Clim. Past Discuss., 11, C2374–C2375, 2015
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# *Interactive comment on* "Multi-time scale data assimilation for atmosphere–ocean state estimates" *by* N. Steiger and G. Hakim

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Received and published: 19 November 2015

We would like to thank referee 3 for helpful comments.

Yes, it is the case that in our method we assume x_b and H(x_b) are normally distributed and we can certainly include this caveat with some discussion in the paper.

We agree that simply adding white noise to the proxies is a simplification of "real" noise in proxies, though because the purpose of the paper is to illustrate the new method, we think that using the white noise "standard" is the most reasonable choice to make. We can also add a brief discussion of this caveat to the portion of the paper discussing the creation of the pseudoproxies.

We also agree that having uncertainty information in the reconstructions would en-

hance the results and interpretation, and it would not be a problem to include that information in the figures and discussion it in the text.

The choice of using correlation and coefficient of efficiency as skill metrics is mostly because they are traditionally used by the paleoclimate community, therefore our results can be put into context with other paleoclimate reconstructions. We also think this choice is reasonable since the primary purpose of the paper is to evaluate the mean of the reconstruction, and not the probabilistic aspects of the results.

We thank the reviewer for for the important references to previous work in this general area and we will include them and modify the text accordingly.

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Interactive comment on Clim. Past Discuss., 11, 3729, 2015.