Response anonymous reviewer #2:

We would like to thank the anonymous reviewer #2 for his/her wise and detailed comments that helped us to improve the manuscript.

General comments:

First, my main general comment about the paper is that it could be made into a much improved resource for readers by reorganising it and changing its emphasis. The authors seem to have attempted to describe CORA in terms of additional things that are done to data extracted from the Coriolis database. However, I believe that users of the dataset would prefer a more comprehensive description of the dataset. This would also improve the flow of the paper e.g. section 4 would then not need to discuss quality control (QC) checks done when data are ingested into the Coriolis database as these could be described briefly in an expanded section 3.

We have reorganized the paper to improve its structure and we have provided a more comprehensive description of the dataset. We took care of separating the description of the CORA3 data processing from the diagnostics. We have shifted the description of real time quality controls, which was previously shared between section 2 and section 4, in an expanded section 3 (3.2.1).
The sections are now organized as follow:

1 Introduction
2 CORA3 dataset content
  2.1 Data sources
  2.2 Organisation of the CORA3 dataset.
  2.3 Data coverage
3 CORA3 data processing
  3.1 Check of duplicate profiles
  3.2 Data validation
    3.2.1 Data validation in real and near real time
    3.2.2 Data Validation in delayed time
  3.3 Data corrections
    3.3.1 Corrections for Argo floats
    3.3.2 XBT bias corrections
4 CORA3 diagnostics
  4.1 Quality and known data issues
    4.1.1 Overview
    4.1.2 Particular case of Argo floats
  4.2 Global Ocean Indicators
5 Conclusion and perspectives

Second, there are a number of things in the paper that are stated without indication of the reasoning behind them. For example the spatial and temporal criteria that are used

in the duplicate check and the thresholds used in quality control checks. I would like to see more indication of why these things were chosen.

See the responses to specific points.

Third, care should be taken to define all acronyms and initialisms at first use (e.g. CLIVAR, TAO, PMEL), and to better allow for the fact that readers will not have expertise in all the areas covered by the paper (e.g. what is the MyOceanII project, what is ETOP05, what is the Hanawa XBT correction and why should readers be concerned about whether it has been applied)?

We have checked that the acronyms are defined upon their first use. We have explained them when it was missing. We have also tried to make the text more accessible to all readers.

Finally, it is indicated (page 1287, lines 20-22 and lines 24-25) that the CORA dataset is missing data before the early 2000s. Why were these gaps not filled by sourcing data from other places other than the Coriolis database? This appears to be a major negative to using the CORA dataset and some comment from the authors to address this concern would be welcome.

Subsurface salinity data from TAO/TRITON PIRATA and RAMA buoys are missing in the CORA3 database before the year 2003 and there is a gap in the acquisition of TAO/TRITON PIRATA data for the year 2000. It is true that it would have been possible to fill these gaps by directly sourcing data from PMEL. However, we think that sourcing data from other places than the Coriolis database compromises our ability to release update of the CORA dataset every year. It was a priority for us that the work done for the CORA dataset does not duplicate the work done for the Coriolis database. Our general rule was first to download data in the Coriolis database and then update the CORA dataset. This will be corrected in the next versions of CORA as the complete time series from TAO/TRITON PIRATA and RAMA buoys become available trough OCEAN SITES.

Specific comments:

- The introduction tends to be too detailed and would benefit from being reworked e.g. much of the paragraph about Argo data should be kept for the later section. It would also benefit from more text that places CORA into context with the other ocean datasets. Why is it preferable for a user to make use of CORA in place of World Ocean Database, for example? Also, the first sentence does not make sense and needs rephrasing.

We have rewritten the introduction, shifting specific points to the following sections. We have also added an overview of the different existing datasets (mainly World Ocean Database and EN3 dataset), how the data are quality controlled in these datasets and which corrections are applied. We think that these descriptions will help a user to choose between the existing datasets according to its own needs.

- Page 1275, line 18 - 'quick updates of the dataset required by reanalysis projects' - what is the requirement and does CORA fulfill this?

