



Aquatic vegetation cover and lacustrine cores in Stordalen Mire, Sweden

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Objectives

Groundtruthing biomass of certain emergent aquatic vegetation along the shores of Inre Harrsjön, Villasjön, Mellersta Harrsjön, and Mellersta Stream to enable scaling up of Arctic system processes with remote-sensing data.

Background

- Stordalen Mire, located in northernmost Sweden is a thawing permafrost peatland. As this permafrost thaws, it can release the climate warming gases methane and carbon dioxide.
- The Mire exhibits various thaw stages that are characterized by unique vegetation, microbial life, and organic matter composition.
- The Mire features three different types of land covers: Palsa (frozen peat mounds), sphagnum (peat moss), and eriophorum (sedge dominated sites). The terrestrial part of the Mire is also hydrologically connected through a stream and lakes.
- Samples were taken from four different lakes/streams in the mire: Villasjön (VH), Mellersta Harrsjön (MH), Inre Harrsjön (IH), Mire Stream (MS).

Site Location

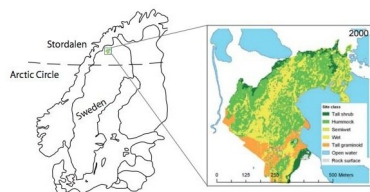


Figure 1. Map of Sweden with a landcover map of the Stordalen Mire. (Climate Impact Research Center (CIRC)).

Lake Core Sampling

- Samples of lake cores were taken near bubble traps located in MS and IH.
- The gravity corer and hammer corer were used to collect lake sediment samples and sectioned off according to 10 cm increments to 30 cm.
- Lake cores contain sediment layered over years that may contain organic matter, pollen, leaves, vegetation, and stored methane and carbon dioxide.
- Purpose: to measure environmental DNA/RNA from lake core sediments and production and oxidation potential of sediments.



Figure 4. Image of Kevia Miles and Serafina Rivera taking hammer cores from MS.



Figure 3. Image of lake sediment core analysis by Sarah Gianturco and Chelsea Oti.

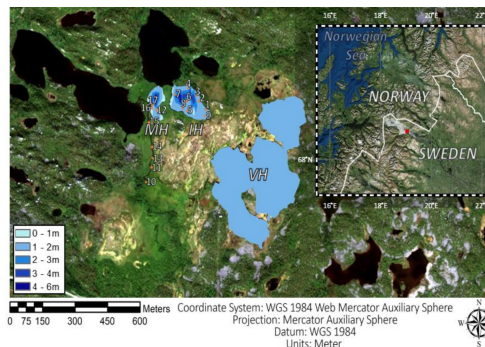


Figure 2. Map of Stordalen Mire with labeled locations of MH, IH, and VH. Image taken from Horruitiner et al., 2015.

Aquatic Plant Species Distribution and Biomass Using Drone Imagery

- Aquatic vegetation samples were taken from IH, VH, MS, and MH to identify species, estimate percent cover and measure biomass.
- Drone images were taken and developed in tandem with the sample collection to enable scaling of species percent cover and biomass to support work on Hg and methane at these lakes.
- Most commonly found species:

Equisetum spp.
Sparganium spp.
Potamogeton spp.
Myriophyllum spp.
Chara spp.

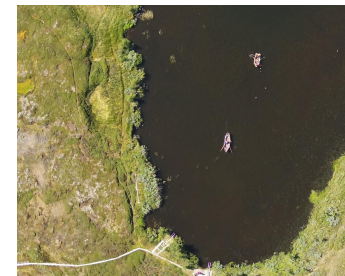


Figure 5. Drone image of IH where you can see the sampling boats and some emergent vegetation in the lakes.



Figure 6. Image of Ruth Varner, Chelsea Oti, Kevia Miles, and Tamara Marcus processing a gravity core.

Acknowledgments

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References

Horruitiner, C., Varner, R. K., Palace, M., Johnson, J., Wik, M., Lundgren, D., Sinclair, S., Nicastro, A., & Crawford, M. (2015). Examining the role of aquatic vegetation in methane production: Examples from a shallow high latitude lake in Abisko, Sweden. Abstract B41C-0447, presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14–18 Dec.