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The Use of Mesocosms

in Risk Assessment of Active Substances in Ballast Water Treatment

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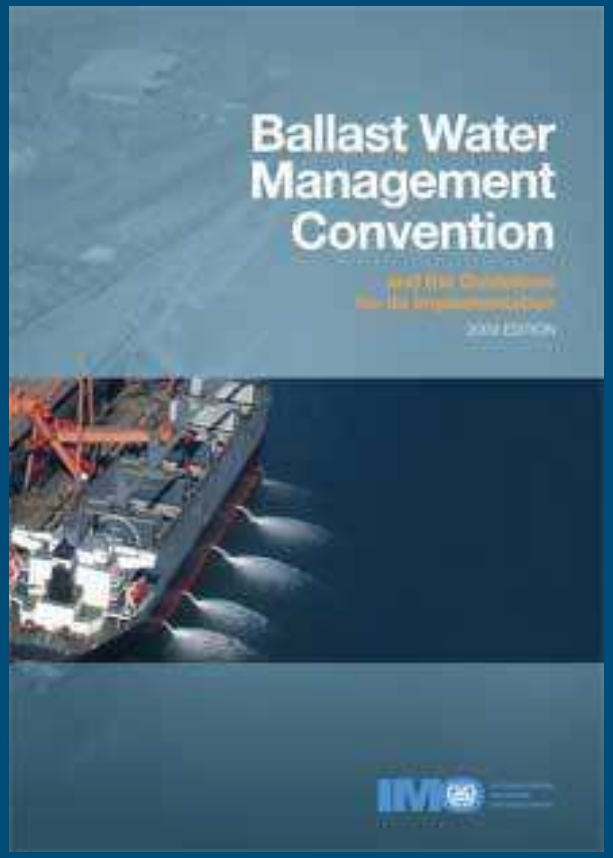
Mesocosms in Risk Assessment



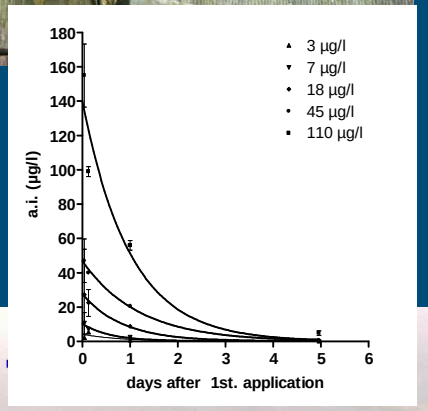
- Ballast Water Management Convention
- G9 ‘active substances’
- Risk assessment

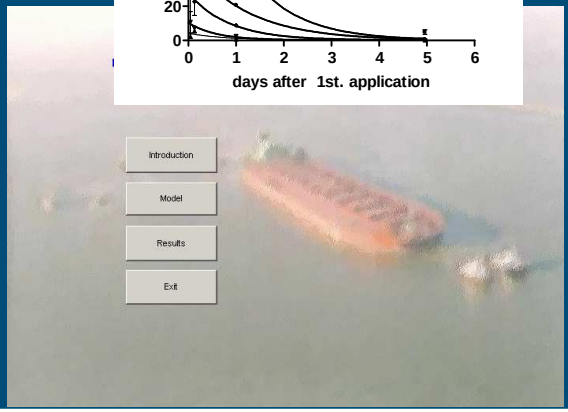
Mesocosms in Risk Assessment

- PEC/PNEC ratio
  - Predicted Environmental Concentration
  - Predicted No adverse Effect Concentration
- PEC/PNEC > 1 **RISK**

