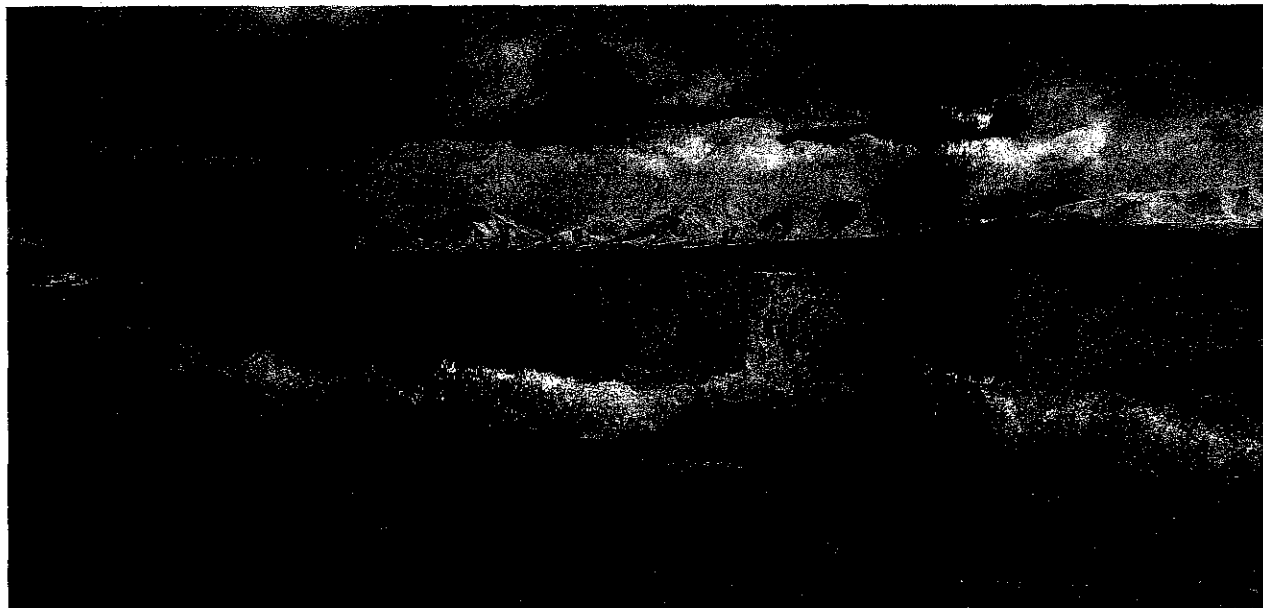


Temperature data throw new light on climate case

**GUEST
COLUMNIST**
Chris de Freitas



A High Court review hinges on the accuracy of claims for dangerous human-caused global warming

New developments allied to a judicial review of climate warming in New Zealand could be relevant to climate-related policy planning

Two years ago, The New Zealand Climate Science Education Trust contested a claim by the National Institute of Water and Atmospheric Research

station that affect thermal conditions such as the growth or removal of vegetation and, in particular, urban growth and development leading to what is known as the urban heat island (UHI) effect.

These changes can introduce inhomogeneities into the long term tem-

assessed the quality of national climate datasets for use in long-term climate change detection, a homogenised New Zealand national temperature record has only once appeared in the research literature, in a paper by M J Salinger published in 1980. This work did not set out a schedule of adjustments and was based on a measurement technique that was significantly improved by its author and a statistician colleague, D A Rhoades, over a decade

of water and atmospheric research (NIWA) that New Zealand air temperatures had climbed by about one degree Celsius over the past century. The High Court ruled against the trust and ordered it to repay court costs.

The event and the outcome attracted considerable media attention. Sparks flew, as they so often do with the many issues associated with global warming.

The trust was accused of several things, including using the courts as a substitute for science, wasting the court's time, using persons as witnesses who do not have applicable qualifications, or worse, pedalling the influence of cranks and climate deniers.

The trust was suspected of hosting global warming sceptics, which was clearly not the case, as the group was not asserting climate warming does not exist. Rather it represented the view of those who are sceptical of alarmist claims that dangerous human-caused global warming is taking place.

The trust questioned NIWA's processes for claiming abnormal warming and wished to have the details revealed to the public.

The dispute centres on climate data from the so-called "Seven Station Series" – climate stations in Auckland, Masterton, Wellington, Nelson, Hokitika, Lincoln and Dunedin – used by NIWA for temperature records and adjustment by NIWA of these records.

The trust did not question NIWA's ethics or intentions because it accepted the fact that climate data need to be quality controlled.

This is because long air temperature time series are more often than not beset by problems that contaminate what would otherwise be a near-natural record; for example, those discontinuities caused by the relocation of weather stations, changes in instrumentation and observing practices, or gradual changes around the weather

temperature time series that distort or hide the true climatic signal.

The UHI is the best-studied example of data contamination in which data from urban stations are influenced by localised warming due to asphalt and concrete replacing grass and trees. Numerous studies have demonstrated that only very small changes in population are enough to induce a statistically significant local warming.

Despite the research work undertaken so far, there have been few attempts globally to re-assess quantitatively the nature and reliability of homogeneity adjustments to complete national data sets. The High Court case highlighted the situation in New Zea-

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land but this has recently changed.

In a newly published paper in the highly respected journal *Environmental Modelling and Assessment*, three researchers, including this writer, report on the results an updated analysis of the New Zealand climate record.

The period from 1909 to 2009 is analysed and the data homogenised. Current New Zealand century-long climatology based on 1981 methods produces a trend of about one degree Celsius per century. The new analysis, which uses updated assessment and quality controlled techniques, produces a barely perceptible warming trend of about 0.3 °C per century.

Although many studies have

later. Applying that improvement could have a significant effect on trends but this has never previously been published, until now.

The newly published work aimed to apply the method set out by Rhoades and Salinger exactly as they describe, without adjusting it in any way. The aim was to derive a *modernised* New Zealand Temperature Record providing a 100-year time series of mean monthly land surface temperatures.

National temperature trends are widely used for a large number of societal design and planning purposes and it is important that they should be as reliable as modern methods allow. Moreover, New Zealand provides one of the longest continuous climate

series in the Pacific Ocean as well as one of the longest in the Southern Hemisphere. This means our trends are of ongoing interest to a wide audience of scientists.

The science of climate change depends entirely on reliable data, quality controlled and homogenized rigorously. Adjusting the data to achieve the reliability required is difficult and controversial.

The new finding is not the end of the matter. It's just another research paper for the open minded to consider.

Chris de Freitas is an associate professor in the School of Environment at the University of Auckland.

c.defreitas@auckland.ac.nz