

Environmental Quality standards for organic substances in sediments: the Water Framework Directive challenging science, and vice versa

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Content

- Issues:
 - Should sediment EQS be set, and how to derive them?
 - How can compliance be checked ...?
- Setting EQS
 - Background
 - Current state of the "science"
 - The WFD challenging science ...
 - And vice versa!
- Compliance checking
- No conclusion(s) yet, a process

Background (1)

WFD, art. 16 (7)

“The Commission shall submit proposals for quality standards applicable to the concentrations in surface water, sediment or biota.”

... and Annex V (1.2.6)

“in deriving EQS, MS shall act in accordance with the following provisions. Standards may be set for water, sediment or biota. Where possible, both acute and chronic data shall be obtained for the taxa set out below which are relevant (...). The ‘base set’ of taxa are”

- Algae and/or macrophytes
- Daphnia or representative organisms for saline waters
- Fish

Approaches and results (Lepper, 2005)

- Freshwater \Rightarrow based upon the "TGD", namely
 - Ecotoxicological tests + assessment factors
 - Equilibrium partitioning
- Transitional and coastal waters \Rightarrow same
 - Ecotoxicological tests + assessment factors
 - AF increased as compared to freshwaters
- For most substances, lack of data
- No sediment EQS issued

Lepper P. (2005) Manual on the methodological framework to derive EQS for priority substances in accordance with Art. 16 of the WFD – Fraunhofer Institute, 51 p

Current state of the art

- SETAC Pellston workshop, Aug. 2002
 - Approaches reviewed
 - Mechanistic approaches: Equilibrium Partitioning
 - Empiric approaches: ERL-ERM, SLC, logistic modelling
 - Consensus-based methods
 - None particularly flawed, but (i) need to field check, (ii) use as guidelines and not as regulatory [pass/fail] standards
- Few innovations since 2002: CBR, field-based SSD

Batley G.E. & al. (2005) Scientific underpinnings of sediment quality guidelines *in* Use of SQG and related tools for the assessment of contaminated sediments, Wenning R.J., Batley G.E., Ingersoll C.G. & Moore D.W. ed., pp 39-120

SETAC workshop, 2006

- Uncertainty in derivation and application
 - Several EQS representing different protection goals / levels of protection
 - EQS exceedence does not necessarily mean environmental damage
- EqP useful for estimating (safe) sediment concentrations of very hydrophobic substances
 - Sediment toxicity studies necessary
 - Interest in the 'body burden' approach
- FW versus SW
 - Possibly differential exposure ... for polar substances
 - Possibly different sensitivity ... but current knowledge does not support evenly higher AF's nor extrapolation from FW to SW

Matthiessen P. & al. (2008) Water and Sediment EQS derivation and application, Crane M. ed., 109 p.

SEDNet Conference, Oslo, May
27-29th, 2008

The WFD challenging science

- CSTEЕ comments to EQS derivation guidance
- PS directive content
- European Parliament orientations
- Marine and coastal sediments

CSTEE comments to Lepper (2005)

- EQS differ from PNEC
 - PNEC obtained from a tiered derivation approach,
 - EQS are legally binding and as such may trigger management decisions
- Sediment (and biota) EQS should be derived ... but EqP not appropriate
- Some contest by EC: INERIS report
 - complexities and uncertainties in setting and monitoring legally binding sediment (and biota) EQS are currently too great to obtain reliable EQS for these matrices

CSTEE (2004) Opinion on the "Setting of EQS for Priority Substances" ... - Brussels, European Commission, Health & Consumer Protection DG, 32p

Bonnomet V., Alvarez C. (2006) Implementation of requirements on priority substances within the context of the Water Framework Directive. Methodology for setting EQS: identifying gaps and further developments. International Office for Water / INERIS. report ENV.D.2/ATA/2004/0103. 49 p

Project

Priority Substances Directive

- “If concentrations of certain substances are consistently below the EQS for water, Member States may opt to monitor such substances in sediment and/or biota only. Any Member State wishing to do so shall establish an EQS for sediment and/or biota offering at least the same level of protection as the EQS for water”
- “Member States shall arrange for the long term trend analysis of concentrations of those priority substances listed in Part A of Annex I that tend to accumulate in sediment and/or biota”
- “member states to ensure that concentrations of substances . . . do not increase in sediments and biota.”

