**Restoring an unsung hero**
*Researchers, biologists, and Indigenous communities work together to bring eelgrass — with its role in creating healthy shorelines and its capacity for carbon storage — back to Nova Scotia coastlines.*

By Alison Auld
Climate Story Network

When Trinity Nicholas was a child, she would wade through lush beds of eelgrass off the shores of her home in Pictou County to swim in the warm waters of the Northumberland Strait.

Meadows of the green fronds lined the coastline, providing vital habitat for lobsters, crabs, tiny invertebrates, and a range of other species, including the eels that were an important part of her heritage on the Pictou Landing First Nation.

Years later when Nicholas learned of a project to help restore the plants to parts of Nova Scotia and the Maritimes, she ventured back to the same site in search of samples. Instead of the healthy seagrass beds of her childhood, she found a desolate, sandy expanse free of the marine life that used to grow around Maliko'mijk Island.

"Eelgrass used to be so abundant around the shores there," she says from the reserve about two hours outside Halifax. "When we went to do the restoration, it was basically empty. We searched for two days to find eelgrass to use. It’s very depleted and the erosion is only getting worse."

It is a phenomenon being seen throughout the Maritimes and around the world, as the plant falls prey to warming waters, invasive species, human activities that disrupt the seafloor, and pollution. The loss has significant implications for coastal sustainability, biodiversity, and carbon sequestration, according to scientists trying to stem its decline throughout the Northern hemisphere.

Common eelgrass, a type of seagrass known by its Latin name Zostera Marina, is a haven for marine species that feed, seek shelter, and spawn there. In Atlantic Canada, it’s a key habitat for about 25 different fisheries, including eels, lobster, flatfish, and salmon.

The flowering plant — much like lawn grass, but unique in its ability to survive in the ocean — also protects coasts against erosion by breaking the energy of waves, something that is increasingly important as storms become more frequent and are gaining strength.

One of its most notable benefits, however, is carbon storage.

"It really is an unsung hero," says Kristina Boerder, a Dalhousie University research scientist who is spearheading an ambitious project to study and restore eelgrass throughout parts of the Maritimes.

"It is extremely efficient in trapping carbon and storing it. About .2 per cent of the global ocean is occupied by seagrasses, but it does store a disproportionately large amount of carbon in the ocean."

The grass stores almost 10 per cent of the blue carbon buried in the world's ocean every year, with part of it getting funnelled into its underwater root system and forming a sedimentary carbon pool much like trees on land. If left undisturbed, carbon can be stored indefinitely.

The problem is that little is known about where and how abundant eelgrass is in Nova Scotia, and how much carbon it’s actually storing.

Those are some of the questions the Community Eelgrass Restoration Initiative (CERI) is hoping to answer, while also harvesting and planting seedlings in about 10 sites in the province. Led by Dr. Boerder and scientists at the Future of Marine Ecosystems (FOME) lab at Dalhousie University, the community-led project is being done in close collaboration with the Confederacy of Mainland Mi'kmaq.

"We are aiming to restore a significant area of seagrass around Nova Scotia, rebuilding these ecosystems and doing it in a climate-smart way," says Derek Tittensor, head of the FOME research group and a professor of Biology at Dalhousie.

"Importantly, we are also integrating Indigenous and scientific knowledge of these remarkable ecosystems through a two-eyed seeing approach. Everything we do is about working with – and learning from – Indigenous and local communities."

The team has planted almost 1,900 seedlings to date, including almost 1,000 distributed by 30 elders and community members who waded into shallow water at the Pictou Landing First Nation last summer. They plan to do plantings every year, as does Dr. Boerder who also plans to assess the eelgrass in the Bras d'Or lakes.

They are also examining hundreds of mud samples to date and measure the amount of carbon stored in sediment. Dr. Tittensor is doing lab experiments to simulate the effects of warming water on seed germination and restoration success. And CERI is collecting sightings of eelgrass from citizen scientists to get a better handle on the species range.

Nicholas, the engagement officer for Pictou Landing's Indigenous Habitat Participation program, says she's hopeful the work will help slow erosion, restore the fledgling eel fishery, and preserve sacred territory.

"These are traditional grounds, and our elders are very interested in saving them," she says. "It's just so important to us as Mi'kmaq people, especially as the stewards of our own land."