# Mushroom Diversity and Counts as a Function of Fire History in Arctic Peatlands Mandala Pham\*<sup>1,2</sup>, Nigel Golden<sup>2</sup>, Logan Berner<sup>3</sup>, Gabriel Duran<sup>4</sup>, Sue Natali<sup>2</sup> \*mandaphm@gmail.com; <sup>1</sup>Institute for Geophysics, The University of Texas, <sup>2</sup>Woodwell Climate Research Center, <sup>3</sup>Northern Arizona University, <sup>4</sup>Université du Québec à Montréal

### Introduction

Mushrooms in the Arctic ecosystem play a vital role in symbiotic relationships, organic matter decomposition, and biogeochemical cycling. Climate change-induced fires may alter these relationships, leading to feedback loops that modify carbon and nutrient dynamics. No prior surveys have been conducted at this site so our objective was to explore mushroom species diversity, relative abundance, and counts at sites with different burn histories.

### **Study Area**





## Methods

- Sampled within a 30 m radius circular plots for 1 hour of sampling time
- Collected sample of each mushroom and surrounding vegetation (i.e., substrate)
- Measured environmental characteristics of site
- Measured mushroom weight, length, and cap diameter
- IDed to species and photographed for archive (Fig. 2)



Figure 1: In-field collection of mushrooms



Figure 2: Processing of samples and photographing

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#### Results



Figure 3: Species counts in unburned sites. LALA (Laccaria laccata) shows the highest counts.



Figure 4: Species counts in burned sites. LIUM (Lichenomphalia umbellifera) shows the highest counts.



Discussion

- areas.

## **Future Work**



 Unburned sites exhibited a wide range of species, but had low abundance (i.e., counts) save for Laccaria laccata (Fig. 3). In contrast, burned sites displayed high counts for most species but exhibited a lower diversity compared to unburned sites (Fig. 4).

There was high variability among sites, with the highest counts (Site 14) occurring atop a ptarmigan nest (Fig. 5).

When comparing burned and unburned sites overall (Fig. 6), burned areas had a much higher count of mushrooms but less species diversity compared to unburned

Climate-induced changes in vegetation, environmental conditions, and fire frequency will likely alter mushroom abundance and diversity, with important consequences for ecosystem function.

 Future work on nutrient analysis and more thorough coverage of study area Will use multivariate analysis and diversity indices to provide insights into mechanisms contributing to mushroom diversity and explore their implications for the YKD Delta