

Climate Change: Our Biggest Challenge

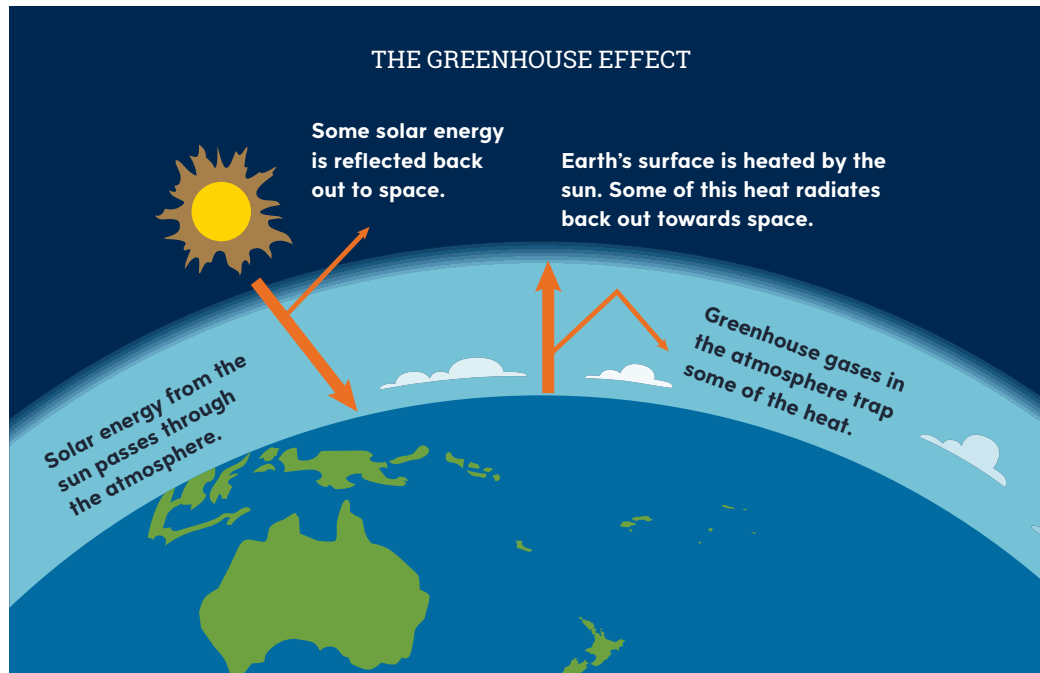
by Tricia Glensor

Over the past century, our planet has been getting warmer. When you're playing winter sports in a southerly gale, this might not seem like a bad thing. But think again. Climate change isn't only about warmer weather. A rise in the temperature means more extreme weather, including wild storms and heatwaves. Climate change also means more frequent droughts and wildfires, melting ice sheets, melting glaciers, and flooding. These things aren't waiting for us in the distant future. Climate change is here, and it's the biggest challenge the world has ever faced.

Understanding Climate Change

Understanding climate change means understanding the greenhouse effect – a natural process that keeps our planet warm using energy from the sun. Some of this energy is trapped by gases in the atmosphere called greenhouse gases (carbon dioxide, methane, and nitrous oxide are the most important). Without greenhouse gases, Earth wouldn't be warm enough to support life.

In recent years, however, the amount of greenhouse gases in the atmosphere has increased. Carbon dioxide levels are the highest they've been in hundreds of thousands of years. Now, more heat is being trapped, causing our planet to become warmer. This change is happening at an alarming rate – and it's caused by people.



