Minister C. McKenna

@ec_minister • 28 dec 2018

We are working with @YourAlberta, Indigenous partners and industry leaders to protect species at risk and double the amount of nature protected in Canada's lands and oceans.

#ProtectingNature #NatureLegacy

Taking action

The Government of Canada will work with the provinces and territories to:

- Support research and technology development in areas with the potential for emission reductions.
- Help companies supporting technologies that improve both competitiveness and environmental performance.
- Lead by example by purchasing clean technologies for government operations.
- Support indigenous peoples and remote communities to adopt and adapt clean technologies to their needs.
- Collaborate with provinces and territories to establish a clean technology data strategy.

Government of Canada, *canada.ca*, 2018

File 15 p. 155 • What is climate change?

What is climate change? Any change in climate over time due to natural factors, human activity or both.

The climate in Canada varies by region, and from year to year.

Greenhouse gas emissions are the main cause of climate change.

Climate change affects Canada's biodiversity, economy and the health of the Canadians.

Key impacts of climate change:

- Increased melting of snow and ice cover
- More extreme precipitation, e.g., freezing rain[1]
- More frequent forest fires
- Ocean ecosystems suffering from warming
- Droughts becoming more severe
- Air temperatures are rising

Across Canada, communities, organizations and all levels of government are working together to research climate change.

Adaptation and migration are strategies for responding to climate change.

adaptation.nrcan.gc.ca

1. *pluie verglaçante*

1.

File 15 p. 156 • The Way of Water

She'd heard a myth—from Hanna, of course—that Canada once held the third richest reserve of fresh water in the world. Canada used to have clean sparkling lakes deep enough for people to drown in. That was before the unseasonal storms and floods. Before the rivers dried up and scarred the landscape in a network of snaking corpses. Before Lake Ontario became a giant tailings pond[1]. Before Canada-Corp shut off Niagara Falls then came into everyone's home and cemented their taps[2] shut for not paying the water tax.

When that happened, her mother secretly set up rainwater catchers on her property. Collecting rainwater was illegal because the rain belonged to CanadaCorp. When Raytheon and the WMA[3] diverted the rain to the USA, her cistern[4] dried up and they had to resort to getting their water from the rationed public water taps that cost the equivalent of $20 a glass in water credits. It didn't matter if you were rich–no one got more than two litres a day. Hilda and her mother hadn't seen a good rain in over a decade. Lake Ontario turned into a mud puddle, like Erie before it.

Nina Munteanu, "The Way of Water", in *Canadian Tales of Climate Change*, 2017

1. *bassin de résidus miniers*

2. *robinets*

3. Water Management Administration

4. water storage tank

File 15 p. 157 • Falling from Grace

Introduction: Faye is doing a scientific project on land which is also exploited by the wood industry.

The next day Paul found two more timber markings[1] on trees in our buffer zone[2]. After eight hours in the canopy, we returned to camp, dirty and tired.

"Roger insisted it was a mistake?" Paul stacked samples into a waterproof bin.

"That's what he said." I pulled off my muddy boot and moaned with pleasure at the release.

"He's a company man." Paul snorted. "A peon[3]."

"I'll have to drive over to talk to him again." I sighed, another morning of sampling lost.

I set up my laptop—the battery freshly charged on the drive to the camp—to transcribe entries from my field notebook into a database, our study too far along to risk losing data. Why would the company go after our study trees? It couldn't be a mistake. They had maps. I stopped typing and pondered the growth rings on the stump[4]. The buffer kept our study site pure, dark and quiet […] Let in more light and species would be displaced by others that preferred sunnier, drier conditions. I watched the passage of a spider across its web strung between a branch of salal and the bark[5] of one of the large hemlocks next to me. Would the spider survive a disruption to its simplest existence, at risk from a few extra rays of sun each day, a few millimetres less rain in a year? I turned my attention back to the computer screen and typed a quote from a colleague in Washington State. Unlike people, trees give back so much and require little in return.

Ann Eriksson, *Falling from Grace*, 2010

1. marks on trees selected to be cut down **2.** *zone de protection*

3. day labourer **4.** *souche* **5.** *écorce*

File 15 p. 158 • North America's biggest green buildings

In January, tenants[1] will move into a six-storey Vancouver apartment building designed to be so energy efficient, you could heat each bedroom with a 100-watt light bulb. Boasting[2] a total of 85 studio, one-and twobedroom units, The Heights at 388 Skeena St. will be the largest "passive house" building in Canada.

But it won't hold that distinction for long. Others are under construction and many more are at the rezoning stage, including a residence that will house 750 students at the University of Toronto's Scarborough campus and two 40-plus[3] highrise towers in Vancouver that aim to be the tallest passive house buildings in the world.

Passive houses use up to 90 per cent less energy for heating and cooling than conventional buildings—and produce far fewer greenhouse gas emissions. […]

According to the most recent report from the Intergovernmental Panel on Climate Change, buildings generate about 20 per cent of global greenhouse gas emissions linked to human-caused climate change, and 47 per cent of all indirect emissions from electricity and heat production. While most passive houses in Canada so far have been single-family homes, that's about to change.

