

# How can we turn permafrost knowledge into action?

Version 1, August 2022, permafrostnet@carleton.ca

**Canada's northern land and communities are shaped by permafrost** – ground that has been frozen for thousands of years. Permafrost thaw is changing the land, damaging infrastructure, and threatening the Indigenous ways of life. We have a chance to build a more sustainable future on changing permafrost lands. Our vision is to braid western and Indigenous knowledge systems with existing networks and stakeholders to collectively find solutions for existing and new challenges.

## Federal, provincial, and territorial policymakers

**What are the key problems? What promising solutions exist?**

We make policies to incentivize action and standards to ensure quality.

## Northern government and communities

**What changes to expect in the next 80 years?**

We know how information can be turned into action locally.

## Research in academia and government

**What are the priority questions where science and engineering can make contributions?**

We make computer simulations of climate change and its impacts, monitor changes in-situ and remotely, and develop new technologies.

## Professional and academic training

**What new skills and knowledge are needed and proven useful?**

We train experts and develop new practice.



Webpage with more information

Here are examples of groups affected by permafrost thaw. Everyone has their own problems to solve and unique knowledge and experiences they can contribute to adapting to permafrost thaw. When we all connect and collaborate together, we can find solutions for living with permafrost thaw.

**This infographic is a starting point to get your input and feedback to help all of us on this journey. Please feel free to add, delete, and edit this infographic.**



## Land-use and infrastructure planning and design

**What conditions to plan with for the next 80 years?**

We know how climate and geotechnical conditions affect land use and structures.

## Private sector (mining, transportation, energy, communication, consulting, insurance)

**What new practices will I need to keep my services reliable and efficient?**

We have unique observations and local knowledge

## Indigenous organizations and communities

**What changes to expect in the long term?**

We know the land and hold traditional knowledge. We see, understand, and deeply care about the changes that are directly impacting us.

## Canadians

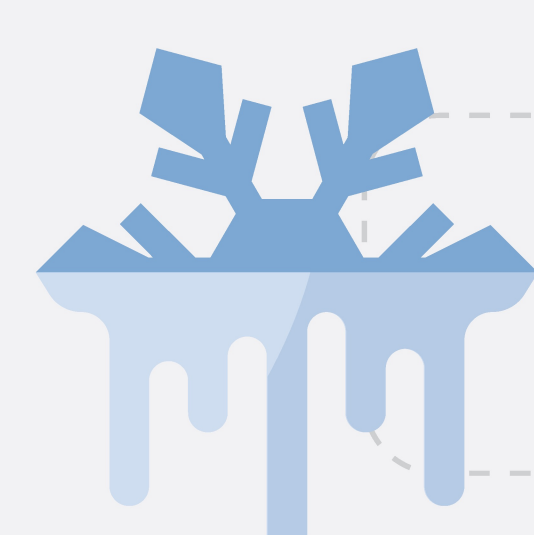
**What is happening in my country and in the world?**

