

Reply to McIntyre and McKittrick: Proxy-based temperature reconstructions are robust

McIntyre and McKittrick (1) raise no valid issues regarding our paper. We specifically discussed divergence of “composite plus scale” (CPS) and “error-in-variables” (EIV) reconstructions before A.D. 1000 [ref. 2 and supporting information (SI) therein] and demonstrated (in the SI) that the EIV reconstruction is the more reliable where they diverge. The method of uncertainty estimation (use of calibration/validation residuals) is conventional (3, 4) and was described explicitly in ref. 2 (also in ref. 5), and Matlab code is available at www.meteo.psu.edu/~mann/supplements/MultiproxyMeans07/code/codeveri/calc_error.m.

McIntyre and McKittrick’s claim that the common procedure (6) of screening proxy data (used in some of our reconstructions) generates “hockey sticks” is unsupported in peer-reviewed literature and reflects an unfamiliarity with the concept of screening regression/validation.

As clearly explained in ref. 2, proxies incorporating instrumental information were eliminated for validation and thus did not enter into skill assessment.

The claim that “upside down” data were used is bizarre. Multivariate regression methods are insensitive to the sign of predictors. Screening, when used, employed one-sided tests

only when a definite sign could be a priori reasoned on physical grounds. Potential nonclimatic influences on the Tiljander and other proxies were discussed in the SI, which showed that none of our central conclusions relied on their use.

Finally, McIntyre and McKittrick misrepresent both the National Research Council report and the issues in that report that we claimed to address (see abstract in ref. 2). They ignore subsequent findings (4) concerning “strip bark” records and fail to note that we required significance of both reduction of error and coefficient of efficiency statistics relative to a standard red noise hypothesis to define a skillful reconstruction. In summary, their criticisms have no merit.

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The authors declare no conflict of interest.

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