The GLORYS (GLobal Ocean ReanalYsis and Simulation) project has carried out two global eddy-permitting ocean/sea-ice reanalyses, one (GLORYS1) on the period 2002-2009, produced in 2009, and one (GLORYS2) on the period 1992-2009, produced in 2010. The next one is planned for the end of the year 2012 and these reanalysis will be pursued in the frame of the GMES marine core Service with an update requirement of 1-2 years.
We plan to update the CORA dataset every year.

- Page 1276, line 5 - the list of references should include Gouretski and Koltermann, 2007, GRL 34, L01610 since this paper first highlighted the issue.

The reference has been added.

- Page 1278, line 16 - what are the QC checks that are done and what is the process of checking the data visually? This is important information that should be included in an expanded section 3.

All the data managed by the Coriolis data centre are first going through automatic quality checks. The Argo project defined a series of automated tests that are applied in real-time for Argo data but also for the other profiles (XBT, CTD,…).
We have expanded section 3 that now provides a description of the main automated tests. A table has been added to give the complete list of the 18 tests.
Visual checks are performed within 48 hours by an operator on the data managed by the Coriolis center (Argo floats from Coriolis DAC, data acquired on French research vessels, Gliders) as well as sea mammal's data from CEBC. Temperature and salinity of a profile are displayed and compared to neighbouring profiles and climatology (Worl Ocean Atlas 2005). This visual approach is combined with an interactive editor and quality flags for position, date or measurements can be modified if necessary.

- Page 1278, line 18 - what do all the numbers 0 to 9 mean (only 1 and 4 are defined here)?

We have added a table with the complete definition of flags.

- Page 1279, line 8 - are these pressure adjustments applied in the CORA data as this is not stated clearly?

The CORA3 dataset reflects the state of the Argo database on the GDACs ftp servers at the date of data retrievals (mid-2010 for data that span 1990-2009 and March 2011 for the year 2010). Argo DACs started to apply these pressure adjustments on the real time Argo data flow during the year 2009. During the year 2009, PIs also started to apply these pressure adjustments in delayed mode before computing the salinity adjustments. However, delayed mode processing is a long term task and some floats have not been reprocessed by the PIs yet. Among correctable APEX float in CORA3, about 27% are not corrected and 23% have a correction equal to zero. In the last case, this could be because the float does not need any pressure correction or more probably because the float has been processed in delayed mode but only for the salinity parameter.

- Page 1279, line 18 - why is the period 1990 - 2010 chosen?

The year 1990 was chosen as a start because the Coriolis database does not contain global data before this year and also because reanalysis project such as GLORYS start in the early 1990's to assimilate remote sensing data such as satellite altimetry.
The year 2010 was chosen as the end because it was the last full year available when much of the work on CORA3 was done (i.e. during the year 2011)

- Page 1279, line 18 - if some of the data included in CORA3 were downloaded as long ago as 2010, won't this have missed some of the delayed mode updates to Argo data?

Yes, the most up-to-date Argo database is found on the GDACs ftp servers and not in the CORA3 dataset. These data have been re-qualified during the validation phase of CORA3 to improve the data quality in a homogeneous way, but no data correction has been applied.

- Page 1280, line 4 - if the paper is to refer to the CORA documentation in this way, it might be useful for this to be attached to this paper as a supplementary file.

We have given more indications in the text and Table1:
Eleven 'probe types' were defined and a PROBE_TYPE code has been associated to each profile of the dataset (in an index file). Table 1 gives, for each 'probe type', temperature, salinity and depth/pressure accuracies as well as the type of the netcdf files where the data can be found.
We do not need to refer back to the CORA documentation anymore.

- Page 1280, line 10 - are any adjustments performed on MBT data? Are these included in the CORA dataset?
MBT data are not included in the CORA dataset.

- Page 1280, line 25 - is this meant to say level rather than profile? This distinction needs to be made clearer throughout the manuscript - which tests reject a whole profile and which reject individual levels? Are there QC flags provided for the whole profiles?