Mesocosms in Risk Assessment

- PEC
  - Discharge
  - Chemical properties
  - Dilution

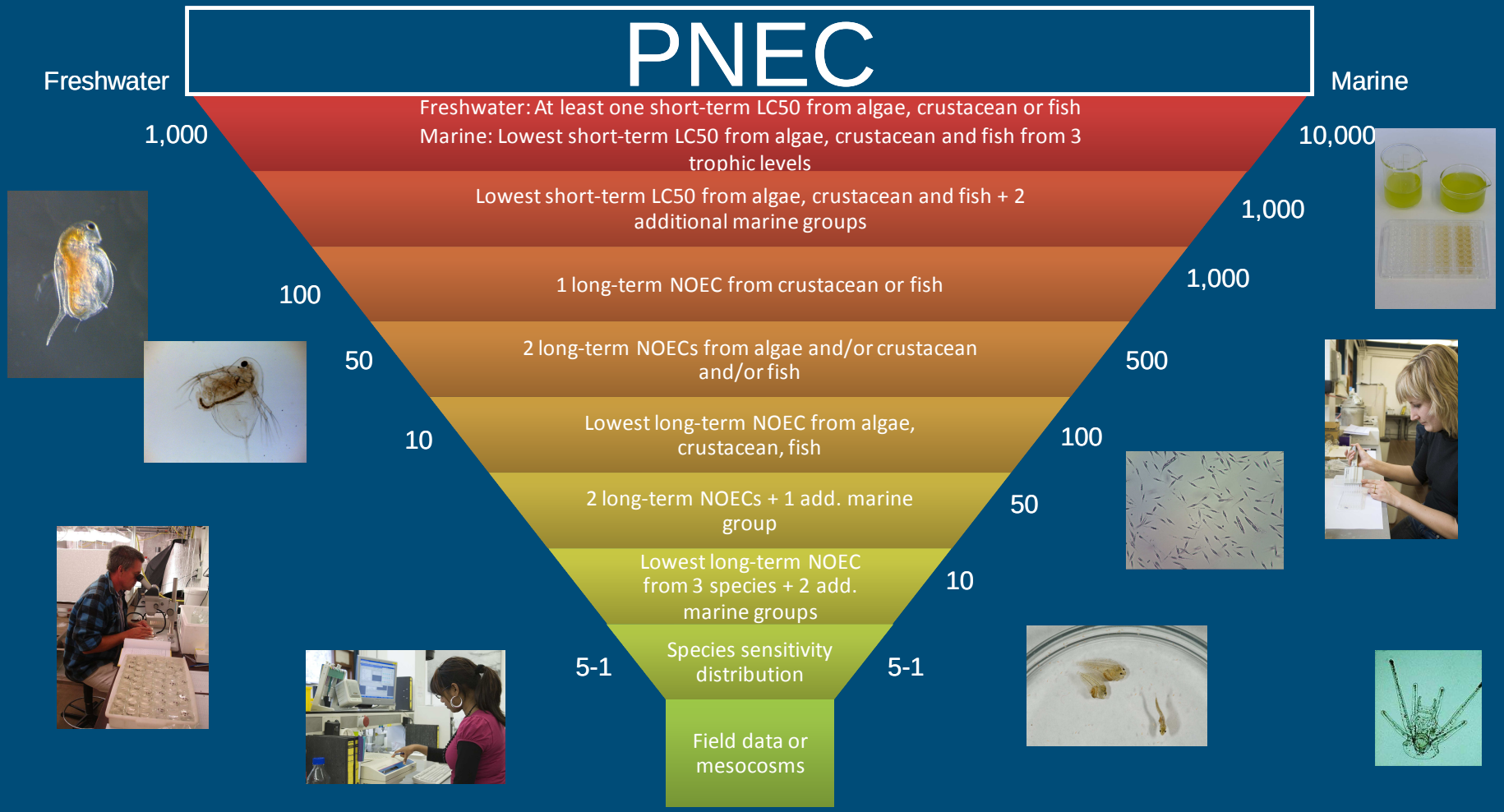




Mesocosms in Risk Assessment

- PNEC
  - Toxicity data
    LC_{50} or NOEC
  - Assessment factors
    lab to field

Mesocosms in Risk Assessment



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Mesocosms in Risk Assessment

Stagnant freshwater mesocosms for agricultural pesticide registration

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Mesocosms in Risk Assessment

