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# Scientists record symbolic milestone to celebrate Morton, 2016

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Climate Change Science

Baring Head. Photo / File

The last time the amount of carbon dioxide in our atmosphere was at a level of 400 parts per million (ppm), sea levels were at least 10 metres higher than they are today.

During the Pliocene period, about three million years ago, when global temperatures were 2C or so above today's levels, forests grew on what today is a mostly barren island in the Canadian Arctic and savannas and woodlands were spread across what is now North African desert.

It was a wetter, warmer period in the planet's recent geological history.

And last week, at a windswept point at the bottom of the North Island, the 400ppm milestone was reached in New Zealand for the first time since.

Scientists from the National Institute of Water and Atmosphere (Niwa) had been watching the readings recorded at the Clean Air Monitoring Station at Baring Head closely as it edged toward the symbolic threshold.

It came a year after it was crossed at the Mauna Loa station in Hawaii, which has recorded a 24 per cent rise in carbon dioxide levels since it began gathering data in 1958.

At the time of the Hawaiian 400ppm reading, scientists described it as a "psychological tripwire" and a stark reminder that the world was still not on a track

to limit CO2 emissions -- growing at an annual rate of more than 2ppm -- and therefore climate impacts.

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Nasa's Dr Gavin Schmidt said: "We are a society that has inadvertently chosen the double-black diamond run without having learned to ski first. It will be a bumpy ride."

Last month, the level was passed at the Australian monitoring station at Cape Grim, Tasmania.

*Continued below.*

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But enough gas has now mixed through the atmosphere and reached the high-latitude Southern Hemisphere stations to push past the figure.

Niwa atmospheric scientist Dr Sara Mikaloff-Fletcher said she had known the level would be reached for some time, describing it as "a bit like turning 40 and realising you haven't started saving for your retirement".

"It was already a problem when you turned 38 and 39, but this is a natural time to stop and take stock.

"It is a useful point to recognise that because we have left things so long, there is very limited opportunity to get back on track and stop drastic climate change."

Carbon dioxide levels had been steadily increasing for decades, although there was a "tiny" flattening out during the global financial crisis, she said.

"This is a path we have been on for a very long time. The 400ppm threshold represents an opportunity for people to recognise this landmark and understand that there is only a small amount of time to accomplish change."

Carbon dioxide is the primary greenhouse gas contributing to warming of the atmosphere, and long-serving Niwa staff recall the level once being a steadier 345ppm.

The milestone follows news that New Zealand's greenhouse gas emissions rose by 1 per cent in 2014, adding to a 23 per cent increase since 1990.

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Climate Change Minister Paula Bennett -- who this year signed New Zealand's international pledge to slash its greenhouse gas emissions by 30 per cent from 2005 levels and 11 per cent from 1990 levels by 2030 -- responded to that increase by vowing to set up a high-level taskforce to drive down emissions.

But in a recent interview with the Herald, Victoria University climate scientist Dr James Renwick criticised the Government's response to climate change and its reliance upon buying emissions units.

"We are in the top bracket of emitters, on a per-capita basis, and as the recent Royal Society of New Zealand report shows, there are many things we can do now that will reduce our emissions," he said.

"I am saddened that as a country, we are not doing the right thing."

While a new study showed that burning all of the world's remaining fossil fuels would push up the average global temperature by between 6.4C and 9.5C -- a catastrophic scenario -- Dr Renwick said even the 2C rise nations were trying to limit warming to would be difficult to deal with.

Under present projections, the sea level around New Zealand is expected to rise between 50cm and 100cm this century, leaving populations to adapt by either abandoning coasts and islands, changing infrastructure and coastal zones, or protecting areas with barriers or dykes.

Storms occurring on top of a higher sea level would affect public infrastructure such as roads, railways and stormwater systems, as well as private homes and other buildings.

Climate change was also expected to result in more large storms compounding the effects of sea level rise.

- NZ Herald