Each test, if fails, provides an alert on a profile. The profile is then visually checked and control quality flags of each measurement at each level are examined and changed if necessary. We made it clearer throughout the manuscript.

- Page 1281, line 1 - what are the depth and region dependent thresholds?

The depth and region dependent thresholds are those defined in the appendix 9 of the World Ocean Database 2005 documentation (Johnson et al, 2006);

- Page 1281, line 3 - why were these thresholds chosen?

This test has been set up to catch false salinity values near the surface acquired by some CTD that have not been launched correctly (i.e. with no short wait for pump start a few meters below the surface before beginning the profile). The threshold 5 PSU within 2dB has been chosen empirically.

- Page 1281, lines 4-6 - the discussion of this test is too brief and needs expanding. Why use the annual fields rather than e.g. monthly? Why is the threshold 10 times the standard deviation? Is the climatology interpolated to the profile location and levels? Are the objectively analysed World Ocean Atlas fields used (the statistical mean fields might be more appropriate given the use of the standard deviation)?

Annual climatological fields are used because the seasonal ones are only defined for the first 1500m. However, the standard deviation takes into account the seasonal variability.
We used objective analysed fields from World Ocean Atlas, because they are less noisy than the statistical mean fields.

The climatology is interpolated at the profile position (bilinear interpolation) and at the observed levels (linear interpolation).

The 10 σ criterion has been chosen empirically to reach a compromise between visualizing a lot of good profiles (if the criterion is too strict) and not checking bad ones (if the criterion is too loose). With this 10 σ criterion about 70% of the alerts were confirmed after the visual check (i.e. at least one point of the profile was flagged as bad after the visual check). The other 30% were false alerts (i.e. none of the quality flags were changed after the visual check).

- Page 1281, lines 7-15 - this is an interesting test that deserves more discussion. There are some issues with the current way it is described: the word bias is used, which implies that the offset calculated using this equation is an error. However, it may be real and I suggest using a different word.

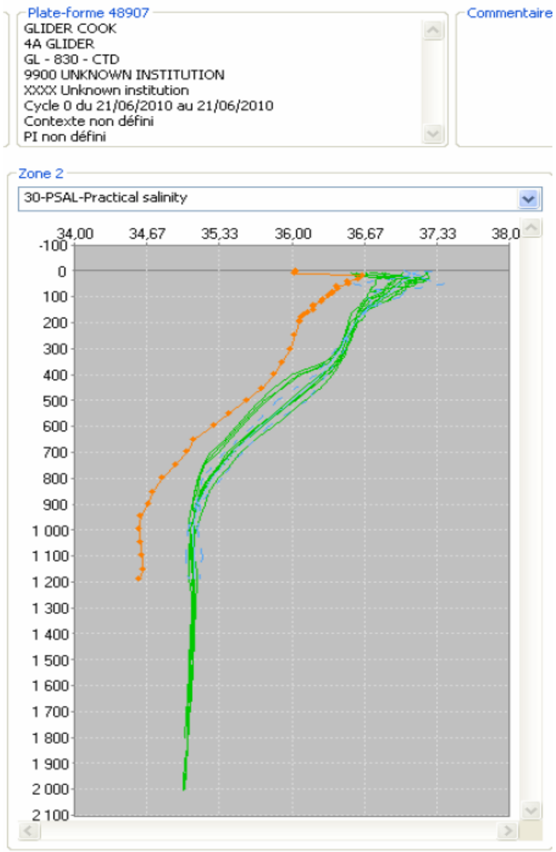
We have changed the word *bias* by the word *offset*.

Why is it the standard deviation that is averaged to give the threshold (rather than average the variance) and why is 3 times the standard deviation used?

