

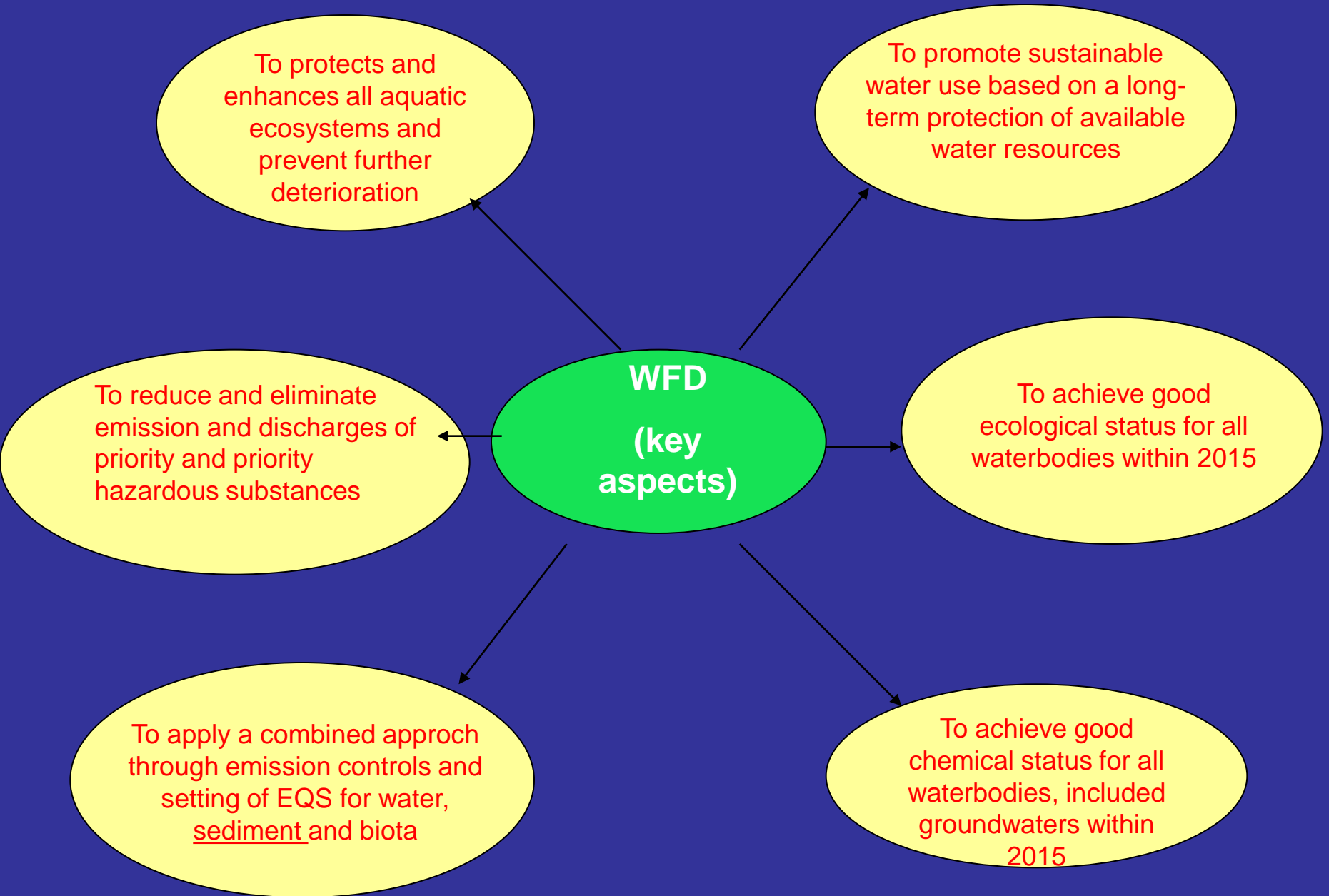


EU Water Framework Directive

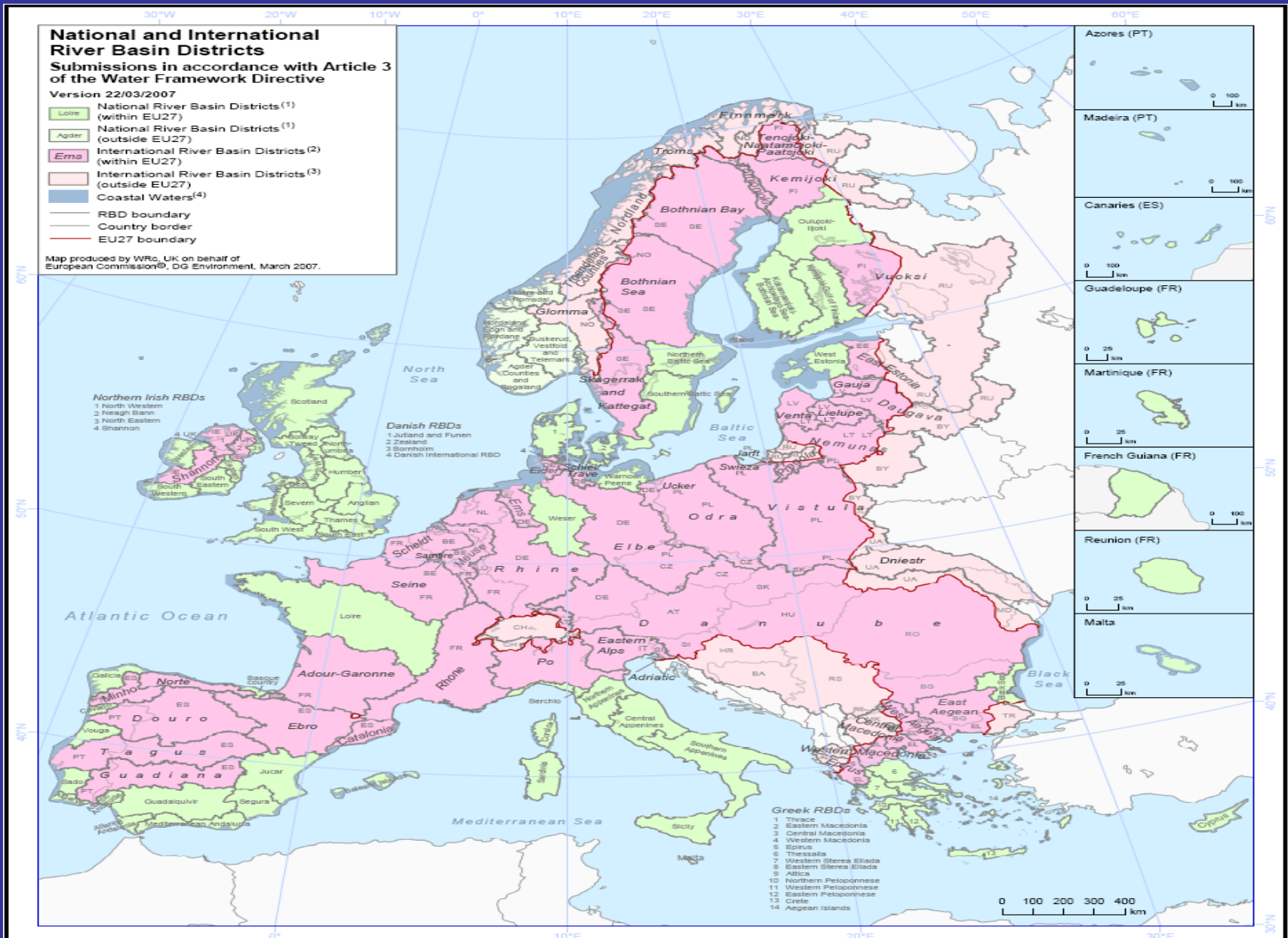
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**Topical Workshop Sediment Risk Assessment
Helsinki, ECHA 7-8 May 2013**



WFD-River Basin districts



