UFZ-Seminar

HELMHOLTZ Zentrum für Umweltforschung

Research Unit

Water Resources and Environment

16 May 2022, 3 p.m.

Seminar Room 1, Brückstr. 3a, Magdeburg

Linda C. Weiss

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will give a talk on:

EFFECTS OF ELEVATED PCO2 ON BIOTA IN FRESHWATER HABITATS

Anthropogenically released CO_2 accumulates in the global carbon cycle and is anticipated to imbalance global carbon fluxes. For example, increased atmospheric CO_2 induces a net air-to-sea flux where the oceans take up large amounts of atmospheric CO_2 (i.e., ocean acidification). Not only the oceans take up large amounts of atmospheric CO_2 but also freshwater carbon hydrogeochemistry is affected, giving rise to even higher amounts of pCO_2 in freshwater habitats. However, ecosystem-wide effects of elevated pCO_2 in freshwater habitats are yet undetermined. We find that, chemical communication between predator (here: *Chaoborus*) and prey (here: *Daphnia*) is significantly impaired. Under control pCO_2 levels, *Daphnia* expresses neckteeth to counter *Chaoborus* predation in a cost-benefit adjusted manner. Under elevated pCO_2 *Chaoborus* is not able to strike effectively for its prey, and *Daphnia* is not able to specifically react to its predator. We performed a full-factorial experiment and tested 10 *Daphnia* clones and their reaction norm to the predator, elevated levels of pCO_2 and the combination of both stressors. Interestingly, we find quite variable effects; some clones increase their defense expression levels, while others decrease their defense expression. We tested, how these differences in trait variability affect an artificial *Daphnia* population in mesocosm experiment across time. We repeatedly find distinct clones that outcompete other clones in specific treatments, so that there is an environmentally induced shift in the population structure.