It is true that it would have been more correct to use the averaged variance instead of the averaged standard deviation. However, there is no impact on the results of this test. Indeed, averaged standard deviation over depth is always smaller than the root mean square of the averaged variance over depth. As a consequence, our threshold computed with the mean standard deviation was stricter than if we had used the averaged variance. Then, we get more profiles with an alert, but as the quality flags are put by hand when each suspicious profile are visualized, correct data have not been excessively flagged as bad with this test.
The 3 criterion has been chosen empirically. With this criterion, 80% of the alerts were confirmed after the visual check

Finally, I am slightly unconvinced about the example given in Figure 1. Were any checks done against other profiles in the area that confirms this profile to be wrong?

We have chosen to give this example, because this profile was only invalidated by the offset test. But, it is true that this profile is only reaching down 500m depth and therefore it is difficult to say whether the PSAL offset is a bias without any other check. However, all the salinity profiles from this platform (a glider that did about 10 profiles a day during 15 days) shows the same offset compare to the climatology interpolated to the profile position. The figure below shows a salinity profile made by this glider and reaching down 1200m (in orange). It is compared to nearby profiles (close in time and space) mainly from Argo floats (in green).
These kinds of checks are always made before deciding to flag the data as bad in the CORA3 dataset.



Page 1282, first paragraph - this needs expanding. What are the previous systematic checks? How are the profiles verified?

We further control Argo floats pointed out several times by the previous tests and comparison to climatology (the ones described before) and those pointed out by comparison with satellite altimetry.

Those floats are verified systematically over their whole life period to ensure a homogeneous quality control for all profiles. Profiles of an Argo float are plotted against the climatology and visualized one by one, each profile been compared to the previous and the following profiles. All the profiles of the same float are plotted on a ϴ-S diagram and control quality flags are modified if necessary.

- Page 1282, line 9 - the GLORYS renalysis only covers a limited time span of CORA3. Does this affect the quality of data outside this span? Could an alternative reanalysis be used that covers the whole period?

In the early years of the time period (1990 to 1992) the number of observations is rather small and the reanalysis is poorly constrained by in situ observations. This means that the quality control based on innovation is less efficient than during the observation rich years of the "altimetric era" (1993-present) where there is a constraint by both in situ and altimetric observations. During the 3 first years, CORA3 data base certainly includes some suspicious in

situ profiles that could have been partly identified with a reanalysis starting earlier but we do not think it will affect significantly the overall quality of the data base. Based on Figure 4, we can say that it would concern less than 0.5% of the profiles.
For the year 2010, it is true that the help of a background check from a reanalysis would have improved the quality of CORA. It is planned to bring future GLORYS reanalyses closer to real time and to cover this year. So it will be possible to remove from next CORA data base version the suspicious profiles identified in the future reanalysis.
Of course, the use of another reanalysis assimilating CORA data base (or another one) is a way to improve the quality of CORA. This has not been done in CORA3.2 but can be done for the next versions of the data base.

- Page 1282, line 18 - can the authors present any evidence to say that the assumption of a Gaussian distribution is justified?

Most of the ocean data assimilation systems (Kalman filters, 3D/4D-VAR) rely on the hypothesis that innovations are normally distributed.