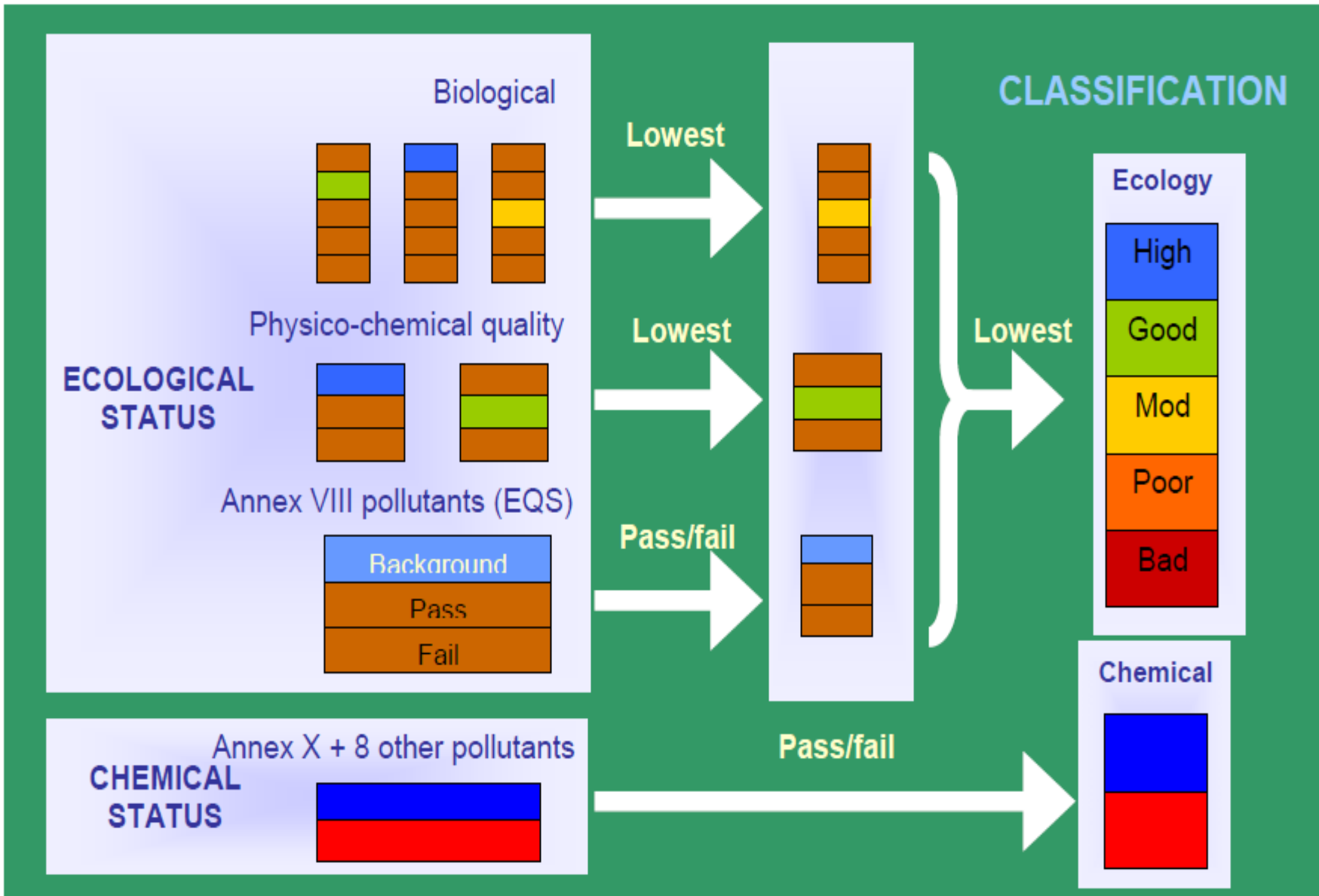


Figure 1.1 Role of EQS in waterbody classification

Biological Quality Elements

Rivers-Water Framework Directive

- Phytoplankton
- Macrophytes and Phytobenthos
- Benthic Invertebrate Fauna
- Fish Fauna

