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Within-season variability of methane fluxes from a Swedish boreal lake

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Abstract

Northern lake systems are large contributors to the amount of methane (CH4) emitted into the atmosphere. Northern landscapes are expected to experience substantial climate change that can affect lake methane emissions. Hence, it is important that there are cost-efficient methods available for measuring CH4 with a decent spatiotemporal coverage. Conventional methods, such as the use of manual flux chambers (FC) has shown to be valuable for measuring CH4 in lake systems. However, it does not provide a high enough resolution to compare temporal dynamics within seasons. Therefore, this study includes the use of low-cost Figaro TGS-2600 sensors in automatic flux chambers (AFC) for measuring CH4 in an experimental lake in northern Sweden. Several AFCs were deployed from mid-July to late August to catch the late summer fluxes from the lake. Results show that the use of sensors in AFCs, can provide high resolution measurements over long time periods, and could therefore be highly valuable for capturing and analyzing periods with higher and lower CH4 emissions. In combination with the deployment of several AFCs in a lake system the whole lake CH4 output may be established.