



Trace elements indicate changes to hydrologic connectivity in thawing subarctic peatland



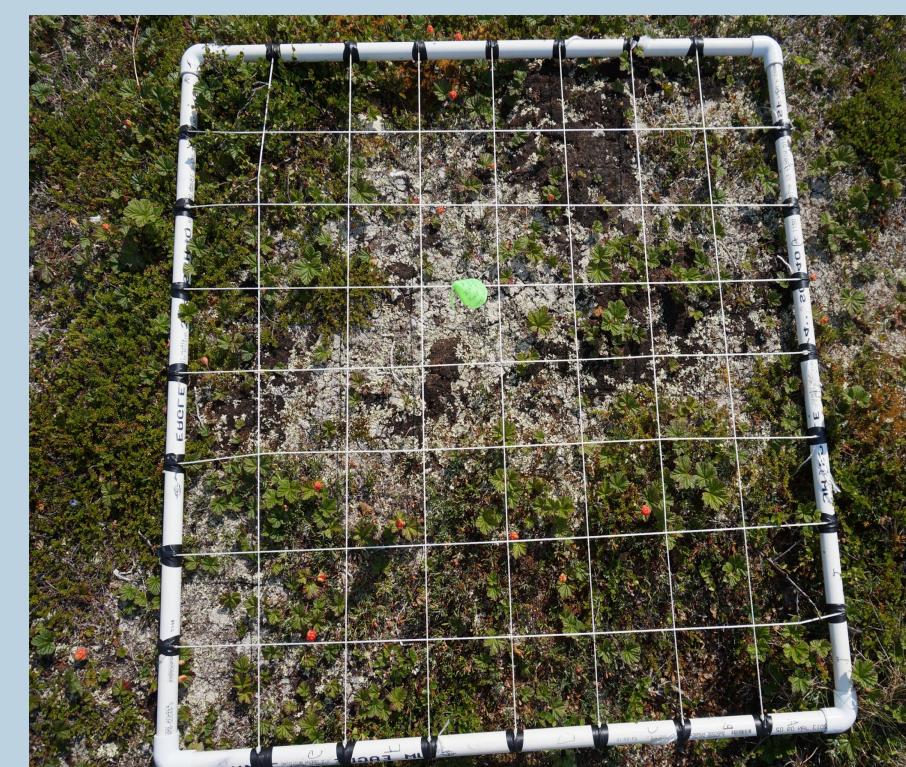
