

## ***Interactive comment on “The 1816 ‘year without a summer’ in an atmospheric reanalysis” by Philip Brohan et al.***

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Received and published: 2 September 2016

Referee #4, you have raised a very valid point when you say:

"1) I think the authors should elaborate a bit more on the improvement achieved when including the volcanic forcing, rather than the phrase 'and it is' ..."

Looking at the data, the correlation of observations and reanalysis data WITHOUT the eruption is 0.61, with a standard error of the mean of 0.22.

Using the reanalysis data WITH the volcanoes only changes the numbers very slightly, with a new mean of 0.66, a standard error of 0.25.

A couple of points. First, rather than decreasing the scatter of the results, the addition of the eruption actually INCREASED the scatter of the results.

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Next, the statistical significance of the change is basically zero. Given the scatter of the results, the change in the mean is far, far too small to achieve statistical significance.

This means, of course, that the authors CANNOT claim that the results using the eruption are in any way preferable to those not using the eruption.

It also explains why you had to ask the question ... because the changes were meaningless. A statistical analysis would have demonstrated that, so the authors didn't bother with the analysis ...

I fear that your point alone totally invalidates the study, as the difference between with and without the volcano is far, far too small to rely on, it could very easily be just chance.

w.

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Interactive comment on Clim. Past Discuss., doi:10.5194/cp-2016-78, 2016.

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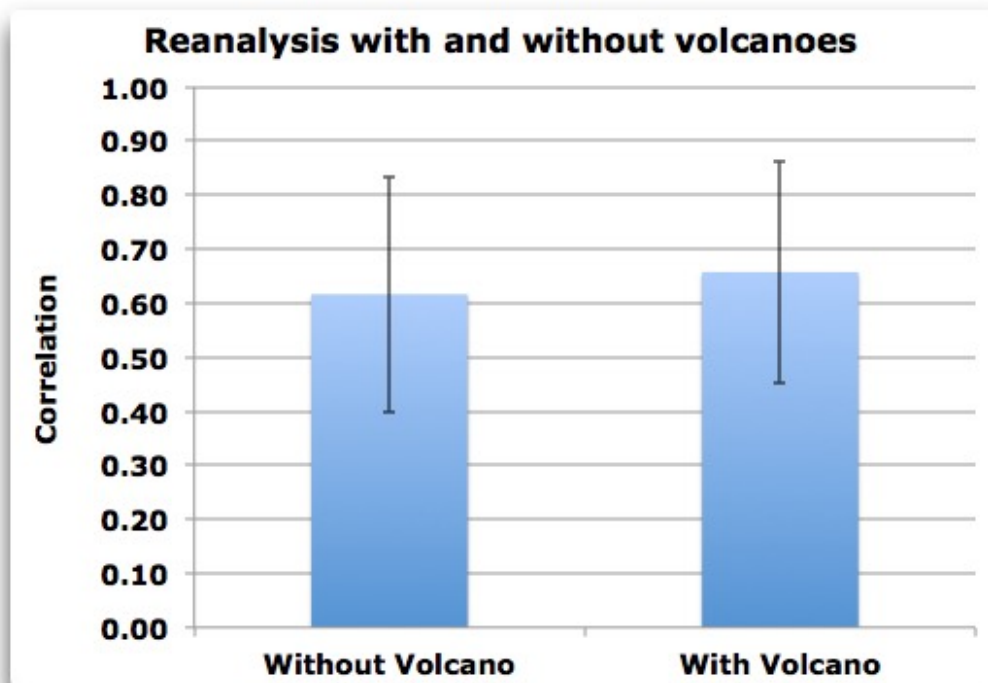


Fig. 1.

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