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Interactive comment on "Comparison of N. Atlantic heat storage estimates during the Argo period (1999–2010)" *by* N. C. Wells et al.

Anonymous Referee #1

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General comments: The paper is of moderate scientific interest, particularly in the context of the large N. Atlantic cooling anomaly 2009/10. The method is generally sound, although there are some points which need further clarification, in particular how trend uncertainties and statistical significances were estimated. The writing could do with some improvement, a thorough proof reading would not have gone amiss. There are far too many figures and tables, and many of these could be combined easily; at the moment everything is a bit disjointed, and I don't think sufficient thought was given as to how the results might best be presented.

Specific comments: 1. My major concern is with the calculation of stat. significance and trend uncertainties. In particular, how were degrees of freedom for each dataset calculated, and how was temporal autocorrelation accounted for? This is not given

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in the Methods. 2. I would prefer that anomalies were calculated by removing each dataset's climatology, rather than the same dataset from both. 3. The correlations between the datasets are interesting and useful, if alarmingly low, Regressions between the datasets would add to this by including differences in the datasets' variances. Clearly the EN3 has higher variance at high frequency, and it's possible the comparison is unfair if the TAMARA dataset can't represent those high-freq. signals. It might be fairer to compare the two datasets at the time-frequencies for which both time series can be reasonably expected to represent, using moving averages, autocorrelation functions or spectral analysis. 4. Too many figures and Tables. The information in Table 1 is mostly reproduced in Figure 3, so why not just have the Figure; similarly, the info in Tables 2-5 is replicated in later figures. Figures 3 and 4 could be easily combined, as could Tables 6 and 7. I did not find reference to Figure 2 anywhere in the text.

Technical comments: 5. Page 2364, Line 7, typo: missing 'is' between 'One' and 'derived' 6. What do TAMARA and EN3 stand for (I assume they're acronyms)? 7. Lots of different superscript symbols occur for 'degrees' throughout the text, none of them correct. 8. Page 2366, Line 26, typo: missing 'the' before second 'Argo' 9. Page 2367, line 12, grammar: 'data' is plural, so 'comes' should be 'come' and 'is' should be 'are' 10. Page 2367, line 24: why 4 standard deviations? 11. Page 2369. line 15: 'Of these Argo floats...' Of what Argo floats?

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