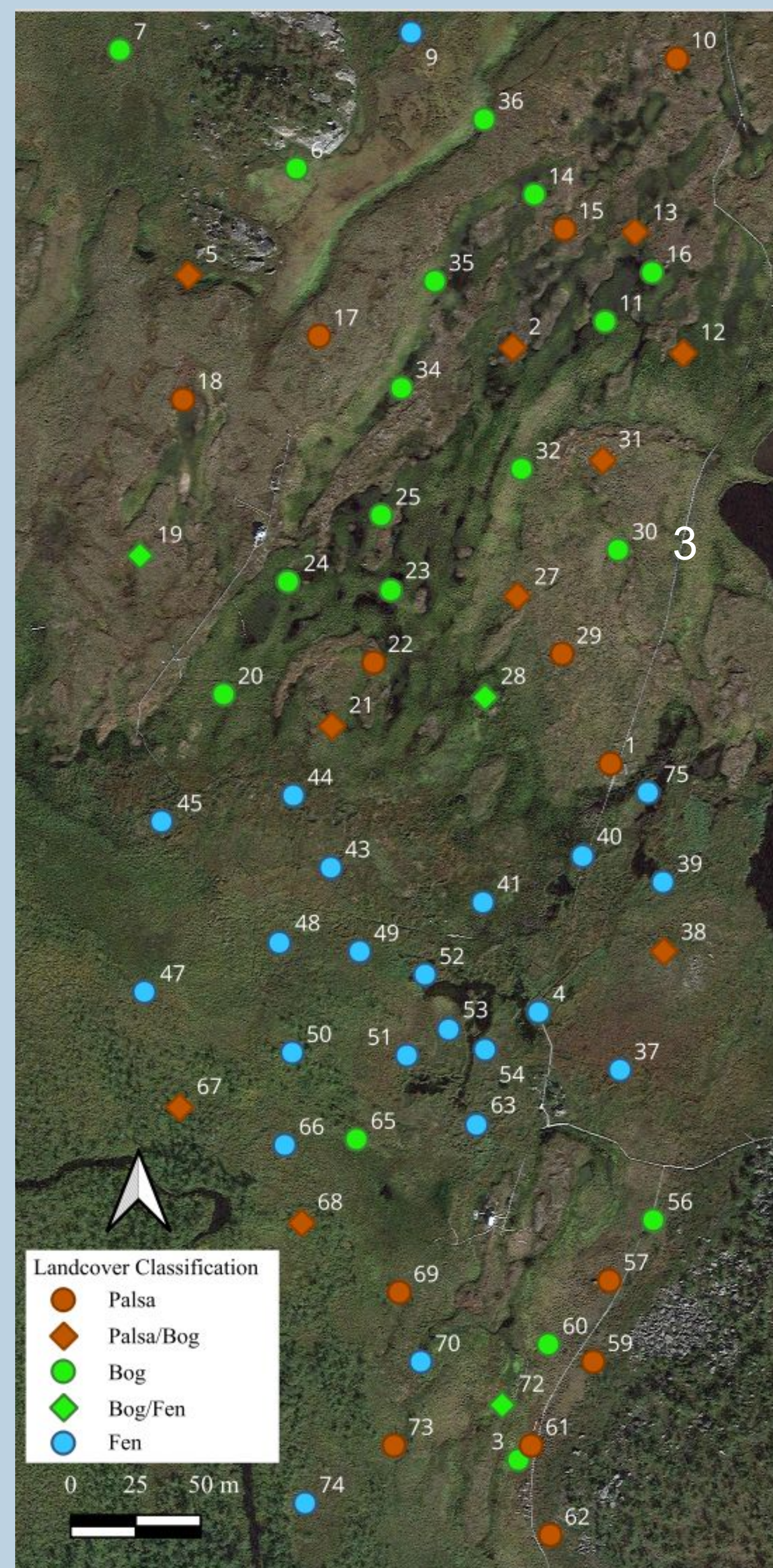
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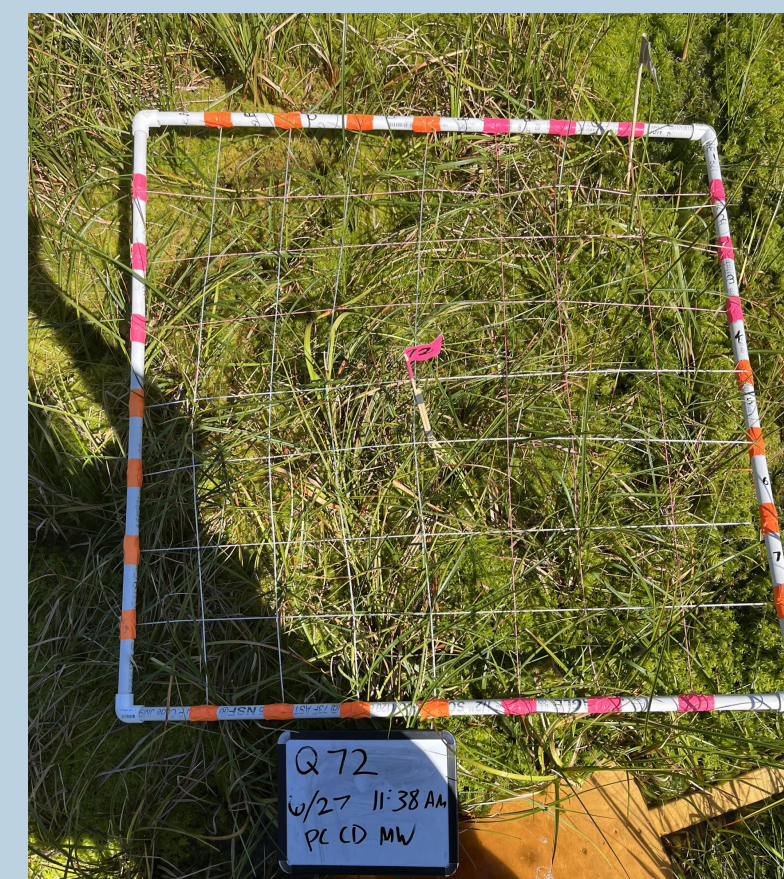
Introduction

