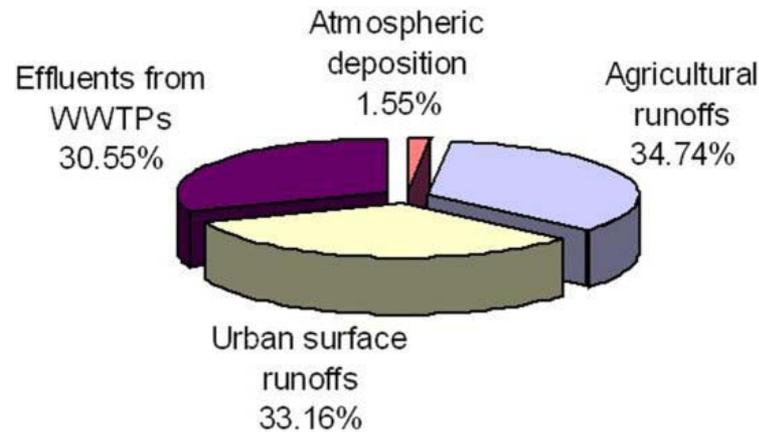
Procedure of the source assessment (continued)

Source Identification



Procedure of the source assessment (continued)

Estimation of source contribution



Benefits of using source assessment for WFD

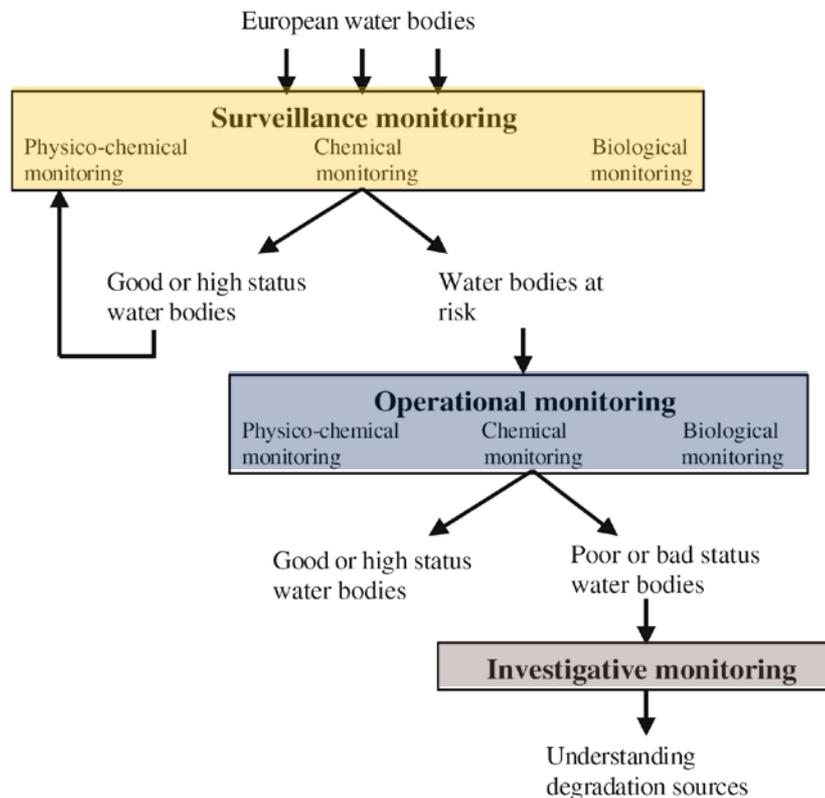
- ❑ Identification of sources of PSs
- ❑ The characterisation of catchments
- ❑ Integrated management at catchment level
- ❑ Improvements in Programme of Measures (PoMs)
 - Identification of most efficient measures
 - Cost effective decisions
 - Facilitation of prioritisation
- ❑ Monitoring of the effectiveness of PoMs
- ❑ Use of data can aid transparency and stakeholder buy-in

Monitoring and the WFD

- ❑ Monitoring is required to give a ‘clear and comprehensive overview of water status within catchments’ (Article 7).
- ❑ The information gained from monitoring is required for a number of additional purposes including use in inter-calibration and verifying risk assessments (Annex V).
- ❑ The purpose for monitoring is more numerous than previously required by Member States (MSs).
- ❑ The division of monitoring into 3 separate networks.