Ecological Status in Rivers-Water Framework Directive

Elements	High status	Good Status	Moderate Status
Benthic Invertebrate Fauna	<p>The taxonomic composition and abundance correspond totally or nearly totally to undisturbed conditions.</p> <p>The ratio of disturbance sensitive taxa to insensitive taxa shows no signs of alteration from undisturbed levels.</p> <p>The level of diversity of invertebrate taxa shows no sign of alteration from undisturbed levels.</p>	<p>There are slight changes in the composition and abundance of invertebrate taxa from the type-specific communities.</p> <p>The ratio of disturbance-sensitive taxa to insensitive taxa shows slight alteration from type-specific levels.</p> <p>The level of diversity of invertebrate taxa shows slight signs of alteration from type-specific level.</p>	<p>The composition and abundance of invertebrate taxa differ moderately from the type-specific communities.</p> <p>Major taxonomic groups of the type-specific community are absent.</p> <p>The ratio of disturbance-sensitive taxa to insensitive taxa, the level of diversity, are substantially lower than the type-specific level and significantly lower than for good status.</p>

Good Chemical Status-WFD

- Compliance with environmental quality standards (EQS), derived for the substances of the European List of Priority.
- The EQS can be defined for water column, sediment or biota.

European Priority Substances-Sediment/Biota Matrix

Priority Substance	Sediment	Biota	Priority Substance	Sediment	Biota
Alachlor	O	---	Naphthalene	O	O
Anthracene	P	O	Nickel and its compounds	O	O
Atrazine	---	---	Nonylphenols	O	O
Benzene	---	---	Octylphenols	O	O
Brominated diphenyl ethers	P	P	Pentachlorobenzene	P	O
Cadmium and compounds	O	O	Pentachlorophenol	O	---
C10-13-chloroalkanes	P	P	Polyaromatic Hydrocarbons	P	O ^d
Chlorfenvinphos	O	---	Simazine	---	---
Chlorpyrifos (-ethyl, -methyl)	O	---	Tributyltin compounds	P ^e	P
1,2-Dichloroethane	---	---	Trichlorobenzenes	---	---
Dichloromethane	---	---	Trichloromethane	---	---
Di(2-ethylhexyl)phthalate	O	O	Trifluralin	O	---
Diuron	---	---	DDT (including DDE, DDD)	P	P
Endosulfan	O	---	Aldrin	O	O
Fluoranthene	P	O	Endrin	O	O
Hexachlorobenzene	P	P	Isodrin	O	O
Hexachlorobutadiene	O	O	Dieldrin	O	O
Hexachlorocyclohexane ^b	O	P	Tetrachloroethylene	---	---
Isoproturon	O	---	Tetrachloromethane	---	---
Lead and its compounds	O	O	Trichloroethylene	---	---
Mercury and its compounds	O	P			

P = preferred matrix, O = optional matrix

EQS (environmental quality standard)- WFD definition

The concentration of a particular pollutant or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment.

<i>Protection Objectives</i>	<i>Methodology for derivation of specific quality standard</i>
Pelagic community (inland waters)	Acute and chronic bioassay Use of assessment factors (annex V Directive 2000/60/EC)
Pelagic community (marine waters)	Acute and chronic bioassays Use of assessment factors/ TGD
<u>Benthic community (inland waters)</u>	<u>Equilibrium partitioning method-toxicity data benthos</u>
<u>Benthic Community (marine waters)</u>	<u>Equilibrium partitioning mehod– toxicity data benthos</u>
Top predators (marine mammals)	Toxicity data-birds diet-use of BCF e BMF
Human Health (consumption of fish products)	Tolerable daily intake- Use of BCF
Human Health (consumption of drinking water)	European Directive 75/440/CE – Drinking water directive – 98/83/CE Removal Efficiency

**DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE
COUNCIL on environmental quality standards in the field of
water policy 2008/105/EC**

