

Methane fluxes from the Arctic

An expert survey of chamber measurement techniques

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Motivation

- Permafrost regions and boreal wetlands are a known source of atmospheric methane but the magnitude of emissions is unclear.
- One common way to measure methane emissions in remote polar regions is the static chamber method because of its portability and easy deployment.
- However:** There is a wide range of combinations of chamber measurement techniques, flux calculation, and flux quality control approaches that are currently used to quantify methane fluxes from chamber measurements.
- New multigas analyzers with high frequency concentration measurements reveal patterns and disturbances in chamber methane concentrations over time that call for adjustments in the measurement assumptions, derived from the earlier manual gas sampling methods.

Hypothesis

Different measurement, flux calculation and quality control (QC) approaches for chamber measurements might introduce significant uncertainty to flux datasets and conceal actual temporal and spatial variations in CH₄ fluxes.



Various chamber measurement setups used by different research groups

Research question 1

What are the approaches for measurement, calculation, and quality control of chamber CH₄ fluxes applied by different research groups?

Research question 2

How large is the uncertainty in CH₄ fluxes introduced by the different flux calculation and QC approaches used by different research groups?

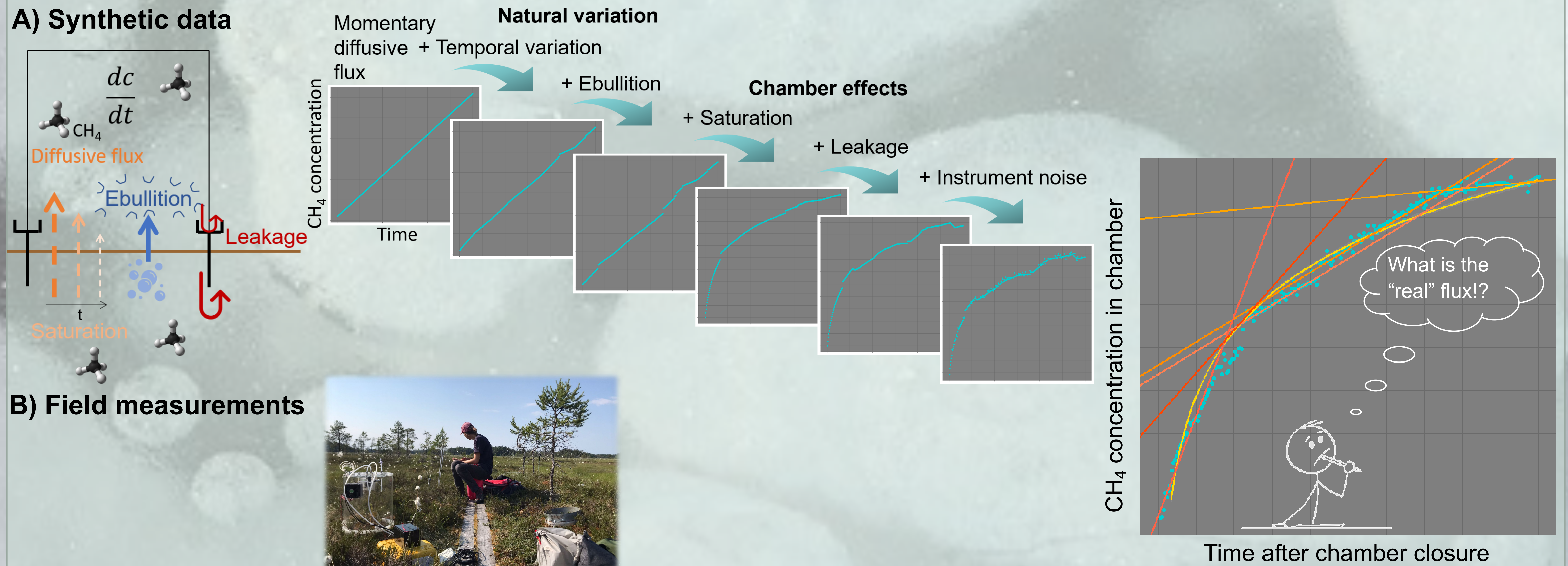
Method 1: Qualitative survey

Survey of measurement, calculation, and QC methods
 Visual QC of selected flux measurements

Method 2: Quantitative survey

We will share a common raw dataset for flux processing by different research groups.

A) Synthetic data



B) Field measurements



Now we need your expertise!

Do you have some experience with flux chamber measurements and/or chamber flux data processing?
 Then your contribution will be highly valuable to our study!

- Requirements to participate: At least one field season of measurement experience using methane flux chambers
- Estimated time commitment: 40 min

- Requirements to participate: You should have a method to process high temporal resolution methane chamber measurements
- Estimated time commitment: 1.5 h

Please [sign up here](#) by July 1st to participate in either or both of the surveys:

- Qualitative survey will be sent out on May 15th
- Quantitative survey will be sent out on July 15th

For a link to the signup sheet please contact katharina.jentzsch@awi.de