Flow-through marine mesocosms for testing contaminated sediment

Static enclosures for planktonic communities

Mesocosms in Risk Assessment

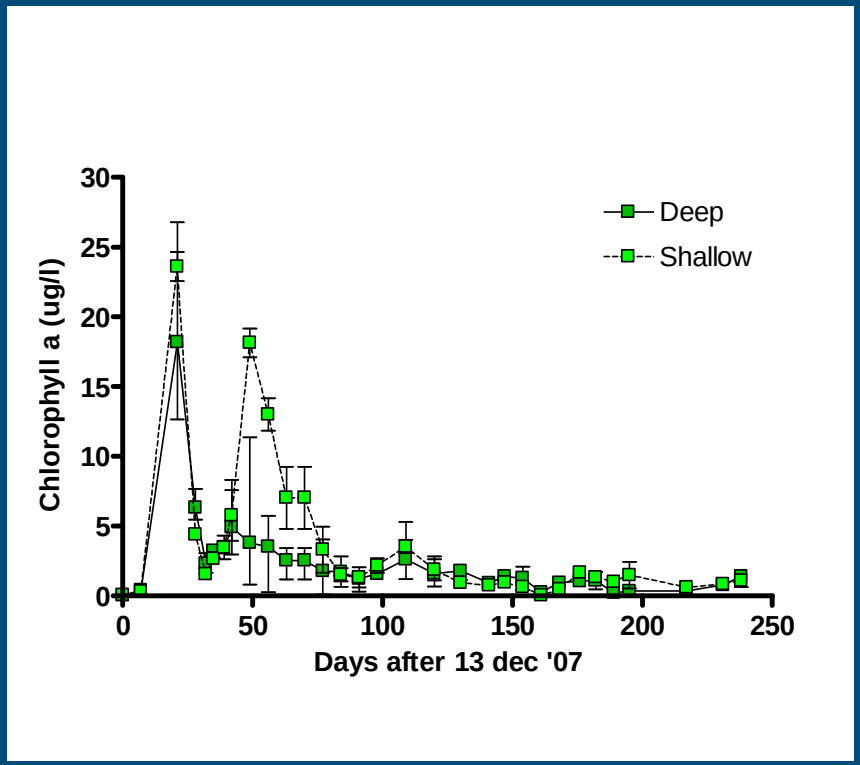
Natural community

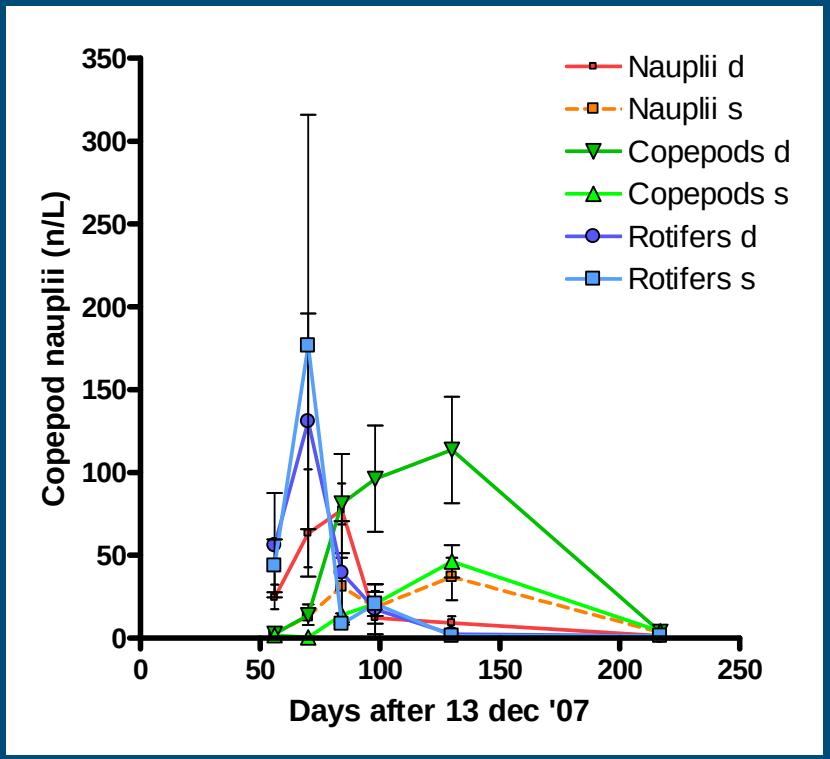
- Phytoplankton
- Zooplankton
- Periphyton

