

## ***Interactive comment on “From pole to pole: 33 years of physical oceanography on board of R/V POLARSTERN” by Amelie Driemel et al.***

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Received and published: 9 February 2017

This paper describes a significant data set comprising over 10,000 CTD casts collected with various different CTD instrumentation over 33 years since 1983 by the RV Polarstern, with the majority of the data collected in particularly data sparse regions (Arctic and Antarctic). It reviews the data collection, calibration and processing techniques used, and describes how these have changed since the first cruise. It is not only interesting, but also valuable, to see how the instruments and technology have changed with time – and provides an insight into working methods of the past (for example, manually typing in supporting information, processing when back on land) in comparison with current procedures.

The data set is well described, stressing the importance of careful calibration, docu-

C1

mentation of procedures/methodology, importance of metadata (e.g. in particular the instrument type); all indications of good practice. This means that these data can be used with confidence in the future as a research resource in their own right, but added value will be gained by combination with CTD (and other) data collected on additional cruises, and if at all possible, they should be contributed to global and regional data compilations if this has not already occurred (e.g. CLIVAR & Carbon Hydrographic Data Office (CCHDO), World Ocean Database/World Ocean Atlas, ICES Oceanographic Database, SeaDataNet, etc.).

As noted above, this is a significant data set. The calibration and processing methodologies for the different instruments are carefully described. Although the accuracy of the earlier measurements is lower than for the more recent ones (as one would expect), considerable care has been taken over the data collection and subsequent calibration and processing: thus, overall the quality is high. Figure 4 is helpful in indicating how the error bars have decreased with time for the salinity measurements, especially since the introduction of the SBE911plus CTD. For the more recent cruises, where extra parameters have been measured (e.g. dissolved oxygen, chlorophyll fluorescence, attenuation/transmission), it would be helpful to know if any calibration/processing/quality control has been carried out on these; this would benefit potential users. The paper rightly emphasises the importance of sufficient accompanying metadata to enable appropriate interpretation of the data sets – in particular the value of instrument details (e.g. manufacturer, type and specifications). The quality codes, their description, comments and suggestion of what the data would be suitable for is certainly useful.

The data are archived with PANGAEA and are accessible via the identifier given: this leads to a page giving the overall data set citation, and a link to a table giving cruise leg level information including principal investigator, number of observations taken, CTD type, geographic region (with a link to a map), link to the cruise page and the data, and the quality code for the data collected on that cruise leg. Whilst this is quite clear, and straightforward if data from one (or a small number) of cruises is required, it would

C2

be more convenient if the entire data set could be downloaded with one “click”, and/or the Antarctic or Arctic collections could be similarly accessed. The data set can be used with Ocean Data View (ODV), but it is not clear if an ODV “collection” is available for immediate upload to ODV. For maximum re-use it would be beneficial to offer the data set in additional formats (e.g. CF compliant netCDF, as used, for example, by the OceanSites and modelling communities).

In summary, this is a high quality data set, well described by the paper, which can be re-used with relative ease. These data are unique in that the oceans are constantly changing, but some of the cruises have visited the same locations several times giving important insights into variability with time. These will be especially useful for further use in global ocean change, ocean modelling and climate studies. The paper includes clear information relating to the methodology used for collection, calibration and processing and indicates the quality of the data collected on each cruise leg via a clearly defined quality code. Maps are available showing the data collection locations on a cruise by cruise basis and links to cruise reports, where available, are provided. Recommendations would be to make more use internationally agreed standards (e.g. ISO, OGC, standardised controlled vocabularies) to improve interoperability thus allowing potential users to more easily consume the data through machine to machine connections, and to ensure that data are included in major global data collections, in particular the widely used World Ocean Database, enhancing this database in data sparse regions.

Please also note the supplement to this comment:

<http://www.earth-syst-sci-data-discuss.net/essd-2016-64/essd-2016-64-RC2-supplement.pdf>

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Interactive comment on Earth Syst. Sci. Data Discuss., doi:10.5194/essd-2016-64, 2016.

C3