Supplementary Material for "A causality-based method for multi-model comparison: Application to relationships between atmospheric and marine biogeochemical variables"

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1 Supplementary Figures
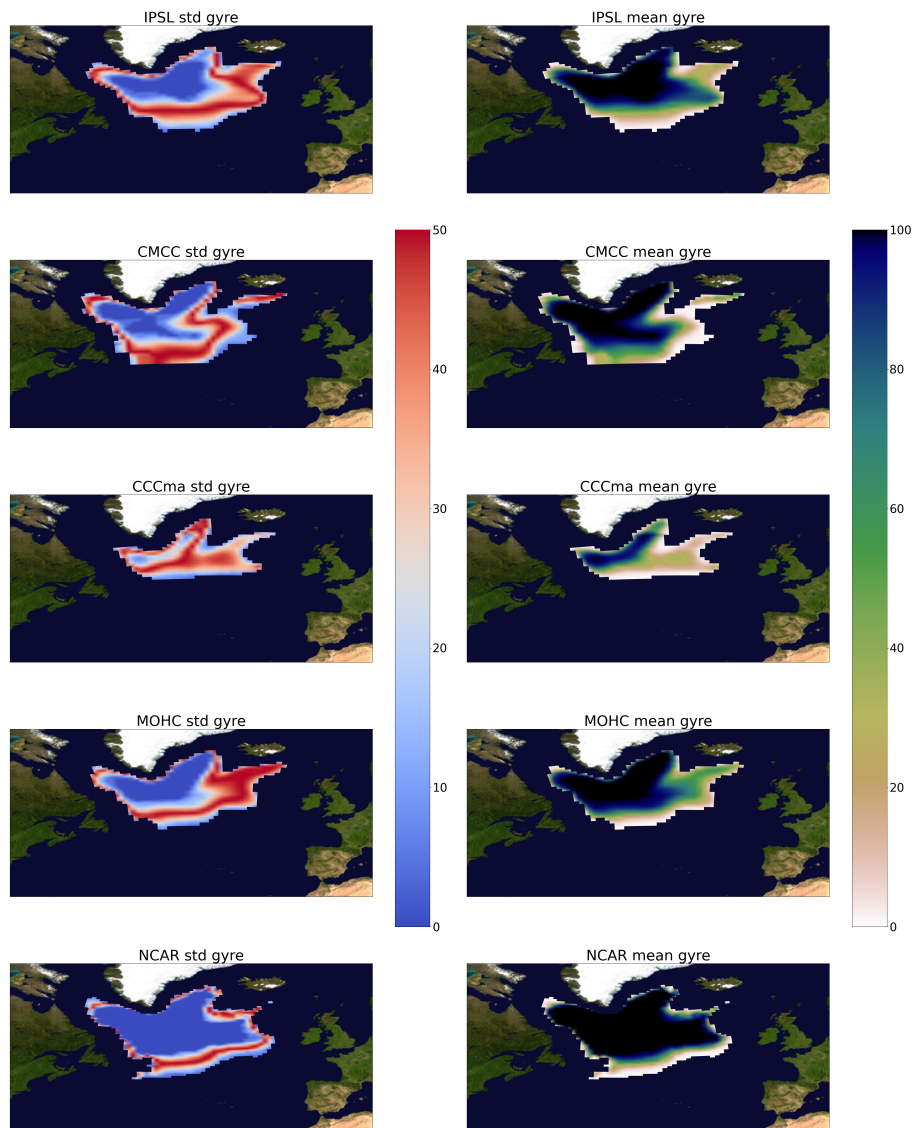
Figure S1: The subpolar gyre and its variability among the 5 Earth System models. Left column: "std gyre" indicating variability expressed by the standard deviation of appearance. The points in red are the points varying the most. Right column: the "mean gyre" metrics indicating, in percentage, how often each point is considered as part of the gyre. A grid point having 100% indicates that for each time step this point is part of the gyre. *Map credit: NASA-Visible Earth: The Blue Marble Land Surface, Ocean Color and Sea Ice*
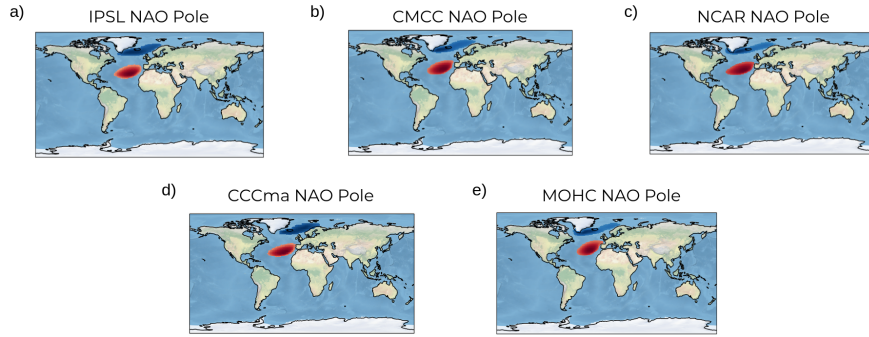
Figure S2: Sea Level Pressure poles used for the computation of the North Atlantic Oscillation index. In red the high pressure pole and in blue the low pressure one.
