AURA – Arctic Urban Risks and Adaptations
https://www.respondtorisk.com/

Project description:

Climate change is increasing vulnerability of Arctic urban communities to natural hazards such as unstable permafrost, wildfire, and rain-in-winter events. These hazards put residents and property at risk and impose economic costs, and households, businesses, andgovernments must adapt to these interacting hazards. This research is developing detailed maps showing how the occurrence of these three natural hazards has evolved simultaneously in the Municipality of Anchorage and the Fairbanks North Star Borough, Alaska, and Whitehorse, Yukon, Canada over the past several decades, and how they might change over the next 40 years. The interdisciplinary research team of economists; permafrost, fire,weather, climate, and environmental scientists; and policy experts conducts transdisciplinary research on Arctic natural hazards and their impacts on the natural and built environmentsand society. The research team works closely with local governments and non-governmental organizations (NGOs), Indigenous groups, insurance companies, and residents to co-produce knowledge on the costs, risks, and actions taken to mitigate and adapt to these hazards. The team and stakeholders collaborate to determine optimal ways to measure the effects of hazards on society and the built environment, identify trade-offs and interactions, develop a multiple-hazard risk assessment, and generate options for future adaptive planning. This project is one of the first to include effects of climate change on private as well as public infrastructure, a gap which has limited the understanding of effects of climate change in Alaska. Results provide a framework that other Arctic communities can use to assess risks and reduce economic damages due to climate change and provide examples to increase resilience.

Goals

1. Work with communities to assess wildfire, permafrost, and rain-in-winter hazards and risks as they have changed since 1980 and are projected to change over the next four decades.
2. Estimate the public and private costs associated with these hazards and actions taken to mitigate or adapt to them.
3. Work with government employees, NGOs, and tribal entities to learn how communities are adapting to and mitigating these changing hazards, how the hazards may interacting with each other to cause cumulative effects, and help develop co-develop a vision for improving future adaptation.

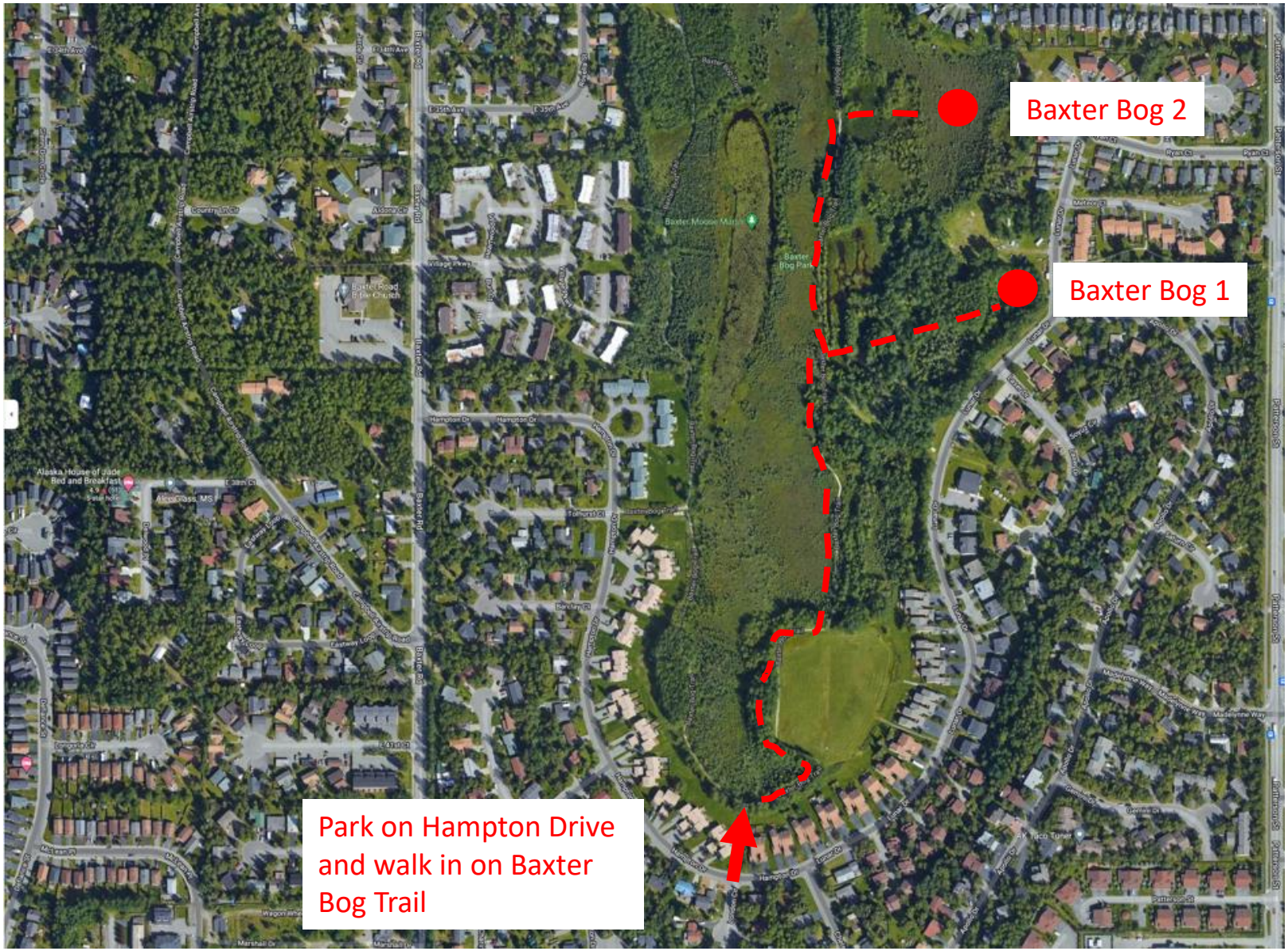
Requested information in black. Our responses in green.