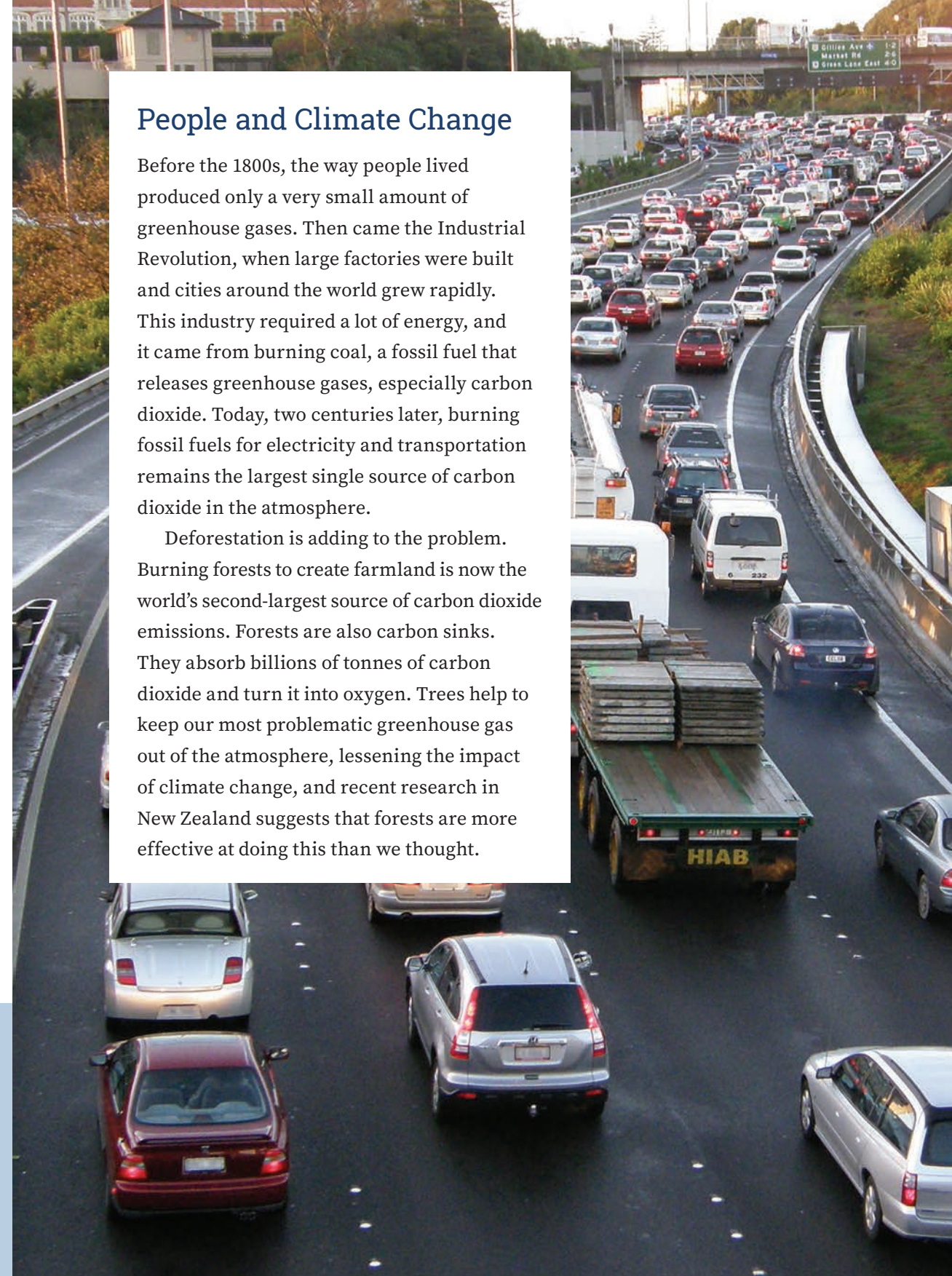
People and Climate Change

Before the 1800s, the way people lived produced only a very small amount of greenhouse gases. Then came the Industrial Revolution, when large factories were built and cities around the world grew rapidly. This industry required a lot of energy, and it came from burning coal, a fossil fuel that releases greenhouse gases, especially carbon dioxide. Today, two centuries later, burning fossil fuels for electricity and transportation remains the largest single source of carbon dioxide in the atmosphere.

