Wetlands + Carbon

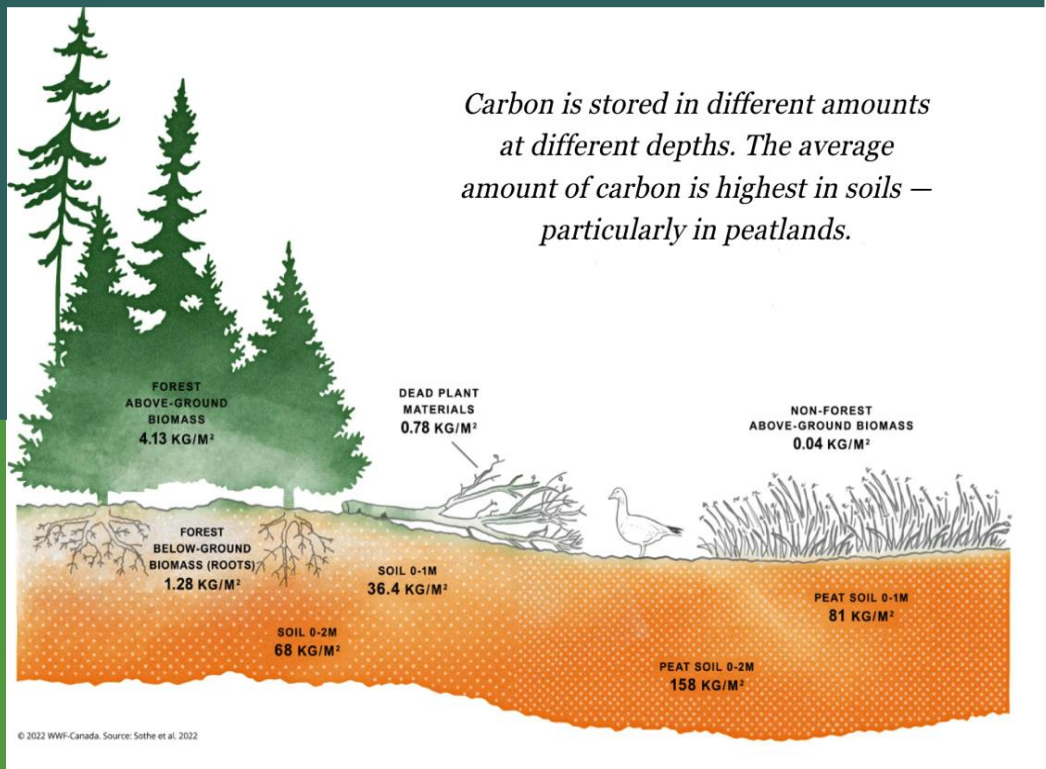
Protect our Wetlands

Wetlands + Carbon

Wetlands & carbon go together, like macaroni & cheese, like a needle & thread, like salt & pepper.

Wetlands are the best tool we have today to manage carbon emissions, greenhouse gases, and climate change. Nature gives us these wetlands free of charge, all we have to do is take care of them.

Caring about climate change, caring about carbon management, caring about greenhouse gas reduction, means **caring about wetlands.**



Wetlands + Carbon, The Facts

Wetlands are also called *peatlands*, *fens*, *swamps* or *bogs.* They come in various shapes and sizes but they are **absolutely critical** for preventing and reducing the effects of **climate change**, preserving **biodiversity**, minimising **flood risk**, and **purifying water supplies**.

- Wetlands are the world's largest natural carbon storehouse. The world's wetlands hold *twice* the carbon that the world's forests hold.
- Peat is formed when dead plants decompose slowly in waterlogged conditions. The partially decomposed plants pile up and become compacted, forming peat.
- The carbon that the plants absorbed from the atmosphere when they were alive is stored within peat soils. This helps to cool the earth and the air, which in turn helps to reduce climate warming.
- Healthy wetlands depend upon the surrounding forests and undergrowth to develop and become a carbon storehouse.
- Damage to wetland landscapes releases huge quantities of carbon in the form of greenhouse gasses.
- If wetlands in Nova Scotia are destroyed, the released greenhouse gases will be added to all the other emissions in the province. Nova Scotia has to reduce emissions to meet its carbon targets so adding even more carbon is not smart.
- Finding solutions to take greenhouse gasses out of the atmosphere and lock them in the ground will be expensive. Wetlands and their ecosystems provide this service free of charge. That's a win-win situation.

Wetlands and their surrounding forests and undergrowth are significant allies in the global efforts to combat climate change. Their protection and restoration are vital in the transition to a global zero-carbon society.

Wetlands + Carbon, The Story

Scientists have been telling us for years that our climate is changing. We are now at a point where that changing climate has turned into a crisis. All over the world we are seeing out-of-control forest fires, devastating floods, droughts and a loss of biodiversity.

Wetlands, the Carbon Storage Rock Stars

Peatlands are one of the most valuable terrestrial ecosystems in our fight against climate change[1]. These unique ecosystems cover just 3 percent of the earth's land mass yet they are second only to oceans in the amount of carbon they store. They hold twice the carbon that is held by the worlds' forests. *In Canada, one square metre of peatland can contain up to **five times** as much carbon as the same area of Amazon rainforest.*

The loss of an existing wetland means not only the loss of future carbon storage, but the wetland, the surrounding soil, the trees and the vegetation will all release stored carbon. When disturbed or warmed, wetlands release the three greenhouse gases (GHGs) that contribute the most to global warming: **carbon dioxide** (CO2), **methane** (CH4) and **nitrous oxide** (N2O).