- Strontium (Sr) and Rubidium (Rb) are trace elements found in bedrock that can provide info to:
- Understand the influence of groundwater flow
- Predict how the landscapes of climate sensitive ecosystems like permafrost peatlands will change

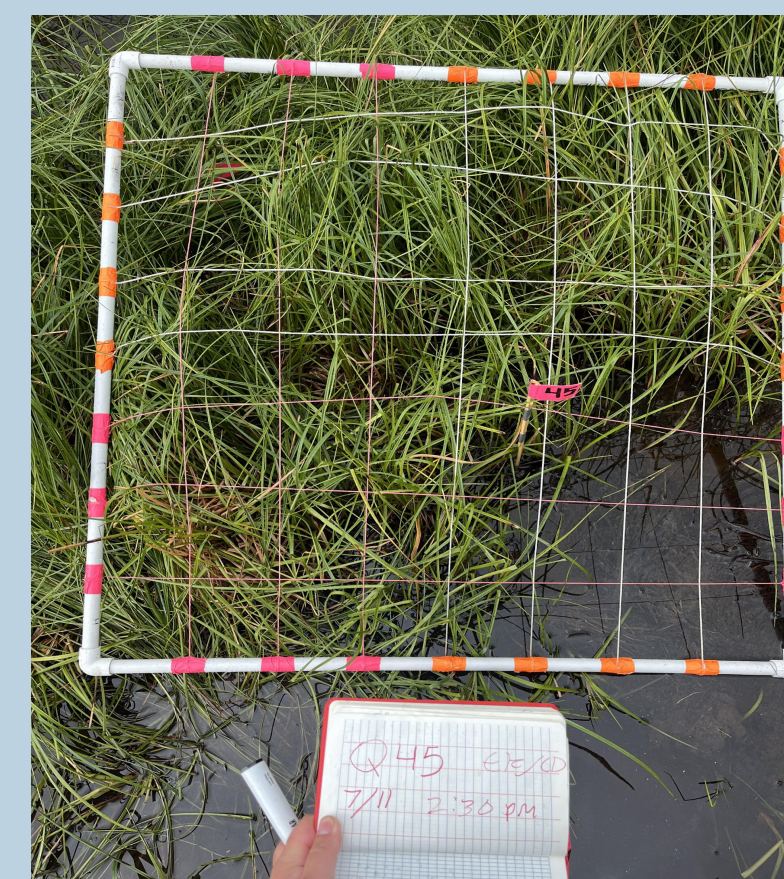
Study Site



Example of a palsa site (pc: Moira Hughs)



Example of a bog site (pc: C. Distelcamp)



Example of a fen site (pc: C. Distelcamp)

