

The role of climate change in historic drought

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Led by Luke Harrington and Professor David Frame from the New Zealand Climate Change Research Institute, the research measured the likelihood of extreme weather patterns occurring in modern day New Zealand compared to weather patterns in the late nineteenth century.

"We used new statistical techniques to examine the specific types of weather systems which passed over New Zealand during the 2013 summer drought. We then used climate models to evaluate whether they were more likely to occur in the present day, when compared with the late nineteenth century," says Mr Harrington.

"Our results show that due to changes in climate over the last 130 years, in response to both [greenhouse gas emissions](#) and ozone depletion, weather patterns such as those seen in the 2013 drought were 20 percent more likely to occur in the present day than in the late 1800s."

The 2013 New Zealand drought affected the entire North Island and the west coast of the South Island, and is considered one of the most severe droughts to have affected these areas in at least 40 years.

"The 2013 drought had a huge impact on New Zealand—according to Treasury estimates, the drought cost the New Zealand economy at least \$1.3 billion. It's also an important case study to help New Zealanders understand how the nature of extreme events is changing for New Zealand," says Mr Harrington.

"We are already seeing changes in the frequency of extreme weather

over New Zealand due to a changing climate. The results from our research are yet another sign that we can expect droughts more frequently in the future and that, when they occur, they are likely to be more intense.

"By looking at the properties of the drought in several different ways, we hope the in-depth detail of our results will be useful for primary industries' planning in anticipation of future New Zealand summers in a warming world."

This research, carried out in collaboration with researchers from the National Institute of Water and Atmospheric Research (NIWA), the University of New South Wales in Sydney and the University of Oxford in the United Kingdom, has been published in the *Journal of Geophysical Research: Atmospheres*.

More information: Harrington, L. J., P. B. Gibson, S. M. Dean, D. Mitchell, S. M. Rosier, and D. J. Frame (2016), Investigating event-specific drought attribution using self-organizing maps, *J. Geophys. Res. Atmos.*, 121, [DOI: 10.1002/2016JD025602](https://doi.org/10.1002/2016JD025602)

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