Supplementary Material

# Supplementary Figures to Biskaborn et al.



**Supplementary Figure 1.** Biplot of the first two dimensions (Dim1, Dim2) generated by multi-dimensional scaling (MDS) analysis of multiple proxy data involved in the manuscript. Samples between proxies were brought to comparable stratigraphical levels by interpolation and resampling according to their ages. We used the same data matrix used for lead-lag correlations described in the manuscript. MDS is based on Euclidean distance, data were standardized, i.e. brought to comparable value ranges using the standardization method ‘range’ in R (function ‘decostand’, package ‘vegan’, please see manuscript). Explained variance of each dimension is given at the axis label. Dim1 explains almost half of the entire data variance, suggesting relationships on the right side: diatom diversity (Hill numbers), organic matter (TOC, TN), redox-related elements (e.g. Fe, Mn), paleotemperature and light *Cyclotella* species – and on the left side of the biplot: detrital elements (Ti, K, Al, Si) and *Aulacoseira* species.

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**Supplementary Figure 2.** Pearson correlation matrix of selected proxy data involved in the manuscript using the function ‘corrplot’ in R. Positive correlations indicated in red, negative correlations indicated in blue.



**Supplementary Figure 3.** Correlation between diatom Hill’s N2 and TOC. Y-axis shows the correlation coefficient of the cross correlation (ACF = auto correlation function). The dashed blue line indicates the 95% confidence interval of the autocorrelation of the moving parameter. All cross correlations outside this limit are to be distinguished significantly from the noise of the autocorrelation of the parameter.



**Supplementary Figure 4.** Correlation between diatom Hill’s N2 and T July (pollen). Y-axis shows the correlation coefficient of the cross correlation (ACF = auto correlation function). The dashed blue line indicates the 95% confidence interval of the autocorrelation of the moving parameter. All cross correlations outside this limit are to be distinguished significantly from the noise of the autocorrelation of the parameter.



**Supplementary Figure 5.** Correlation between diatom Hill’s N2 and clay. Y-axis shows the correlation coefficient of the cross correlation (ACF = auto correlation function). The dashed blue line indicates the 95% confidence interval of the autocorrelation of the moving parameter. All cross correlations outside this limit are to be distinguished significantly from the noise of the autocorrelation of the parameter.

# Supplementary Data to Biskaborn et al.

Supplementary data is submitted separately to the Journal as Excel file.