

Interactive comment on “Documentary-derived chronologies of rainfall variability in Antigua, Lesser Antilles, 1770–1890” by A. J. Berland et al.

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We would like to express our sincere thanks to Professor Nash for highly constructive comments and suggestions, which will allow for some significant improvements to be made to the manuscript. We take much encouragement from the fact that Prof. Nash – who has worked extensively with this method of document-based precipitation reconstruction in southern Africa – approves of our analysis, interpretations and presentation of findings.

The typographic errors highlighted in the review are duly noted and will be amended. Similarly, we welcome suggestions of scholarship that should be cited in discussion of the limitations of documentary climate reconstruction (Page 1543, lines 3-6) and will add these to the final manuscript. We note that information relating to the Blue Books,

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which were listed in Table 1, was edited out of Section 3 mistakenly in our efforts to shorten the paper. This can be re-inserted easily.

A basic statistical comparison of the island-wide and central-eastern Antiguan rainfall chronologies (suggested on page C406 of the review) has now been undertaken and reveals good agreement between the two. We will be sure to mention this in Section 6 (Page 1551, lines 15-16) as suggested. On reflection, we concur with Prof. Nash that it would be clearer to refer to rain-years in the format 1769-70, 1770-71, 1771-72 etc., rather than 1769-1770, 1770-1771, 1771-1772. This too can be rectified without difficulty.

Unfortunately, our research has uncovered very little information about the instrumental data obtained from Oliver (1894) and the Blue Books for the years 1887 to 1890 (introduced on page 1542, lines 1-16). These sources provide little more than the monthly precipitation totals themselves. As regards the location of the recording instruments, Oliver (1894) and the Blue Books of 1887, 1888 and 1889 state clearly that these measurements were taken at the ‘Public Library’ in St. John’s, while the 1890 Blue Book notes that the data were recorded at ‘The Government Laboratory’ in the same city. We did search many archival and published sources for additional evidence about the recording practises that were used, but without success. There is a similar dearth of information regarding the annual rainfall totals provided by Auchinleck (1956) for the calendar years 1874 to 1949. Auchinleck notes only that these figures were obtained by calculating the mean annual rainfall measured at various ‘recording stations’ throughout Antigua. He mentions that the number of recording stations for which data was available varied from 40 to 70 every year, but does not specify the number in each year. Towards the end of our discussion of these instrumental data (Section 4.1) we note:

“There is no information available about the instruments or procedures used to obtain the rainfall measurements in question. This makes their precision uncertain, though the annual precipitation cycle exhibited by the monthly means of the St. John’s data

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(not shown) does match that derived from modern data (Fig. 2a). The Auchinleck series incorporates varying numbers of precipitation records in each year, the origins of which are unspecified. Annual totals are, therefore, not strictly comparable.” (Page 1542, lines 10-16).

This was intended to highlight the lack of information available which could provide an insight into the homogeneity and validity of the rainfall measurements. Some elaboration may be necessary here to make this clearer for readers.

With respect to the possibility of employing the confidence rating (CR) system proposed by Kelso and Vogel (2007), this is indeed something that we considered in the initial stages of data analysis. The nature of the climate data, however, does vary slightly from that presented in the reconstructions performed by the aforementioned researchers; while they based their rain-year classifications on descriptions of both meteorological conditions and their social/agricultural implications, ours are based solely on direct references to the state of the weather. Information regarding the impacts of climate variability was treated as auxiliary and used primarily to contextualise findings once classifications were assigned (e.g. in Sections 5.1 and 5.2). In the end, this eliminated the need for assigning any classifications that would have received a CR of 1 in Kelso and Vogel’s scheme; we either had sufficient evidence to classify each rain-year with a fair level of confidence or we did not assign a wetness/dryness class. When the latter was the case, this is indicated by the presence of ‘A’ or ‘?’ annotations in Figures 3a and 5a. We certainly could make some distinction between level 2 and level 3 CRs for the definitive classifications (i.e. very wet, wet, normal, dry or very dry) in the island-wide chronology. Having previously compiled the relevant information, we can report that 72 of the 84 classifications in that chronology can be assigned a CR of 3, while the remainder receive a CR of 2. We propose to summarise the details relating to these CRs in the main manuscript text or a footnote. Although we agree that using different bar shadings in Figures 3a and 5a to reflect confidence levels would be the simplest means of conveying this data, other reviewers have noted that these plots are already

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complex, so we will avoid adding another source of potential confusion.

In the case of the central-eastern Antiguan chronology, CRs as defined by Kelso and Vogel (2007) are not appropriate for many of our seasonal classifications. This is because a substantial proportion of these classifications were assigned on the basis of descriptions of the progression weather conditions or climate events over intervals of several weeks or months within each season. It was much less frequent for the plantation papers to provide syntheses of conditions throughout entire seasons. Thus, the total number of references to the “particular climatological condition” expressed by final seasonal classifications (Kelso and Vogel, 2007: 365) was often found to be an overly pessimistic reflection of the true level of confidence with which wetness/dryness classes were assigned. Of course, it would have been possible to devise an adapted version of Kelso and Vogel’s scheme which would be more appropriate for this analysis. However, we decided that the use of statistics of the availability of data points and sources (Figures 3b and 5b) was a preferable means of indicating classification confidence, because (1) it would not entail such lengthy elaboration as this alternative and (2) it could be applied in a consistent manner to both the island-wide and central-eastern Antiguan reconstructions.

References

Auchinleck, G. G.: The Rainfall of Antigua and Barbuda. Compiled from Available records, Antigua Sugar Association, St. John’s, 1956.

Kelso, C. and Vogel, C.: The climate of Namaqualand in the nineteenth century, *Climatic Change*, 83, 357–380, 2007.

Oliver, V. L.: The History of the Island of Antigua, one of the Leeward Caribbees in the West Indies, from the First Settlement in 1635 to the Present Time, Vol. I, Mitchell and Hughes, London, 1894.

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