

Ed Brook 2/10/2021 Comments Response

Reply to Comments: Thank you for your thoughtful comments. We, the authors have elected to implement all the changes you recommend, aside from one. The following list details those changes, and line numbers refer to the marked-up version “NyeCondon_CP_2ndMarkup.pdf”.

Line 11: Edited final sentence of abstract to eliminate the statement that our results “confirm the ambiguity of the BA/YD’s trigger”.

Line 19: Added Rasmussen et al., 2014 citation.

Line 32: Changed “often” to “sometimes”.

Line 37: Relegated definition of “shape” to a more relevant section.

Lines 39-42: Made motivation of novel statistical methods more concise.

Lines 52-53: Clarified that records use the GICC05 age scale, and that record length was a key factor in our decision to use the chosen records.

Lines 61-64: Clarified the meaning of CH4 and CO2 records.

Lines 67-69: Clarified our interpretation of small sub-events.

Lines 76-77: Introduced the meaning of Figure 2 in its own sentence.

Line 92: Eliminated and clarified the confusing phrase “containing D-O events”.

Lines 100-105: Simplified the description of “normalizing” and “centering” and clarified the associated analysis’ relationship to our main analysis.

Lines 109-110: Summarized PCOut upon its first introduction, rather than later in the paper.

Lines 113-116: Clarified the omission of measurements (ii) and (iii) on interstadial data; corrected small syntax errors.

Line 123: Typo correction

Line 125: Started new sentence at “While not ideal...”

Lines 127-129: Deleted extraneous sentence.

Line 133: Moved summarization of PCOut to lines 109-110.

Line 136: Changed “our data” to “the data considered here”.

Line 139: Deleted extraneous word, “robustly”.

Line 140: Changed “location” to “center”.

Line 164: Clarified that the above procedure applies to a_i .

Line 166: Clarified that eq. 4 is used to calculate b_i later, but it does not apply to b_i as written.

Lines 169-171: Provides basic intuition for weights a_i and b_i and clarifies the use of 0.25 and 1.25 in eq. 6.

Line 174: Changed “constructed dataset” to “study”.

Lines 178-179: Replaced mathematical notation with more readable explanation of single variable procedure.

Line 185: Changed “compiled” to “composite”.

Line 186: Typo correction

Lines 228-229: Deleted incorrect statement regarding the volume of records used to study the YD.

Lines 244-245: Deleted extraneous sentence.

Lines 245 and 247: Changed “our” to “the observed”.

Lines 258-259: Deleted extraneous sentence.

Lines 261-262: Deleted statement about cross-correlation lag analysis.

Line 268: Changed “increase in” to “higher”.

Lines 275-277: Deleted extraneous sentence.

Lines 285-286: Clarified that metric measurements are found in our tables, and that the data used can be found in the given sources.

Line 287: Clarified author names.

Figure 1: Added references in caption. Dr. Brook made an additional suggestion to indicate stadial regions, which we elect to respectfully decline. We remain convinced that further additions to this figure would overcrowd it, and that indicating stadials would not increase the readability of our method from this figure. Instead, we note that the vertical lines show the interstadial-stadial transitions, and thus mark the beginning of each stadial.

Figure 2: Initial sentence of caption is now descriptive, whereas the final sentence is now more explanatory.

Figure 3: Corrected typos, clarified pink arrows and symbols, and clarified the visual representations of metrics in relation to the actual analysis performed.

Figure 4: This figure has been altered to better represent its depiction of the PCOut procedure. Equation numbers are now closer to the graphs representing them, and arrows are longer and more indicative of the fact that equations are being sequentially transitioned between. Changes in the caption also align with these clarifications in order to better aid the reader in understanding this figure: The first sentence is more descriptive, and panels are more clearly referred to.

Tables 2&3: These tables’ referral to stadials rather than D-O events is now clearer, both in the caption and the table itself.