

Investigating the worth of flux-based approaches in development of brownfields: the FRAC-WECO project

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Many brownfields must be developed to respond to economical development while preserving and restoring natural resources and ecosystems. This remediation must be done in an efficient way, both from a risk and economical point of view.

This requires prioritisation and efficiency involving sequentially: (a) methodologies and norms; (b) evaluation of the possible impact on the environment, by direct exposure but also, by dispersion in the environment, particularly through water resources; (c) risk assessment for humans, natural resources and ecosystems; (d) tools and methodologies for optimizing remediation measures.

Most of the classical risk assessment methodologies mainly focus on pollution levels at the contamination source. The FRAC-WECO multi-disciplinary research project (Flux-based Risk Assessment of the impact of Contaminants on Water resources and ECOSystems) proposes to develop a methodology based on the 'Source-Pathway-Receptor' approach for conceptualizing the physical system and on the European Environmental Agency (EEA) DPSIR concept (Drivers-Pressures-State-Impacts-Response) for integrating the physical and socio-economical components.

Illustration will be given of the ongoing activities combining measurements and modelling approaches for accurately calculating water and contaminant fluxes from the contaminated sites at the catchment scale, including biogeochemical processes affecting the mobility, retardation and reactivity of various specific contaminants. This work is being done in relation with groundwater vulnerability aspects and eco-toxicological risk that must be taken into account for adequate management and cleaning of contaminated sites.

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