Article 16 Water Framework Directive

Key components EQS Directive

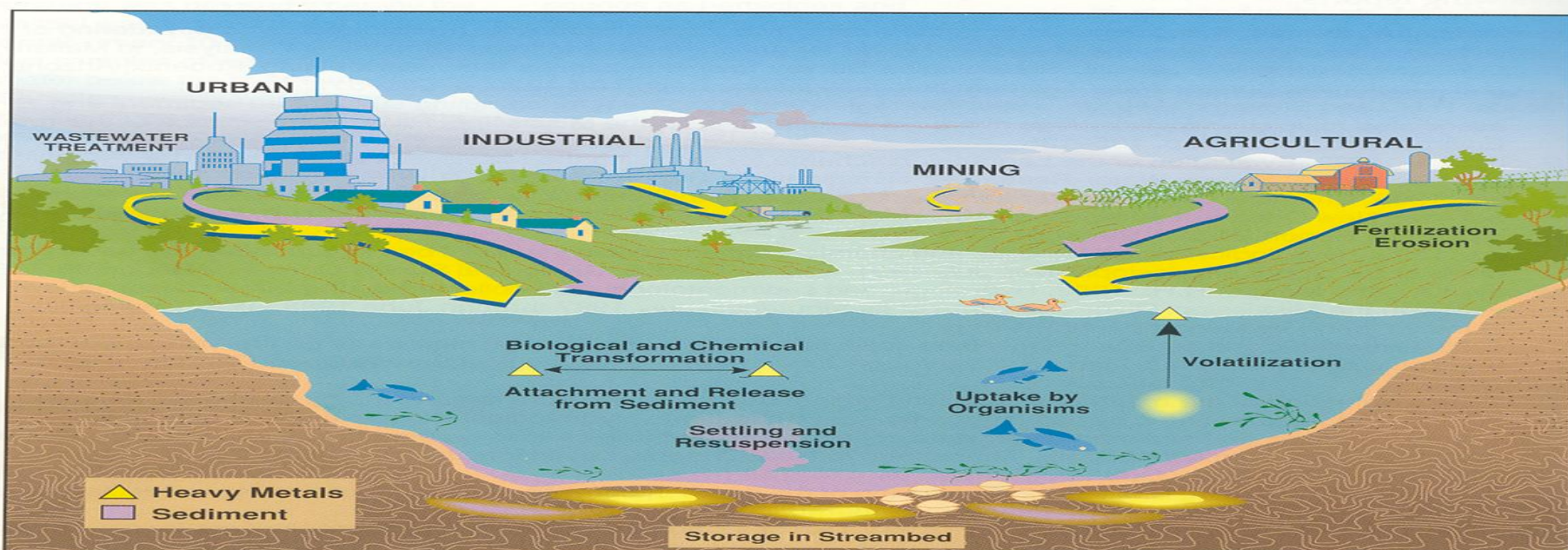
- EQS for water phase for 33 priority substances
- EQS for 8 list I substances of dangerous substances directive (DDT, Aldrin, Dieldrin..)
- EQS Biota for hexachlorobenzene, mercury and hexachloroutadiene.
- Establishment of an inventory of emission, releases and losses of priority substances.
- Use of Background and bioavailability for the metals₂

Environmental Quality Standards

- **EQS: Annual average (Based mainly on Chronic bioassays)**
- **EQS: Maximum allowable concentration (Based mainly on acute bioassays)**
- **Difference between inland waters (rivers, lakes) and other waters (transitional, coastal and territorial).**
- **Specific dispositions for Metals**

Role of Sediments

- Possibility for the Member States to derive EQS for the sediment compartment for the substances of the list of priority for specific waterbodies.
- Obligation of trend analysis in relation to the no-deterioration objective of the water framework directive.



Commission adoption New Priority Substances

- 31 January 2012:
- The Commission adopted a **report** on its review of the list of priority substances, and a **proposal** for a directive of the European Parliament and the Council amending Directives 2000/60/EC* and 2008/105/EC** as regards priority substances in the field of water policy.
- Discussion in place (EU Commission, EU Parliament and EU Council).

New Possible Priority Substances

Substance	BCF	Log Kow	Major Uses
Methyl 5-(2,4-dichlorophenoxy)-2-nitrobenzoate (Bifenox)	1500	3.64	It is used as a control of weeds in post-emergence applications in winter cereals
Terbutryn	181	3,48-3.77	Selective herbicide, triazine compound
Cybutryne (Irgarol®)	160-30000	2,8-3,95	Effective herbicidal biocide mainly used as an antifouling agent in paints for boats and vessels. It is applied at marine as well as at inland freshwater sites
Cypermethrin	1204	6.6	Insecticide
Dichlorvos	1,2	1.9	organophosphorous insecticide

New Possible Priority Substances

Substance	BCF	Log Kow	Major Uses
Heptachlor/Heptachlor epoxide	56000	5.40-6.10	Organochlorine insecticide-banned
“Dioxins” PCDD+PCDF+PCB DL	30000- 50000	6.1 - 8.20	PCDDs and PCDFs are unintentionally formed and released from thermal processes as a result of incomplete combustion or chemical reactions.
Perfluorooctane sulfonic acid and its salts (PFOS)	2796	5.16 (KOC)	Providing grease, oil and water resistance to materials such as textiles, carpets, paper and in general coatings

New possible Priority Substances

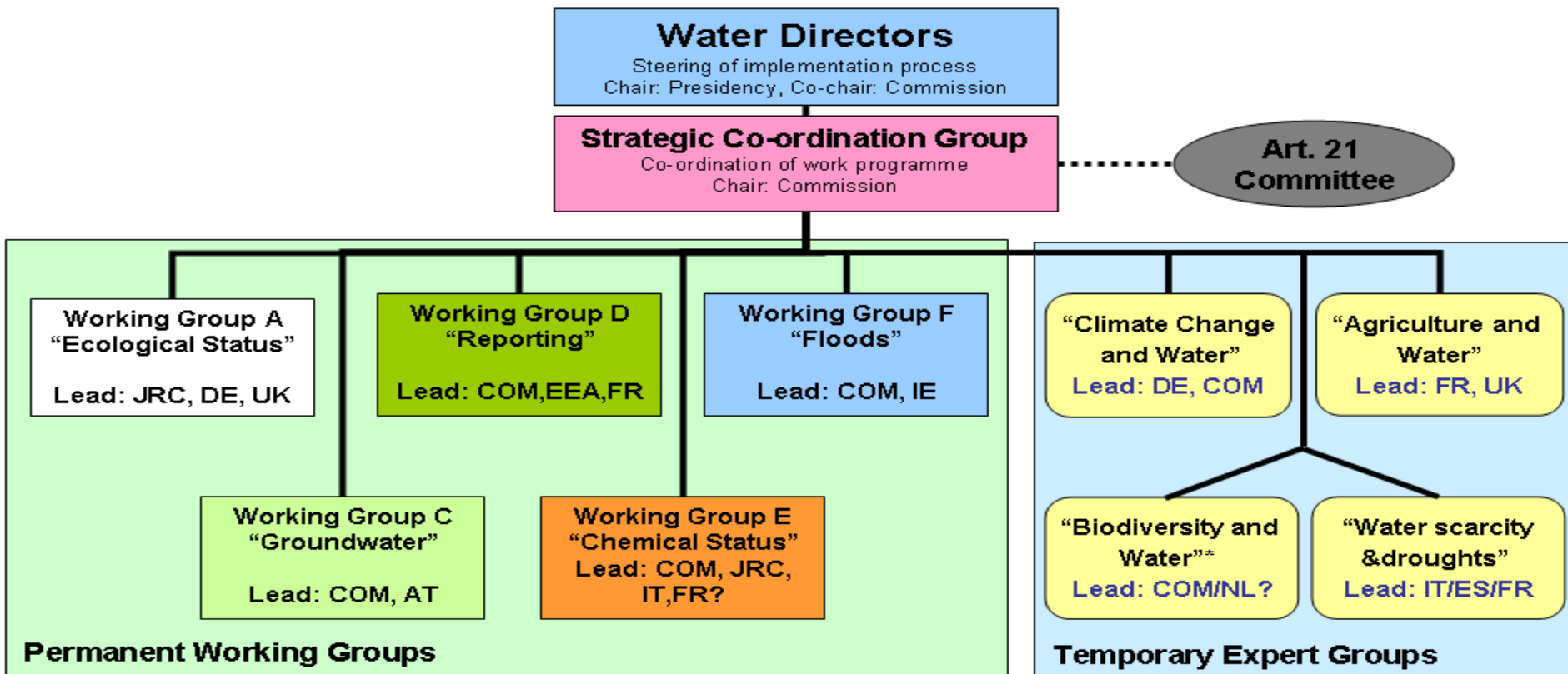
Substance	BCF	Log Kow	Major Uses
Hexabromo-cyclododecane (HBCDD)	18100	5.07-5.62	Used as a flame retardant
Quinoxifen	5040	4.66	Fungicide
Dicofol	8050-13500	6	Organochlorinated acaricide