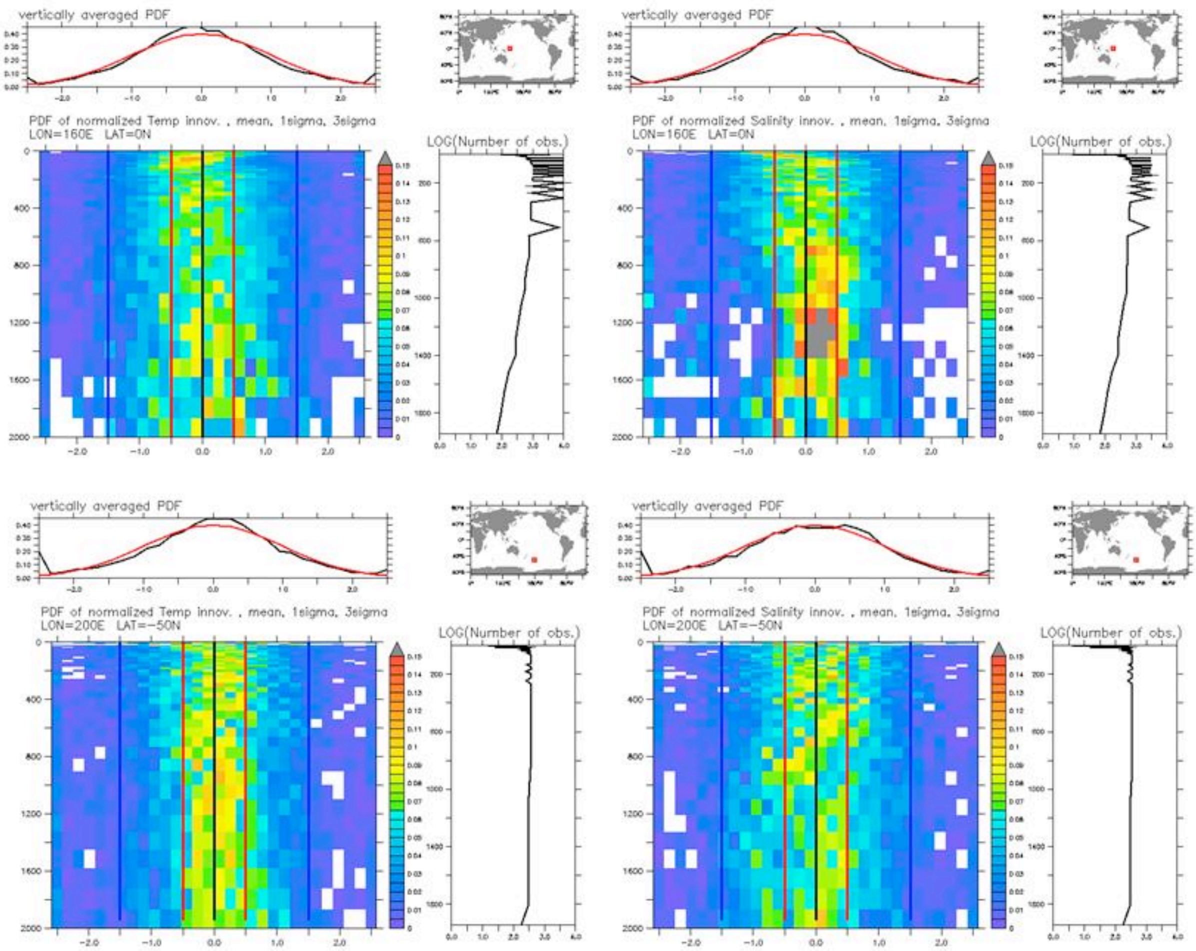
For GLORYS2 quality control presented in this paper, the probability density functions (PDFs) of the innovations have been calculated as a function of space location (x,y,z) for the global ocean. We found that in most places, innovation PDFs are very close to a normal distribution. We show below 2 examples of this check, revealing the gaussianity of the PDF.

On each panel, the upper right map shows the 5°x5° box where innovations are collected to build the PDF.

The lower right figure displays the log of the innovation number used to build the PDF(z) at each depth. The lower left panel shows the PDF(z) of the innovation at each depth. This PDF is normalized (i.e. the standard deviation is 1 at each depth, and the PDF is centered). This has been done by removing the mean from each innovation and re-scaling it with respect to it standard deviation (STD) (This has been done only to have a clearer plot). Horizontal axis unit represents normalized innovation.

The upper left figure of the panel is the vertical average (black line) of all PDF(z) (i.e. vertical mean of the lower left plot). The red line is a perfect Gaussian PDF (mean=0, STD=1).

It is clear from these plots that the innovations (temperature, salinity) PDFs are very close to a Gaussian distribution. The tails of the PDFs contain the suspicious observations.



- Page 1283, line 5 - how was this threshold decided upon?

The threshold value (0.5) in test (ii) is empirical and has been tuned in order to minimize the false alarms in the case of a model having a large forecast error (good profiles detected as bad with test (i)). A small threshold value will imply less false alarms but also less detection of bad profiles. So, one has to choose a threshold value small enough but not too small. A good compromise is 0.5.

