DISCUSSION OF: A STATISTICAL ANALYSIS OF MULTIPLE TEMPERATURE PROXIES: ARE RECONSTRUCTIONS OF SURFACE TEMPERATURES OVER THE LAST 1000 YEARS RELIABLE?[1]

BY EUGENE R. WAHL AND CASPAR M. AMMANN

*NOAA's National Climatic Data Center and
the National Center for Atmospheric Research*

McShane and Wyner (2011) (MW) introduce new methods into the effort to reconstruct the large-scale Northern Hemisphere temperature average over the past millennium, helping to advance interaction between applied statisticians and paleoclimatologists to improve understanding of pre-instrumental climates. However, despite a good effort to capture the various points of contention in the reconstruction arena, MW provide an incomplete, and at times inadequate, review of the existing literature considering reconstruction of Northern Hemisphere surface temperatures over the past millennium. In particular, the evaluations cited regarding the original Mann, Bradley and Hughes (MBH) reconstruction (1998/1999) and MBH's use of principal component (PC) summaries of dendroclimatic proxy data fail to address this issue properly, and in the process propagate errors that have been fully addressed in the literature. Similarly, MW omit important information in their examination of the methodology outlined and used by Ammann and Wahl (2007) (AW) to test the significance of the MBH reconstruction. Because examinations related to the MBH reconstruction have had particular salience not only in the specialist literature, but also politically [cf. House Committee on Energy and Commerce (2005); American Association for the Advancement of Science (2005); Wegman, Scott and Said (2006); Russell et al. (2010)] and in terms of scientific review and advisement [National Research Council (2006)], it is important that these omissions be corrected. We will focus our discussion on them, along with providing more general closing observations.

MBH used PC summaries of tree ring proxy information in different parts of the world to reduce the weighting of these regions in terms of the number of proxy data series from them employed in the MBH reconstruction. The use of PCs (more generally, the use of eigenvector/singular value decomposition methods) for the purpose of dimension reduction of data is a common practice in climatol-