

Investigating ostracods as potential groundwater flow indicators: a study case from Lake Constance, Germany

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Lake Constance is the second largest lake in Central Europe with a catchment area of 11,500 km², a mean depth of 90 m and surface of 536 km². It has high ecological, social and economic value, and belongs to the largest and one of the most important drinking water reservoirs in Southern Germany, supplying water for around 5 Million people. Lately, structures at the bottom were found that may indicate unknown groundwater seeps into the lake.

The investigation of groundwater seeps and their potential impact on water quality is an issue of utmost importance for the sustained protection of Lake Constance. In order to identify biological indicators of groundwater seeps and to assess potential threats to water quality and their effect on biological communities we analyzed the seasonal variation in diversity and distribution of ostracods as well as their relationship to environmental variables using canonical correspondence analysis (CCA). In total 103 surface sediment samples were taken between June 2015 and June 2016 at 5 “hot spots” (Mehrerau, Birnau, Birnau-West, Mainau and Überlinger-See) using a van Veen grab. Water depth (m), temperature (°C), conductivity ($\mu\text{S cm}^{-1}$) were measured *in situ* with a multi-parameter CTD (Rosette) sonde. Water depth ranged from 2 m to 115 m. Seventeen ostracod taxa belonging to 15 genera were identified. Overall, *Limnocytherina sanctipatricii* was the most abundant and widely distributed species, ranging from 15% to 50%, particularly in November. This species was associated mainly to cold deep waters. *Leucocythere mirabilis*, usually associated to deep waters was also found at shallow sites (5.7 m deep) with 33% abundance. Potential groundwater flow indicators such as *Prionocypris zenkeri*, *Herpetocypris reptans* and *Darwinula stevensoni*, were found mostly in low abundances (max. 1%) particularly at Mehrerau and Birnau-West and were associated mainly with shallow depth (10-20 m) This study is part of the “ReWaM Joint Project - Using tracers to identify groundwater and surface water input to lakes and the importance for water quantity and quality: Case study from Lake Constance (SEEZEICHEN)” and has been supported by the German Federal Ministry of Education and Research (BMBF 02WRM1365C).

Zulässig ist eine Abbildung oder Tabelle pro Abstract.

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