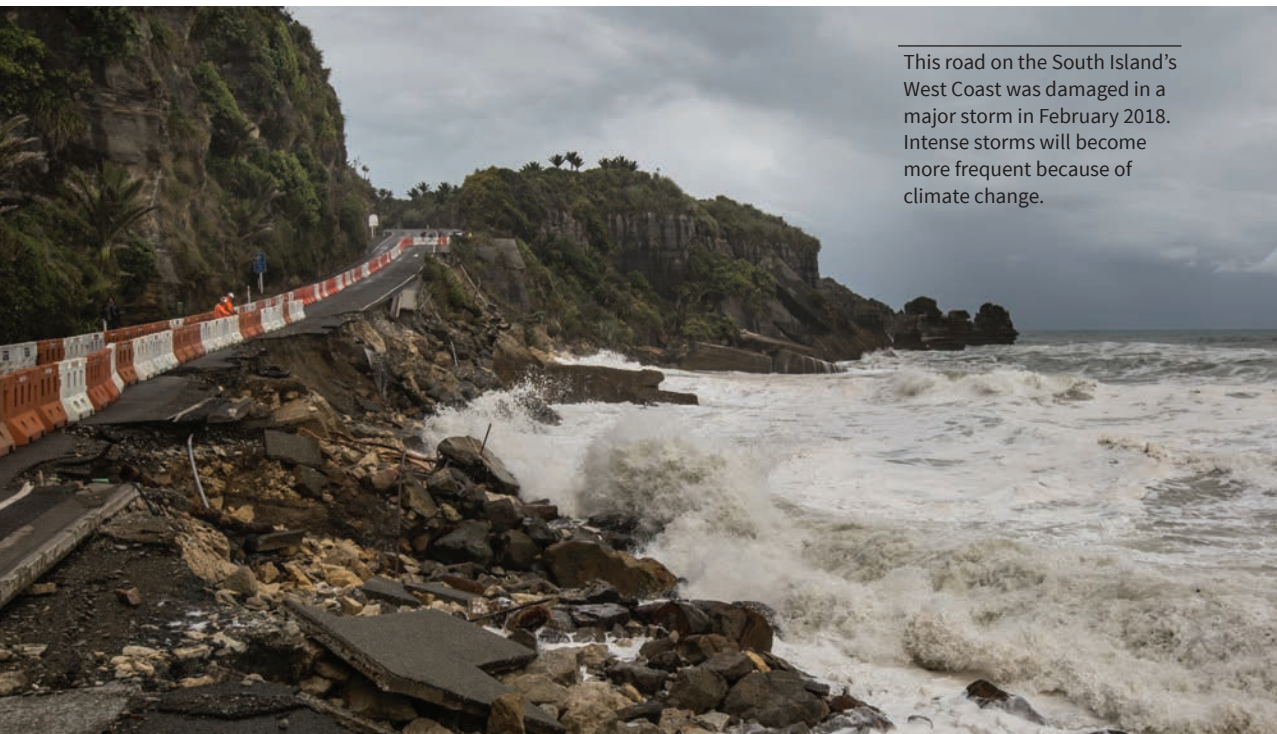
Deforestation is adding to the problem. Burning forests to create farmland is now the world's second-largest source of carbon dioxide emissions. Forests are also carbon sinks. They absorb billions of tonnes of carbon dioxide and turn it into oxygen. Trees help to keep our most problematic greenhouse gas out of the atmosphere, lessening the impact of climate change, and recent research in New Zealand suggests that forests are more effective at doing this than we thought.

EARTH'S CHANGING CLIMATE

Earth's climate has always varied. For millions of years, these changes were caused by natural processes, such as volcanic eruptions or small differences in our planet's orbit around the sun. Mostly Earth was a lot warmer than it is now; sometimes it was so cold there was an ice age. The last ice age on Earth ended around 12,000 years ago.



Agriculture is another major source of greenhouse gases, mostly methane and nitrous oxide. While these gases don't stay in the atmosphere as long as carbon dioxide, both are potent (each molecule of methane traps around twenty-six times more heat than a molecule of carbon dioxide, and one molecule of nitrous oxide traps around 219 times more heat than carbon dioxide). In New Zealand, most of our methane comes from sheep and cattle belching as they digest grass. Nitrous oxide is mainly produced when urine from farm animals reacts with living organisms, called microbes, in the soil.



