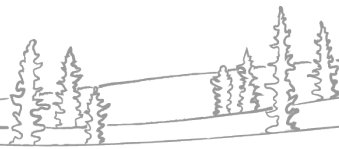




Landscape Carbon in the Northwest Territories

Understanding carbon stored in northern landscapes



Canada's forests, wetlands, peatlands, and soils store large amounts of carbon. When carbon stays stored in the land, it helps regulate the Earth's climate.

The Northwest Territories (NWT) is home to some of the largest carbon stores in the world. As the climate warms, these landscapes are changing. This makes it more important to understand and care for them.

What is landscape carbon?

Landscape carbon is the carbon stored in natural areas, including forests, soils, wetlands, and frozen ground.

In the NWT, carbon is stored in boreal forests, but most of it is found underground. Much of this carbon is stored in peatlands, which are wetlands formed from layers of plant material built up over many years, and in permafrost, which is ground that stays frozen year-round.

When these ecosystems remain healthy, they can store carbon for hundreds or even thousands of years. When carbon is released into the air, it can increase greenhouse gases and contribute to climate change.



Boreal forests and wetlands in the Northwest Territories store carbon above and below ground.

Why Landscape carbon matters in the NWT

The NWT contains some of the most carbon-rich landscapes in Canada.

These landscapes:

- store large amounts of carbon
- support wildlife and water systems
- support Indigenous stewardship and ways of life.

Protecting these ecosystems helps keep carbon in the ground and supports healthy environments and communities.

What is changing

Climate change is affecting northern landscapes. Warmer temperatures and changing conditions are putting pressure on carbon-rich ecosystems.

Key changes include:

- **Permafrost thaw.** Frozen ground is thawing in many areas. This can cause stored carbon to break down and release greenhouse gases
- **Peatland disturbance and drying.** When peatlands are disturbed or dry out, they release stored carbon and may store less carbon over time
- **Wildfires.** Larger, more frequent, and more severe fires can release large amounts of carbon stored in vegetation and soils.

These changes can increase the risk that some areas shift from storing carbon to releasing it.



Photos showing wildfire and land slumps from permafrost thaw.

Protecting landscape carbon

Healthy ecosystems can continue to store carbon and support communities when they

are well managed.

Possible approaches include:

- Protecting intact ecosystems through conservation, land-use planning or mitigation
- Reducing impacts where development occurs, such as limiting land disturbance and planning for site restoration where disturbance occurs
- Restoring damaged ecosystems where possible
- Improving research and monitoring to better understand changes to our landscapes
- Supporting Indigenous-led stewardship and monitoring programs.

These approaches can help keep carbon stored in the land while also supporting biodiversity, community well-being, and long-term resilience.

Learn more

In February 2025, the Government of the Northwest Territories and Polar Knowledge Canada hosted a Landscape Carbon Workshop in Yellowknife. The workshop brought together people from across the North and beyond to share knowledge about landscape carbon. The workshop was supported through funding from Polar Knowledge Canada, Environment and Climate Change Canada, and the Government of the Northwest Territories. Additional workshop support was provided by C-CORE.

Workshop materials and resources are available online:

<https://www.gov.nt.ca/ecc/en/services/climate-change/research-partnerships>



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