

## Carbon dioxide in Taal volcanic lake: a simple gasometer open to the atmosphere.

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Taal Volcanic lake is currently experiencing a very significant degassing and its surface waters with concentrations up to 430mg/l are highly supersaturated with respect to the atmosphere. Large temporal variations in CO<sub>2</sub> that were observed in the lake during the past 3 years suggest that CO<sub>2</sub> is a very sensitive indicator of activity. Contrary to sulfates and chlorides (and other solutes) which are largely conservative species in the lake waters; dissolved CO<sub>2</sub> has a more dynamic behavior in the lake (much like temperature). Its concentration reflects a steady-state balance between CO<sub>2</sub> supplied to the lake by hot springs (in a dissolved form) and by direct degassing and CO<sub>2</sub> lost by diffusion at the air-water interface. A new CO<sub>2</sub> reactor made of fluoropolymer membrane coupled with a miniaturized NDIR sensor was used in January 2016 to measure dissolved CO<sub>2</sub>. The new membrane offers gas permeability several times higher than standard PTFE used previously.

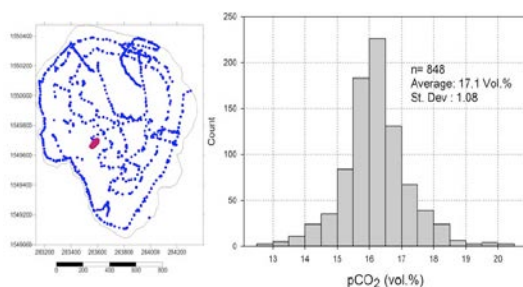


Fig1: the dissolved CO<sub>2</sub> concentrations measured by the new reactor are almost constant throughout the lake.