Results

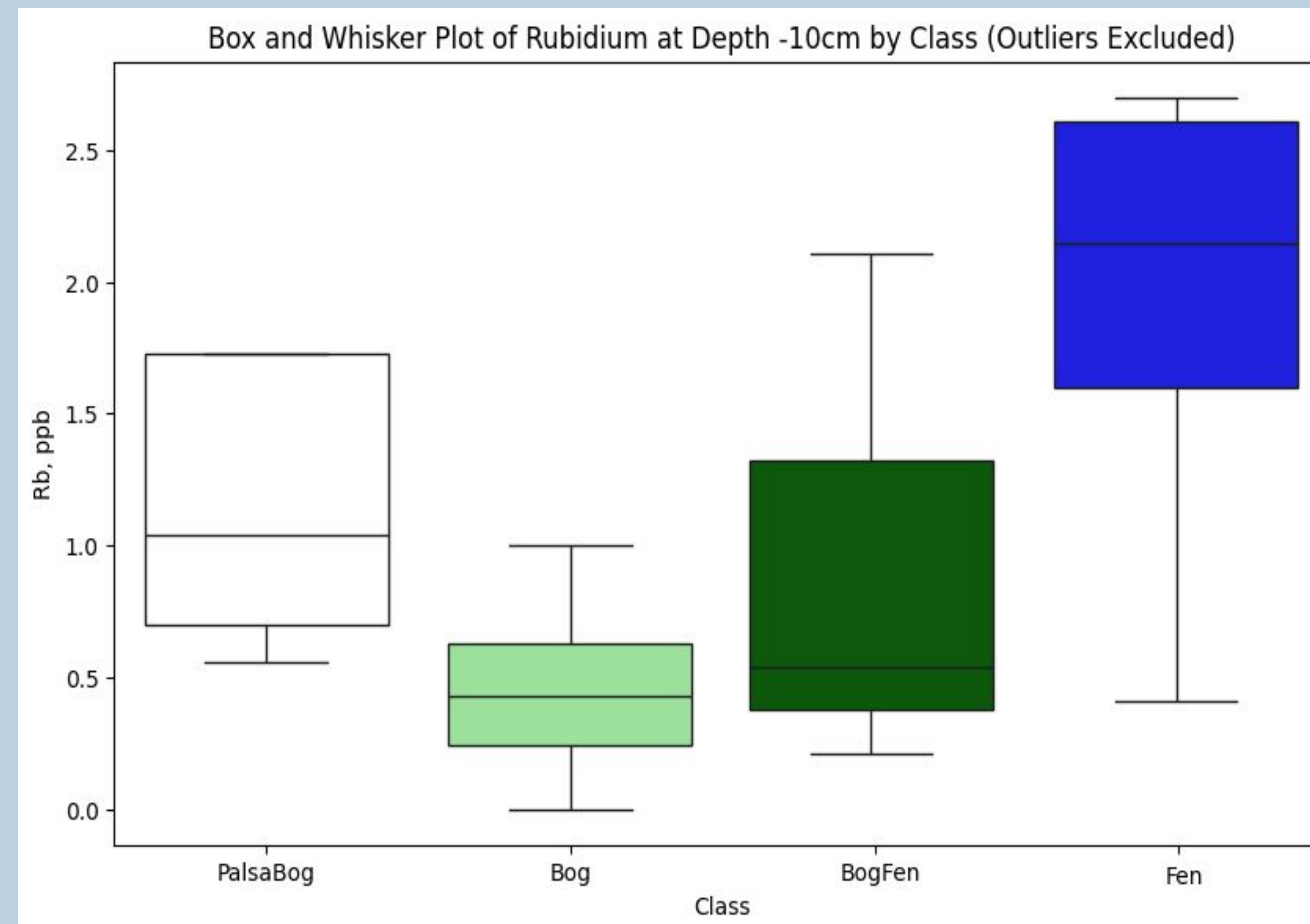
