Interactive comment on "Sea ice in the Baltic Sea – revisiting BASIS ice, a historical data set covering the period 1960/1961–1978/1979" *by* U. Löptien and H. Dietze

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Anonymous Referee #2

-R: The main goal of this paper is to describe the effort made by the authors to convert the data present in the BASIS ice data bank into the modern Network Common Data Format. In my opinion this is an extremely useful and commendable work that merits to be mentioned as an example of concrete effort to preserve historical data. Of course the type of data that constitute the BASIS data bank cannot be compared, in terms of quality level and coverage, with what we can get today with the modern technologies

but I agree with the authors when they write "BASIS is the best available information on historic ice conditions in the Baltic Sea". In other words, even if errors cannot always be quantitatively estimated and, sometime, the lacks of information is more than what is desirable, nevertheless the information contained in the "converted" data bank can still be useful for a variety of applications. For this reason I would recommend publication of the manuscript provided revisions are made to address the above specific comments below.

-A: We thank reviewer #2 (R2) for the encouraging comments and will clarify all of his issues listed below in the revised manuscript.

-R: Page 423 line 1-3: "If, however, a grid box contains a lead or the ice edge, the third digit does not encode ice thickness but, instead, encodes the fraction of open water in the box (Table 3)." How can you know that an ice edge is present? This is not evident looking at table 3.

-A: It is indicated by the first digit equaling "9". We will add this information to the revised manuscript.

-R: Page 424 Line 19. "we use the respective mean values ..." Which mean? Is the mean of all observation within a box for a fixed time interval?

-A: We use the mean values of the given ranges in ice concentrations. We will clarify this in the revised manuscript.

-R: EOF Please give some more detail about the time series used for EOF. Looking at the PC 1 in Figure 4 one deduce that the EOF was applied to the mean annual time series. Is this correct? Or rather the EOF was applied to the monthly time series and than PCs were averaged on an annual basis?

-A: Good question! We will explain in the revised manuscript that we refer to winter mean values.

-R: EOF: What about the other components? Are they below some percent significance

level? Can you just indicate which percent of variance is explained by the second EOF and, if above a selected significance level, comment it spatial and time (PC) variability?

-A: The second (third and fourth) EOF explains 10% (7% and 5%, resp.) of the variance. The respective patterns are related to rather small scale variability. We will add this information to the revised manuscript.

-R: Correlation between PC and NAO: is 0.66 the r-squared or the correlation coefficient? From the text one can argue that it is r rather than r-squared, but it would be better to specify.

-A: Thanks – we will specify that we refer to the correlation coefficient and not the r-squared value.

-R: "...the relation between the NAO index and the ice extent is nonstationary ..." in which sense? Usually when thinking about stationarity (in statistical sense) one have in mind a time series rather than a relation between time series.

-A: This was indeed somewhat misleading: with non-stationarity we refer to the fact that the correlations vary considerable depending on the underlying time period. We will add this information to the revised manuscript.

-R: "... concentrations in the Bothnian Bay are always high in winter and thus interannual variability of the ice cover is rather weak." Can you explain why?

A: We will clarify this.