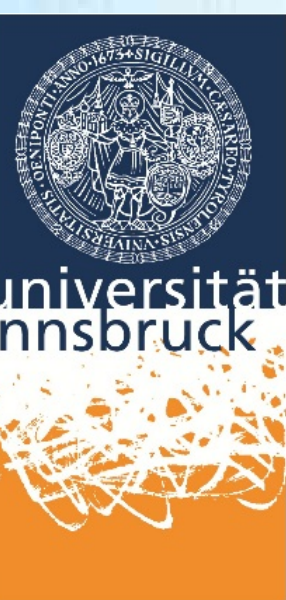
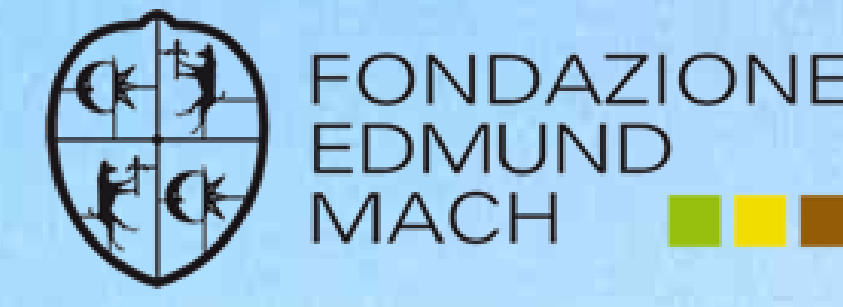


GREENHOUSE GAS EMISSIONS FROM ALPINE LAKES

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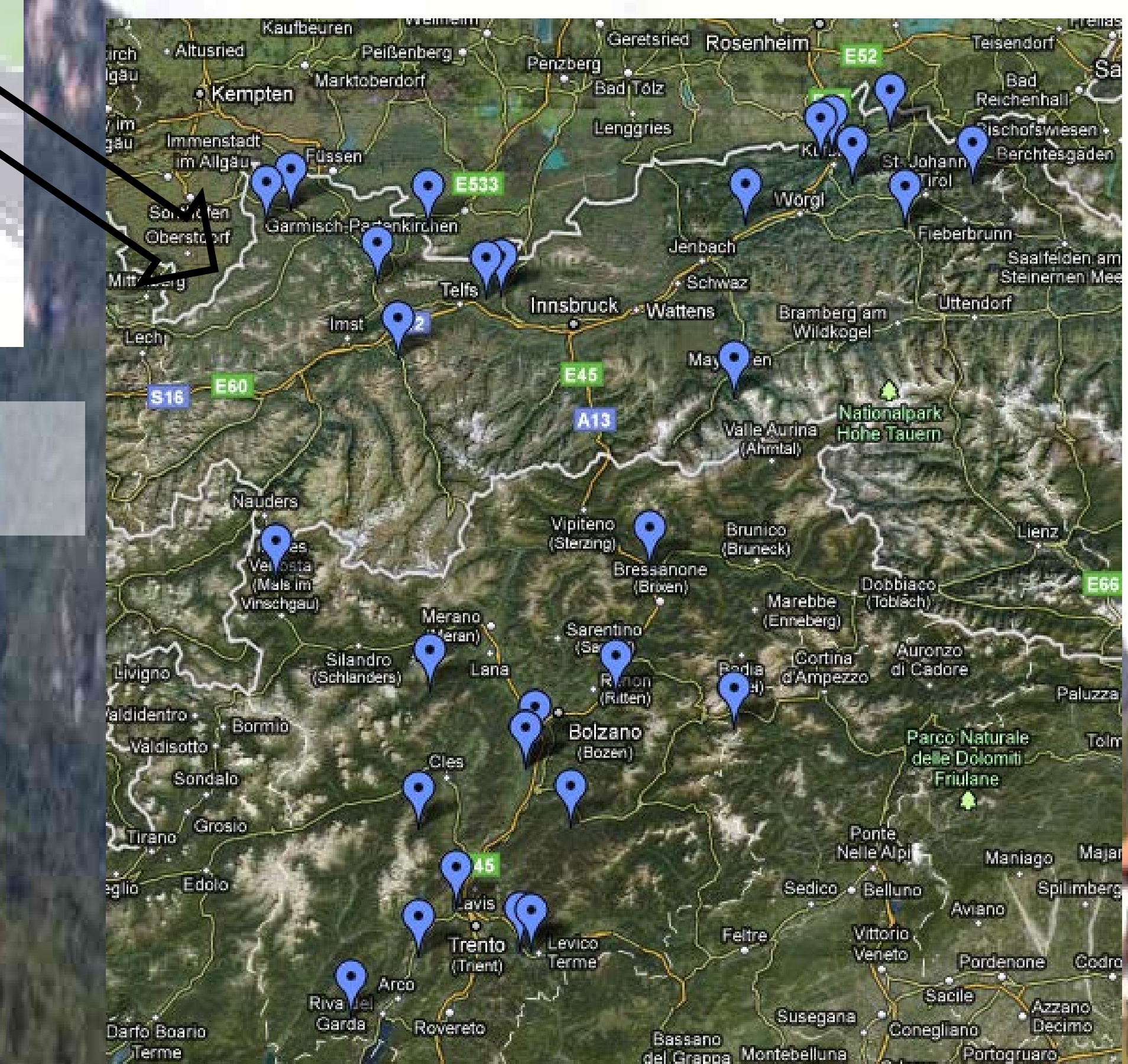
Freshwaters systems receive as much as carbon as the oceans while covering a small amount of Earth's surface. Lakes due to their anoxic and reductive conditions may be overlooked methane emitters. Our study is focused on Alpine lakes in order to see if those lakes could be potential methane emitters.