Added species

- Periwinkle
- Lugworm
- Cockle
- Mudshrimp
- Sponge
- Macroalgae

Mesocosms in Risk Assessment





Phytoplankton

Zooplankton

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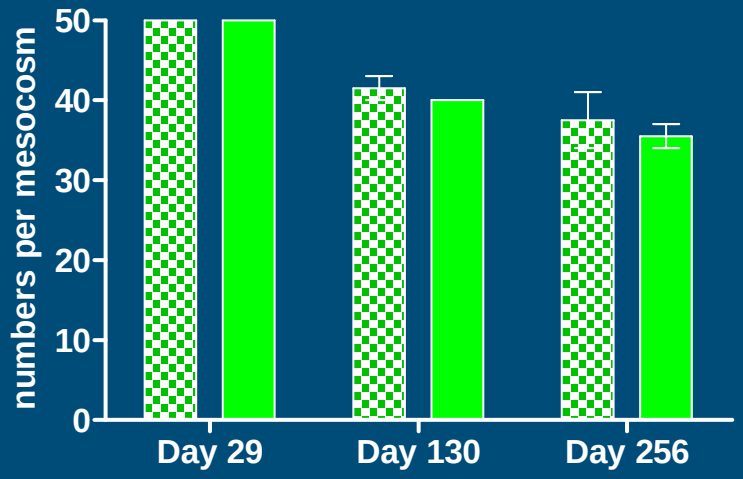
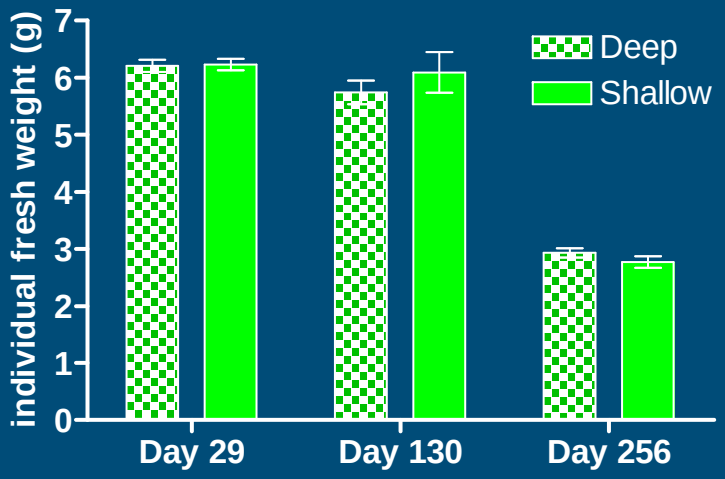
Lugworm – Arenicola marina





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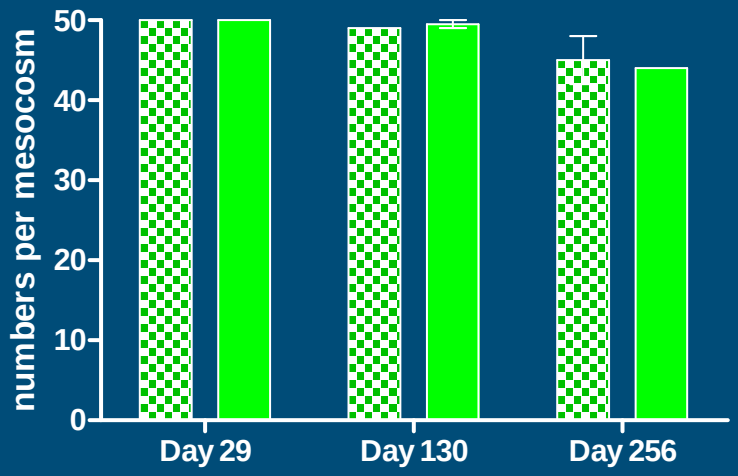
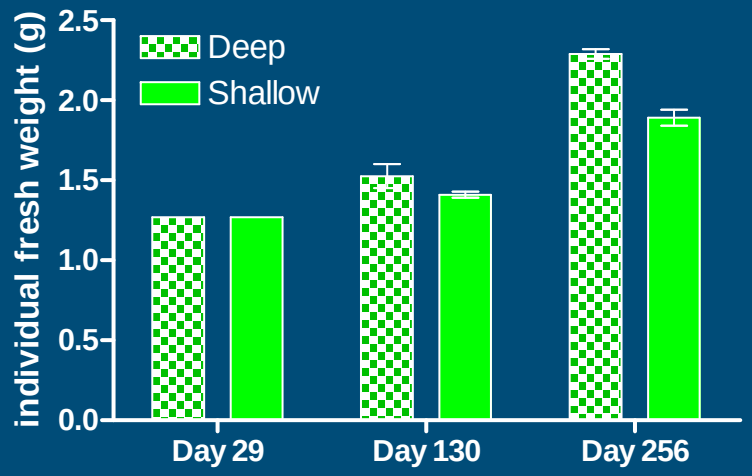
Periwinkle – Littorina littorea





