LETTER

Proxy inconsistency and other problems in millennial paleoclimate reconstructions

Mann *et al*. (1) present two paleoclimate reconstruction methods [“error-in-variables” (EIV) and “composite plus scale” (CPS)], claiming statistically significant skill for both. Their figure 3 reveals that from approximately 750 to 1100, the CPS 95% confidence interval excludes the EIV 95% confidence interval and vice versa. This is evidence not of skill, but of inconsistency.

Contrary to assurances (1), archived Mann *et al*. source code did not show how they calculated their figure 3 confidence intervals, which are unjustifiably narrow. Paleoclimate reconstructions are an application of multivariate calibration, which provides a theoretical basis for confidence interval calculation (e.g., refs. 2 and 3). Inconsistency among proxies sharply inflates confidence intervals (3). Applying the inconsistency test of ref. 3 to Mann *et al*. A.D. 1000 proxy data shows that finite confidence intervals cannot be defined before ≈1800.

Numerous other problems undermine their conclusions. Their CPS reconstruction screens proxies by calibration-period correlation, a procedure known to generate “hockey sticks” from red noise (4). The proportion of proxies with “significant” correlation to gridcell temperature is overestimated by comparison to two (not one) gridcells, inclusion of “proxies” incorporating instrumental temperatures, and underadjustment for autocorrelation.

Their non-dendro network uses some data with the axes upside down, e.g., Korttajarvi sediments, which are also compromised by agricultural impact (M. Tiljander, personal communication), and uses data not qualified as temperature proxies (e.g., speleothem $\delta^{13}C$).

Although Mann *et al*. purport to “follow the suggestions” of ref. 5, they employed “strip-bark” dendrochronologies despite the recommendation of ref. 5 that these chronologies be “avoided” and fail to observe the caveats of ref. 5 that negative CE statistics indicate unreliable results.

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