New Possible Priority Substances

Substance	BCF	Log Kow	Major Uses
Aclonifen	2896	4.37	herbicidal active substance belonging to the chemical class of diphenylether
Diclofenac	69-2732	3,28-4.02	pharmaceutical ingredient used by patients for the treatment of inflammation and pain
17alpha-ethinylestradiol	610	3.67-4.2	synthetic steroid
Beta-Estradiol	-	4.01	Estrogenic hormone

Water Directors conclusions

CIS Organisation 2010-2012



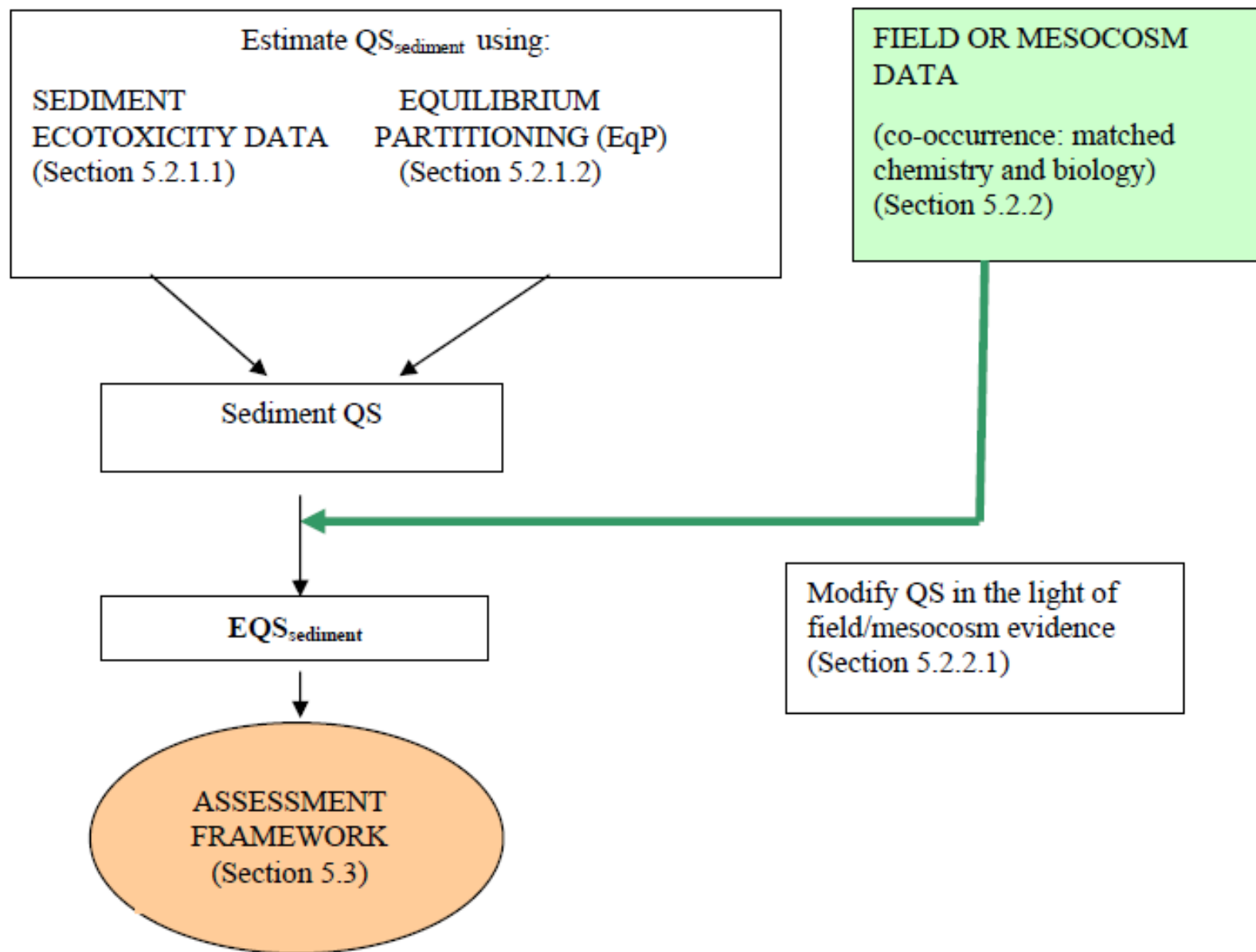
*The precise modalities of the work on biodiversity and water will be decided at a later stage after discussions by Nature Directors and Water Directors

