



29 January 2010

Terry Dunleavy MBE
14A Bayview Road
North Shore City 0622
New Zealand

BY EMAIL: terry.dunleavy@nzclimatescience.org.nz

Dear Mr Dunleavy,

Official Information Act request relating to climate information.

In a letter dated 21 December 2009, you sought information relating to climate information and data. Your specific request was framed in the six questions of that letter.

I note at the outset that a significant proportion of your request sought justifications and/or explanations regarding NIWA's science. This is not the purpose of the Official Information Act, which is to provide copies of information held by Crown entities rather than create more information or debate the information sought. That said, NIWA is willing to provide responses to those questions, in this instance, even though it is not obliged to do so. However, as a commercial entity it is required to generate revenue and efficiently use its resources, accordingly it is unlikely to be able to continue doing so on an ongoing basis.

NIWA's responses to your questions (as numbered in your letter) are as follows:

1. The original observations are already available to the public over the internet from the NIWA climate database, accessible via the NIWA website. The link to the climate database is <http://cliflo.niwa.co.nz>. As advised the Official Information Act does not compel NIWA to provide justifications, however, in respect of your query regarding the "representativeness" of this set of seven stations for analysing New Zealand temperature trends we note the following:
 - a. The seven stations provide a widespread geographic coverage of both the North Island and the South Island. The stations are Auckland, Masterton, Wellington, Nelson, Hokitika, Lincoln and Dunedin; and
 - b. As documented on NIWA's website at <http://www.niwa.co.nz/our-science/climate/news/all/nz-temperature-rise-clear>, surface night time minimum air temperatures measured from ships over the oceans surrounding New Zealand indicate an upward trend of about 0.7°C from 1900 to 1993. Sea surface temperatures measured from the same ships warmed by 0.6°C in that period. These trends are similar to the trend from the seven station land series over the same period, indicating that this series is broadly representative of the whole country for tracking long-term temperature change trends. The ocean observations referred to above are documented in the paper "Surface temperature trends in New Zealand and the Surrounding Ocean, 1871 – 1993", published by Folland and Salinger in the International Journal of Climatology Volume 15, pages 1195-1218 (1995).

I understand that you have queried the reliability of the records from these stations. Information relating to the reliability of the records from these seven stations (once appropriate site adjustments and corrections have been made) is contained within Dr

www.niwa.co.nz

National Institute of Water & Atmospheric Research Ltd
41 Market Place, Auckland Central, Auckland
Private Bag 99940, Newmarket, Auckland 1149, New Zealand
Phone +64-6-375 2090, Fax +64-9-375 2092

Salinger's thesis - Salinger, M.J., 1981. *New Zealand Climate: The instrumental record*. which was submitted for the degree of Doctor of Philosophy at the Victoria University of Wellington, January 1981. Dr Salinger's thesis is available on interloan from the Victoria University Library.

2. You sought explanations relating to the way in which original records were processed to provide the individual station records. The methodology is documented in the following publicly available sources:

- Salinger, M.J., 1981. *New Zealand Climate: The instrumental record*. Thesis submitted for the degree of Doctor of Philosophy at the Victoria University of Wellington, January 1981;
- Salinger, M.J., 1977. Dunedin temperatures since 1853. Proceedings of 9th New Zealand Geographical Society Conference, pp.106-109; and
- Salinger, M.J., 1979. New Zealand temperatures since instrumental records began. Proceedings of 10th New Zealand Geographical Society Conference and 49th ANZAAS Conference, Auckland, pp.13-17.

The original worksheets and / or computer records used for the calculations in Dr Salinger's thesis work are the property of Dr Salinger, who no longer works for NIWA. NIWA does not hold copies of the original worksheets.

3. You asked about adjustments made to the seven station data series. Information regarding those adjustments is available from the following publicly available sources:

- Salinger, M.J., 1981. *New Zealand Climate: The instrumental record*. Thesis submitted for the degree of Doctor of Philosophy at the Victoria University of Wellington, January 1981;
- Rhoades, D.A., and Salinger, M.J., 1993: Adjustment of temperature and rainfall measurements for site changes. *International Journal of Climatology*, 13, 899 – 913; and
- <http://www.niwa.co.nz/news-and-publications/news/featured/new-zealand-as-climate-is-warming>.

In addition, NIWA staff are compiling some further material on the reasons for the station data adjustments, including dates of site changes, which should be available through the NIWA website within the next few weeks.

4. The “seven station temperature series” shown on NIWA's website at <http://www.niwa.co.nz/our-science/climate/information-and-resources/clivar/pastclimate> makes no statements regarding the “accuracy” of temperature trends – the dotted trend line is the best fit linear trend to the data over the period 1909 to 2008. Zheng *et al*/ published a detailed statistical analysis of the trends from the seven station dataset in the following publicly available scientific paper:

- Zheng, X., Basher, R.E., and Thompson, C.S., 1997: Trend Detection in Regional-Mean Temperature Series: Maximum, Minimum, Mean, Diurnal Range, and SST. *Journal of Climate* 10, 317 – 326.

In that paper they concluded that the trend in national average air temperature for 1896 to 1994 was $0.11 \pm 0.035^{\circ}\text{C}$ per decade (95% confidence interval).

5. No adjustments were made to the raw data from the eleven stations to produce the dataset referred to in this question.

6. NIWA has provided, and does provide, data to NASA, NOAA and the Hadley Centre at irregular intervals, however, that data is raw and is not adjusted before it is supplied. As such, the data is available via NIWA's climate database (<http://cliflo.niwa.co.nz>).

NIWA cannot comment on any adjustments made to that data by those institutions after receipt - you will need to address any queries to those organisations directly.

NIWA has considered your request for correspondence between it, NASA, NOAA and the Hadley Centre and cannot provide you with copies of that correspondence for the following reasons:

- a. Correspondence between the organisations are conducted on a confidential basis, and the expectation of the correspondents is that the contents would not be disclosed;
- b. If NIWA disclosed the correspondence sought it would jeopardise the supply of further information and correspondence from, and with, NASA, NOAA and the Hadley Centre;
- c. Disclosure would also prejudice NIWA's ability to undertake further research in this field;
- d. The correspondence also contains private information; and
- e. Providing the information sought would involve a substantial amount of collation or research.

NIWA has considered the reasons which would support disclosure of that correspondence, but believes that the balance favours non-disclosure of the information you seek.

NIWA makes its raw and adjusted climate data available for free download through its Climate database, accessible via the NIWA website which enables that data to be checked against data cited by NASA, NOAA and the Hadley Centre,

NIWA also widely publishes a large amount of other climate related information, its analyses, methodologies and conclusions. Again, a lot of that information is available, free, through the NIWA website, libraries or other Internet sites. The availability of that raw data, methodologies, analyses and conclusions widely available, allows the veracity and validity of NIWA's analyses and conclusions to be easily checked and verified and comparisons with NASA, NOAA and the Hadley Centre's research to be undertaken. However, NIWA is unable to provide information relating to any analyses or adjustments made by NASA, NOAA or the Hadley Centre directly.

Given the availability of that information which enables independent confirmation of NIWA's research and comparison with data cited by other organisations, NIWA will not release correspondence which would significantly and adversely affect its ability to collaborate with other institutions and conduct further research into climate change.

Section 28(3) of the Official Information Act allows you complain to the Ombudsman regarding this response.

I hope the information referred to in this letter is helpful and provides you with the information you sought.

Regards,



Tim Mahood
General Counsel