Biogeosciences Discuss., 4, S2505–S2506, 2008
www.biogeosciences-discuss.net/4/S2505/2008/

Biogeosciences Discussions

Interactive comment on "Coccolithophores and calcite saturation state in the Baltic and Black Seas" *by* T. Tyrrell et al.

T. Tyrrell et al.

Received and published: 24 January 2008

We thank the anonymous referee for their constructive comments.

"While the importance of carbonate chemistry and in particular low saturation states with respect to calcite during winter might contribute to the lack of success of coccolithophores, the paper does not convince me that this is the prime control. The salinity in particular seems to be as likely a candidate. I suppose that the authors will agree with me that at this stage the case can not be settled." We disagree as to the most likely cause but agree that it is not currently possible to settle the case.

Specific comments:

1. We acknowledge that the refitted constants of Mehrbach et al are generally considered more suitable for studies with natural seawater samples, but note that an ex-

ception needs to be made for low salinity waters such as those of the Baltic Sea. The Mehrbach et al constants have been developed for full salinity waters. We will explain this in the new MS. For this reason (and as explained in the response to referee 1) we do not propose to include error bars to saturation state values in figure 2.

2. All data from the central Baltic Sea are previously published and will be referenced appropriately. Data from the Gulf of Riga and Bothnian Bay were collected subsequently by one of us (Bernd Schneider and his group). The source of riverine alkalinity data will be cited in the revised MS.

3. We will add a map of the Baltic Sea showing sampling locations, and a table showing carbonate chemistry (see also response to referee 1). We do not propose to show maps of Baltic Sea salinity, but these are available elsewhere (we will cite). It is beyond the scope of this paper to present maps of Baltic Sea alkalinity and DIC; a map of the distribution of alkalinity in the Baltic Sea is contained in Hjalmarsson, S., Wesslander, K., Anderson, L. G., Omstedt, A., M., Pertillä, and Mintrop, L., 2008. Distribution, long-term development and mass balance calculation of total alkalinity in the Baltic Sea, Cont. Shelf Res. (in press), available online since December 5, 2007.

4. We will make it clearer in the revised MS that pCO_2 and C_T were measured, and other carbonate system variables calculated from them. Locations of measurements will be clearer with the addition of a map.

Interactive comment on Biogeosciences Discuss., 4, 3581, 2007.