We illustrate this with the following example:
Imagine the following conditions for a temperature observation:
model background = 16.0°C
observation= 13.2°C
truth = 13.0°C
clim= 13.5°C
T=2°C (threshold value)

This implies:
|innovation| = |13.2-16.0|=2.8°C
|obs − clim| = |13.2-13.5|=0.3°C

test (i) : |innovation| > T   is TRUE
test (ii) : |obs − clim| > 0.5 |innovation| <=> 0.3 > 0.5x2.8   is FALSE

We clearly see that test (ii) prevents having a false alarm.

- Page 1283, lines 20-22 - is anything done about the fact that too many observations are rejected during ENSO events?

It is quite difficult with the present method based on past innovation statistics to address that issue. The natural way to reduce this shortcoming would be to accumulate more innovation statistics over more El Nino / La Nina events, something which is difficult to do given the weak number of ENSO events that are well observed. This is also complicated by the fact that reanalyses have a reduced quality away from the Argo period. We do not see at present time how we could really improve this point.

- Page 1284, lines 4-5 - what happens to the profiles whose quality is difficult to evaluate (are they rejected or accepted)?

We have kept the flags unchanged for the profile whose quality is difficult to evaluate.

- Page 1284, line 12 - why is the window increased to 24 hours? Is any checking done on two profiles that are selected as duplicate to see if they are identical?

The Coriolis data centre is not only loading Argo data from GDACs but also Argo data circulating on GTS (because Argo data are generally sent more rapidly to the GTS than to the GDACs). The Coriolis data centre is checking for duplicates and deletes Argo data received from GTS once Argo data from GDAC is available. The time window is increased to 24 hours when duplicates are check between PF files (Argo data processed by DACs) and TE files (that may contain Argo data sent to the GTS) because it happened that some Argo profiles circulating on GTS were dated with the ARGOS localization date instead of the date of the profile (that can differ from several hours).

Pages 1285-1286 - the section about XBT bias corrections should either be made more comprehensive (e.g. to give a non-expert reader an understanding of what the Hanawa

correction is) or should be shortened to be a brief summary that refers back to Hamon et al. (2012) for the details of the method.
Overall, I was left confused about what has been done about applying the XBT bias corrections. Were the Hamon et al. (2012) corrections recalculated for the CORA3 dataset and if so, why? Why were some of the details changed e.g. using the average temperature in the top 400m to separate profiles rather than 200m in Hamon et al. (2012) and what is the effect of making the different choice about applying the Hanawa corrections first?

We have chosen to shorten the description of the method as it is the same as the one described in Hamon et al. (2012). The separation of the profiles in four categories is done as in Hamon et al. We separate profiles using temperature averaged over the first 200m (it was an error in our text).
However, we have not used the coefficients given in table 2 of Hamon et al, 2012 but we have re-computed them for several reasons. First, the coefficients given in Hamon et al 2012 are up to 2007 and we need them also for the last 3 years of the CORA3 dataset (2008-2010). Secondly, looking at the figure5 in Hamon et al 2012 it appears that the corrections computed for the 2000s are based on fewer collocated pairs than for the years before. We then decided to use not only CTD profiles as in Hamon et al. 2012 but also Argo, drifting buoys, and mooring buoys data (only those with quality flags 1 or 2) to get more reference profiles co-localized with XBTs. We then obtain between 6000 and 16000 collocated pairs each year between 2002 and 2010 which is much more than if only CTDs were used as reference profiles. The final reason why we have recomputed the correction coefficients is that we were not sure if the Hanawa new fall rate equation was applied or not for a large part of XBT profiles in CORA3. This is because information on the XBT model and the fall rate equation applied is missing for a large part of XBT profiles (mainly for the profiles before 1995 and for the XBT data transmitted trough GTS). We then decided not to apply the Hanawa fall-rate for XBT depth computed with the old fall rate equation. This differs from Hamon et al. 2012, where the linear Hanawa correction was first applied when possible. Thus, the coefficients computed in our case slightly differ from those given in Hammon et al.2012, because they are computed with different reference profiles and because they compensate for the fact that we did not apply the Hanawa correction first for a part of XBT profiles.

