**ChimERA: Coupling exposure and effects into a predictive integrated framework for risk assessment**

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**Introduction**

**Current ecological risk assessments (ERA)**
- Environmental realism?
- Ecological relevance?
- Methodological accuracy?

**Challenges for current ERA practices**
- Exposure not constant in time and space
- Multiple stressors
- Recovery
- Interactions between species

**Modelling can play a key role in meeting these challenges**

**Objectives**

**Current models**
- Not directly linked to fate and exposure models
- Focus on one population

**ChimERA**
Integrate exposure and effect models for into a new ecological risk assessment tool

**Approach**

1. **Development of ChimERA: Coupling of**
   - Multimedia Fate and Exposure model
   - Multiple population models

2. **Testing and Calibration**
   - Key processes
   - ChimERA model

   **Dedicated experiments**
   Mesocosm data

3. **Scenario analysis and risk assessment**
   - Simulations of environmentally realistic stressor mixtures
     - Continuous discharges
     - Continuous discharges + pulse
     - ...
   - Identification of scenarios that lead to highest risk
   - Input from experts through workshop series

**Figure 1:** Structure of the integrated ERA model ‘ChimERA’, composed of sub-models for chemical fate & exposure, and individual (TK/TD), population (IBM) and community-level (food web model) effects. Red arrows represent contaminant flows, white arrows are mass/individual flows and black dashed lines indicate dependence during computation.

**Figure 2:** Scenario analysis in WP4: Red arrows are chemical fluxes, dark blue arrows are water fluxes, light blue arrow is migration.

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