



Variability of methane in the epilimnion of Lake Kivu

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We report a data-set of methane (CH_4) concentrations in the surface waters of Lake Kivu obtained during four cruises covering the two main seasons (rainy and dry). Spatial gradients of CH_4 concentrations were modest in the surface waters of the main basin of Lake Kivu. In Kabuno Bay, CH_4 concentrations in surface waters were higher than in the main basin of Lake Kivu, owing to the stronger influence of internal geothermal inputs from depth, due to the relative shallowness of this sub-basin. Seasonal variations of CH_4 in the main basin of Lake Kivu were strongly driven by deepening of the mixolimnion and mixing of surface waters with deeper waters characterized by CH_4 concentrations. Physical and chemical vertical patterns in Kabuno Bay were stable seasonally, owing to a stronger stratification and smaller surface area inducing fetch limitation of wind driven turbulence. A global and regional cross-system comparison of CH_4 in surface waters of lakes highlights that CH_4 concentrations in surface waters, both Kabuno Bay and the main basin of Lake Kivu are at the lower end of values in lakes globally, despite the huge amounts of CH_4 in the deeper layers of the lake.