According to a recent WWF-Canada study (2022)[2] led by scientists at McMaster University's Remote Sensing Lab:

> *Disturbed peatlands throughout the world emit two gigatonnes of carbon dioxide each year, which is equivalent to five per cent of human-produced greenhouse gases (or the annual output of 500 coal plants). Canada is home to a quarter of the world's remaining peatland carbon stores[3].*

This study has measured, for the first time, how much carbon is stored in Canada's landscapes. The results are staggering. Canada stores a massive 327 Pg (that's 327 **billion** tonnes) of carbon in its terrestrial ecosystems - equivalent to about 25 years of human-caused global greenhouse gas emissions at 2019 emission levels.

About 6% of Canada's carbon is stored in vegetation (trees, shrubs, grasses, dead leaves and roots). The remaining 94% is found in the top one metre of soil, with ***32% of this carbon found in peatlands!***

The fate of existing wetland ecosystems must be factored in when predicting carbon emissions. In fact, a carbon emission prediction should be calculated as part of any urban or rural development.

Nature's Climate Engineering Miracles

Recent learnings about carbon storage in peatlands have significant implications for both Canada and the world. Locating high-carbon regions allows for more targeted conservation measures. Implementing nature-based climate solutions (NBCS), such as protecting and conserving areas and actively managing whole landscapes in these regions, can help ensure this globally significant amount of carbon remains "locked in nature", and increase the possibility of more absorption in the future.

Nature Based Climate Solutions (NBCS) also provide important habitat for wildlife, including Species At Risk (SAR), allowing us to fight climate change and biodiversity loss at the same time. And let's not forget, climate-induced flooding is a big part of our lives now. Wetlands play a key role in helping to mitigate these floods[4].

The bright minds of the engineering world are in a race to invent a factory that would draw down and lock in carbon. Such a factory would cost billions. Wetlands offer this service **for free**

It can take hundreds of years for a healthy wetland to develop. It takes no time for an excavator to release tonnes of carbon, nitrous oxide and methane (Greenhouse Gases) into the atmosphere.

Where are the holes in Environmental Protection in Nova Scotia and Canada

Nova Scotia Wetlands Conservation Policy 2011

- You need approval from the NS Department of Environment to alter a wetland
- If 2 or more hectares of a wetland are disturbed, the project must undergo an environmental Assessment
- The Wildlife Habitat and Watercourses Protection Regulations (under the Forests Act), require a Special Management Zone separating forestry operations from all watercourses and wetlands with standing or flowing water. This buffer is 20 meters. These regulations **are not applicable** to commercial, industrial or urban development, mining or agricultural operations, but apply in all public and private forests (NSDNR).
- **Compensation:** for every hectare of wetland altered, 2 hectares must be compensated somewhere else.

Where are the holes in Environmental Protection in Nova Scotia and Canada

The Migratory Bird Protection Convention Act (1994) and the Migratory Bird Regulations (2022)

- These are federal regulations
- Only migratory birds **listed** under this Act are protected (so not all birds)
- Eligible Migratory Birds and their nests are protected when they are actively nesting on a **viable nest**
- Their habitat is **not** protected except for a small buffer zone around the viable nest.
- Staging areas (where migratory birds rest, re-group and recharge on their journey) are **not** protected.

Nova Scotia Species at Risk Act 1998

- These are provincial regulations
- Basically any species listed as protected under this Act cannot be disturbed, killed, injured nor are you allowed to possess any species listed under this Act.
- You are not allowed to destroy or interfere with the dwelling place of a species listed under this Act.
- However, if you have a permit giving you permission, you are **exempt** from these two rules.
- The Minister can issue a permit subject to the terms and conditions The Minister feels are appropriate.

Species at Risk Act Canada 2002

- Basically the same as the Nova Scotia Regulations and pertain to species at risk on federal lands
- This Act goes further to say that the critical habitat of a species at risk cannot be damaged or destroyed, even if the critical habitat is on provincial or territorial lands
- **BUT:** a critical habitat is defined in the action plan designed to help the species survive or recover. If one does not exist, then the critical habitat is not defined, which means the habitat is **not protected**.

Compiled and Written By: Lil MacPherson and Sandy Martin

Sources:

1: Xu, Bin: How scientists are restoring boreal peatlands to help keep carbon in the ground. Northern Alberta Institute of Technology. *The Conversation* (April 8, 2021) https://theconversation.com/how-scientists-are-restoring-boreal-peatlands-to-help-keep-carbon-in-the-ground-145290

2: Sothe, Camile et al: Large Soil Carbon Storage in Terrestrial Ecosystems of Canada. WWF-Canada / McMaster University *American Geophysical Union* (AGU) February 2, 2022 https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021GB007213

3: https://wwf.ca/carbon-stocks

4: Carbon Sequestering in Wetlands: Board of Water and Soil Resources, St. Paul, MN, USA https://bwsr.state.mn.us/carbon-sequestration-wetlands

Kendall, R. A., Harper, K. A., Burton, D. and Hamdan, K. The role of temperate treed swamps as a carbon sink in southwestern Nova Scotia. Can. J. For. Res. 51: 78–88 (2021) dx.doi.org/10.1139/cjfr-2019-0311.

Let your city council and provincial government know that they can choose better locations for development. They must make better choices for our future.