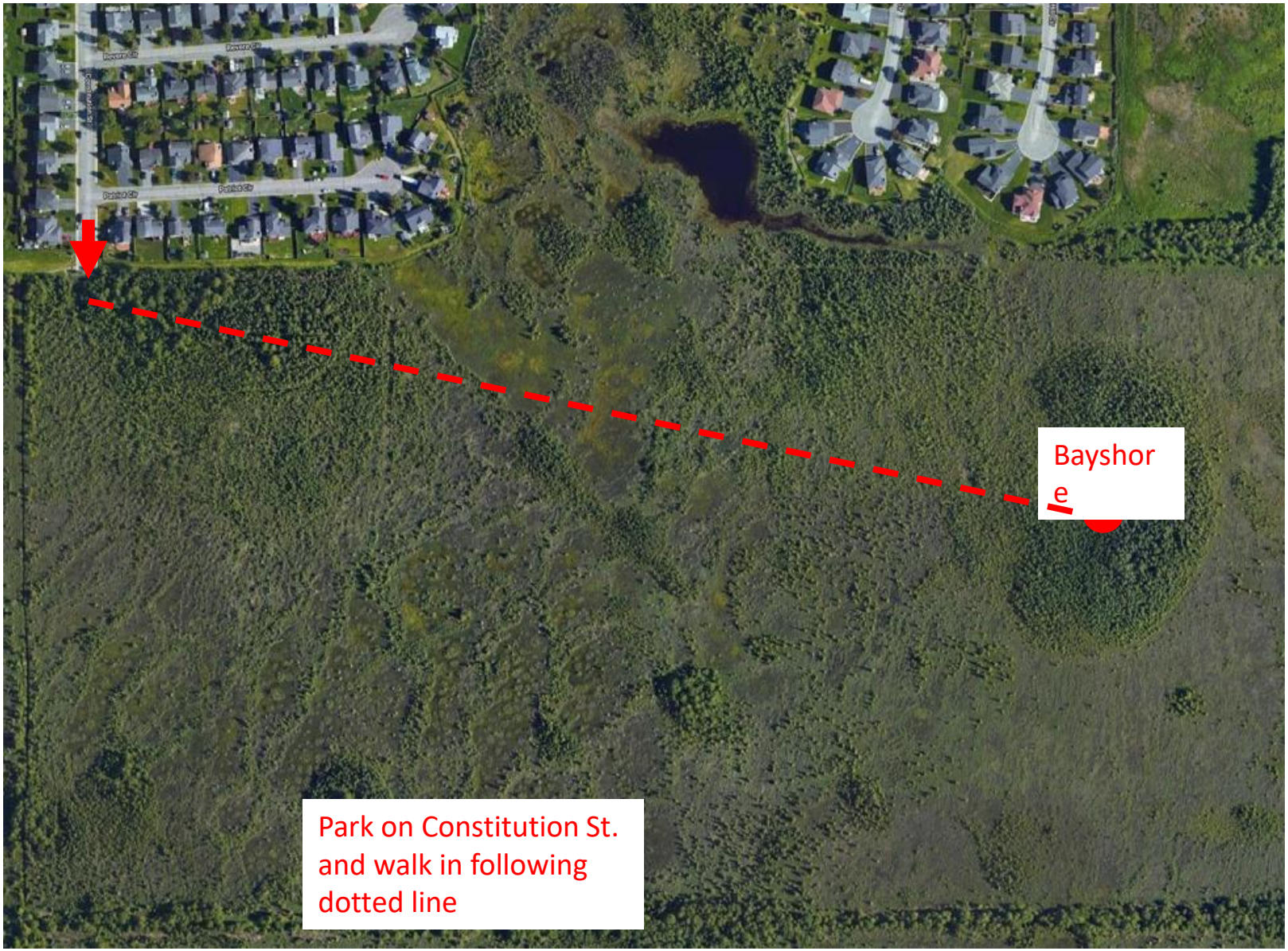
- Map or aerial image indicating the proposed locations and proposed access routes: please see slides 2-5
- Description of equipment to be used for installation: please see slide 5
- What the completed installation will look like: please see slide 6