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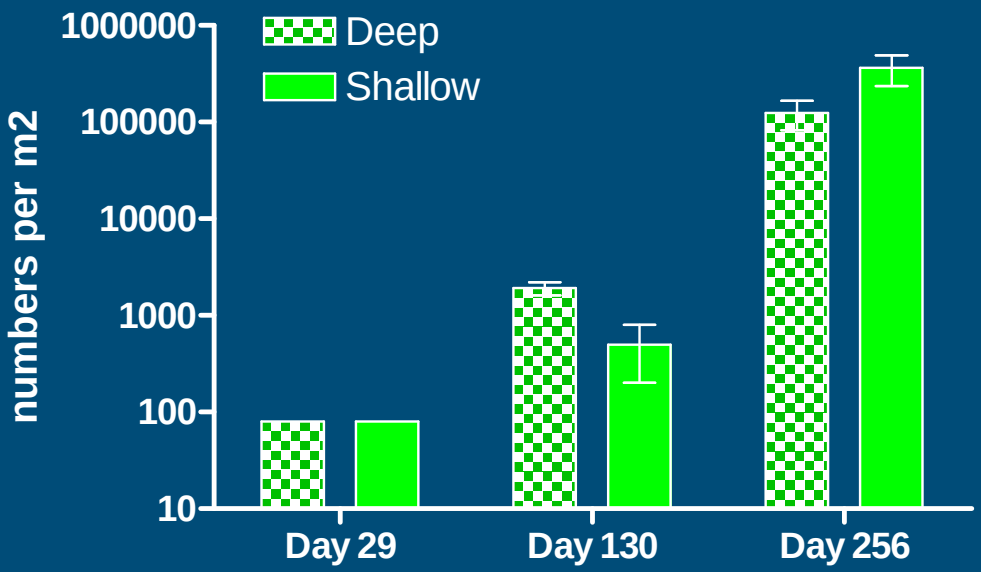