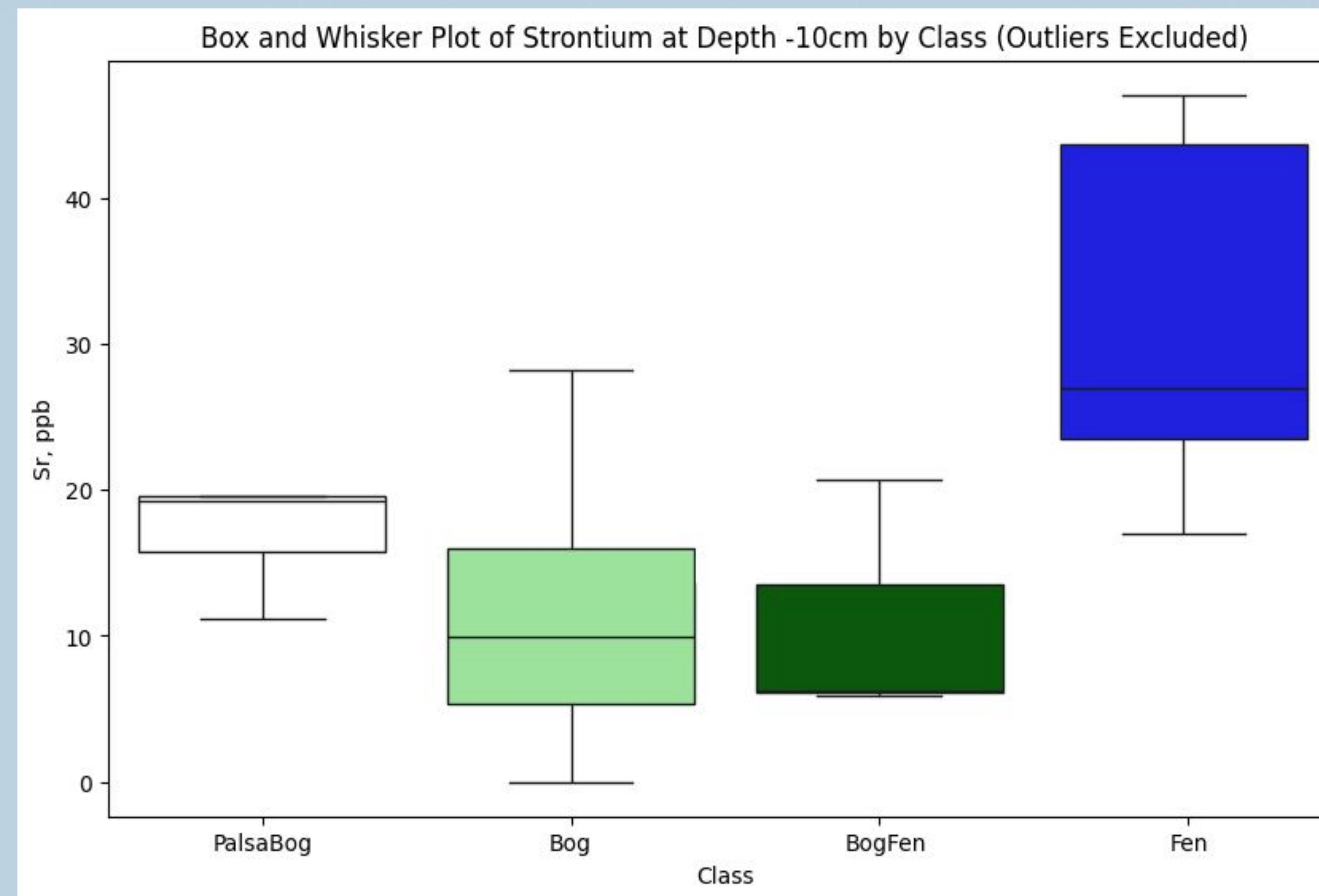
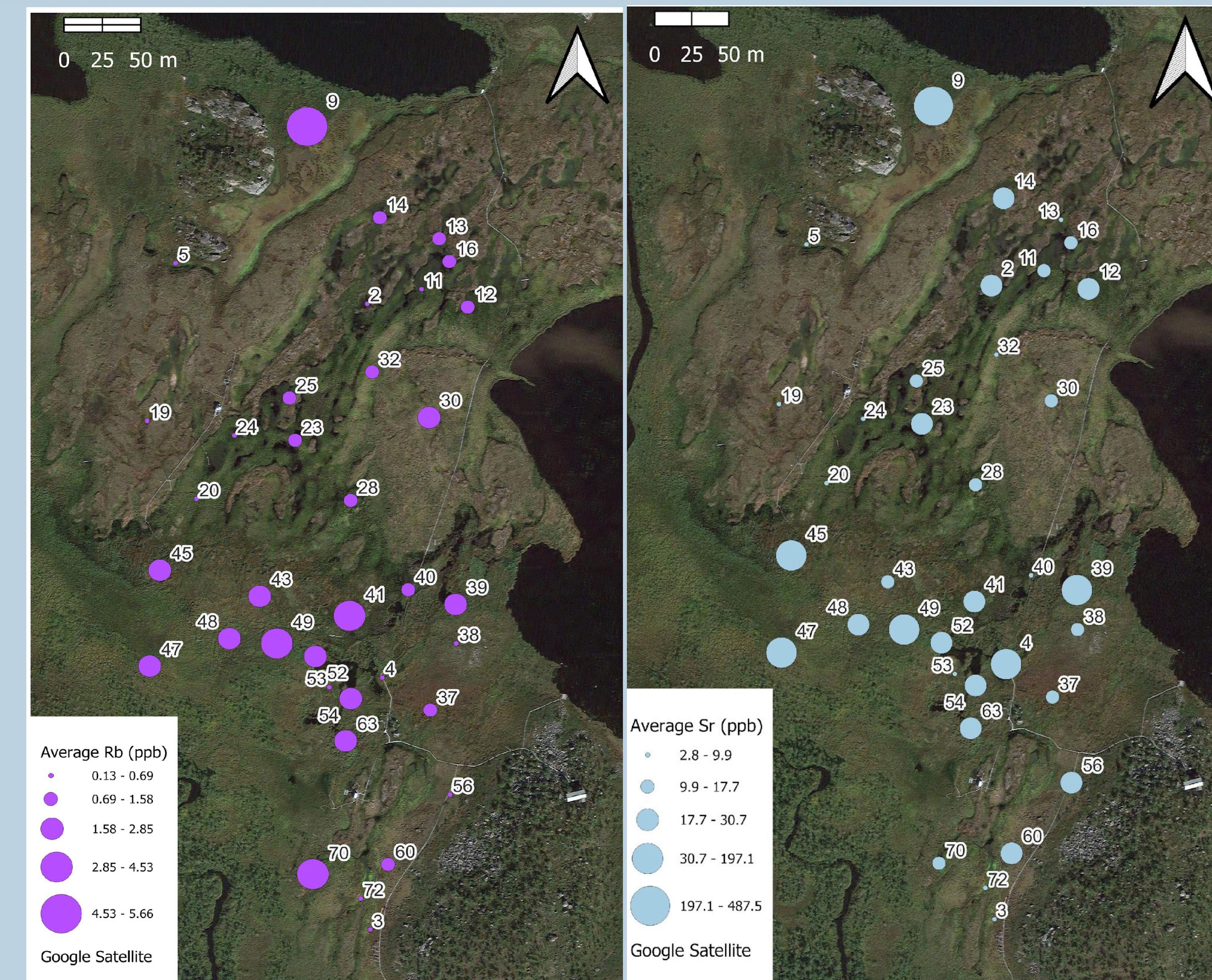


