

SCIENCE SPOTLIGHT



ADAPTING IN THE PRAIRIES



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

Canada


children's
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Adapting in the Prairies



Origin Story:

HERE TO HELP! THE PRAIRIE CLIMATE CENTRE

As the Earth warms, humans and animals are experiencing changes to our day-to-day lives. Hotter summers and changes in precipitation require us to look at the ways we are used to doing things and make adjustments in response to these changes. This is called adaptation: our ability to change in response to a situation. We do this every year when we start wearing different clothing as the seasons change. Animals adapt by growing extra fur or by changing colour.

Adapting as a city is a little harder. Cities can get stuck in patterns of doing things the same way year after year. But with a rapidly changing climate, those same strategies may no longer be appropriate.

One organization that is helping cities adapt to climate change is the Prairie Climate Centre, or the PCC. An internal research centre at the University of Winnipeg, the PCC's mission is to share knowledge and communicate about climate change in a way that Canadians from any walk of life can understand and feel connected to. One of the ways they do this is through the *Climate Atlas of Canada* – an interactive online tool that combines science, storytelling, and mapping to provide a localized view of climate change. Using the data from the *Climate Atlas*, the PCC created a research series called *Building a Climate-Resilient City*, with recommendations of changes that cities can make in the way they do things now to prepare for the future.



ADAPTATION IN



One city working to adapt to climate change is Selkirk, Manitoba. The PCC worked closely with the city of Selkirk, just north of Winnipeg, to identify risks to their city due to the rapidly changing climate in the area. They used data from the *Climate Atlas of Canada* to create a list of four of the most likely outcomes that will affect the city:

1. Increased temperatures causing heat waves – periods of intense high temperatures
2. Warmer winters
3. More precipitation which could cause flooding
4. More cold snaps in the spring and fall

With this list, they were able to identify how each of these outcomes would impact the city and how it serves its citizens.

Increased temperatures causing heat waves could have many negative impacts, especially on the citizens of Selkirk. Selkirk is home to many senior citizens and people living in social housing. Intense heat can be especially risky for these populations where they may not have access to air conditioning to keep cool. In addition, city workers doing landscaping and working in outdoor recreation facilities could experience health issues from working outdoors for long periods of time. And the risk of forest fires greatly increases with the projected high temperatures.

Warmer winters may sound nice, but they could also bring more chances of heavy, wet snowfall and ice forming on roads due to an increase in freeze-thaw cycles. When wet snow falls, machinery and people need to work harder to remove it. This has a risk of physical injury as well as mechanical issues with snow removal equipment. And more ice on the roads could mean more risk for drivers, walkers, and cyclists – and is hard on the roads themselves.

Selkirk has experienced overland flooding in the past, and an increase in precipitation could make this happen more regularly. Overland flooding is when water flows on the ground and can seep into buildings through windows, doors, or cracks in the foundation. This can result in sewer backup, which can cause a lot of damage to homes and businesses, not to mention sewage flowing into the river close by.

Even though winters in Selkirk are projected to be warmer, information from the *Climate Atlas* shows that cold snaps, or short periods of intense, cold temperatures, could increase. This increases the number of freeze-thaw cycles and can impact road conditions, snow removal, and puts stress on furnaces and heating systems.

Once these risks were identified, it was time to take action. The city, with help from the PCC, created adaptation actions – a plan for how the city would adapt to each of these climate change scenarios. The plan included many different practical strategies for the city to undertake around each scenario. Some examples include public education campaigns focused on informing citizens about the signs of heat exhaustion, creating more shaded public spaces by planting more trees, a program whereby neighbours check in with each other during extreme weather events, and a rain barrel program to encourage the community to use rainwater to water gardens during the summer. To mitigate issues due to cold snaps and increased precipitation, the city planned to expand and improve its snow removal equipment as well as upgrade its road sanding and salting procedures, which are only good for certain temperatures, to granite chips, which provide better traction in colder temperatures.

All these adaptation actions are things that the city and its residents can do both immediately and over time to make sure that they are prepared for the different climate change scenarios that may occur in the years to come.



Time for GENACTION!

Try This at Home:

CLIMATE CHANGE CLOSE TO HOME

To discover the effects of climate change in your area, using a device like a smart phone or a computer, go to the *Climate Atlas of Canada*: <https://climateatlas.ca/>. At the top of the screen, click on Map. Next, find your location on the map and click on it. A display will pop up with information about your area. Grab a piece of paper and a pencil and make sure the climate change box is toggled to MORE.

Locate the icons at the bottom of the screen. These are climate variables – different ways we can see the results of climate change. Make a simple chart like the one below.

As you click your way through the climate variables, write in the values you find in each of the boxes in the correct timeline column. When you have filled in all the boxes, subtract the Recent Past value from the Near Future value and see how much the number will change. This is the impact that climate change will have on our cities if we do nothing to adapt to climate change in the future.

Climate Variables	Recent Past 1976-2005	Immediate Future 2021-2050	Near Future 2050-2080	Near Future (minus) Recent Past
Hot Weather				
Cold Weather				
Temperature				
Precipitation				
Agriculture				

Next, go through the same activity but with the climate change box toggled to LESS. This will show the impact that our actions can have on climate change in the future. Compare the two charts and see what changing habits now can do for the health of the Earth later.





Climate Action

Start a Climate Club!

You may not be a city planner and able to change the way your city is preparing for climate change, but you can definitely have an impact in your school by starting a Climate Club!

Gather a group of friends together who want to make a difference and make a list of climate actions that the whole school can work towards. These could be small actions like turning off lights in the classrooms when they are empty, powering down computers when they are not in use, and challenging students to bring “no waste” lunches to school each day.

Once you have support from classmates, teachers, and principals, consider taking on bigger climate actions, like:

Plant a School Garden

This is a great way to learn about sustainable food sources while growing delicious fresh produce.

Start a Compost Program

If your city does not have a compost program, start one in the school yard! Creating a compost heap can be as simple as designating a space outside where food waste, grass clippings, and leaves are placed. Climate Club members can turn the compost each week until it breaks down and creates a rich soil which can be put back into your garden.

Spread the Word

Spread the word about climate change to everyone at school – and ask them to tell their family and friends too! A Climate Club is a great way for everyone to share their knowledge and get involved in taking climate action.



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.