We are the people who can take climate action, collectively

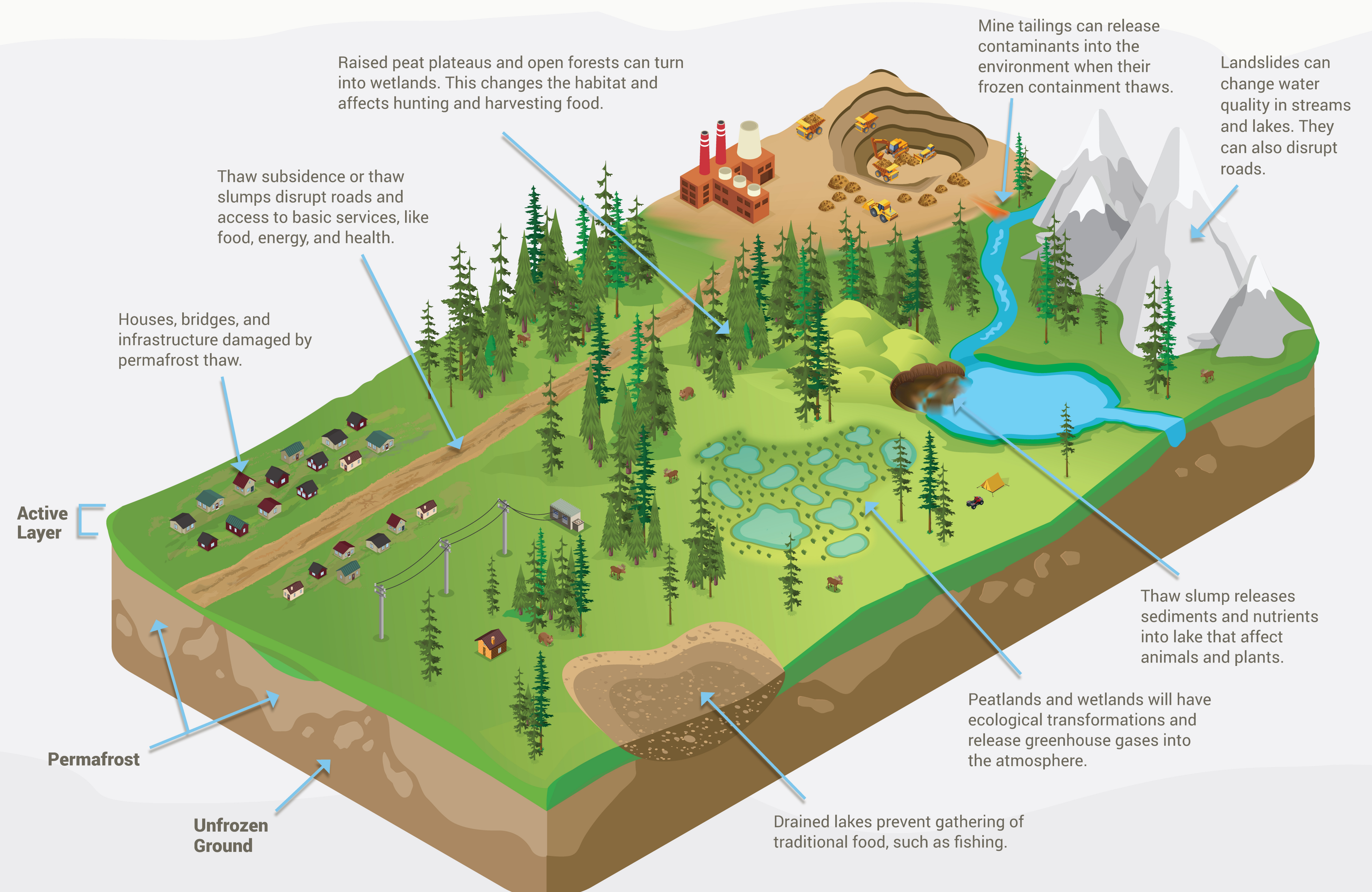
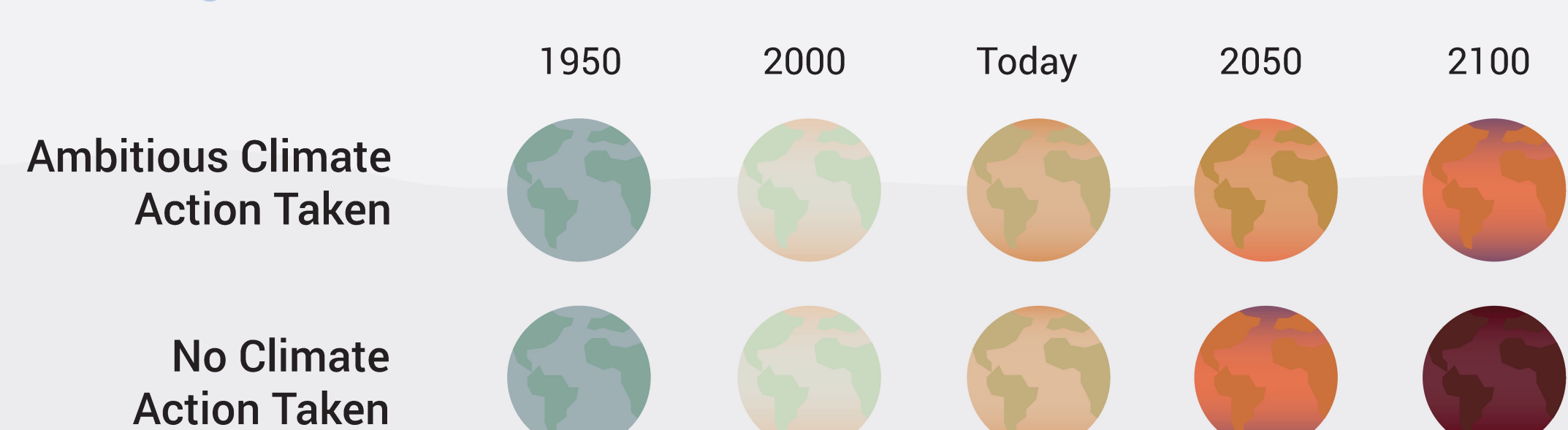
# Permafrost change matters to Canadians everywhere

**Permafrost** is ground that has been frozen (below 0 °C) for at least two years. It is found below the surface layer of ground that freezes in cold seasons and thaws in warm seasons.

**Northerners are already experiencing the rapidly increasing impacts of permafrost thaw. Here are some changes that happen with permafrost thaw:**



Scientists have found that **permafrost is thawing** due to climate change. This means that thaw will continue to intensify with future climate change.



Global air temperatures will continue to rise and thaw permafrost if little climate action is taken. Thawing permafrost will cause serious problems to land structure, infrastructure, wildlife, and Northern communities.

