A CHEMICAL CATEGORISATION APPROACH FOR LRTP ASSESSMENT

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Introduction

Existing screening criteria / modelling approaches to estimate long-range environmental transport potential (LRTP) of chemicals may lead to both false positives and false negatives with obvious implications for chemical management strategies.

Hypotheses

The applicability domain of relevant modelling tools proposed for regulatory use (e.g. The OCED tool; Wegmann et al. 2009) cannot be determined, understood, and potentially expanded without confronting simple models (Figure 1) against more complex models and observations.

Cross-cutting objective

To develop and evaluate a mechanistic and categorical approach to assess LRTP that differentiates chemicals according to the major processes that are removing them from the atmosphere and leading to their transfer to surface media (Figure 2).

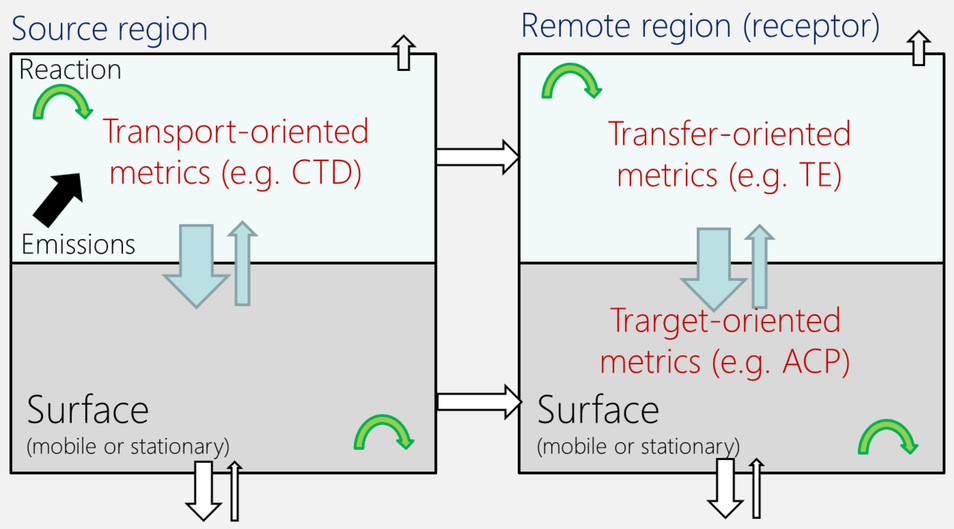

Figure 1: Examples of metrics used in LRATP assessments: CTD = Characteristic Travel Distance; TE = Transfer Efficiency (Wegmann et al. 2009); ACP = Arctic Contamination Potential (Wania, 2006).

Ongoing and completed activities

- Review existing models and empirical data in terms of their utility for LRTP assessments.
- Analyze to what extent current modelling tools reflect reality and meet anticipated regulatory requirements
- Analyze possible alternative criteria and LRTP metrics
- Develop a flow diagram to assess chemicals for LRTP
- Propose possible further steps to improve simple screening criteria and models motivated by regulatory needs.

Ambitions

- Advance the science of LRTP assessments for scientifically sound decision-making.
- Inform the upcoming efforts to review and update The OECD Tool as organized by the OECD, as well as support other relevant regulatory efforts.
- Further dissemination to the scientific community.

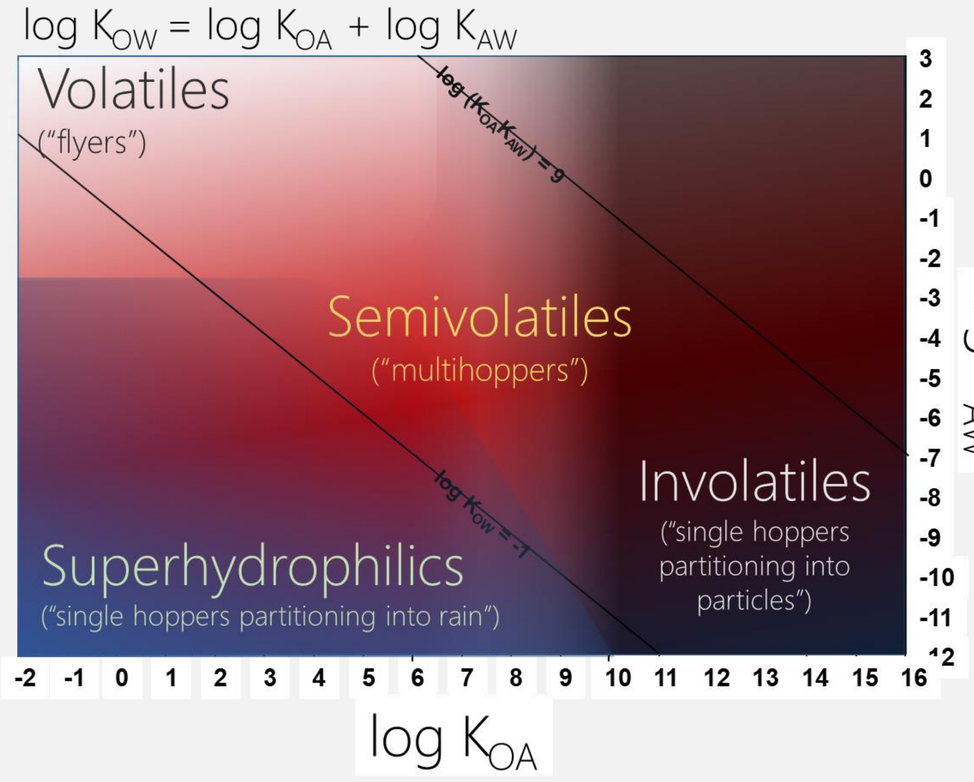

Figure 2: Major modes of environmental transport on a global scale for perfectly persistent chemicals defined by their partitioning properties log K_{AW} and log K_{OA} (modified after Wania, 2006).

References

Wegmann F, Cavin L, MacLeod M, Scheringer M, Hungerbühler K, 2009. The OECD software tool for screening chemicals for persistence and long-range transport potential. *Environmental Modelling & Software* **24**: 228-237.

Wania F, 2006. Potential of Degradable Organic Chemicals for Absolute and Relative Enrichment in the Arctic. *Environmental Science and Technology* **40**: 569-577.