

**TU081 REEchangE - Rare Earth Elements Ecotoxicology in a Changing Environment**

H. Tien, Hamburg University of Applied Sciences/University of the West of Scotland; A. Hursthouse, University of the West of Scotland / School of Science; S. Heise, Hamburg University of Applied Sciences / Life Sciences. REEchangE focuses on the anthropogenic release of the rare earth elements (REE) lanthanum and gadolinium to the environment and their potential risk within ecosystems. REE are increasingly applied e.g. in green technology, and consequently also emitted to the environment. But there is a diversity of potential polluting sources of which little is known, and no regulatory environmental framework for immissions exists so far. In addition, a review by Herrmann et al. (2016) demonstrated the considerable lack of reliable data for La toxicity in the aquatic environment. Considering their future use, release, and environmental fate, an evaluation of environmental risk from lanthanum and gadolinium will have to be based on information on exposure pathways, exposure and effect concentrations. The project REEchangE addresses these topics in the following ways: (1) by studying the toxicity to aquatic organisms. Results on ecotoxic responses obtained for *Aliivibrio fischeri* and *Rhaphidocelis subcapitata* so far are in the same range as literature data, and show a higher toxicity of Gd compared to La. Effect concentrations are of the same magnitude as for cadmium. (2) by substance flow analysis (SFA) for La and Gd, exemplarily performed for Germany. Information has been collected from published work for a variety of potential sources for La and Gd in rivers and lakes. Additionally, water and sediment samples have been analysed at specific locations. Current data point to wastewater and specialised industries as prominent sources of emission. (3) by investigating the impact of changing environmental parameters (pH, redox, salinity) on the bioavailability of particle bound La and Gd. In a microcosm, a battery of miniaturized biotests will be applied to monitor the toxicity responses in overlying water and sediment. This includes tests with *Aliivibrio fischeri*, *Vibrio proteolyticus*, *Arthrobacter globiformis* and especially *Daphnia magna*. Additionally, speciation and bioavailability of the La and Gd are examined following a procedure by Simpson et al. (2014), applying a cascade of different filters and a chelating resin. The presented poster will depict the current results of the microcosm experiments along with the information on bioavailability based on biotests and speciation data.