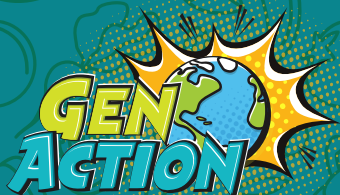


# SCIENCE SPOTLIGHT



## POWERING UP WITH FARM EXPERTS



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

Canada







# Powering Up with Farm Experts

## Origin Story:

### WHAT IS CLIMATE MODELING?

A climatologist is a scientist who studies climate change. A climate modeler is a climatologist who wants to learn what will happen to Earth's climate in the future. To do it, they need a supercomputer and a lot of data: information on temperature, humidity, and much more. Using math, coding, physics, and an understanding of Earth's processes, they build working models of Earth in computer software and run experiments to see how climate will change.

"WE SHOULD  
CALL IT CLIMATE  
CHAOS,"

*said a Nova Scotia  
farmer about the weather.*

"WE SEEM TO  
GET CAUGHT IN  
THE LONGER  
CYCLES OF WET  
OR DRY,"

*said another.*

## Planning for the Future:

### TALKING TO THE EXPERTS ON THE GROUND: FARMERS!

A farmer watches as a storm passes over his field. Usually, he would be glad for the rain after weeks of drought. But he knows when it all comes down like this, his fields will be left waterlogged for days, preventing him from harvesting. Chances are the seeds he planted recently will be washed out too. In a changing climate, a Maritime farmer has to be prepared for anything.

Dr. Bernard Soubry is a climate scientist who used to be a Maritime farmer. He returned to research when he saw how farmers, and our food, are being impacted by increased flooding, droughts, and wind brought on by climate change.

He asked a very important question: can we combine climate modelling with farmers' local expert knowledge to better understand how climate change impacts our food systems? Climate models tend to be accurate, but on a really big scale and over a long period of time.

Farmers know exactly what is happening on a local level. This combination could help improve how we plan for a changing climate. So, he contacted some of his farmer friends, and they reached out to friends of theirs, and before long, Dr. Soubry had lots of farmers across the Maritimes to talk to.

To Dr. Soubry, it was clear; the farmers' observations matched the models but were way more specific, focusing on direct impacts to them, their farm, and our food. If we asked farmers for their input on climate action plans, they would have a lot of detailed and valuable expertise to bring to the table!

A council gathers. Representatives from across the Maritimes come together to answer the question: how do we plan and prepare for climate change? Stakeholders such as policymakers, scientists, and members of the Mi'kmaw Band Council are here. So are the farmers. This is the future of climate policymaking.





# Time for **GENACTION!**

## Try this at Home: **NEW PERSPECTIVES**

Dr. Soubry's work is all about including many perspectives. Different people approach a problem with different needs, solutions, and priorities. Next time you have a decision to make, ask a few different people what they would do. Do their perspectives help you see the problem in another way? Does their input help you make a better decision?

## Climate Action: **WORKING TOGETHER**

We are all part of the food system, and as people who eat food, we all need our food systems to adapt to climate change. So, what can we do? Well, Dr. Bernard Soubry had some great suggestions.

He is quick to remind us that as consumers, we are a part of the food system. Our consumer choices matter; we can buy local food, pay a fair price for it, or get a CSA (a share in a farm, where you pay money upfront and then receive a weekly basket of food). We need to listen to farmers' needs and help amplify their voices. For instance, join a group advocating for better climate adaptation policy.

If you live in a rural area, your MP (member of parliament) or MLA (member of the legislative assembly) was likely partially elected by farmers and people whose livelihoods rely on them. Call and ask them what their plan is to adapt for climate change. The most important thing, Dr. Soubry says, is to join forces with other people to advocate for a just future. Not only should we push for tasty food grown by people making a good livelihood, but we also want to ensure these choices help preserve our soil and planet.

## **MEET OUR LOCAL SCIENCE HERO:**

**Dr. Bernard Soubry is a climate social scientist.**



**How did your interest  
in food systems and  
climate change come about?**

The story is a long one, with twists and turns and ins and outs. In the end, he boils it down to this:  
"I like food, I like eating.  
Anyone who likes food and eating is, at some point,  
'Where does this stuff come from?  
How can I get some?'. "

**What is your favourite part  
of being a scientist?**



"Getting paid to read books!"

**If you could share one call to action with  
Canadian youth, what would you say?**

"Call the office of the minister for Agriculture and ask where the plan is to adapt the food system to climate change. More specifically, ask for cover crop subsidy, but only if you want extra credit."



# 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.

