Supplementary Material

Seasonal SIMS δ18O record in *Astarte borealis* from the Baltic Sea tracks a modern regime shift in the NAO

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*Supplemental Figure 1. Cross-plot of* in situ *temperature and salinity measured less than 2 km from where specimen RFP3S-47 was collected (54o47’30.1”N, 13o03’29.9”E). There is no significant relationship between temperature and salinity (n = 146, r2 = 0.02, p = 0.08), indicating that there is no seasonal cycle of salinity at our study site.*

*Supplemental Table 1. P-values from Mann-Whitney tests applied to four different subsets of the* in situ *salinity dataset. ‘Cold’ (‘Warm’) represents salinities where temperatures were below (above) the median temperature value. ‘DJFM’ represents salinities collected in December, January, February, and March. ‘JJAS’ represents salinities collected in June, July, August, and September. The sample size for each dataset is as follows: Cold = 73, Warm = 73, DJFM = 63, JJAS = 30.*

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| --- | --- | --- | --- | --- |
| *Mann-Whitney Test p-values* | Cold | Warm | DJFM | JJAS |
| Cold | **1.00** | - | - | **-** |
| Warm | 0.13 | **1.00** | - | **-** |
| DJFM | 0.56 | 0.43 | **1.00** | **-** |
| JJAS | 0.81 | 0.19 | 0.59 | **1.00** |



*Figure S2. Lagged correlation analysis between yearly-averaged SIMS δ18Oshell values and* in situ *salinity. The x-axis values represent the number of years that salinity lags SIMS δ18Oshell values. The red-dotted lines (r = ± 0.28) indicate the point at which the correlation becomes significant at the 95% confidence level (Hu et al., 2017)*