EP orientations (06/05/2008)

- More substances registered as PS / PHS, including PCBs and dioxins
- EC invited to submit a new proposal including standards for biota and sediments
 - For all substances of concern
 - after emissions inventory

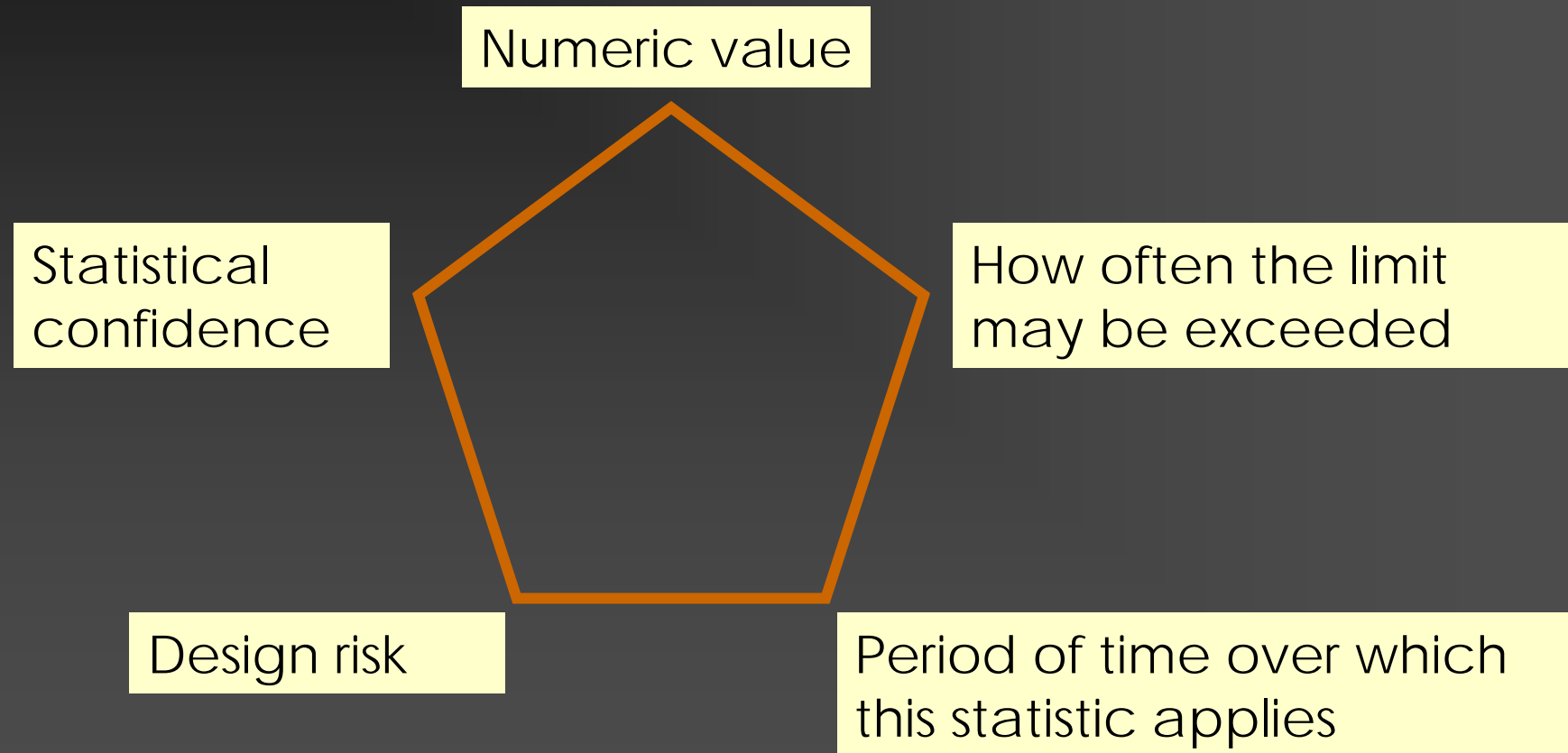
http://www.europarl.europa.eu/news/expert/infopress_page/064-28137-127-05-19-911-20080505IPR28136-06-05-2008-2008-false/default_en.htm

