

# Do mesocosm studies still have a future as higher tier risk assessment tool?

Seamus Taylor<sup>1</sup>, Eric Bruns<sup>2</sup>, Peter Ebke<sup>3</sup>, Dan Pickford<sup>4</sup>, Tido Strauss<sup>5</sup>, Nadine Taylor<sup>6</sup>, Udo Hommen<sup>7</sup>

<sup>1</sup>Adama, United Kingdom, <sup>2</sup>Bayer AG, Germany, <sup>3</sup>Mesocosm GmbH, Germany, <sup>4</sup>Syngenta, United Kingdom, <sup>5</sup>gaia Research Institute, Germany,

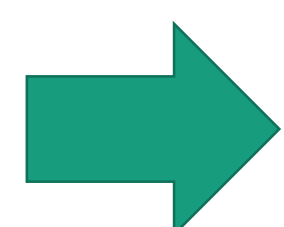
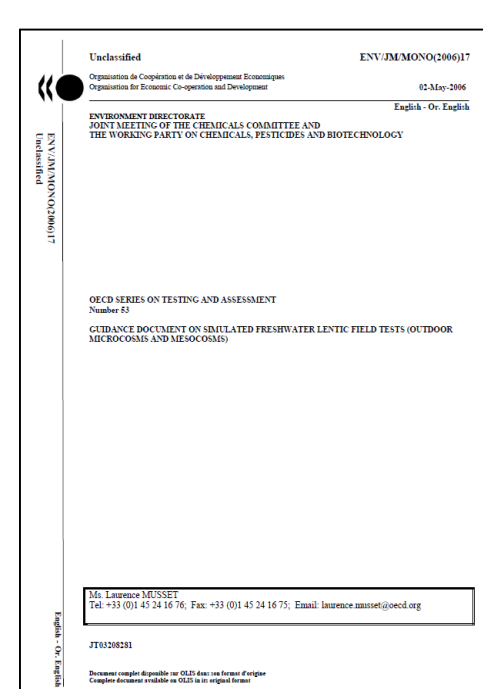
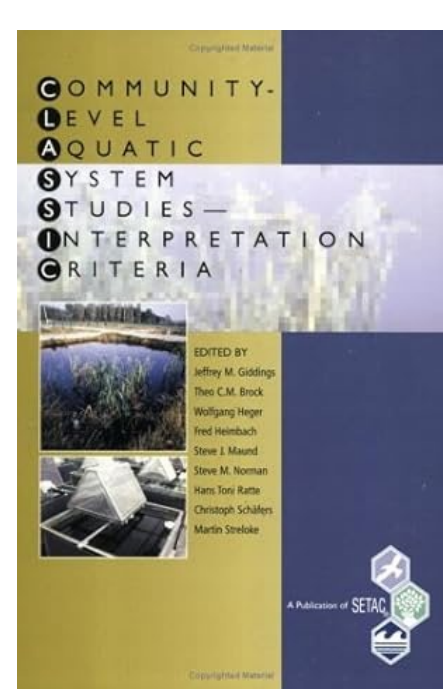
<sup>6</sup>Cambridge Environmental Assessments (CEA), United Kingdom, <sup>7</sup>Fraunhofer Institute for Molecular Biology and Applied Ecology (IME), Germany

## Background

- Mesocosm studies are recognised in EU Plant Protection Product (PPP) legislation (Regulation 1107/2009) for use in aquatic risk assessments for invertebrates, algae, and macrophytes
- They have been used for over 30 years to analyse the effects of PPPs on aquatic populations and communities but also for biocides, industrial chemicals and to derive water quality criteria
- However, several critical issues have been raised in recent years, both from an industry and a regulatory perspective regarding the use of mesocosms in chemical risk assessments

## Objective

- With this poster we intend to outline the critical issues and to stimulate interest among different stakeholders in building a SETAC working group and / or organising a SETAC technical workshop to address these issues



## Examples of different mesocosm test systems

Enclosures in experimental ditches, enclosures in artificial ponds, rectangular shallow ponds, circular deeper ponds



(courtesy of Wageningen Environmental Research)



(courtesy of Mesocosm GmbH)



(courtesy of CEA)



(courtesy of gaia)

## What are the issues with mesocosms?

How to conduct studies with macrophytes/phytoplankton

Representation of different edge of field water bodies and the importance of vulnerable and sensitive species

Statistical methods (e.g. MDDs and alternatives, PRCs and other multivariate methods)

Acceptability of exposure scenarios vs predicted exposure

Low acceptability of recovery

How to use multiple studies in the same risk assessment

## How to address these issues?

- The last multi-stakeholder workshop on the use of mesocosm studies was held 25 years ago (CLASSIC Workshop), the OECD guidance on lentic field tests is almost 20 years old and the aquatic guidance document (AGD) for plant protection products was published 2013 (EFSA PPR panel 2013)
- In the meantime, methods and regulatory requirements have evolved, thus we think it is time to review the current situation and to discuss what is needed in the future
- We propose to organize a **SETAC working group** or **SETAC multi-stakeholder workshop** including academia, industry, contract laboratories and regulators on the conduct and use of mesocosm studies in chemical risk assessment, especially for plant protection products
- The objective would be to characterize the current state, discuss the critical issues and to prepare a background document for future refinement of the aquatic guidance or similar documents
- If you are interested to be part of a working group or an organisation committee for such a workshop, please contact [udo.hommen@ime.fraunhofer.de](mailto:udo.hommen@ime.fraunhofer.de)
- As this is planned to be a SETAC activity with multi-stakeholder representation, we particularly welcome interest from EU authority experts, academia and contract research laboratories

## References

- Giddings et al. 2002. Community-Level Aquatic System Studies – Interpretation Criteria. <https://www.setac.org/resource/classic-pdf.html>
- OECD. 2006. Guidance Document on Simulated Freshwater Lentic Field Tests (Outdoor Microcosms and Mesocosms). <https://doi.org/10.1787/bb366ec4-en>
- EFSA PPR panel. 2013. Guidance on tiered risk assessment for plant protection products for aquatic organisms in edge-of-field surface waters. <https://doi.org/10.2903/j.efsa.2013.3290>