43 lakes were sampled; Spread along **Trentino, South Tirol (IT)** and **North Tirol (AU)**; From 240 m a.s.l to 1700 m a.s.l altitude range.

Sites Selection



Fig. 1: Map of the sampling sites



Sampling at the water surface to evaluate the content of **dissolved CH₄** and **CO₂** that could be emitted in the atmosphere.

Sampling Method

Samples Analysis

Analysis of the headspace by **Gas Chromatography**.

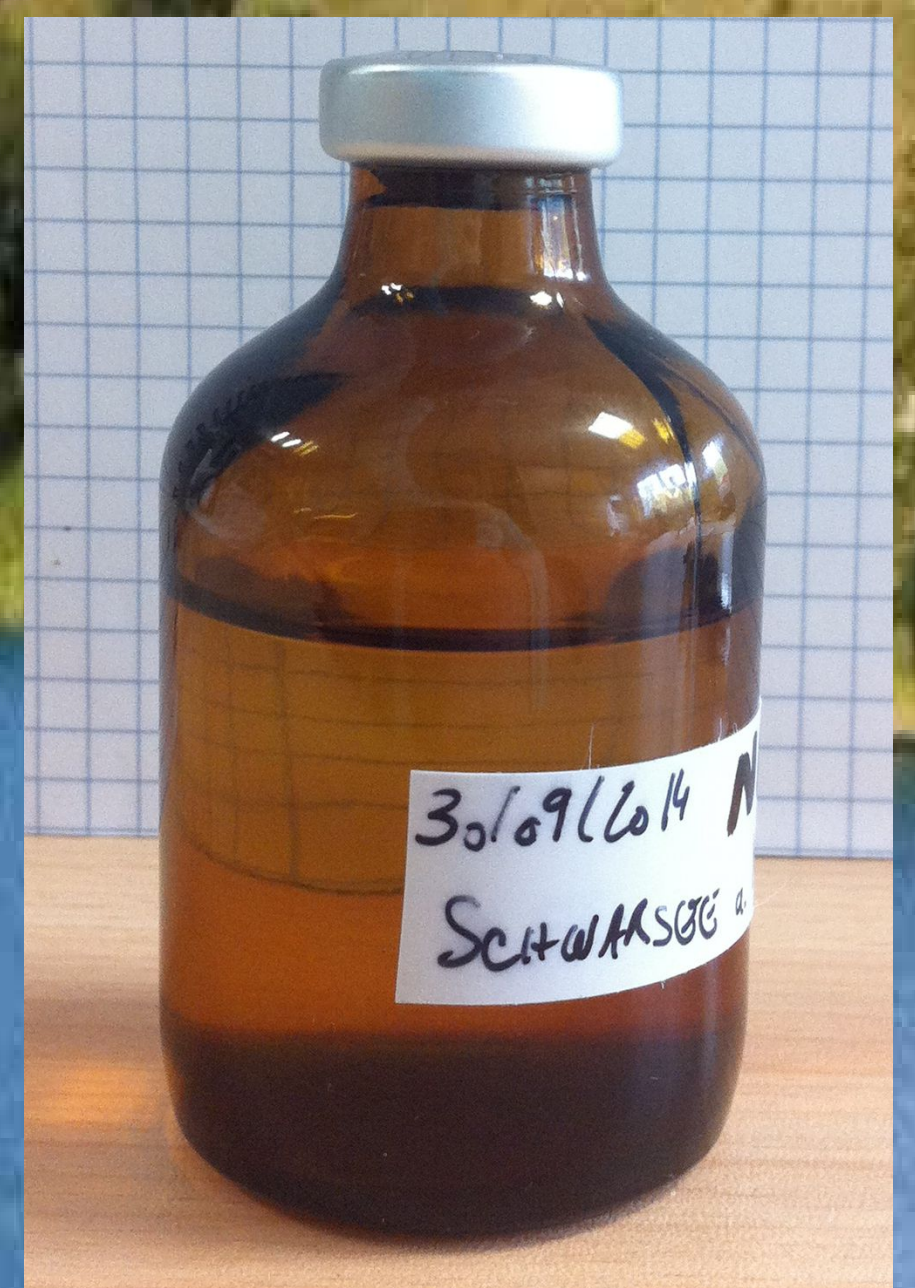


Fig. 2: Water sample after the headspace



Fig. 3: Gas Chromatographer equipped with Flame Ionization Detector for CH₄ analysis.

