Please find in attachment, the manuscript entitled “A millennial summer temperature reconstruction for northeastern Canada using oxygen isotopes in subfossil trees” which has been modified following the comments of the editor. Her comments appear in black while our responses are in blue characters. Every response is numbered following the order of comments. We thank the editor for their useful comments and suggestions, our answers are listed below. Our corrections in the manuscript are at lines 25-27 and 348-362 ans we have also added the Masson-Delmotte *et al.,* 2013 as a new reference for the chapter 5 of the ICC report (2013).

M.Naulier

1. I just have one final concern, which is related to the comparison of recent changes to the MCA anomaly. Please note that in the chapter 5 of the IPCC AR5 report (Masson-Delmotte et al, 2013), this comparison (at the hemispheric scale) was performed by considering 30 year time periods or 50 year time periods, and then the average temperature change was compared to that of the most recent 30 or 50 year time period (1963-2012 or 1983-2012) (see table 5.4).One point that is not clear in your manuscript is the following : did you compare the average values for the whole multi-centennial MCA and the last 50 years, or did you follow the same approach as in the IPCC chapter 5?It would be valuable to perform a comparison with running 50 year averages and running 30year averages, and also report the periods when temperature was above or below the average value of the last 50 or 30 years.

Good point. Until now we had only compared the temperature average of the MCA (1000-1250) to the LIA (1450-1850) and the last 50-years (1950-2000). Now, we make the same test as in IPCC chapter 5 considering that in our case (with the smoothed data), the last 50 years correspond to the 1959-2009 period and the last 30 years to the 1979-2009. Following these new tests, we have provided new information in 3.2.2 of the discussion: “It is without surprise that the MCA was warmer than the LIA (+0.4±0.3°C) in the L20 area. We have furthermore compared maximal temperature of the MCA with the modern warming, following the approach used in the IPCC report (2014, Chapter 5). The running 50-years averages between 1000 and 1100 were higher (+0.2±0.1°C) than the measured temperature of the last 50 years (1959-2009). It is worth nothing that when considering 30-years running averages, the 1979-2009 period appears to be the warmest (average of +0.6°C±0.4) over the last millennium. Considering these results, one can infer that the MCA and recent warming show similar average maximal temperature in the study area. These results contrast somewhat with Northern hemisphere temperature reconstructions that have determined that the mean annual temperature of the modern period was the warmest in northern Canada (Mann *et al.,* 2009; Ljungqvist *et al.,* 2012). Indeed, the data available for these hemispheric reconstructions in the last IPCC report are scarce for north-eastern Canada (Viau *et al.,* 2012). Clearly, the i-STREC results indicate that the MCA in northeastern Canada has been as warm as the modern period of the last millennium (Figure 5)” (lines 348-362).

2. I also have one comment. We have recently published a new multi proxy reconstruction of the winter NAO (Ortega et al, Nature, 2015) spanning the last 1000 years. Could it be possible to investigate the relationship (if any) between your dataset and that reconstruction?

We do not see the scientific basis for justifying a comparison between winter NAO and maximal summer temperature in our study region. However for the sake of discussing the question with the editor, we present the compiled new NAO data (Ortega et al, Nature, 2015) with i-STREC (Figure 1). There are significant correlations ($p<0.01$; c.v. 0.49) between NAO and i-STREC, either positive (5 periods) or negative (4 periods). These correlations do not highlight periods of maximum summer temperature with coherent characteristics. Therefore the comparison does not allow inferring a possible control of the winter NAO on the summer maximal temperature in northeastern Canada. However, the new NAO series could be very helpful for evaluating and highlighting the influence of the winter NAO on the winter climate in northeastern Canada as previously demonstrated (*e.g.*, Hurrell *et al.,* 2003).

Hurrell, J. W., Kushnir, Y., Ottersen, G., and Visbeck, M.: The North Atlantic Oscillation: climatic significance and environmental impact, American Geophysical Union, 2003.

Ortega, P., Lehner, F., Swingedouw, D., Masson-Delmotte, V., Raible, C. C., Casado, M., & Yiou, P.: A model-tested North Atlantic Oscillation reconstruction for the past millennium. *Nature*, *523*(7558), 71-74, 2015.

