

## ***Interactive comment on “Eddy covariance flux measurements confirm extreme CH<sub>4</sub> emissions from a Swiss hydropower reservoir and resolve their short-term variability” by W. Eugster et al.***

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Received and published: 6 July 2011

Dear Konstantin Gerilowski

The considerations about the Teuftal landfill site is of course a valuable input. We know the site, but I was under the impression that the gas produced by the depony is used by the gas power plant of BKW, the Bernese company producing electrical energy. This plant started its operation in 1989 (see <http://www.teuftal.ch/Geschichte.html>) and was expanded from 1800 kW to 2700 kW in 1993. This document also reports that the production of methane gas by 2000 has declined, and so did the productivity of the electrical power plant. Finally, in 2007 (the year before we performed our mea-

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surements over Lake Wohlen) the power plant was replaced by a much smaller 180 kW combined power plant (electricity and heating) as an adaptation to the much lower methane gas production of the site.

Moreover, the Teuftal landfill site is located in a side valley to the south, which is a direction where typical winds are not coming from, unless it is associated with nocturnal cold air drainage flows that would make it down to the Wohlensee lake surface. This hypothesis could be tested for our revised manuscript, although we do not expect to see substantial amounts of CH<sub>4</sub> escape from the landfill due to the measures that were taken to use it for electrical power generation.

As the first author of our current manuscript I however want to get advice on this issue from our colleagues who are more knowledgeable in the domain of landfill CH<sub>4</sub> emissions. In fact, we were measuring with our eddy covariance flux system at their landfill of interest in Liestal and published the results in Eugster and Plüss (2010). These measurements were done between the two Lake Wohlen campaigns that we report on in the present manuscript.

In principle, even if the high methane concentrations on the lake are from the Teuftal site, this source is far outside the flux footprint area and hence should only influence the mean concentrations we measured, but not the fluxes.

The speculation that this may be an explanation for the higher fluxes at low wind speeds (the point also mentioned by reviewer #1) is another point that we will address in more detail in our final reply. So far our understanding was that the relation between wind speed and CH<sub>4</sub> flux that the reviewer #1 refers to is valid only for diffusive fluxes (which are unimportant in this case where ebullition dominates), whereas such a relationship is not expected for ebullition; but we will definitely consider all this feedback in our final reply to the reviewers and the revision of our paper.

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## References

Eugster, W., Plüss, P. (2010) A fault-tolerant eddy covariance system for measuring CH<sub>4</sub> fluxes. *Agricultural and Forest Meteorology*, **150**(6), 841–851. doi:10.1016/j.agrformet.2009.12.008

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Interactive comment on Biogeosciences Discuss., 8, 5019, 2011.