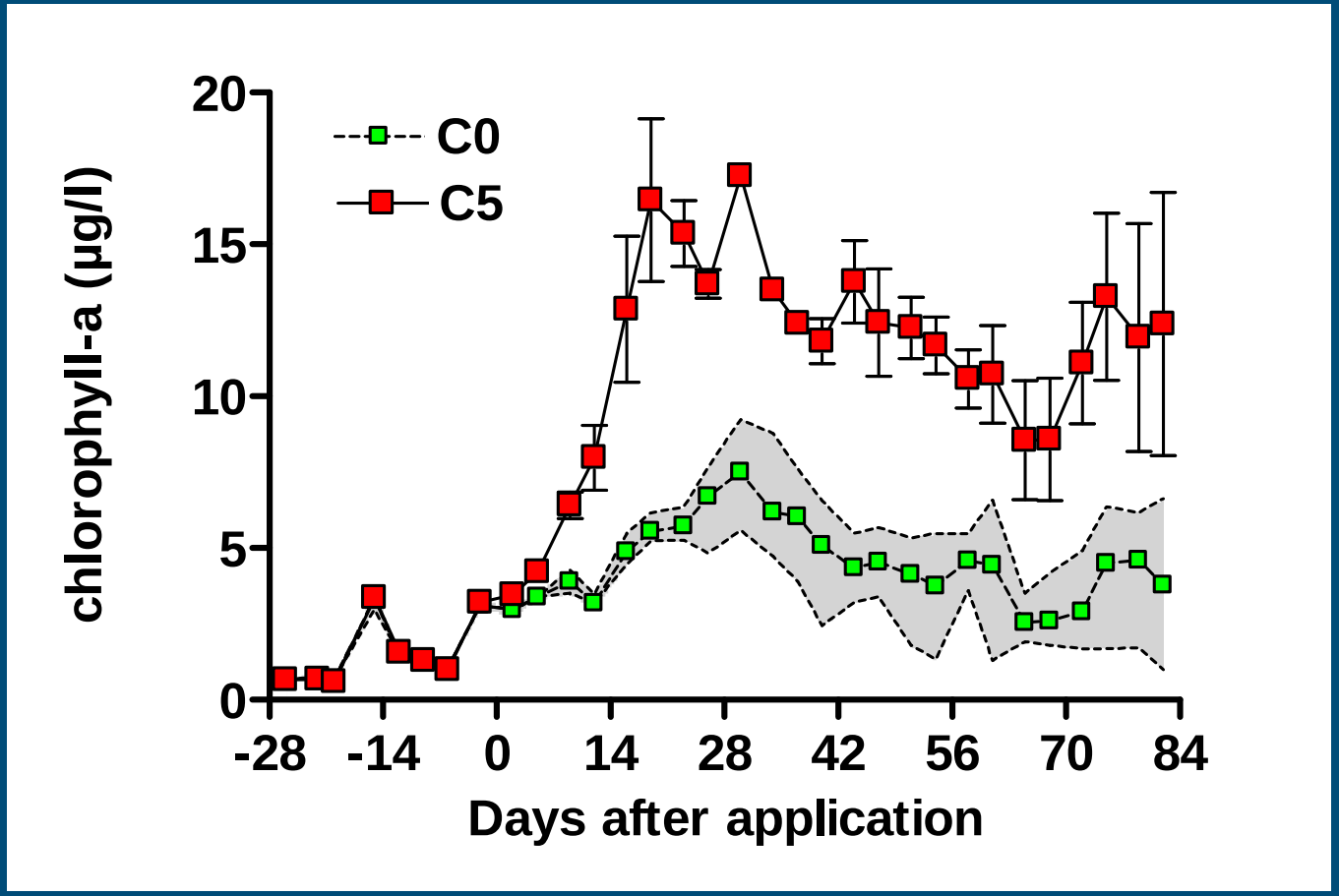
Mesocosms in Risk Assessment

