Review on Export of calcium carbonate corrosive waters from the East Siberian Sea by Leif Anderson et al.

Anderson et al. report on recent observations of various water masses in the Arctic Ocean from the SWERUS-C3 expedition onboard the icebreaker *Oden* in July to September 2014. The nutrient and carbonate system measurements are a valid addition to the still relative scarce data set from the Arctic Ocean. The data are well presented and discussed. The paper is very well written. I have a few minor comments and recommend publication in Biogeosciences.

p. 1, lines 31-32: for the importance of pteropods you might cite, for example, Comeau et al. (2010)

p. 2, lines 27-30: 'Even if the crystals are built up of carbonate ions it is in most cases hydrogen carbonate ions (HCO_3^-) that are extracted by the organisms from seawater and converted to CO_3^{2-} internally (e.g. Findlay et al., 2011). Thus there might not be a direct coupling between the biological formation rate of $CaCO_3$ minerals and ocean acidification.' This topic has been discussed recently by Cyronak et al. (2015) and Bach (1915).

p. 3 lines 3-4: You might cite the paper on the solubility product of high-Mg calcite by Haese et al. (2014)

p. 3 lines 24-25: by measuring DIC, TA, and pH the carbonate system has been overdetermined (only stations visited after 24 August). Did you investigate the consistency of these data? (compare the recent discussion on inconsistencies in the marine carbonate system by Hoppe et al., 2012).

p. 5. 'The two major factors that impact calcium carbonate solubility in the surface ocean are salinity and pH.' The direct effect of salinity on calcium carbonate solubility is rather low, however, salinity is a proxy for total alkalinity which, together with another carbonate system parameter as for example pH, determines the saturation level.

References

[1] Bach, L.T. Reconsidering the role of carbonate ion concentration in calcification by marine organisms. *Biogeosciences*, 12(16):4939–4951, 2015.

[2] Comeau, S., R. Jeffree, J.-L. Teyssié, and J.-P. Gattuso. Response of the Arctic pteropod Limacina helicina to projected future environmental conditions. *PloS one*, 5(6):e11362, 2010.

[3] Cyronak, T., K.G. Schulz, and P.L. Jokiel. The Omega myth: what really drives lower calcification rates in an acidifying ocean. *ICES Journal of Marine Science: Journal du Conseil*, page fsv075, 2015.

[4] Haese, RR and Smith, J and Weber, R and Trafford, J. High-magnesium calcite dissolution in tropical continental shelf sediments controlled by ocean acidification. *Environmental science & technology*, 48(15):8522–8528, 2014.

[5] Hoppe, C.J. M., G. Langer, S.D. Rokitta, D.A. Wolf-Gladrow, and B. Rost. Implications of observed inconsistencies in carbonate chemistry measurements for ocean acidification studies. *Biogeosciences*, 9:2401–2405, 2012.