The Role of Ecotoxicological Data in Sediment Quality and Dredged Material Assessment Frameworks

CARMEN CASADO CLAIRE MASON SUSANNE HEISE

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Topic A: Application of ecotoxicological testing in sediment quality and dredged material assessment frameworks

Summary points:

- **Uncertainities**

Guidance should be developed covering sediment sampling to measuring responses
Interlaboratory/ intercomparison exercises should be carried out

- **Ecological Relevance**

Toxicity categories must be adapted to resolution of test system
Protection goals defined
Frequency of monitoring should increase

- **Biotests for Decision Making**

Well standardised procedures
Adequate control
Case studies that identify real signal

Topic B: Sediment Quality criteria linked to ecotoxicology

reflect on sediment quality criteria and their efficiency to protect the environment and its living resources

Summary points:

- When comparing with chemical analysis either have to check method is appropriate (partial digest for metals, for example) or be able to remove confounding factors if want to make sure relevant to bioavailability
- If using cofactors such as organic carbon (black carbon) make sure relationship exists before applying
- Check how pollution is defined within the regulations being worked to first to determine which tests will be most relevant
- More data needed for benthic organisms in relation to bioassays
- Also greater awareness of emerging contaminants going forward and how these relate to ecotox testing
- General agreement that combined thresholds (chemically and ecotox derived) work well but may be overprotective.
- Regional differences need consideration
- Measuring efficiency/ effectiveness of threshold chosen is one of the biggest challenges.

How can we be sure that our threshold values are a real signal?

Topic C: Deriving sediment quality guidelines against the background of the European Water Framework Directive (WFD)

Summary points:

- Harmonization: at the catchment scale is necessary, taking into consideration local background and upstream-downstream continuum.
- Derivation of thresholds:

If thresholds are used in regulation, it is necessary that they are based on sediment toxicity data

Thresholds based on EqP are difficult to validate (defined in the laboratory not in the field)

Thresholds for emerging contaminants are scarce/ non-existent

Models for defining thresholds are still highly uncertain or not well defined

Often background information showing how threshold dervived is not available.

Topic D: Passive sampling

shed a light on the applicability of passive sampling methodology to derive thresholds suitable for assessment purposes

Summary points:

- Relatively new method, but it is clear application of this technique is widening (refer to presentations given during the workshop)
- Recent publications discuss link to bioavailability and also have started to compare with existing sediment quality criteria, mainly in waters only (any references supplied will be shared with participants)
- In sediments, it is only the dissolved phase in porewaters that is considered which explains the potential link to bioavailability but some organisms ingest particulates and in addition to passive samplers, complementary tests using mussels is required
- Proposed useful as a screening tool to identify hotspots for remediation, followed by use for monitoring following remediation
- Wide range of contaminants can be measured (need different PS membranes) – emerging contaminants?

What are the next steps required to be able to use passive sampling in dredge assessment frameworks, particularly in relation to sediments

Next steps

A- Application of ecotoxicological testing in sediment quality and dredged material assessment frameworks

Collaboration to produce guidance, etc

Reliability – draw together results from case studies to help understand uncertainties and support biotest selection for decision making

Ecological relevance – compare sensitivities of test organisms with targeted sediment organisms

B- Sediment Quality criteria linked to ecotoxicology

Regional differences and scope need to be considered

Progress on sediment quality criteria for emerging contaminants urgently required

C-Deriving sediment quality guidelines against the background of the European WFD

Agreement on the need of making publicly available the information on derivation and having databases publicly available for finding threshold values from the different countries.

D- Passive sampling

Examples show promising application of passive sampling, and potential link to bioavailability. Training to widen capability is next step advocated.

Next steps

A first initiative coming out of the workshop is the working meeting on reliability of sediment toxicity in the SedNet Conference 2021 – if interested in presenting results, etc please contact Carmen Casado Carmen.Casado@centreecotox.ch, or Susanne Heise, Susanne.heise@haw-hamburg.de