SCIENCE SPOTLIGHT

FORESTRY, PART OF OUR CARBON FRIENDLY FUTURE

GEN ACTION

This project was undertaken with the financial support of the Government of Canada.

Canada

OKANAGAN SCIENCE CENTRE

Forestry, Part of Our Carbon Friendly Future

Origin Story:
HOW MUCH FOREST DOES CANADA HAVE?

Canada is a huge country and much of it is covered by forests. Did you know that as a country we have more than 362 million hectares of forest? That is 9 percent of the world's forest and is bigger than two billion hockey rinks.

There are many different kinds of forest in Canada. While each type of forest has its own climate and its own unique make up of trees and animals, most of Canada's forests are disturbed naturally by things like fire, insects, disease, or strong winds.

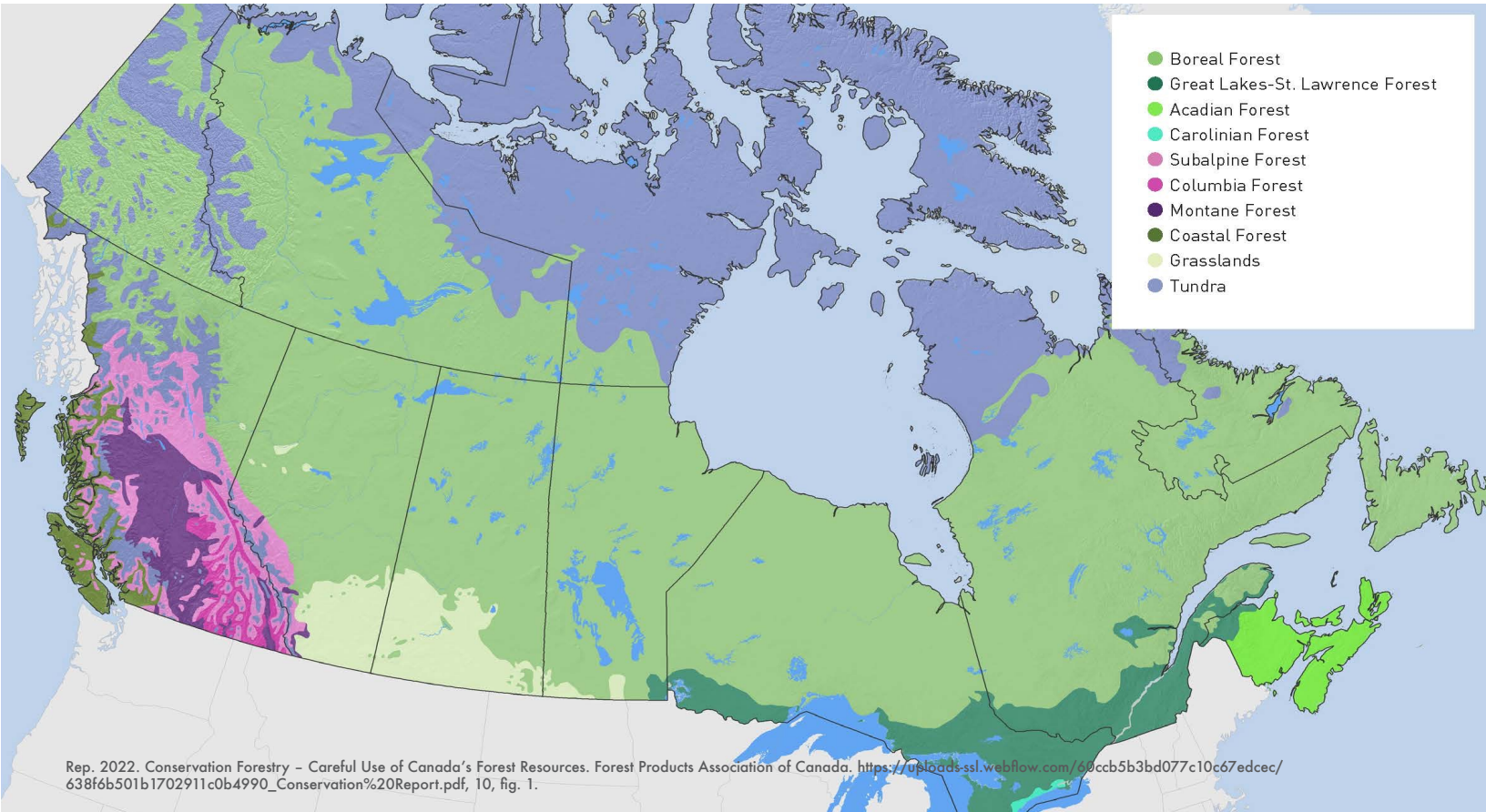
These disturbances are normal and help the forest regenerate itself. These disturbances also help make sure that there are forests of different ages, which is important since some animals need older forests, some need young forests, and others need both young and old forests for their habitat.