Emily Chung, *CBC News*, Dec 11, 2017

1. *locataire* **2.** possess **3.** more than 40 floors

We are reducing methane emissions in Alberta.

It's estimated that methane leakage[1] from oil and gas wells[2] in Alberta accounts for approximately 3.5 megatonnes of emissions every year. Reducing methane emissions in the oil and gas sector is a key component of Alberta's Climate Leadership Plan, and it's an area that has spawned[3] commitments from Canada, Mexico and the United States.

ERA has invested in projects that address methane.

"I'm excited to see where these will go," says ERA's Director of Projects, Mark Summers. "We've supported terrific projects that directly address methane emissions in the oil and gas sector, and the learnings from these initiatives will support further methane emissions reductions in Alberta." […]

Building a better seal for wells

In addition to projects that test new technologies, ERA also invested in a project by Calgary-based company Seal Well to support the development of their new technology.

Today, Alberta oil and gas companies use concrete[4] to seal[5] wells once they are no longer in use, but concrete deteriorates over time—resulting in methane leaks. Seal Well developed technology that uses a bismuth-based alloy[6] to seal oil and gas wells for the lifetime of the well. Seal Well estimates that, if they seal 750 wells in Alberta b 2025, GHG[7] emissions will be reduced by 43,000 tonnes per year.

Seventy per cent of methane in Alberta is generated by the energy industry and these technologies have the potential to make an important contribution to help Alberta and Canada meet GHG reduction commitments.

ERA, eralberta.ca, 2019

1. *fuite* **2.** *puits* **3.** generate **4.** *béton*

5. *sceller* **6.** *alliage* **7.** greenhouse gas

File 15 p. 160 • Weston Youth Innovation Award

Presented annually, the Weston Youth Innovation Award was created to encourage and recognize young Canadian innovators.

Who is eligible?

We look for individuals or groups who:

1. are between the ages of 14 and 18,

2. have used science and/or technology as the basis for developing creative and innovative ideas aimed at solving real-world problems,

3. put their ideas into action and as a result, have had a positive impact either in their own community or on a broader scale[1].

Marcus Dean

Canadian teens are getting top marks for pushing the boundaries[2] of technology, engineering, and health through science in an effort to change the world.

Whiz kid Marcus Deans, 14, has come up with a novel way to filter water using sugar, sand and crustacean shells, and he is taking his invention to Phoenix to compete in the Intel International Science and Engineering Fair (ISEF) starting May 8. His simple and economical water filter, the NOGOS, will afford developing countries clean water—"it completely removed bacteria and filtered water to the same quality as tap water in Canada," says the Grade 9 student from Windsor, Ont.

Toronto Sun, April 2016

Fonthill Nurdles

The Nurdles team shone in the project area and the judges were impressed with their research and innovative design. […] The Nurdles researched causes for the decline in bee populations. One of the areas they wanted to improve was providing a clean source of water for local bees. In order to do this, they have developed a *Bee Hydratation station* that gardeners and beekeepers can put in their yards to supply a fresh water supply for bees and attract them with pollinator-friendly flowers.

The team came home with the Project Award and have been invited to the Ontario Innovation Awards.

mypelham.com, Feb, 2018

1. *à une plus grande échelle* **2.** limit

File 15 p. 165 • World's largest-scale hydrail system

Metrolinx, the Greater Toronto Area's transit authority, recently published a comprehensive report that shows:

• Hydrogen trains are an attractive alternative to track electrification.

• A system for Toronto's regional GO transit is technically feasible to build and operate.

• The system's overall lifetime costs would be equal to those of conventional overhead electrification.

As a result of the report, they have announced their intention to begin operating the world's largest zero-emission hydrail train system in Toronto by 2025.

How and Where Does Hydrail Deliver Savings?

A hydrail train system provides significant savings in capital and operating costs. The capital-cost savings are potentially enormous: because no overhead electrical catenary lines (and the associated electrical infrastructure and road crossings) are required, system installation and deployment is far more cost-effective. Operating costs are lower over the lifespan of the system. Because hydrogen fuel cell trains run on hydrogen, they do not require grid-sourced electricity while they are in operation. This allows system operators to draw electricity from the grid at off-peak times, when electrical rates are lower. In addition, the trains' regenerative braking system recharges the batteries, which both saves on energy costs and results in less wear and tear[1], and contributes to lower maintenance costs.

The Switch is Underway: Let's Move Forward Together

Zero-emission vehicles are the way of the future. As rail system and transit authorities face increasing pressure to reduce their carbon footprints, hydrail technology offers a viable and cost-effective zero-emission solution. […]

The world is ready for hydrail.

Nicolas Pocard, *blog.ballard.com*, Jun. 8, 2018

1. *usure*