

## ***Interactive comment on “Constraining the temperature history of the past millennium using early instrumental observations” by P. Brohan et al.***

**P. Brohan et al.**

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This review echos the comments made by G. Schmidt and to which we have responded separately.

It also criticises our claim that the comparisons presented represent a powerful validation of long-timescale proxy reconstructions, and suggest a statistical analysis with formal assessments of uncertainty.

Such an analysis would be interesting and valuable, but it would go against the point of this paper, which is to show that collecting new observations offers an alternative route to sophisticated statistical analysis as a method for assessing the power of historical

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climate reconstructions.

There is still widespread doubt about the accuracy of proxy-based reconstructions of large-scale temperature change over the last 1000 years, and a lot of papers have appeared trying to resolve that doubt by sophisticated statistical analysis. We've learned a lot from such statistical work, but the uncertainty remains, and there is considerable value in a much simpler validation by direct comparison with observations - hence this paper. Our aim is to present an alternative to statistical detail - not a new statistical test.

So we appreciate the comment, but we don't propose to add any statistical uncertainty assessment to the paper in revision.

The review also states that 'an analysis over a four decade period is not sufficient to judge if the proxy data provide reliable estimates of past temperature over an entire millennium'. While a longer-period comparison would obviously be better, there are some tests of a long-period reconstruction that can be done with short-period data: A main criticism of proxy reconstructions is that they are over-fitted to their calibration period - that the proxies have been selected to agree with observations in the twentieth century so a calibration based on the twentieth century won't give reliable results for earlier eras. To test against over-fitting we need to do a test outside the calibration period, and that is what this paper does - it provides clear evidence that the proxies are not over-fit - that the correspondence between proxy and observed temperature is a fundamental aspect of the proxy and not a statistical fluke.

In revising the paper we will clarify how this comparison strengthens the proxy reconstructions.

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Interactive comment on Clim. Past Discuss., 8, 1653, 2012.