Reviewer #2

We thank reviewer 2 for once again looking through our manuscript.

In response to the suggestion from this reviewer an extra row has been added to Table 3 to show the proportion of high and low variability regions in the extra-tropics using our standard deviation threshold. The caption for Table 3 has also been updated accordingly.

Reviewer #3

We thank reviewer 3 for taking over the reviewing of this manuscript.

In response to the suggestions from this reviewer the following changes have been made:

1. The abstract at line 23 has been changed to change 'forecasting accuracy' to 'short-range ocean forecasting accuracy'.

2. Re. SST independence for the forecasts. This has been dealt with in the response to the comment about Section 4.2.2 (see point 3. below).

3. The discussion in the Summary regarding the gap in skill between analyses and forecasts for sub-surface tracers has been modified in accordance with the reviewers suggestions so it no longer explicitly refers to this jump as 'over-fitting' and instead also considers the independence and abundance of the observations. Additionally the discussion at the end of Section 4.2.2 has been similarly modified.
   The sections of the paper that have been explicitly changed by this are as follows:

   a) The last paragraph of Section 4.2.2 (starting at line 1086) has been extended to 3 paragraphs to discusses the relative independence and abundance of both the SST and the sub-surface profile datasets.
   b) The relevant paragraph in the Summary (starting on line 1375 of the existing document) has also been reworked to no longer only talk about over-fitting. It now also summarises the discussions in Section 4.2.2 and links back to this section too.

4. The comment about emphasising the independence of the drifter observations was not addressed in the last resubmission because we felt it was already taken into account. In particular when the observations are introduced on line 918 they are referred to as 'independent' and then again on line 930 we say "It should be emphasised here that this verification is based on independent data as velocities are not assimilated by the FOAM system." (and in fact this was added as part of the last review).
   However the independence is not mentioned in Section 5 (although it is mentioned that velocities are not assimilated which is almost the same thing). In hindsight though I feel that there is something to be said for including it in Section 5 because some readers may only look at this Summary section and/or may need reminding. Therefore 'drifter-derived velocities' on line 1435 has been changed to 'independent velocities derived from drifter positions'.

5. The appendix at line 1560 has been modified to make things clearer:

   a) 'This 48 hour observation window allowed...' has been replaced with 'The addition of this retrospective assimilation cycle allowed...' as the reviewer suggests.

b) The following extra information has also been added in response to the reviewers comments '(i.e. observations arriving more than 24 hours behind time but less than 48 hours would now be assimilated which was not the case at v10)'.

In response to the other comments made by this reviewer:

1. The comment about sea-ice is suggesting that FOAM ice forecasts would not be useful on seasonal time scales. This is quite possibly true but we think that this is outside the scope of this paper which focuses on the FOAM short-range ocean/ice forecasting system.
    It should be noted here that, although the GloSea5 seasonal forecasts are initialised using these FOAM ocean/ice fields, GloSea5 uses a fully coupled ocean-ice-atmosphere model for which the exchanges over ice are very different.

2. Re. Gary's suggestion of adding a metric for the quantification of NEMOVAR fitting small-scale features better. This was not ignored in the last submission but rather we included it with Reviewer #2's request for a table to show the improvement in high variability/mesoscale areas and Reviewer #1's request for spatial correlations for the 2D maps in Figure 10. These requests led to the creation of Tables 3 & 4 which we thought answered this point.