While we know how to live on land with and without permafrost, living on land with thawing permafrost is a new and unpredictable challenge.

Adapting to this challenge will need collaboration from researchers, industry members, government, Indigenous peoples, and many more.

As an Arctic nation, Canada has the chance to be a global leader in monitoring, understanding, and adapting to permafrost thaw.

# Toward a vision and strategy for Canadian permafrost knowledge

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This text and infographic are drafts to be refined through comments from the community. Your feedback will help us build a vision and strategy that resonates broadly. Please send your comments by email to [permafrostnet@carleton.ca](mailto:permafrostnet@carleton.ca) or simply write comments on this handout and give it back to one of the authors.

**Purpose of this initiative:** Working toward co-development of collective approaches for informing adaptation and building resilience to permafrost change.

**Positioning statement:** Canada is a permafrost country in a global climate crisis. Our northern land and communities are shaped by ground that has been frozen for thousands of years. Climate-driven permafrost thaw changes the land, damages infrastructure, and further warms the atmosphere. It threatens Indigenous ways of life and the ability to plan for a resilient future for Northerners. Currently, Canada's permafrost knowledge (like in many other jurisdictions) is not well suited to address our climate-change crisis. **Our vision is a vibrant and sustainable future on changing permafrost lands.** We believe that this can be achieved by **effective adaptation, enabled by networked capacity and services, informed by braiding of western and Indigenous knowledge systems.** Conversely, escalating costs and risks in the long term will result from delayed action. *Permafrost 2030+: Towards a vision and strategy for Canadian permafrost knowledge* strives to collectively define the needs for permafrost knowledge and identify the solutions required to deliver them.

## Values and actions

We value DIVERSITY and INCLUSION: We encourage the expression of viewpoints, beliefs, and practices from people with different identities and life experiences.

- We seek diverse representation on our committee and engagement groups, especially Indigenous and Northern representation.
- We listen to understand and show appreciation for different opinions.
- We encourage everyone to participate in meetings and provide opportunities to contribute outside of formal meetings.

Our activities are SOLUTION-FOCUSED: We undertake proactive solutions.

- We learn from past experiences and focus on future positive outcomes.
- We think critically to understand the roots of challenges.
- We seek new perspectives and expertise to solve problems.

We value TRANSPARENT COLLABORATION: We collaborate and openly share information with permafrost stakeholders.

- We initiate engagement with a wide variety of stakeholders.
- We incorporate stakeholder contributions or explain why they were excluded.
- We openly and honestly share our activities and decisions in a timely and accessible fashion.

We value ACCOUNTABILITY: We take responsibility for our actions.

- We define and communicate our role, responsibilities, governance, and timelines.
- We use resources wisely, especially stakeholder's time.
- We acknowledge and make amends for mistakes.

**Indigenous and Northern participation:** The development of a vision and strategy for permafrost knowledge in Canada necessarily requires co-development and shared governance with strong participation of Northerners and Indigenous peoples and organizations. The initiative's current capacity is not sufficient to support a comprehensive, structured process to achieve pan-northern engagement and participation. An approach beginning without further delay, based on the initiative's current resources is recommended, and structured into two phases: In **Phase 1 (2021–2022)** participants in the initiative reach out through their networks to inform, engage, and invite perspectives and participation. The feedback from this will be collectively recorded (available here [www.permafrostnet.ca/about/permafrost-strategy-in-canada/](http://www.permafrostnet.ca/about/permafrost-strategy-in-canada/)) to inform continuous feedback for the ongoing outreach and in framing key issues and opportunities. We engage informally with key initiatives, for example, the Canadian Permafrost Association, the National Adaptation Strategy, and Climate Science 2050. Based on Phase 1, we intend to gather sufficient momentum and support from partners so that in **Phase 2 (2022 onwards)**, an open and structured process toward co-development and shared governance will be possible and that this can elevate permafrost knowledge in Canada to better inform decisions related to climate change.

**Who we are:** This initiative is led by members of the permafrost Strategy Committee, who are listed as authors of this document ([www.permafrostnet.ca/people/strategy-committee/](http://www.permafrostnet.ca/people/strategy-committee/)). The committee has an evolving membership to reflect the needs and opportunities arising as this initiative develops. The committee was formed with the purpose of catalyzing an open and inclusive strategic thinking exercise for the future of Canadian permafrost research under the directions and oversight of the NSERC PermafrostNet Board of Directors. NSERC PermafrostNet is a Strategic Partnership Network funded for 2019–2024, that unites key scholars and stakeholders from government agencies, industry and Indigenous communities with the common goal of boosting Canada's ability to adapt to large scale permafrost thaw. Its Board of Directors provides guidance and oversight and reflects the interests and concerns of partners from governments, Indigenous organizations, companies, and universities involved in the network.

More information is available on the Permafrost Strategy in Canada **webpage:**