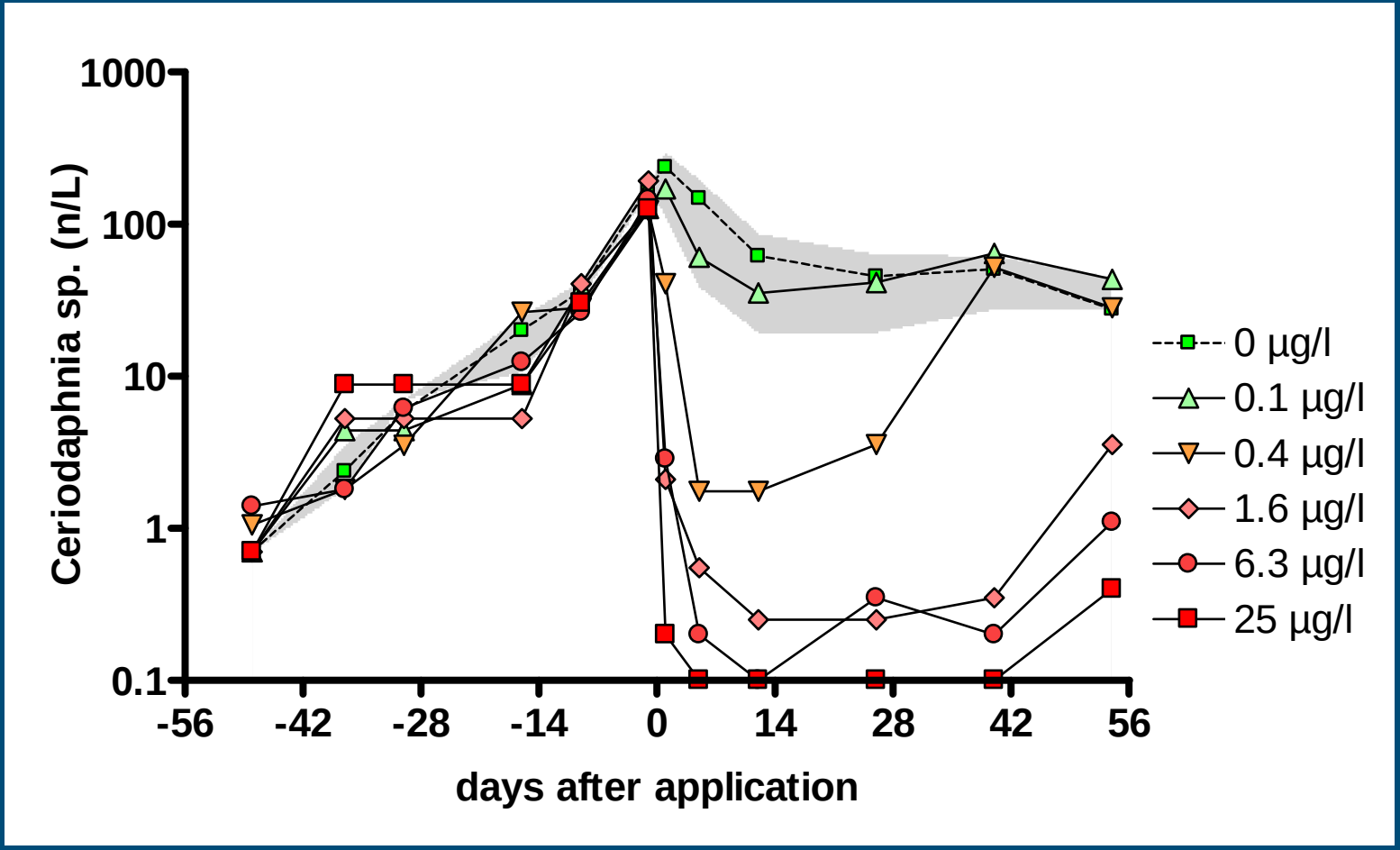
Mudshrimp – Corophium volutator



Mesocosms in Risk Assessment

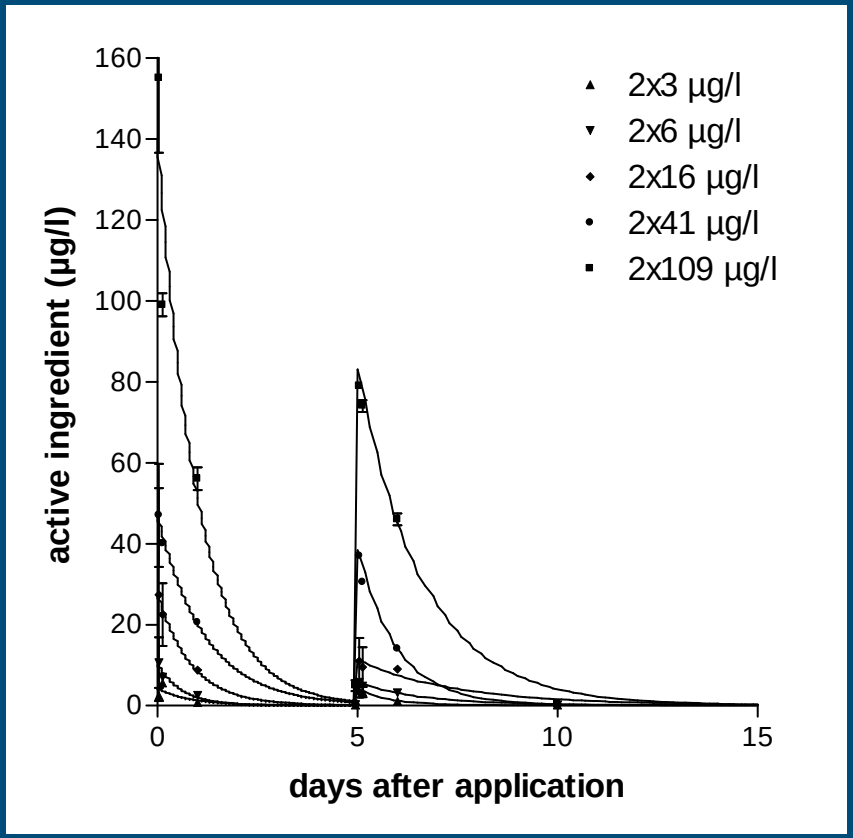


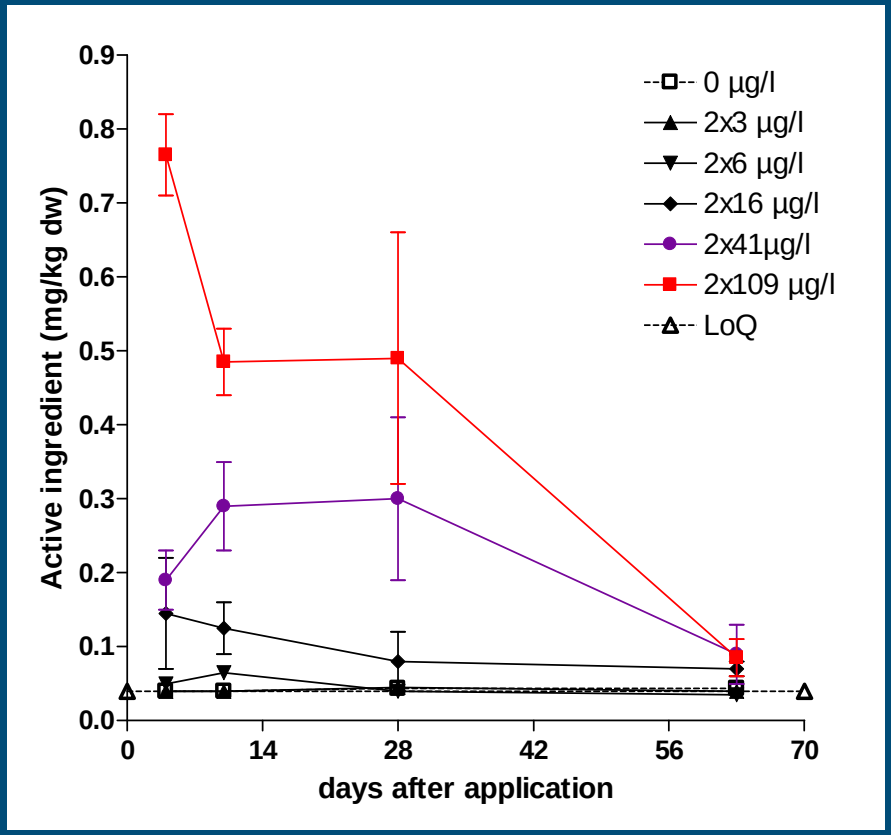
Mesocosms in Risk Assessment



Mesocosms in Risk Assessment

2x application Day 0, Day 5





Concentration in water

Concentration in sediment

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Mesocosms in Risk Assessment

COMMUNITY-LEVEL AQUATIC

From the workshop
"A Meeting of Experts
on Guidelines for
Static Field Mesocosm Tests"

held at
MONKS WOOD EXPERIMENTAL STATION
ABBOTTS RIPTON, HUNTINGDON, UK

3-4 July 1991

E.M.W. de Jong | T.C.M. Brock | E.M. Peeketma | P. Leeuwangh

Guidance for summarizing and evaluating aquatic micro- and mesocosm studies

A guidance document of the Dutch Platform for the Assessment of Higher Tier Studies

Conclusions

- Ecological relevant
- Guidance available
- Mesocosms valuable tool

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Mesocosms in Risk Assessment

Further research beyond a.i.

- Dilution by treated BW

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Thank you

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