WHAT DO OUR FORESTS HAVE TO DO WITH CARBON?

Trees are made mostly of the element carbon, which they get by absorbing carbon dioxide (also called CO_2) from the air – it is a tree's source of food. Trees put some of that carbon into their wood. Wood is a solid material that can keep carbon locked away for hundreds of years. When trees are eaten by insects, rotted by fungi, or burned in forest fires, some of the carbon they have stored is released back into the air and some of it goes into the soil. This is part of what is called the global carbon cycle.

Together the trees and the soil in forests store a lot of carbon. The carbon in forests in Canada is crucial for a lot of reasons. Importantly it provides "fuel" that healthy ecosystems need. Carbon absorbed from the air by trees and plants moves from them to animals and microorganisms (like fungi) in a complicated web of connections.

Canada's forests are also essential because the carbon they take out of the atmosphere helps limit climate change. Climate change, which is caused mainly by burning coal, oil, and gas to make energy, is a threat to many plants and animals and to the health of humans. Making sure that Canada's forests are healthy is one of the ways that we can do our part to reduce the impacts of climate change.



Rep. 2022. Conservation Forestry – Careful Use of Canada's Forest Resources. Forest Products Association of Canada. https://uploads-ssl.webflow.com/60ccb5b3bd077c10c67edcec/638f6b501b1702911c0b4990_Conservation%20Report.pdf, 10, fig. 1.

Carbon and Sustainable Forest Management

We have learned to use wood in many ways to make our lives better. Wood is used to make many products, such as lumber to build your home, wood fibre to make paper, and wood that can be burned to heat your house or make electricity.

If you pick up a piece of wood, about half of the weight you feel is carbon. So long as that piece of wood is around, some of the carbon it contains is kept out of the air. This is an important way in which sustainable forestry helps reduce the impacts of climate change. When a forest is logged and the wood is used to make a product, some carbon is released from the cutting down of the trees, but some of that carbon is also locked away. But while the wood locks up the carbon, in sustainable forestry the area that was logged is allowed to re-grow trees, eventually growing back to contain just as much carbon as before it was logged. This is why sustainable forest management is important, so now we can lock up carbon in both the wood we have harvested and the newly grown forest, while avoiding releasing too much carbon into the atmosphere from unsustainable deforestation practices.

We are lucky that not only do forests re-grow after logging, but when they are young, they grow faster than when they are older, just the same way you grow fast while your parents have mostly stopped growing. So, logging an older forest that was not growing very much gives us carbon we can keep in a product made from its wood. The young forest that re-grows does so quickly, hurrying to get back to the size and store as much carbon as it did before it was logged.

In many parts of Canada, older forests are also more likely to burn. This is partly because older forests have more standing dead trees and more dead wood on the ground, which can act as fuel for fire.

As our climate gets warmer, we are going to see a greater number of fires and more intense fires (fires that will burn hotter and affect more of our forests). In addition to releasing more carbon, which is bad for climate change, these fires can also damage communities where people live. Some forests are also going to experience drought, which causes trees to become stressed and more likely to be impacted by things like insects and disease.

Did you know that in 2017-18 (a bad year for forest fires), forest fires in British Columbia released over 360 million tonnes of carbon into the atmosphere? By comparison, all other sources in the province emit approximately 67 million tonnes of carbon every year.

Managing our forests responsibly can help prevent some of the impacts and can include things like:

- Harvesting trees from forests that are likely to burn and storing their carbon in wood products (instead of letting them burn and putting the carbon back into the air)
- Harvesting trees that have been damaged or killed by insects or fire (this is called salvage harvesting) - doing this allows us to plant new trees that can help take carbon out of the air
- Using controlled fires to burn off the wood on the ground without damaging the living trees
- Planting trees can tolerate drought and warmer temperatures, which will help keep our forests healthy

Professional foresters play an important role in deciding which of these activities to use, where, and when, in order to keep our forests healthy, and to make sure they stay as forests forever.

This Science Spotlight was written based on Forest Products Association of Canada. 2022. "Conservation Forestry – Careful Use of Canada's Forest Resources." 1-40. https://www.fpac.ca/reports/conservation-forestry-careful-use-of-canadas-forest-resources

TIME FOR GENACTION!

TRY THIS AT HOME

Wood based products are all around us, even though sometimes they are hard to see! How many items can you find in your home that come from wood or use wood fibres?