Figure credits: Cal Distelcamp, Hayley Whitney



Key Takeaways and Next Steps

- Fens have higher abundances of Sr and Rb than other landclasses
- Fens are more hydrologically connected, groundwater-fed freshwater bodies have similar Sr concentrations.
- Data from 2024 will be compared to data from 2023, which was collected during a significantly drier season.

Acknowledgements

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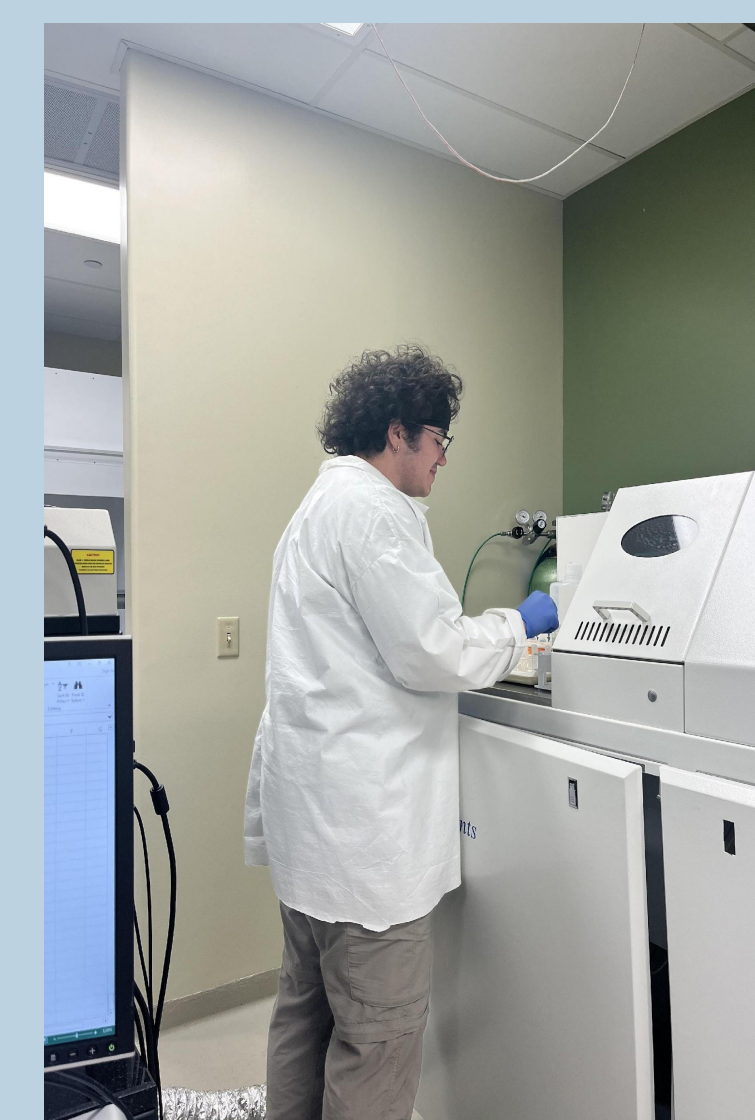
References

Fahnestock, Maria F., "COMPOUND, ELEMENTAL, AND ISOTOPIC PERSPECTIVES ON MERCURY MOBILIZATION DURING THAW IN A DISCONTINUOUS PERMAFROST ZONE" (2022). Doctoral Dissertations. 2669.

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Methods

Abundance of Sr and Rb was measured with Inductively Coupled Plasma Mass Spectrometry (ICP-MS) at UNH.



Running samples on the ICP-MS (pc: Alanna Nenadich)

- Stordalen Mire, a rapidly thawing permafrost peatland
- Palsas underlain by permafrost and bogs may transition to fens if the site is connected to groundwater
- Fens release more methane, a climate warming gas, into the atmosphere
- Predicting where fens could appear in Stordalen Mire is essential to predicting future gas emissions in the Arctic.
- 49 sites sampled for mirewide survey 2024