- When you propose to do the installation and how long that will take:

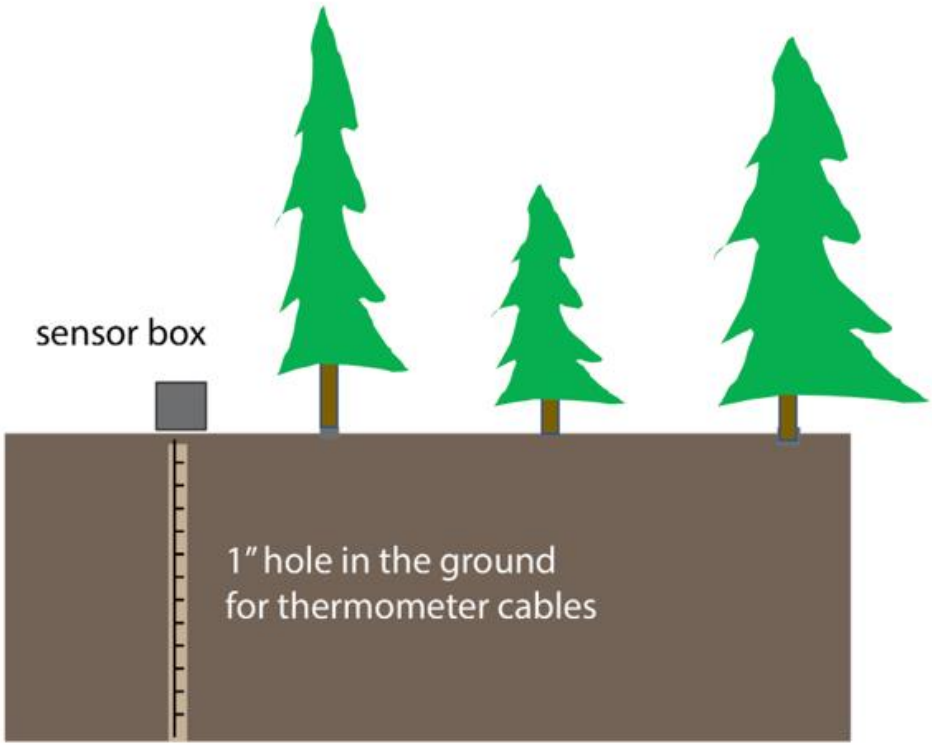
September 13th – 15th 2022. Each site will take approximately 1-3 hours for installation.

- What the decommissioning process will entail: please see slide 7


Baxter Bog 2
Baxter Bog 1
Park on Hampton Drive and walk in on Baxter Bog Trail


Bayshor
e
Park on Constitution St.
and walk in following
dotted line


Birch Lake Road, Eagle River
Park on Beach Lake Road and walk in following dotted line



A. Diagram showing sensor set up.

B. Photo of sensor cable and box that will be visible above ground. Pen for scale.

Examples of completed installation.

Sensor installation:

1. A hole will be drilled by handheld drill (1” diameter) or by manual sledgehammer (1/2” diameter)
2. Depending on the borehole depth, location and substrate specifics, temperature sensors will be placed into the hole using a plastic 1/4”-diameter rod
3. Parts of the cables remaining above the ground surface will be housed in a 3/4”-diameter aluminum conduit to protect from external disturbance. The conduit will be buried, if possible
4. An enclosure box for the data logger will be around 8”x8”x4” in size and will be connected to the conduit with cables.

Reading data/maintaining loggers:

1. Open the enclosure box and connect a data logger to computer by the USB cable
2. Check the logger status and initiate data download with the HOBOware software.
3. Check the battery status and replace batteries if needed. In this case the logger needs to be powered off and re-started again. The logger status needs to be checked in the HOBOware software.
4. Disconnect the HOBOware software and then unplug the USB cable
5. Close the enclose box by tightening the screws.

Sensor removal:

Sensors will be cut at 5” below the ground surface, the box and conduit will be removed, and no ground surface disturbance will remain. Planned for August 2026.