Need some help? Check out the Find-A-Forest-Product resource from It Takes a Forest: **https://ittakesaforest.ca/resources**

1. Play a game: Once all players are ready with their recording sheets, set a timer for 20 minutes and split up.
2. Moving through a house or classroom, each player should add every forest product they identify to the recording sheet, filling out only the first column for now.
3. Once 20 minutes are over, gather to go over your findings and award points in the remaining columns of the recording sheet.

   1 point for every correct forest product found
   1 additional point for every unique forest product found (only found by one player)
   1 additional point for every surprising forest product (a product that at least 1 player did not realize was a forest product)

4. Sum up your total points per product to find your overall score!

Surprising Forest Products:

- **Rubber gloves.** Rubber is made from latex, which comes from the rubber tree!
- **Cork** (used in cork boards, wine corks, etc.). It comes from the cork oak.
- **Car wax.** The carnauba palm leaves supply the wax we use to polish our cars.
- **Chocolate!** Everyone's favourite treat comes from the seeds of the cacao tree.
- **Cough syrup.** Cough syrup contains natural ingredients such as pine needle oil and balsam resin.

Climate Action:
CHOOSE WOOD, THE CARBON FRIENDLY MATERIAL

Wood is the best material we have in our fight against climate change. Using wood instead of metal, concrete or plastic also helps reduce climate change. This is because wood takes a lot less energy to make a product. When energy is produced by burning coal, oil, or gas, this releases CO_2 that makes climate change worse.

New uses for wood are being found all the time. For instance, wood can be made into a material to replace plastic parts in all sorts of things, and wood beams can be used in tall buildings to replace beams made of steel.

When you have the option, choose wood over other materials!

Using wood products can lower you carbon footprint.

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ITTAKESAFOREST.CA

Climate Change
Past, Present, and Future

Earth is the only planet in the solar system known to support life. What makes our home so special? Earth has an atmosphere, a layer of gases between our planet and space. Some of these gases, like carbon dioxide, are called **greenhouse gases**. They are crucial parts of our atmosphere; they trap in the heat of the sun, similar to how heat is trapped in a greenhouse, or in a car on a hot day. This process, called the **greenhouse effect**, keeps Earth's temperature warm enough for living things to thrive.

The sun's rays hit our round, tilted planet unevenly. This uneven heating of Earth's surface leads to differences in temperature, which drives weather patterns. We call the patterns in temperature and weather over long periods of time **climate**. Different parts of the world have vastly different climates; it depends on how much heat they receive, as well as what landscape features are nearby. Water, mountains, ocean currents, and forests all impact our climate. In turn, living things around the world have adapted to the climate they live in.

Something, though, is changing. Over the past two hundred years, humans have been burning fossil fuels, such as coal and oil, to make energy to power our daily lives. Fossil fuels are made from decomposed plant matter and microscopic life millions of years old. This matter is full of carbon, and, burning it releases, or emits, billions of tonnes of **carbon dioxide** gas into the atmosphere every year. When too much carbon dioxide is emitted, the delicate balance of greenhouse gases maintaining

Earth's climate is upset. More and more heat is trapped, causing the planet to warm. Weather patterns change, water levels rise, storms get worse.

Climate has changed many times throughout Earth's history, from ice ages to periods much hotter than today. So why is this time any different? Scientists agree on two things. One, temperatures are rising faster than they ever have in documented climate history. Two, this climate change is driven by human activities, due primarily to greenhouse gas emissions.
Climate change is already impacting people's ways of life all over the world. Powerful storms, droughts, forest fires, and floods are threatening people's access to food, water, and safe homes.

The most important step we can take to prevent serious climate change is to reduce greenhouse gas emissions. Incredibly brave and caring people around the world are finding new ways to reduce emissions and make our communities climate resilient every single day. And you can join them! These Science Spotlights are here to help us learn more about climate change and how you can take action.

Our Commitment to the Decolonization of Science

Institutions of GenAction initiative respect and affirm the inherent and Treaty Rights of all Indigenous Peoples across what we now know as Canada. We give thanks to the Indigenous Peoples who care for this land since time immemorial and pay respect to their traditions and ways of knowing. We acknowledge their many contributions to innovations in Science, Technology, Engineering, and Mathematics, past and present, and are committed to deepening engagement and collaborating with Indigenous Peoples as partners in order to advance truth and reconciliation and the decolonization of science.

Climate Change: Past, Present, and Future is based on...Delmotte, Masson, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, et al. 2021. "Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change." Intergovernmental Panel on Climate Change. Cambridge University Press. In Press.