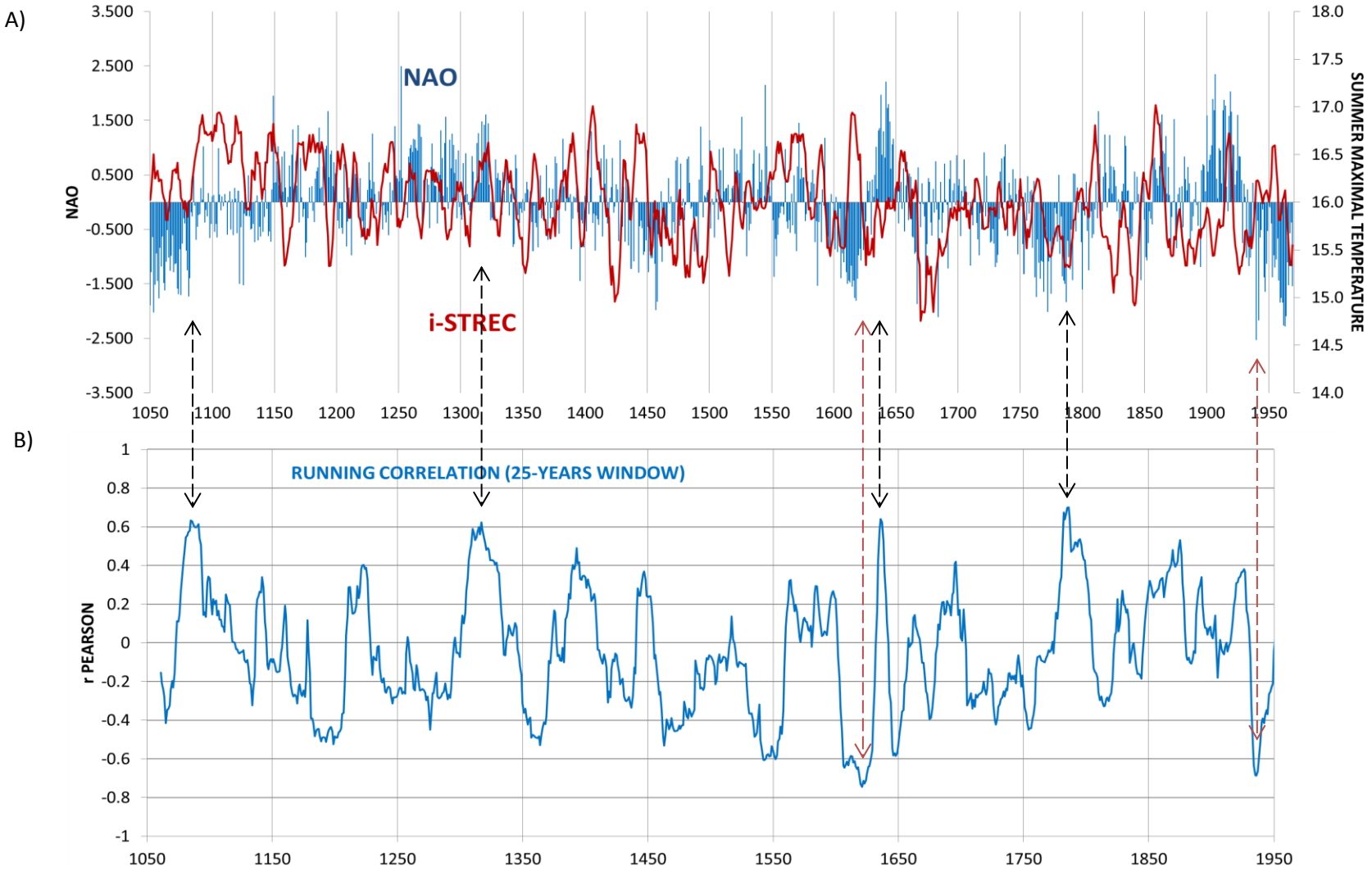


**Figure 1. A) Comparison between i-STREC (summer maximal temperature, red line) and winter NAO (blue bars; Ortega et al., 2015) for the 1050-1970 period. B) Running correlation using 50-year windows between i-STREC and winter NAO. Significant correlations are represented by arrows (black (+), red (-)).**