



UFZ-Seminar „Wasser und Umwelt“

18. November 2013, 15.00Uhr

Saal, Brückstr. 3a, Magdeburg

Alfred Wüest, Eawag

spricht zum Thema:

Double diffusion and methane in Lake Kivu – “interfacing” environmental science and engineering

Double-diffusive upward-directed fluxes play a fascinating role in the accumulation of the ~60 km³ of methane dissolved in the 485 m deep and permanently stratified Lake Kivu. Driven by a geothermal flux of ~100 mW m⁻² and stratified by salt and carbon-dioxide (from deep subaquatic springs), double-diffusive conditions have evolved: As a result, a spectacular staircase of ~350 sharp interfaces and well-mixed layers have formed probably over centuries or even millennia.

Due to very strong stratification and weak wind forcing, turbulence is negligible and restricted to the convectively-driven double-diffusive layers. As a result, the upward directed fluxes from the subaquatic springs are small for the dissolved constituents: Therefore, not only salt and carbon-dioxide have accumulated in the deep-water but also methane. It has reached harvestable concentrations and is now a resource with a value of ~20 billion dollars. The links from double-diffusion to methane accumulation and its harvesting is a wonderful example for opportunities in combining environmental science and engineering.