Results

CH₄ Concentrations
 Range: 0 to 5,89 μmol/L
 Average: 1,11 μmol/L
 Median: 0,47 μmol/L

First results show that Alpine lakes are supersaturated and could be significant CH₄ emitters.

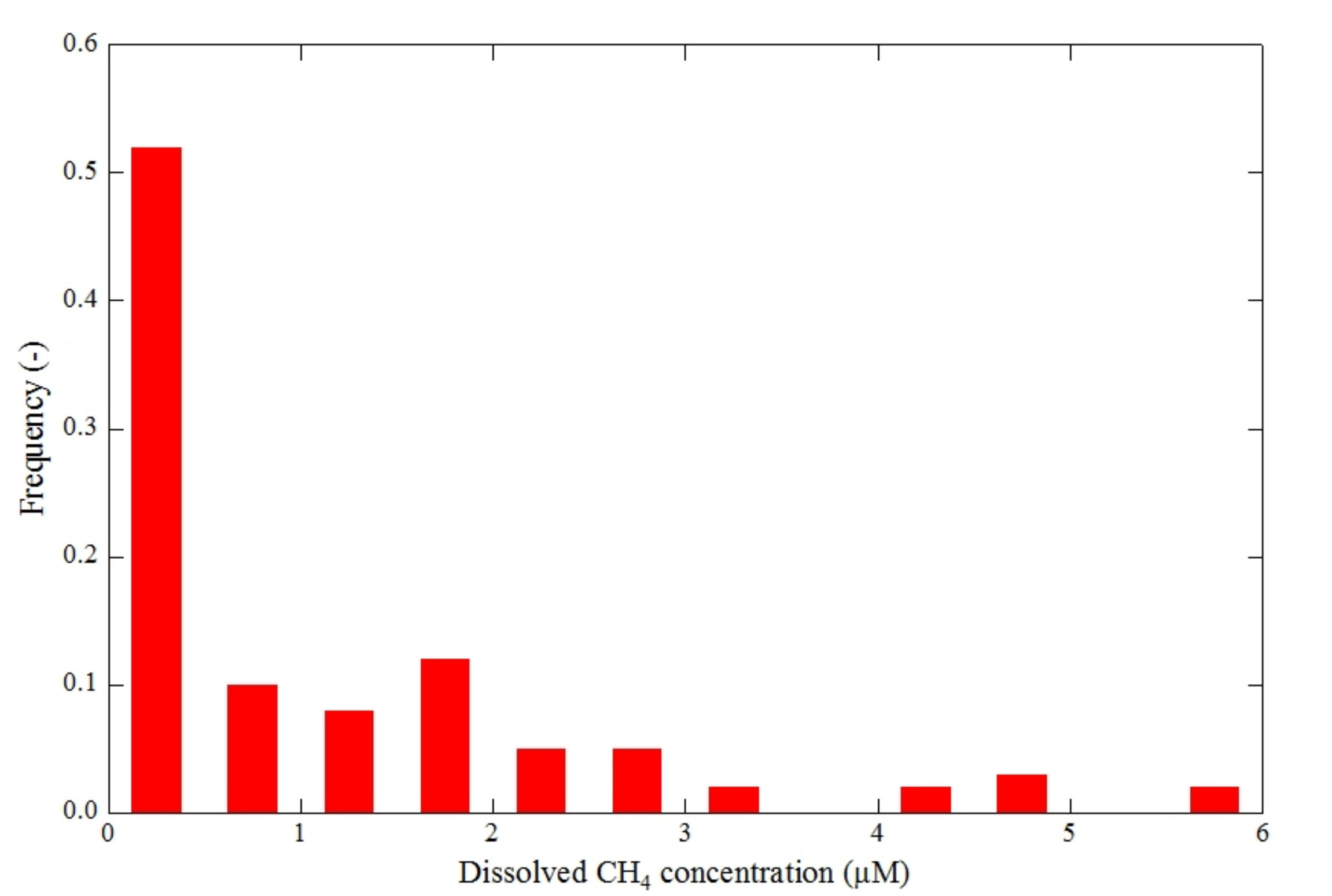


Fig. 4: Frequency distribution of concentration of surface dissolved CH₄ samples.

Research and Development

A remote control boat is under development in order to perform the sampling of dissolved GHG.



Fig. 5: Prototype of the remote controlled sampling device

What's next?

According to the preliminary results a longer monitoring of selected lakes will be done using micrometeorological equipment: Eddy Covariance method
 Complementary measurement:
 Funnels measurement to evaluate the part of bubbling in emissions.
 Chemistry analysis