

PERMAFROST PATHWAYS

Connecting Science,
People, and Policy for Arctic
Justice and Global Climate

THE PROBLEM:

The Arctic is warming at three times the global rate, transforming the region, and threatening both Arctic communities and our global climate. The consequences of this rapid warming are—and will increasingly be—catastrophic, as rising temperatures accelerate one of the world’s most significant climate threats: thawing Arctic permafrost. Thawing permafrost is a climate change hazard for both Arctic residents and everyone on the planet.



LOCAL IMPACTS: Ground collapse, erosion, landscape changes, and cascading effects of permafrost thaw are impacting the homes and lifeways of Arctic residents. There is no governance framework to facilitate just adaptation, including relocation.

GLOBAL IMPACTS: Greenhouse gas emissions from permafrost thaw will exacerbate warming, requiring greater reductions in human emissions to stay within global temperature thresholds. However, these emissions are currently not being accounted for in climate policy.

The Solution

We must incorporate what we already know about permafrost thaw and emissions into our global carbon budgets to set sufficiently ambitious goals that will keep us within our target global temperature threshold. We must also drastically improve our monitoring and understanding of permafrost thaw and resulting emissions to continuously inform the solutions we’ll need to implement in the coming decade to avoid irrevocable harm both in the Arctic and globally.

Our Approach

We will establish a comprehensive monitoring network to fill critical gaps in our ability to track and forecast permafrost thaw and consequent carbon emissions, and work in partnership with local residents, communities, and leaders, as well as national policymakers, to harness these data to support Arctic community adaptation and appropriate climate mitigation policy:

MITIGATION: Provide the international policy community with robust budgets of Arctic carbon emissions to support increased ambition for rapid reductions in fossil fuel emissions.

ADAPTATION: Combine monitoring and modeling tools with Indigenous Knowledge to assess current and future impacts of permafrost thaw, and work with integrated network of Arctic residents, Indigenous leaders, scientists, and policy experts to co-create fair and equitable adaptation action plans that can be implemented at local, regional, and national levels.

Implementation Plan:



MONITORING AND MODELING

- Develop a coordinated pan-Arctic carbon monitoring network.
- Use emerging satellite observations for near real-time detection of landscape change.
- Build a data assimilation model to provide near-term forecasts and longer-term projections of permafrost thaw and carbon emissions.

CLIMATE ADAPTATION STRATEGIES

- Work with Arctic residents to co-develop just and equitable adaptation strategies in communities imminently threatened by permafrost thaw.
- Support creation of a national climate relocation governance framework that respects tribal sovereignty and human rights, and which would guide communities globally.

CLIMATE MITIGATION POLICY

- Incorporate permafrost emissions into IPCC assessments and humanity's remaining carbon budgets to stay within critical global temperature thresholds.
- Engage with policy makers to promote understanding of the risks and human impacts of thawing permafrost and increase climate ambition accordingly.

Why Permafrost Pathways

Permafrost Pathways was launched in 2022 with funding through the TED Audacious Project—a collaborative funding initiative catalyzing big, bold solutions to the world's most urgent challenges. Through a joint effort between Woodwell Climate Research Center, the Arctic Initiative at Harvard Kennedy School, the Alaska Institute for Justice, and the Alaska Native Science Commissions, Permafrost Pathways harnesses the combined expertise of leading research institutions and on-the-ground organizations specializing in climate science, policy, and environmental justice to inform and develop adaptation and mitigation strategies to address permafrost thaw.