- Page 1287, line 17 - what is an ATLAS buoy and what is a next generation atlas mooring?
ATLAS (Autonomous Temperature Line Acquisition System) mooring was initiated by PMEL's Engineering Development Division (EDD) in 1984 Standard ATLAS moorings measured surface winds, air temperature, relative humidity, sea surface temperature, and ten subsurface temperatures from a 500 m long thermistor cable.

By the mid-1990's, a reengineering effort was underway to modernize the ATLAS mooring. A significant Next Generation ATLAS improvement over the Standard ATLAS is the incorporation of inductively coupled sensors for subsurface data. The sensors clamp onto the wire rope strength member that serves as one of the inductive elements. This simplifies fabrication, eliminating the themistor cable with its labor-intensive assembly and deployment procedures. Flexibility in the design also allows the interface of additional sensors including rainfall, short-wave and long-wave radiation, barometric pressure, ocean salinity and currents. The transition to NextGeneration systems throughout the array was completed in November 2001.

- Page 1288, lines 8-14 - does this mean that an entire profile is rejected if 75% of levels are rejected, or is this being done only for the purpose of the figure?

This is being done only for the purpose of the plot. We have made it clearer in the text.

- Page 1288, line 18 - ETOP05 needs to be defined and referenced. How is this dataset used (e.g. is it interpolated to the profile position)?

This dataset is interpolated to the profile position. We have added the reference.

- Page 1288, line 27 - I don't understand what a theoretical position is, please define.

The word "theoretical position" was not correctly chosen. It would have been more appropriate to say the "nominal sites" for buoys in TAO/TRITON PIRATA and RAMA arrays. The nominal position can differ significantly from the measured one because the buoy was not exactly deployed at the nominal site and/or (but to a lesser extent) because of the movement of the buoy around the anchor point. We have made changes in the text.

- Page 1289, lines 5-6 - what is meant by 'checking if the date and time are sensitive'? Please also define what the maximum allowed speeds are.

'checking if the date and time are sensitive' has been replaced by 'checking if the date and time are sensible":

· Year greater than 1997
· Month in range 1 to 12
· Day in range expected for month
· Hour in range 0 to 23
· Minute in range 0 to 59

For Argo floats, drift speed is not expected to exceed 3 $m.s^{-1}$. For XBT or CTD the platform is the ship and drift speed is not expected to exceed 25 $m.s^{-1}$. For Glider and sea mammal platforms, the drift speed is not expected to exceed 10 $m.s^{-1}$.

- Page 1289, lines 8-10 - please comment on why the percentage of bad salinity profiles changes after 2003.

After 2003, a large part of salinity profiles are from Argo floats. The percentage of bad salinity profiles among Argo floats is quite high mainly because of a problem encountered on one float type (SOLO float from WHOI with FSI sensors). However, the percentage of bad salinity profiles among Argo floats starts to be lower after 2007, once the problem was discovered and resolved. In CORA3 dataset, the percentage of profiles with bad salinity is still high after 2007 mainly because of data from coastal moorings. The quality of these high frequency moorings is difficult to evaluate with the tools we had developed, as many of them are located in areas influenced by tides or estuarine processes and thus salinity measurements are far from the open-ocean climatology. As a consequence, while running our tests, we get thousands of alerts coming from part of these high frequency moorings. As it was not possible to visualize them one by one, we decided to flag all the data from coastal high frequency moorings with an alert as bad data. We are now working on more appropriate tests for this type of data.

- Page 1290, 1291 - these pages will be difficult to understand for readers not very familiar with the Argo project. Please rewrite with this in mind and give explanations about what the different types of floats are, what is a controller etc?

We have reworked on this paragraph. We have added a more comprehensive description of the float models and sensors. We have rewritten the explanation about the Truncated Negative Pressure Drift (TNPD), which was unclear.