Monitoring and the WFD (continued)

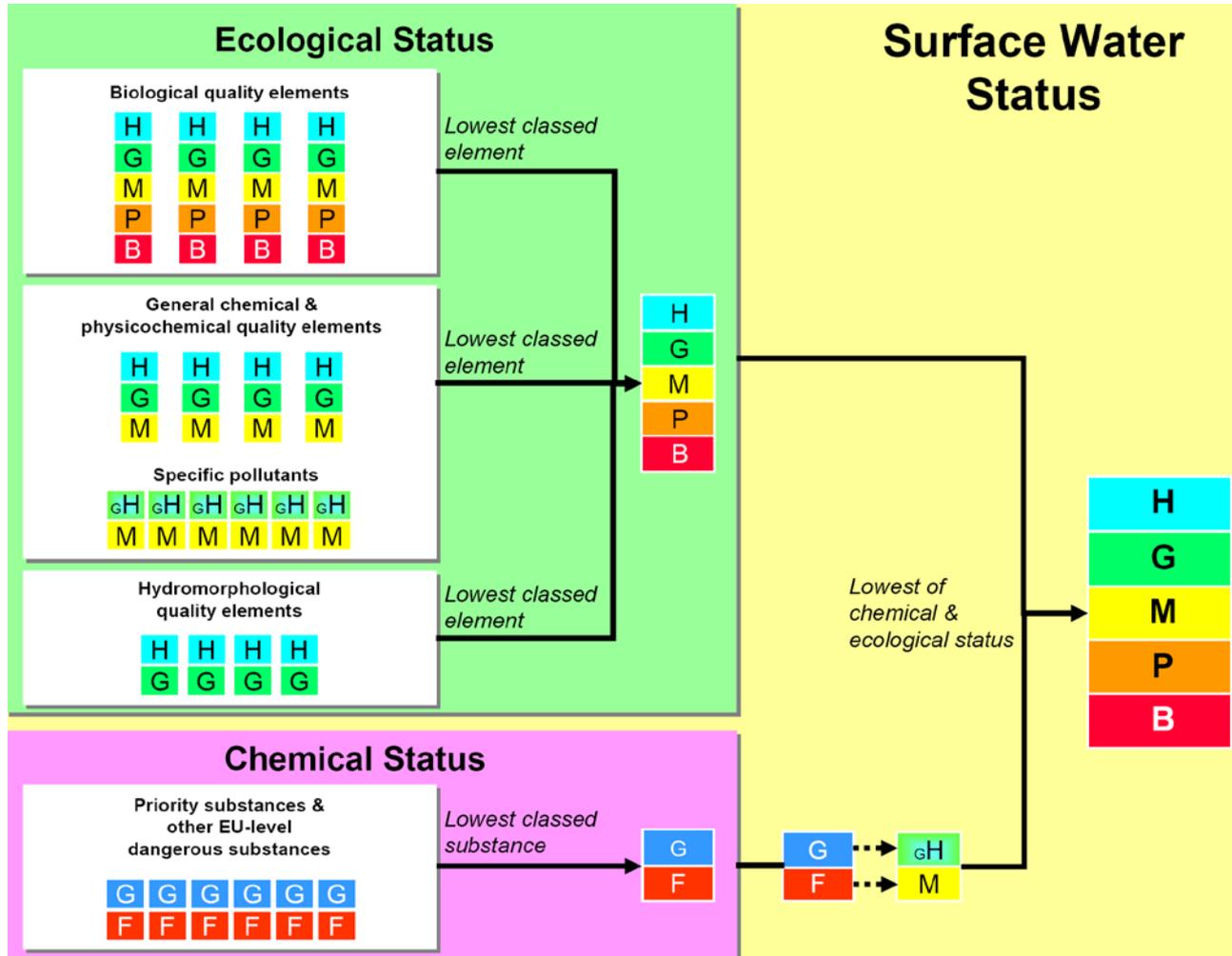
- Three types of monitoring embedded in the WFD (Sanchez and Porcher 2009)



