Clim. Past Discuss., 11, C1857–C1859, 2015
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Climate of the Past Discussions

Interactive comment on "The "Dirty Weather" diaries of Reverend Richard Davis: insights about early Colonial-era meteorology and climate variability for Northern New Zealand, 1839–1851" *by* A. M. Lorrey and P. R. Chappell

Anonymous Referee #2

Received and published: 30 September 2015

General Comments:

This is a valuable (and interesting paper) documenting and analyzing some of the earliest continuous land-based meteorological measurements in New Zealand. It is well written, and provided the authors can satisfactorily address the points I have listed below I would recommend its acceptance.

Specific Comments:

P3813: Section 4.3.1 Temperature Measurements: In section 4.2.1 the authors dis-

cuss likely technical details of the barometer used by Davis. However in Section 4.3.1 although they describe the siting of the temperature measurements (they argue this is within some type of screen) they do not specify the instrument used to make the measurements. I assume this would have been a mercury-in-glass thermometer. Are the authors able to confirm this (or at least state that the usual instrument used at that time was a mercury-in-glass thermometer)?

P3807 and elsewhere – VCSN temperatures: Can the authors please specify near the top of Page 3807 the time period for which the "equivalent VCSN" temperatures are calculated. This is important for the subsequent discussion comparing "Davis" and "modern" (ie VCSN) temperatures. Also there is some confusion elsewhere in the paper about precisely what this period is. Near the bottom of Page 3807 the "modern" period (which I assume is the period from which VCSN data have been used) is given as 1972-2010 - However the first paragraph on page 3814 refers to the modern period as 1972-2012. I suggest it would also be useful to specify the period covered by the VCSN data in the captions for Tables 2 and 3.

Page 3807, line 6: The sentence beginning "As to not . . ." does not make grammatical sense. Perhaps it is supposed to read: "So as to not . . ."? But in any case I do not fully understand (simply from the reference to the Antoine equation) how the authors calculated a 9 am temperature for the VCSN data using vapour pressure data. Perhaps the authors could give a fuller explanation of this by adding an explanatory paragraph in the supplementary material.

Page 3815 and Tables 2 and 3: I am puzzled by the fact that (a) Table 2 shows that for all of the temperature parameters considered (mean, extreme min, extreme max) the Davis 9am temperatures are cooler for every month than the "modern" (ie VCSN-derived) temperatures BUT (b) Table 3 shows that for the estimated daily mean temperature for the year as a whole there is no difference (ie 0 deg C) between the Davis and VCSN temperatures, and that for mean, minimum and maximum temperatures many of the summer months are warmer in the "Davis reconstructed" data than in the "VCSN

modern data" while many of the winter months are cooler.

I'd like to at least see some discussion from the authors about this – e.g. does it indicate a potential radiation-caused bias in the Davis measurements (since presumably the differences between (a) and (b) above must be driven by the Davis 12 noon temperatures?). Or is there any chance it results from the methodology used to convert the VCSN data?

Page 3821, second paragraph: What period are the temperature anomalies (shown in parenthesis) compared against. It appears not to be the "modern" period (1972-2012?) covered by the VCSN data, since if that were the case the Davis diary mean winter temperatures would be (from Table 3) -0.9 deg C, not the -0.6 degC quoted here in the text 9assuming "winter" is June-July-August). And if the base period from which temperature anomalies is calculated is not 1972-2012 then how is the offset between the base period and 1972-2012 calculated?

Page 3834 Table 3: There seem to be some small anomalies between numbers in some of the rows. E.g. For January: Tmin Davis = 14.5; Tmin VCSN = 14.0; Davis era difference = 0.6 [but 14.5-14.0 = 0.5]. Likewise for April.

Interactive comment on Clim. Past Discuss., 11, 3799, 2015.