



## EAG-GS Outreach Program 2013



### Lecture Abstract:

#### Where oxygen disappears: the deep waters of East African lakes

Bernhard Wehrli, Swiss Federal Institute of Technology, ETH Zurich and Eawag, Swiss Federal Institute of Aquatic Science and Technology, Switzerland. [wehrli@eawag.ch](mailto:wehrli@eawag.ch)

The large East African lakes such as Kivu, Tanganyika and Malawi are unique ecosystems with a rich diversity of fish and other aquatic life. Due to their strong stratification they also represent the largest anoxic freshwater systems in the world. On the time-scale of centuries their deep water accumulated large quantities of nutrients and reduced substances including methane. The productivity of their important fisheries is to a large extent controlled by vertical transport of nutrients from the deep water. Recent warming triggered concerns that a more stable stratification could decrease the nutrient supply and therefore in the long run the productivity of these systems. By combining physical and chemical data we can quantify the vertical nutrient fluxes and therefore reduce the uncertainties in ecosystem productivity. On the



Methane extraction platform on Lake Kivu (Alfred Wüest, Eawag)

other hand, the large methane reservoir in the deep-waters of Lake Kivu offers the potential to extract important quantities of gas for electricity production. Again, assessing safe modes of operation requires an understanding of the sources and sinks of methane as well as a quantitative model for its vertical transport. Such data and models provide estimates of the total available methane gas and the annual new production in the lake which limits the long-term “sustainable” extraction.

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Schmid, M., Halbwegs, M., Wehrli, B., Wüest, A. 2005 Weak mixing in Lake Kivu: New insights indicate increasing risks of uncontrolled gas eruption, *Geochemistry, Geophysics, Geosystems* 6, Q07009, doi:10.1029/2004GC000892