

Interactive comment on “The climate in the Baltic Sea region during the last millennium” by S. Schimanke et al.

Anonymous Referee #1

Received and published: 4 June 2012

The manuscript describes a model study on the impact of climatic extremes during the last 1000 years on the Baltic Sea. Climate forcing is obtained from a global paleo-climate model (ECHO-G) which has been dynamically down scaled by a regional climate model. The regional forcing was applied to a Baltic Sea circulation model.

This study fits well in ongoing research on Baltic Sea response to changing climate, especially since sedimentary proxy studies provide some evidence that the Baltic Sea was hypoxic even about 1000 years ago during the MCA.

Specific comments:

p. 1372, l. 14: The Baltic Sea is not an estuary. I suggest some phrases as “estuarine-like circulation”, or something similar.

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p. 1375, l. 8: I miss a few remarks about the biogeochemical model which obviously has been used in this study.

p. 1380, l. 2-4: I do not understand the message of this sentence and its relation to discussion on the NAO before. Could it be re-formulated?

p. 1380, l. 6: Use NAOI (or index) when referring to positive or negative conditions. p. 1382, l. 1: I propose to refer to Fig. 3 at this place.

p. 1384, l. 3-4: This statement seems a bit vague to me. Heat budget is not only controlled by air temperature. Moreover, wind speed, humidity, cloudiness, solar radiation etc. contribute as well.

p. 1384, l. 24: A further effect of increased wind may be a deeper mixing which is another driver for decreasing salinity.

p. 1386, l. 10: Again I doubt this statement. Freezing and melting of ice should compensate in terms of the heat budget. More important seems to me the albedo of snow covered sea ice.

p. 1389: I would like to see some remarks on the reliability of the biogeochemical model, especially under low nutrient loads conditions.

Table 2: Please specify to which temperature you are referring to (air, SST, region) and to what reference the anomalies are considered.

Fig. 7: Labels are too small.

Interactive comment on Clim. Past Discuss., 8, 1369, 2012.

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