Science challenging the WFD

- Few TGD-type data actually available
- EqP applicability
- Variability in benthic communities composition – actual effects on benthos
- Uncertainty (and management thereof)



EQS are not just numerical figures



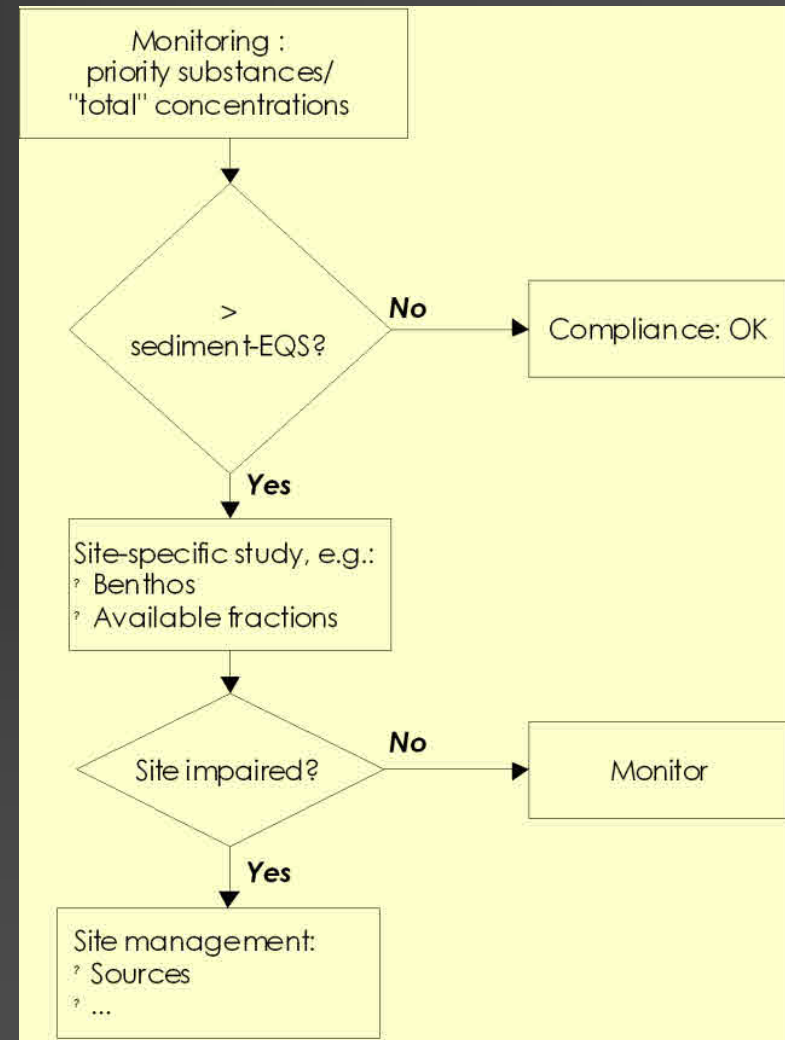
Orientations under discussion

- Article 16 vs article 4, checking compliance
- Link EQS and assessment framework
- Compare results from several derivation procedures
 - Determine a 'consensus-based' value

Crane M. & Babut M. (2007) Environmental Quality Standards for Water Framework Directive Priority Substances: challenges and opportunities – *Integ. Environ. Assess. Manag.* 3, 289-295

Tentative assessment framework

- Total concentrations first
- EQS would trigger a detailed assessment
 - Based on biological methods
 - And / or considerations of availability
- If exceedence of EQS but no apparent impairment of the benthic community: monitor before re-classification



Conclusions and recommendations

- Next steps are critical:
 - Acceptability of the framework?
 - Write up the guidance (deadline autumn 2008)
- Looking forward
 - Develop benthic assessment methods
 - Collect data so as to allow further checking of sediment-EQS predictive ability