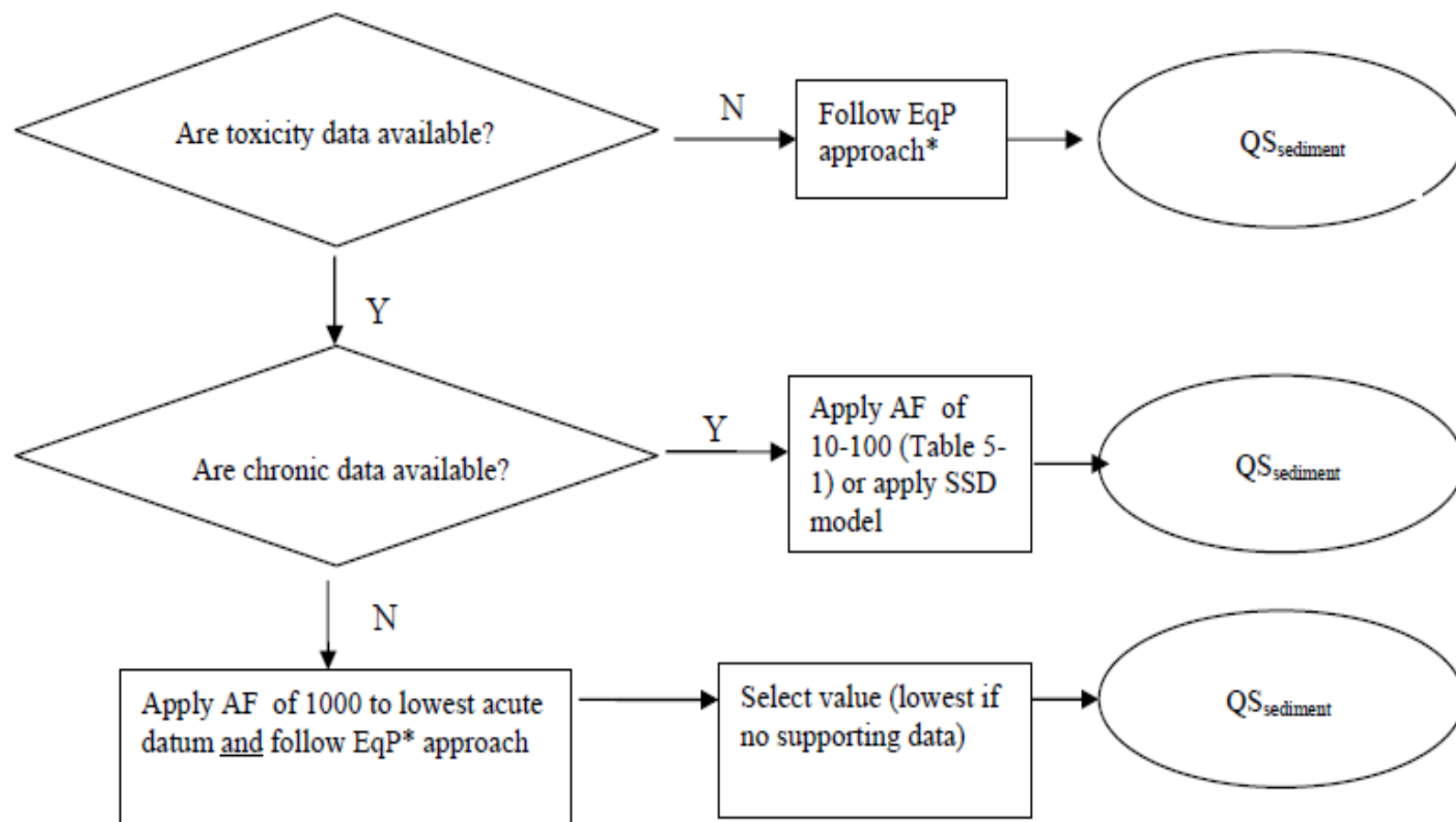
Common Implementation Strategy
for the Water Framework Directive (2000/60/EC)