On page 1291, line 15 what is the '27%' referring to?

We have changed the text that was unclear: "Among them, about 27% are not corrected and 23% have a correction equal to zero."

- Page 1292, lines 1-3 - please provide a reference for this.

A reference has been added.

- Section 4.3 - I found this section rather confusing and it also needs to be made more robust. Please could it be rewritten to state more clearly what the comparison is that is being shown in Figure 12. For example, the figure has a time series marked as 'ARIVO' but this is never mentioned in the section (nor is ARIVO ever defined or a proper reference for it given). Also, since the section ends with pointing out that there are differences in trends and in the time series, it seems odd to have stated that the comparison shows good agreement and that this means that CORA does not miss too much bad data. I also don't understand what 'Differences of the 6-yr trends remain in the error bar estimation' means?

We have rewritten this part. We have also removed 'ARIVO' from the figure 12 as 'ARIVO' is the name of a product from Ifremer which consist of temperature and salinity gridded fields (Von Schuckman et al. JGR 2009). We have replaced 'ARIVO' by 'results from Von Schuckmann and Le Traon 2011'.
We have rewritten the last part of this section to state more clearly what our conclusions are:

Using the CORA3 dataset, the 6-year GSSL trend is 0.64 +/- 0.12 mm/year (or 0.58 +/- 0.10 mm/year keeping only Argo data) and lies within the error bars of the Von Schuckmann and Le Traon (2011) estimates. Although encouraging, several reasons can explain this quite good agreement. One of the reasons is that the method used to compute the GSSL is robust and not very sensitive to some possible remaining bad data in our dataset. Another reason is the possible compensatory effect in our GSSL estimate of some residual positive and negative biases. For example, Barker et al. (2011) noted that negative biases from uncorrectable (and other unusable) APEX profiles nearly compensate positive biases from correctable (but not yet corrected) APEX profiles, in the global 0-700m thermosteric sea level. Further careful comparisons and sensitivity studies are then needed to estimates GSSL with the CORA3 dataset and the users should be aware of these limitations.

- Table 1 - please provide references for the Argo float numbers.

A reference has been added.

- Fig 1 - please state what the envelope is (10 standard deviations?)

The envelope is 10 standard deviations; this has been added to the legend.

- Fig 2 - what do the flag values mean?

These quality flags of 24 are only for the purpose of the plot and indicate that this test (acceptable range) fails at some observed levels of the profile. This profile was visually checked before any flag were modified in the CORA3 dataset. After visualization, all the temperature values measured at depth below 360 m were flagged as bad data (flag 4) in the CORA3 dataset. This was clarified in the legend, so as to avoid confusion.

- Figure 10 and section about Argo data - why the higher numbers of floats with position errors in 2004-06?

During 2004-2006 there are about 0.8% of floats with position errors. Looking at these floats, most of them (80%) are handled by the Indian Dac (Indian National Center for Ocean Information Services - INCOIS) and position flags are then set during their real time controls. Whether the position errors for these floats are justified or not need to be investigated further.

<u>## Technical points:</u>

- Page 1275, line 22 - is e.g. meant rather than i.e.?

Yes**,** this error has been corrected.

- Page 1278, line 6 - National Museum of Natural History needs to be defined better (e.g. by providing a web address).

We have replaced “sea mammals equipped with CTD by the MNHN” which was not correct by “sea mammals equipped with CTD by French (the Centre d'Études Biologiques de Chizé (CEBC, http://www.cebc.cnrs.fr) - the Chizé Centre for Biological Studies -) and other European Union providers (through British Oceanographic Data Centre – BODC- and Sea Mammal Research Unit –SMRU-)”

- Page 1287, line 29 - could a website reference for NDBC be added?

The website reference has been added.

- Page 1289, line 28 - please be consistent on the use of GDAC or global DAC.

This error has been corrected.

- Figures - Unknown and gliders are spelled incorrectly in many of the figures.

These errors have been corrected.