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Biogeosciences Discussions

Interactive comment on "Inorganic carbon time series at Ocean Weather Station M in the Norwegian Sea" *by* I. Skjelvan et al.

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General comments:

As pointed out by Martha Alvarez, there are so few time-series stations in the world ocean that it is a pleasure to see a manuscript showing CT data from a time-series station near Norway at high latitude. These data are worthy to be published. However the data analysis and the discussion need to be strengthened. Today there are many studies on anthropogenic carbon estimates and they cannot be ignored. There are too many references missing.

Specific comments:

- Determining changes in Cant: In addition to the references (Brewer ...) indicated

by M. Alvarez, I would suggest to add the references Goyet et al., 1999 and Touratier et al., 2007. Then "... which has its origin in the multivariate time-series method of Wallace (1995)". The real origin is a paper from Brewer et al. 1995.

- The calculation of anthropogenic carbon presented here should at least be compared with another estimate. I would suggest to add an estimate using the TrOCA method (Touratier et al., 2007) which is very simple (it can be done quickly in an excel spreadsheet) and will provide a "complete" estimate of anthropogenic carbon concentrations (not just from 1981).

- Discussion: This long debatable discussion could be avoided and solid arguments could be shown here. An estimate of anthropogenic carbon using the mixing method (Goyet et al., 1999) allows one to quantify the contribution of anthropogenic carbon concentrations of each different water-mass to the measured location.

Brewer, P. G., D. M. Glover, C. Goyet, et D. K. Shafer (1995). pH of the North Atlantic Ocean: Improvements to the global model for sound absorption in seawater. Journal of Geophysical Research, 100 (C5), 8761-8776.

Goyet C., C. Coatanoan, G. Eischeid, T. Amaoka, K. Okuda, R. Healy et S. Tsunogai (1999). Spatial variation of total CO2 and total alkalinity in the northern Indian Ocean: A novel approach for the quantification of anthropogenic CO2 in seawater. Journal of Marine Research, 57, 135-163)

Touratier F., Azouzi L., and C. Goyet (2007). CFC-11, Δ14C, and 3H tracers as a means to assess anthropogenic CO2 concentrations in the ocean. Tellus, 59B, 318-325.

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