Guidance Document No. 27

Technical Guidance For Deriving
Environmental Quality Standards





* apply additional AF of 10 if log Kow >5

Figure 5.2 Process for the derivation of a QS_{sediment}

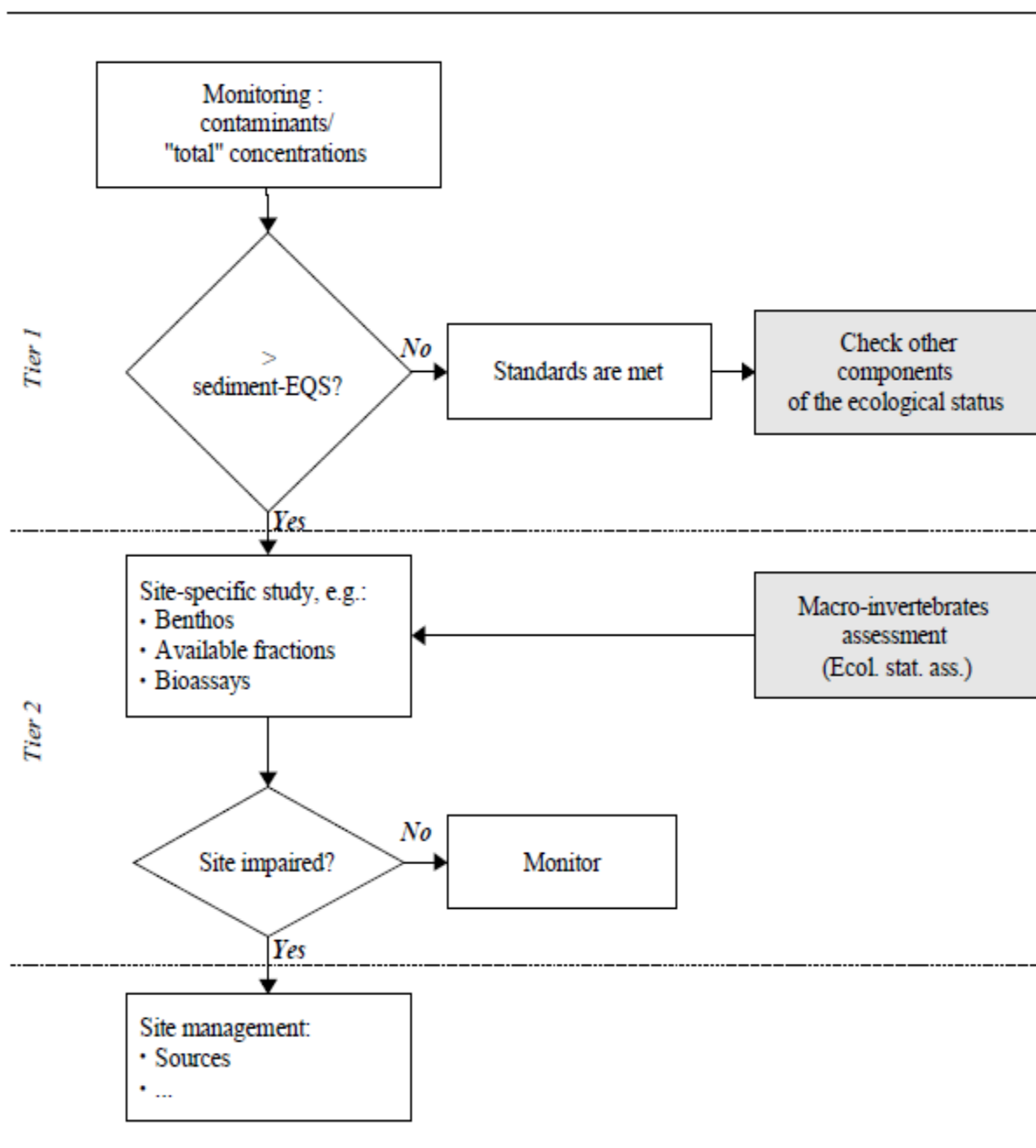


Figure 5.3 Tiered assessment framework for sediments

COMMON IMPLEMENTATION STRATEGY FOR THE WATER FRAMEWORK DIRECTIVE (2000/60/EC)



Guidance document No. 25
ON CHEMICAL MONITORING OF SEDIMENT AND BIOTA
UNDER THE WATER FRAMEWORK DIRECTIVE

WFD Article 8 Monitoring

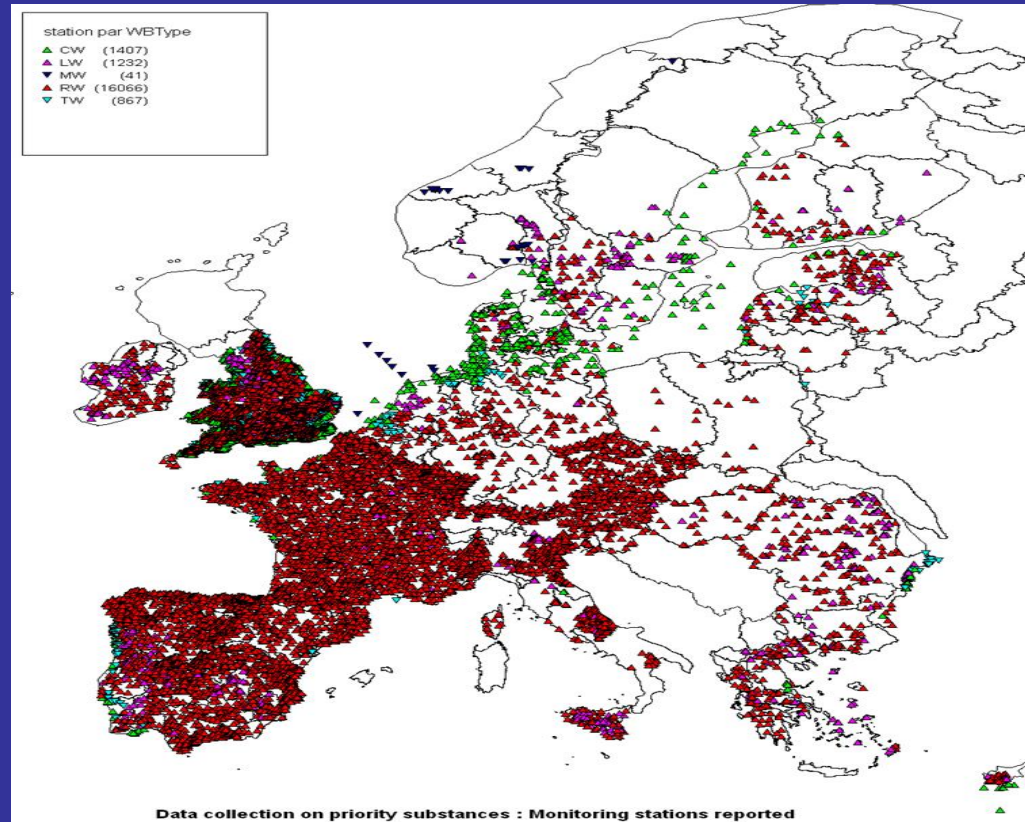
Objective= establishing a coherent and comprehensive overview of water "status" within each river basin district

✓ concerns surface waters (rivers, lakes, transitional and coastal waters), ground waters and protected areas

Surveillance (every management plan)

Operational (status assessment for waterbodies at risk).

