

Tackling global warming head on

By [Jamie Morton](#) [Jamienzherald](#)

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This week, we preview five developments that are poised to shake up the science landscape this year. Today, Jamie Morton looks at the most authoritative report on climate change to date, and its projections.



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Changes would be like shifting New Zealand several hundred kilometres closer to the tropics, and frosts would not be found anywhere except in the mountains. Photo / Sarah Ivey
If there was any doubt that climate change is the biggest crisis facing mankind, the global groundswell of science being poured into the mother of all research efforts should confirm it.

The United Nations Inter-governmental Panel on Climate Change's Fifth Assessment Report, better known as the AR5, will provide policymakers around the world with the most comprehensive document on the issue to date.

"I think in terms of coming up with a carefully considered assessment of all the research that's been done in the past five years, this is the most up-to-date and authoritative document," said Niwa's chief climate scientist, Dr David Wratt, a vice-chairman of one of the IPCC's working groups.

The AR5 has been noted for its analysis of geo-engineering - large-scale concepts of combating global warming through physical intervention, rather than just the generally accepted need to slash greenhouse emissions.

Such ideas have included sucking carbon dioxide from the atmosphere and deflecting sunlight. One bold concept suggested mass amounts of sulphate particles could be injected into the stratosphere, simulating the sun-blocking fallout of a major eruption and cooling the Earth.

Victoria University climate scientist Dr Jim Renwick, a lead author contributing to the AR5, said the current forecast of 4C of warming for the planet within the next century held large and frightening ramifications.

"We're already just under a quarter of the way there at the moment.

"The governments of the world pledged in Copenhagen to limit the global warming to two degrees - that's a very laudable goal, but nobody's doing anything about it.

"To actually get to that now, given the way greenhouse gas emissions have gone in the last decade, would require massive cuts."

Countries such as New Zealand would need to slash emissions by at least half this decade and bring them down to zero by the end of the century.

Comparatively, New Zealand was better off than other areas on Earth under the 4C scenario.

"While it might mean 10C of warming for the Arctic, it was likely to be closer to 3C here, where our ocean surrounds and proximity to Antarctica kept the atmosphere cooler, said Dr Renwick.

"But even so, 3C of warming over New Zealand would put the climate of the country in many ways outside of anything it's experienced for a very long time."

Temperature-wise, he said, it would be like shifting the country several hundred kilometres closer to the tropics.

The climate of the North Island would be closer to Queensland's while the South Island would have that of the North Island. Frosts would not be found anywhere except in the mountains. In eastern regions, the frequency of droughts would double, as would rainfall on the wetter west coast.

"You could expect a change of maybe plus or minus 20 per cent or 25 per cent in average rainfall - that might not sound like much, but a long-term change of even 10 per cent in rainfall can be the difference between a climate suitable for growing crops and one that's too dry to do very much."

A high sea level would also directly affect many of our coastal centres, especially when combined with king tides and storm events.

Elsewhere, the dry centre of Australia would expand southward, areas closer to the tropics would become far wetter, and the east coast of the United States would become even more threatened by storm events and higher sea levels.

Dr Renwick said the AR5 was a "huge undertaking, because such a big problem requires this kind of effort".

But being a document that was policy-relevant, rather than policy-prescriptive, it stopped short of making decisions.

"When most political leaders talk about climate change, they usually talk about how important it

is - whether that translates into action is another story.

"I appreciate it's one thing to recognise the problem, but it's another thing entirely to see a way forward that everyone will buy into."

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Can the body cope with 50C?

By Nick Triggle Health correspondent, BBC News



The optimum air temperature for the body is between 18C and 24C, says the World Health Organization [Continue reading the main story](#).

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Australia is experiencing one of its strongest ever heatwaves.

In fact, it is getting so hot that meteorologists have been forced to increase their temperature scale to 54C and add a new colour code.

The unprecedented temperatures have caused outbreaks of bushfires putting lives at risk.

But such high temperatures also pose another risk - to the body itself.

Extreme temperatures result in stress to the body.

The body works best within a narrow range of body temperature - 36C to 37.5C - and gets rid of heat mainly by sweating, although breathing and an increased heart rate can also expel heat.

The hotter and more humid it gets the more the body has to sweat, increasing the risk of dehydration.

In extreme heat the body starts to struggle to cool itself down, which can then lead to heat cramps, heat exhaustion or even heatstroke - also known as sunstroke.

The latter is a medical emergency which can result in permanent damage to vital organs and even death if it is not treated.

So how hot is too hot?

The World Health Organization says the optimum air temperature for the body is between 18C and 24C. Any hotter and the risks rise.

Some of the risk is linked to what a body is used to. Unsurprisingly people in hotter countries tend to cope better when the mercury starts to rise.

Precautions

Research has shown that when the temperature gets to 35C, accompanied by high humidity, health is put at danger. Once 40C is reached, it can be dangerous even with low humidity levels.

Suffice to say at 50C, the risk is even higher.

Much also depends if an individual falls into one of the vulnerable categories.

Older people, babies and young children and pregnant women are all more susceptible to extremes in heat as are those with chronic conditions such as heart or breathing problems.

Certain types of medication or infections can have an effect too.

During heatwaves the public are advised to take precautions, such as drinking lots of water, avoiding strenuous exercise and dressing sensibly in lightweight and light-coloured clothes.

But in extreme heat it is essential to find a cool environment in which to artificially reduce the body's temperature.

Professor Virginia Murray, of the Health Protection Agency, who has studied the effect of heat on the body, says: "What is really frightening is when the body is not able to cool itself down.

"That can happen when it is really hot during the day and night. The body does not get a chance to get rid of the heat.

"In those circumstances the most important thing is being able to go somewhere to cool down. People need to find a cool area of a building or somewhere with air conditioning."

When people are not able to do that, history shows heat can be a killer. The European heatwave of 2003 - the hottest summer since the 1500s - was estimated to have caused the deaths of more than 70,000 people across the continent.

Meanwhile, up to 10,000 deaths were said to have been caused by the hot summer of 1988 in the US.

In fact, of all the natural disasters that can strike extreme temperatures are the most lethal, causing more deaths overall than floods, earthquakes and tornadoes.

But whether heatwaves or cold snaps are the biggest killer depends on where you live. In both the US and Australia, heat carries the highest risk. In the UK, it's the cold.