Interactive comment on “Hydrographic data from the GEF Patagonia cruises” by M. Charo and A. R. Piola

Anonymous Referee #2
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This manuscript is an excellent example of documenting the calibration procedures for set of cruises - here for three cruises on the Patagonia shelf. The measurements taken - CTD temperature, salinity + oxygen, fluoroscence and turbidity - are detailed and the steps taken to ensure quality of the data and calibrate based on bottle samples are also documented. Thermosalinograph calibration and quality control are likewise documented. I would recommend final publication after some minor changes as detailed below.

We thank Reviewer 2 for his/her comments (in italics). Below we respond to each of the reviewer comments (in red font).

- Was there any calibration/quality control performed on the temperature sensor for the CTD?

Temperature sensor SN031691 used in GEFPAT-1 was factory calibrated in 2010. The pre-and post-cruise calibration data were used to determine the sensor drift, which was used for sensor calibration (SBE, 2010). The laboratory calibrations showed a drift correction of -0.00037 °C/year, corresponding to a temperature offset correction of -0.004ºC for GEFPAT-1 data. Applying this temperature offset correction; the averaged conductivity and salinity differences are -0.00035 S/m and 0.00011, respectively. The GEFPAT-1 CTD data were recalibrated accordingly and the revised data submitted to NODC.

Temperature sensor SN2951 used in GEFPAT-2 and GEFPAT-3 was factory post-calibrated in 2009. The resulting drift temperature correction was -0.00006 °C/year corresponding to an offset correction of -0.00004ºC and -0.00007ºC for each cruise, respectively. These temperatures offset corrections are lower than sensor resolution (0.0002°C). Thus, the temperature data from GEFPAT-2 and GEFPAT-3 do not require calibration for drift.

Temperature sensor SN031689 (secondary sensor for GEFPAT-3) was not factory post-cruise calibrated.

Reference

SeaBird Electronics Inc., Application Note NO. 31, Computing Temperature and Conductivity Slope and Offset Correction Coefficients from Laboratory Calibrations and Salinity Bottle Samples, Sea-Bird Electronics Inc., Bellevue, Washington, USA, 7 pp., February 2010.

- The accuracy/precision of the instruments in table 1 should be given, especially for salinity and oxygen - to give some idea of the size of the performed calibrations relative to the accuracy of the instruments. Please give the accuracy of the

conductivity sensor relative to the practical salinity scale, since calibration results are given on this scale.

The manufacturer quoted values are given in Table 1.

- the authors note that there were numerous instances when the thermosalinograph was subject to biofouling or other disturbances. The authors apply a smoother with an 11 step window to the thermosalinograph data. If this smoother is applied to biofouled sensor data without removal of bad data, it can have the effect of smoothing the biofouled data, possibly with good data, leaving data which does not appear to be erroneous, but is skewed toward the biofouled data. Was any type of bad value removal for biofouling applied before the 11 step window smoother?

The calibrated thermosalinograph and surface CTD data were overlaid to identify suspicious data. Bad data were removed before smoothing the data. This is now clearly stated in the revised manuscript.

- fluorescences and turbidity were measured during some of the cruises. It is noted in the manuscript that these variables were reported with factory calibration only. What was the purpose of taking the fluorescence measurements if no calibration was performed? Wny were no bottle samples utilized for fluorescence calibration? Are the fluorescence measurements useful without calibration? I confess I know little of turbidity measurements. Do they need to be calibrated (beyond factory calibrations)? Are they useful without calibration? What was the purpose of the turbidity measurements?

Fluorescence and turbidity sensors were collected as complementary information; particularly fluorescence data were used to monitor the distribution of phytoplankton in water column. Though the data have not been formally calibrated the fluorescence provides useful qualitative information on the vertical distribution of phytoplankton. These data were used to select plankton sampling levels. Most of the chlorophyll observations were collected at the surface, preventing the fluorometer calibration.

Furthermore, the measure of the degree to which the water loses its transparency (turbidity) qualitatively could indicate algal blooms or re-suspended sediments from the bottom.

- Figures 2-5 show residuals after calibration. It would be instructive to also show the residuals before calibration - to give an idea of how important the calibration were to the use of the data. Likewise, table 2 should give pre and well as post-calibration residual between bottle samples and CTD.

We have included the pre-calibration differences in Figs. 2, 3 and 4 and in Table 2. However we have removed the secondary sensors from GEFPAT-3 in Fig. 2 as otherwise the figure is too confusing.