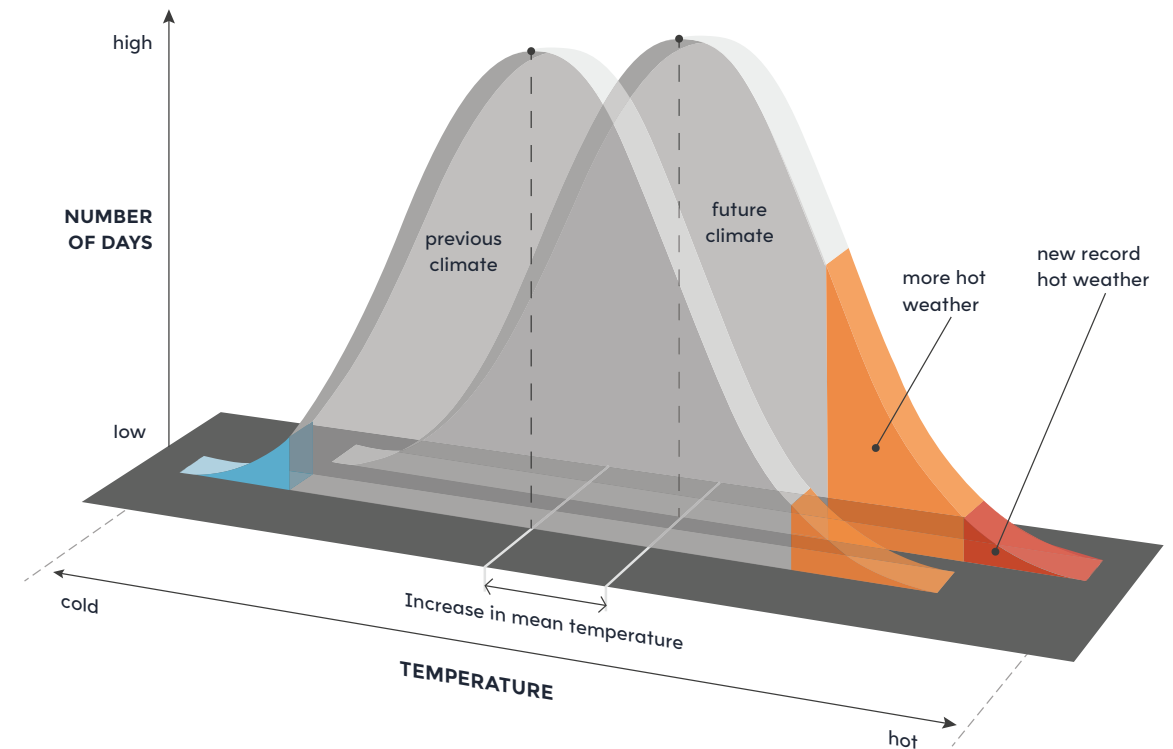
This road on the South Island's West Coast was damaged in a major storm in February 2018. Intense storms will become more frequent because of climate change.

Climate Change: Impact

Burning fossil fuels, deforestation, and agriculture – these activities mean our planet and oceans are now around 1 degree Celsius warmer than they were a century ago. This is a much bigger problem than it sounds. Even a small change in temperature affects Earth's weather and ecosystems. In turn, this affects our food sources and our health.

If the world's greenhouse gas emissions continue at the current rate, Earth's climate will change significantly. Generally speaking, wet places will become wetter and dry places will become dryer. There will be an increase in the mean temperature, with fewer cold days and more warm days. Hot days will be hotter than ever before (sixteen of the seventeen hottest years on record have happened since 2000). Heatwaves and droughts will become more common. Storms may occur less frequently, but they will be more intense. These changes will be seen around the world, including in New Zealand.

THE IMPACT OF CLIMATE CHANGE ON TEMPERATURE





Going, going, almost gone: New Zealand's Fox Glacier

One impact of climate change that can be seen right now is the rising level of the sea. As water gets warmer, it expands and takes up more space. This is one reason the sea is rising. Warmer air is also melting glaciers and ice sheets, adding huge amounts of meltwater to the sea. Scientists predict the increase in sea levels will be as much as a metre by the end of the century. Rising sea water is already a huge challenge in low-lying countries, such as Bangladesh, where there are now more floods at high tide and during storms. Around the world, coastal erosion has become another significant problem because of higher seas.



An aerial view of Greenland's ice sheet, which is melting fast. If the ice sheet is lost, the world's oceans will rise by 7 metres.

What We Can Do

We can't stop climate change completely. The high level of greenhouse gases already in the atmosphere will stay there for thousands of years. But if we reduce our emissions, we can limit how serious the effects of climate change will be.