- Number of monitoring stations in Europe (European Commission 2009)

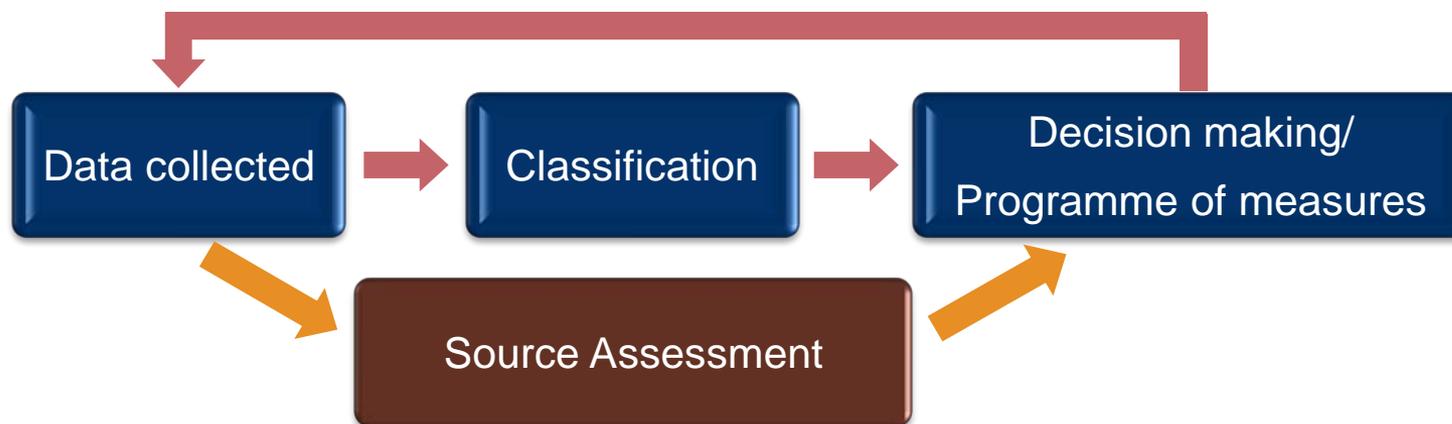
Water body	Surveillance	Operational
Rivers	16,325	34,716
Lakes	4,439	3,920
Transitional	904	732
Coastal	4,592	3,793

Classification of surface water status



Monitoring for programmes of measures (PoMs)

- ❑ Monitoring is not only required for classification.
- ❑ A key task for MSs is, based on sound monitoring and the analysis of the river basin, to select PoMs for achieving the environmental objectives of the WFD (Article 11, Annex III).
- ❑ Also needed to improve transparency in decision making and for stakeholder by in.



Monitoring for source assessment

- ❑ The assessment of risk to WFD objectives and characterisation must involve initial source identification.
- ❑ Design of monitoring network at the water body level needs to be based on source assessment
 - Monitor at locations able to distinguish sources and pathways
 - Monitor to provide data that can be used to estimate relative contribution of sources
- ❑ Source assessment can be used to refine the monitoring networks for subsequent cycles of river basin management plans as understanding of the catchment characteristics improve

Discussion

- ❑ Need for data and field studies to prove the use of source assessment
- ❑ Climate change consideration for source assessment
- ❑ Source assessment can be improved by flexible monitoring stations.
- ❑ This may not be possible for all statutory bodies due to 6 year plans.
- ❑ Stakeholder involvement still required to select most appropriate measures for each catchment.

Conclusion

- ❑ Source assessment could have an important role in the WFD.
- ❑ The wealth of information provided by monitoring will be useful not only for the classification of water bodies.
- ❑ The use of data can be optimised to provide more information on the aquatic environment.
- ❑ Monitoring data collected for the WFD could aid source assessment.
- ❑ Linking monitoring programmes with source assessment will lead to more effective decision making and ultimately improved water quality.

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Thank you

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