

Chemical Pollution & Biodiversity Loss: How to identify those chemicals that require our immediate attention?

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Background & Project Goal

As a result of human pressures biodiversity is declining rapidly. This threatens the provision of ecosystem services and thus the basis of human life. One of the pressures that is contributing to this loss of biodiversity is the toxicity of chemicals that are released into the environment. However, due to the sheer amount of chemicals that are on the market it is a challenge to identify and reduce the emissions of those chemicals that cause most of the toxicity. To overcome this problem it is essential to have reliable prioritization schemes to guide risk reduction efforts.

Current prioritisation schemes are unable to provide this guidance:

1. Consider the aquatic environment only → Terrestrial environment mostly left unconsidered
2. Huge blind spots in hazard and risk assessment → Focus on few species and endpoints (e.g. no data on birds, mammals, amphibians and reptiles)
3. Gaps in exposure assessment → Use of residue concentrations in water as exposure proxy

The aim of this work is to develop a prioritisation scheme that can, based on various lines of evidence, reliably identify those chemicals that have a high potential to cause significant adverse effects in the environment and thus contribute to biodiversity loss.

The Multi-Evidence Biodiversity Prioritisation-Scheme (MEBP)

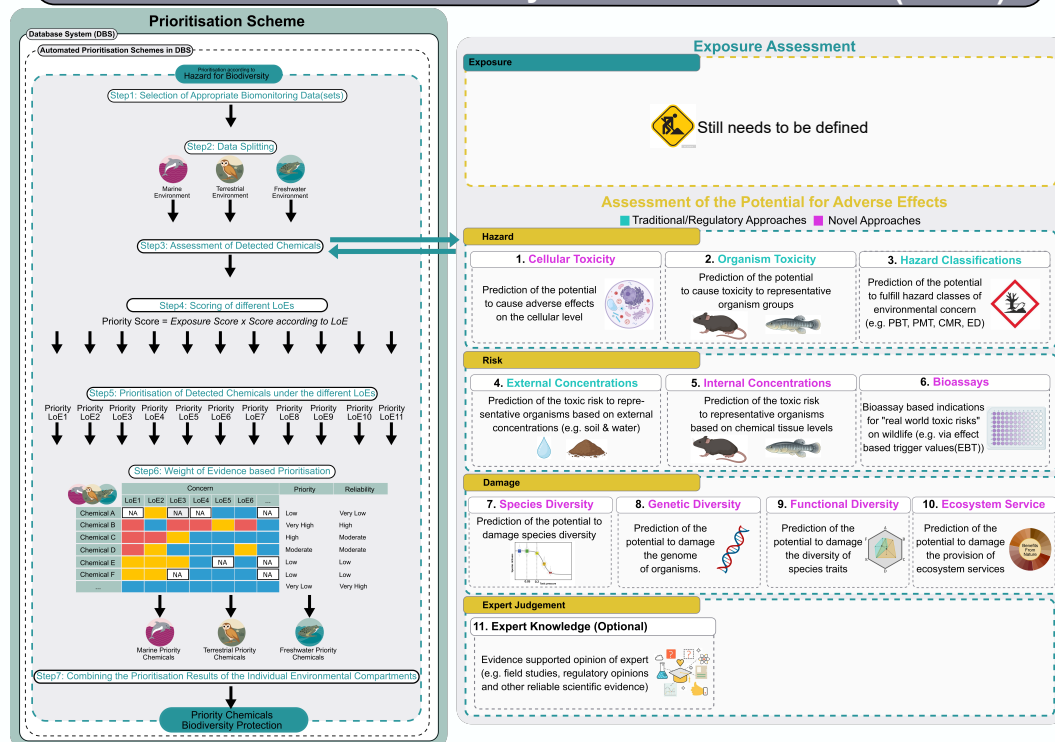


Figure 1: The TerraChem Prioritization Scheme integrates biomonitoring data with multiple lines of evidence (LoEs) to assess the potential of chemicals to adversely affect biodiversity. These lines of evidence span from hazard identification to predicted environmental damage. Chemicals are first prioritized within each LoE and then combined using a weight-of-evidence approach to determine overall priority and reliability of the assessment (e.g. higher reliability, if more LoEs are in agreement). *Some elements of this figure were created using images from BioRender.*

MEBP-Highlights

- First prioritisation scheme that allows the prioritisation of chemicals in a wider ecological context by evaluating potential effects from hazard to damage level and including different biomes.
- Offers an increased reliability as the priority is assessed in a weight of evidence approach that considers different types of information.
- Bridges the gap between regulators and science by combining traditional and novel assessment approaches.
- Designed in such a way that it can be integrated and automatized in a database system, which will allow for easy extensions and updates.
- Provides a more relevant exposure assessment as the scheme is based on tissue concentrations rather than exposure estimates (e.g. water concentrations).
- Results are easy to understand and can be modified according to individual needs.

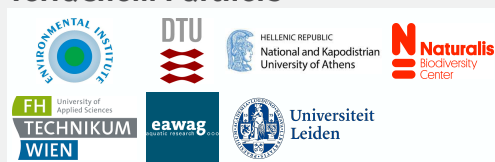
Conclusion & Outlook

MEBP is a Unique Scheme to Support Regulators & Biodiversity Protection

Publication of the Scheme (Paper) in Preparation
Expected Spring-Summer 2026

First Prioritisation Results (Terrestrial Environment Only)
Intended for Summer-Autumn 2026

TerraChem Partners



Funding

- Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the granting authority can be held responsible for them.
- This work has additionally received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

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