In 2015, officials from around the world met in Paris to discuss climate change. Almost two hundred countries agreed to keep global warming to below 2 degrees Celsius, although the ideal, they said, would be 1.5 degrees. It's an ambitious goal. The world has already warmed 1 degree, and many people say the Paris agreement doesn't do enough. One British professor of climate change, Piers Forster, said achieving the 1.5 degree limit would take nothing less than a worldwide "revolution".

CLIMATE-CHANGE REFUGEES?

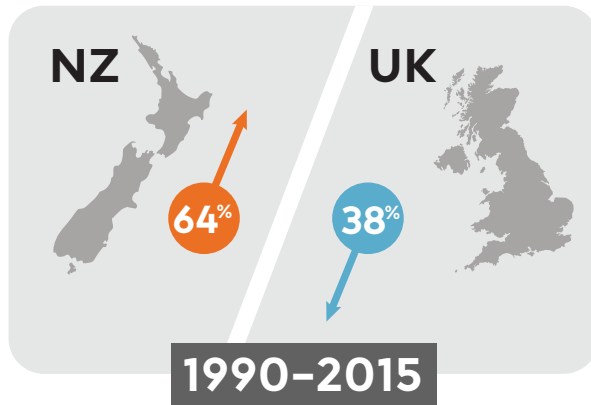
Kiribati (pronounced ki-ri-bas) is a group of tiny islands in the Pacific with a population of around 100,000. The islands are very low lying, and this makes them especially vulnerable to climate change. More intense storms and rising sea water are already having a devastating effect. Large waves are flooding homes and crops, and sea water has contaminated the freshwater supply with salt. The people of Kiribati fear they will be forced to leave their islands, becoming climate-change refugees. They wonder where they will go and how they will ever afford to get there.



Riibeta Abeta worked for many years for Kiribati's Ministry for the Environment. He says education is the key to reducing the impact of climate change.



GREENHOUSE GAS EMISSIONS: A COMPARISON BETWEEN NEW ZEALAND AND THE UK



But people can change, and governments are responding. The New Zealand government has pledged to slash its greenhouse gas emissions by 11 percent from 1990 rates (the year the world properly acknowledged the problem of climate change) by 2030. Given New Zealand's recent record, keeping this pledge will be a challenge. Over the past three decades, our greenhouse gas emissions have increased by 64 percent. In contrast, over the same period, the United Kingdom has decreased its emissions by 38 percent.

Generation Zero is a group of young New Zealanders with a much higher aim. They're campaigning for zero carbon emissions by 2050. This would require a detailed plan from the government with radical policies that would change the way we live. But Generation Zero believes the future of our planet depends on radical change – and everyone needs to step up.

NEW ZEALAND: CLEAN AND GREEN?

As Parliamentary Commissioner for the Environment, Jan Wright has given advice on water quality, the plight of our native birds, the use of 1080 poison ... but the most important issue of all, she says, is climate change. "It affects everything."

Jan lives on Wellington's south coast. She loves her view of the sea – although she warns that we take its health for granted. "Now that there's more carbon dioxide in the atmosphere, there's more carbon dioxide dissolving in the sea. Our oceans are becoming more acidic," Jan says. "This means there will be more jellyfish and less kaimoana. Shellfish such as pāua and pipi will become harder to find."

Jan believes that New Zealand's biggest challenge comes from pastoral agriculture. "Reducing the greenhouse gas emissions that come from this kind of farming won't be easy, and farming animals for meat and milk is such a big part of our economy." So far, there are no obvious solutions, despite the fact our scientists are investigating all kinds of options, such as changing what dairy cows and cattle are fed.

What if you're not a scientist? What can the average person do? "Owning an electric-powered car is great," Jan says, "and I love seeing people on electric bikes." Jan also thinks we should grow more trees. "We've got so much land in New Zealand that isn't suitable for farming. We should fence it off to let the native forest grow back."

Jan's no longer the environment commissioner, but she hasn't retired from the fight against climate change. She's very encouraged by groups like Generation Zero and believes more people are waking up to the problems we face. "These days, I rarely meet anyone who says climate change isn't real." Jan thinks our government needs to set clear, ambitious goals if we want to reduce our greenhouse gas emissions. "New Zealand's a small country, but we can still influence the world. We should be leading the way, showing that New Zealanders really are clean and green."

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