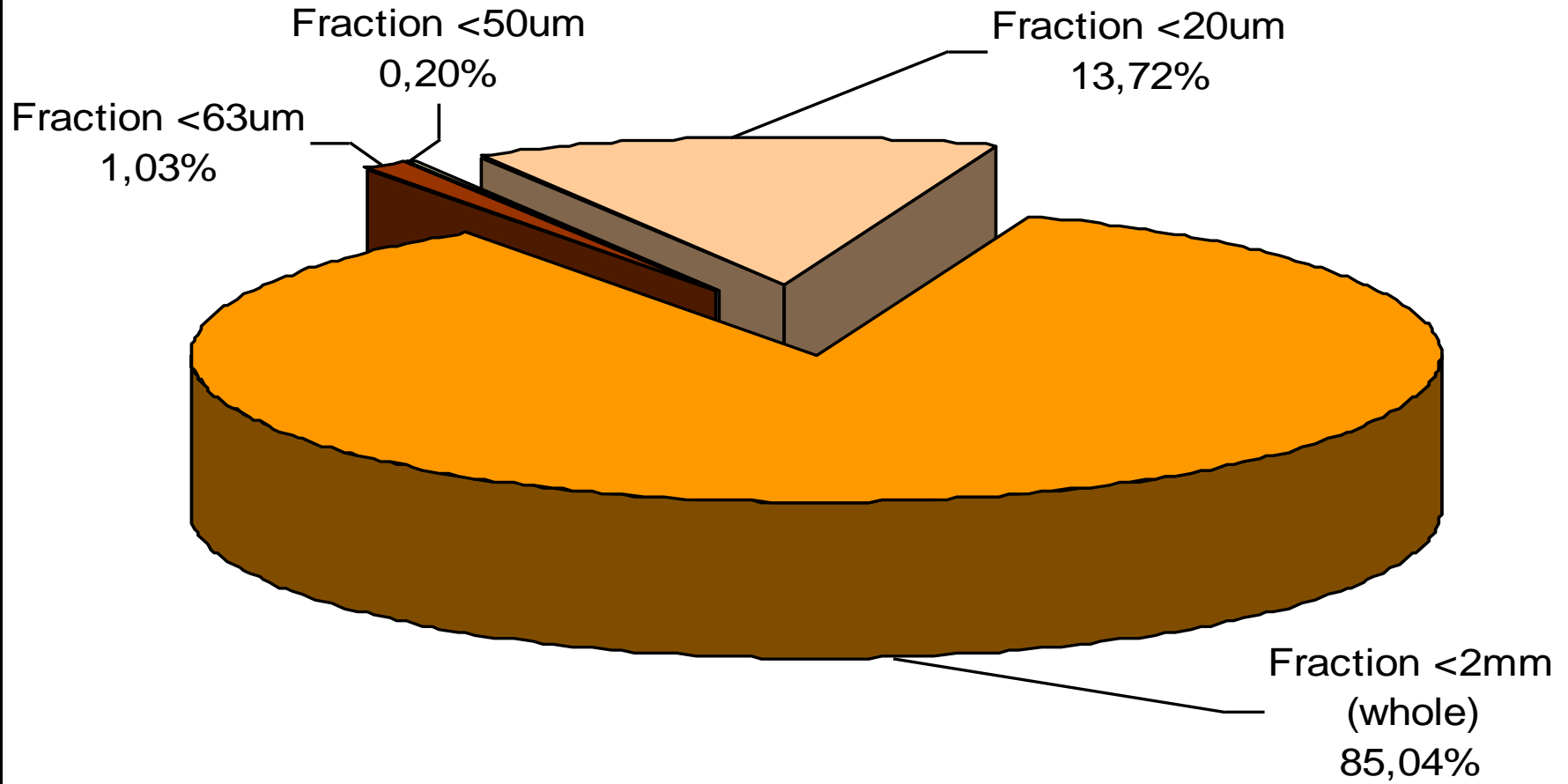
Investigative (accidents, unknown deterioration causes)



- Data 2000-2008
- Surface water
- 26 Member States + CH and NO
- 19 613 stations
 - 5 water body types
- 545 387 sampling
- 14 567 816 analysis

Sediment Monitoring-Member States 2008

912 821 analysis



Guidance on sediment/biota monitoring

- **Quality Assurance/Quality Control**
- **Sampling Strategy (e.g. frequency, selection of sampling stations)**
- **Technical Aspects of sediment sampling**
- **Analytical methods (metals and organic)**
- **Normalisation**
- **Passive Sampling Techniques**
- **Sediment Ecotoxicity test for the evaluation of investigative monitoring and ecological status**

Future perspective

European Report on Effect-Based Tools (biomarker, bioassays in vitro/in-vivo, EDA, Spear, OMICs) in the context of WFD

Use as early warning systems (e.g. biomarkers)

Selection of monitoring points, e.g. grouping of water bodies for operational

Selection of quality elements based on ecological relevance.

Use for **investigative monitoring** to identify the reason for any failure to achieve environmental objectives, in circumstances where the reason is unknown.

Detection of mixture of pollutants



Publications and links of Interest



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Special Issue

Chemical Monitoring Activity for
the Implementation of the Water
Framework Directive

Guest Editors:
Philippe Quevauviller,
Mario Carere and Stefano Polesello

- <http://circabc.europa.eu>
(documents water framework directive).
- <http://water.europa.eu/>
(wise-water information system for europe).
- http://ec.europa.eu/environment/water/index_en.htm
(website of DG Environment)

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