

Continuous On Site Air-Water Gas Exchange Measurements

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Method

A gas flux through an interface e.g. water and air is caused by a disequilibrium of the gas. The gas transfer velocity determines the speed of equilibration. Experiments to measure that velocity in natural waters were already conducted in the 1990s using water samples taken in field (e.g. [1,2]).

In contrast to those experiments we aim to quantify the gas transfer velocity continuously. For that purpose we use a “portable and autonomous mass spectrometric system” [3] which allows us to measure gas concentrations on site both in air and water.

Site and Experiments

The experimental setup was built up at ‘experimental ponds’ [4] at the EAWAG in Dübendorf, Switzerland, in the beginning of 2017. The ponds have a maximum volume of 15 m³ and a maximum surface of 16 m².

During our experiments we interfered with the system, e.g. we heated the water artificially or put gas tracers into the water.

The implementation of the method and the techniques and the results of those experiments will be presented and conclusions about the parameterization of air-water gas exchange of small lakes and rivers at low wind speeds will be drawn.

[1] Crusius and Wanninkhof (2003), *Limnol. Oceanogr.* **48(3)**, 1010–1017, [2] Watson et al. (1991), *Nature* **349**, 145 – 147 [3] Brennwald et al. (2016), *Environ. Sci. Technol.* **50**, 13455-13463,

[4]<http://www.eawag.ch/en/aboutus/working/researchenvironment/experimentierteiche>