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Interactive comment on "A decade of dissolved sulphur compounds measurements in the southwestern Baltic Sea" *by* Yanan Zhao et al.

Anonymous Referee #1

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The manuscript by Zhao et al. deals with a long-term study (10 years data set) of the concentrations of selected dissolved and particulate sulfur species in the water column at the well-established Boknis Eck long-term observation station, Eckernförde Bight, at the transition between the North and the Baltic Sea. It addresses a so far under-investigated topic, clearly of interest for the international scientific BG community, of general biogeochemical relevance as well as consequences for the role of coastal ecosystems for the (trans)formation of climate-relevant gases. The manuscript is well written in most aspects, well structured, and I really enjoyed reading it and am waiting to see it published in a quality-improved final version. The manuscript presents original analytical data of high quality, links these results to phytoplankton indicators as well as hydrography dynamics to deepen our understanding for the controlling factors in this

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Discussion paper

part of the sulfur system. The scientific concept strongly relies on the concept of long-term data observations, but with a clear extension beyond a simple monitoring concept. Results are significant, well described, and discussed in terms of the use of literature-based knowledge. What I am missing here, however, is a reference to previous work published on benthic methane and sulfur cycling and the corresponding element fluxes from Eckernförde Bay, as well as a reference towards the potential impact of submarine ground water discharge. The authors are honest in their interpretation and the conclusions derived are justified by the sum of own and cited data. Title and abstract should be modified in a way to describe the actually measured components: For instance, no sulfide or sulfate data were measured or presented, but besides dissolved DMS compounds, also particulate phases were measured, which should be reflected by the title. Detailed comments: - L18: replace 'essential' by 'important' sources - L21: SCOPE studies on the topic? - L60: replace www links by reliable permanent sources - L123: approach (Ref?) - L127: 'hold' instead of 'true' - L495: Is there a better reference available? - Fig.1: Mention source for map details - Fig.2: Homogenize number format (e.g.'62.5') and bars given in parts e and f (captions) Mention how plots were generated (software) - Fig.6: What do you think about a further figure in comparing your results with previous studies? I would love to see that, indeed. - Fig.7: Replace all symbols by open ones, to allow for a recognition of the number of data generated - Fig.7 c: Start all text at the axes with capitals - Check the format of references: e.g. Wolfe et al. - Check for missing journals titles in the reference list: e.g., Toole et al., Rahmstorf et al., Richir et al., Song et al. . .

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