



Above figure created from: IPCC 2018; Vincent et al. 2017; Hjort et al. 2018; AMAP 2017 a, b, 2018; Walker and Peirce 2015
Figure to the right: Kanevskiy et al. 2013; F-G, Walker et al. 1980.
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PERSONAL INTRODUCTION

My name is Zoe Landers. I am an Alabama native, attending the illustrious Clark Atlanta University. I am a Dual Degree Civil Engineering and Physics major. My goals are to assist communities while placing a special emphasis on BIPOC communities who are disproportionately affected by the lack of access to public transportation, the lack of access to decent housing and the excessive exposure to things such as air pollution and water pollution.

RESEARCH GOAL

Determine how people and their infrastructure can adapt to changing ice rich permafrost systems.

OBJECTIVES

1. Become familiar with Alaska, the Cold Climate Housing Research Center, NREL, and strategies for building on permafrost.
2. Complete an outreach packet of materials on building on ice rich permafrost for Kali School in Point Lay, Alaska, with the rest of the Foundations on Ice Rich Permafrost team.
3. Complete a literature review on previously conducted housing surveys on the North Slope and prepare options and recommendations for a future housing survey in Point Lay, Alaska.

BACKGROUND

Ice-Rich Permafrost Systems

Permafrost is ground that has been frozen for over 2 years and it is found in places of lower elevations and locations where there is a heavier ground cover. (S.M. Muller 1943)

Permafrost vs. Seasonal Frost

Permafrost:

- Remains frozen throughout the summer
- Lies underneath seasonal frost

Seasonal Frost:

- Develops throughout the winter and thaws throughout the summer
- Referred to as the active layer when it develops over permafrost

There are many things that influence permafrost including:

- Surface water
- Vegetation
- Relief irregularities
- Snow covers

OUTREACH

Outreach materials were developed for Kali School. These educational materials reviewed the *Common Types of Ground Ice and Periglacial Landforms in Northern Alaska*.

HOUSING SURVEY

The goal of the Housing Survey is to gather information and determine things such as the demographic of the families who need housing assistance and the existing issues in the home.

According to the *2017 Alaska Housing Assessment*, the North Slope Borough's population has increased by 34% since 2000. 27% of the occupied units are either overcrowded or severely overcrowded. Along with homes being overcrowded, many houses also lack necessities, such as complete kitchens and restrooms.

JUMP INTO STEM EVALUATION

This experience has been extremely valuable, and this opportunity allowed me to achieve my career goals by educating me in new research and knowledge. Also, this opportunity allowed me to network with others in related fields of studies and mentors who are established in their careers.

FUTURE PLANS

My future plans include:

- Receive feedback from the students who participated with the worksheets created;
- Using the feedback and implementing it into future work;
- Link our research and work to the engineering aspect of this project;
- Next summer will return as a CCHRC intern to continue work on this project on a feasibility analysis of mitigation strategies for permafrost and a Permafrost Symposium to bring together scientists and communities.

REFERENCES AND ACKNOWLEDGEMENTS

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