DISCUSSION OF: A STATISTICAL ANALYSIS OF MULTIPLE TEMPERATURE PROXIES: ARE RECONSTRUCTIONS OF SURFACE TEMPERATURES OVER THE LAST 1000 YEARS RELIABLE?

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McShane and Wyner (2011) (henceforth MW) analyze a dataset of "proxy" climate records previously used by Mann et al. (2008) (henceforth M08) to attempt to assess their utility in reconstructing past temperatures. MW introduce new methods in their analysis, which is welcome. However, the absence of both proper data quality control and appropriate "pseudoproxy" tests to assess the performance of their methods invalidate their main conclusions.

We deal first with the issue of data quality. In the frozen 1000 AD network of 95 proxy records used by MW, 36 tree-ring records were not used by M08 due to their failure to meet objective standards of reliability. These records did not meet the minimal replication requirement of at least eight independent contributing tree cores (as described in the Supplemental Information of M08). That requirement yields a smaller dataset of 59 proxy records back to AD 1000 as clearly indicated in M08. MW's inclusion of the additional poor-quality proxies has a material affect on the reconstructions, inflating the level of peak apparent Medieval warmth, particularly in their featured "OLS PC10" ($K = 10$ PCs of the proxy data used as predictors of instrumental mean NH land temperature) reconstruction. The further elimination of four potentially contaminated "Tiljander" proxies [as tested in M08; M08 also tested the impact of removing tree-ring data, including controversial long "Bristlecone pine" tree-ring records. Recent work [cf. Salzer et al. (2009)], however, demonstrates those data to contain a reliable long-term temperature signal], which yields a set of 55 proxies, further reduces the level of peak Medieval warmth (Figure 1(a); cf. Figure 14 in MW; see also Supplementary Figures S1–S2 [Schmidt, Mann and Rutherford (2011a, 2011b)]).

The MW "OLS PC10" reconstruction has greater peak apparent Medieval warmth in comparison with M08 or any of a dozen similar hemispheric temperature reconstructions [Jansen et al. (2007)]. That additional warmth, as shown above, largely disappears with the use of the more appropriate dataset. Using their reconstruction, MW nonetheless still found recent warmth to be unusual in a long-term context: they estimate an 80% probability that the decade 1997–2006 is