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SYSTEMLINK - a new project on the effects of stressors across ecosystem barriers

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The propagation of environmental stressors from water (source) to land (sink) in aquatic-terrestrial meta-ecosystems, has not been intensively investigated. The other way around has been in the focus of linking terrestrial and aquatic domains. To start bridging that gap, SYSTEMLINK, a DFG Research Training Group, addresses the bottom-up and top-down mediated interactions in terrestrial ecosystems, which origin from anthropogenic impairments on aquatic ecosystems. Micropollutants (fungicides and insecticides) as well as invasive species (riparian plants and invertebrates) are considered as crucial forms of multiple stressors in disturbed aquatic ecosystems. SYSTEMLINK will examine the general hypotheses that 1) invasive invertebrates and insecticide exposure and 2) invasive riparian plants and fungicide exposure cause top-down and bottom-up mediated responses in terrestrial ecosystems, respectively. Collaborative experiments in replicated outdoor aquatic-terrestrial mesocosms (site-scale) amended by joint pot experiments (batch-scale), field studies (landscape-scale), and modelling are used to test these general and several more specific hypotheses. The experimental setups will all represent a multi-stress environment and will be derived from the landscape scale. The regular combination of several scales will allow to overcome scale-specific limitations and to ensure both cause-effect quantification and the environmental relevance of the results. Ultimately, SYSTEMLINK thrives to increase our knowledge on effect translation across ecosystem boundaries. By combining biological subsidies and biogeochemical fluxes we will be able to quantify their relative importance. Furthermore, we will closely incorporate the often separated aquatic and terrestrial research areas.