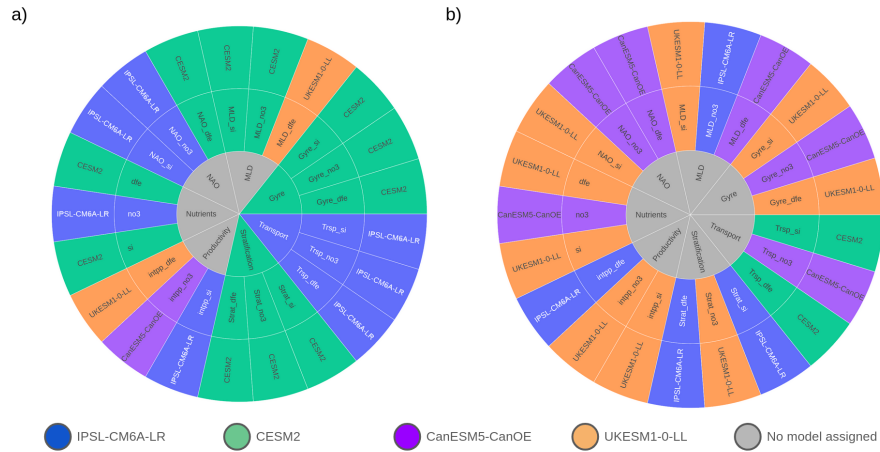
Figure S3: Most similar (a) and most different (b) models to/from CMCC-ESM2 according to dissimilarity introduced in the article. The interior circle is the variable studied. Each variable is presented for each nutrient in the middle circle. The exterior circle indicates which model is the closest/most different for this specific variable.
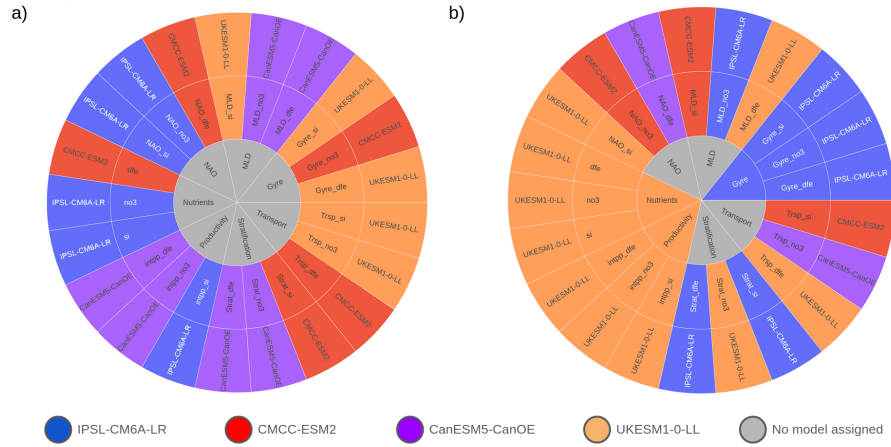
Figure S4: Same as S3 but for CESM2.
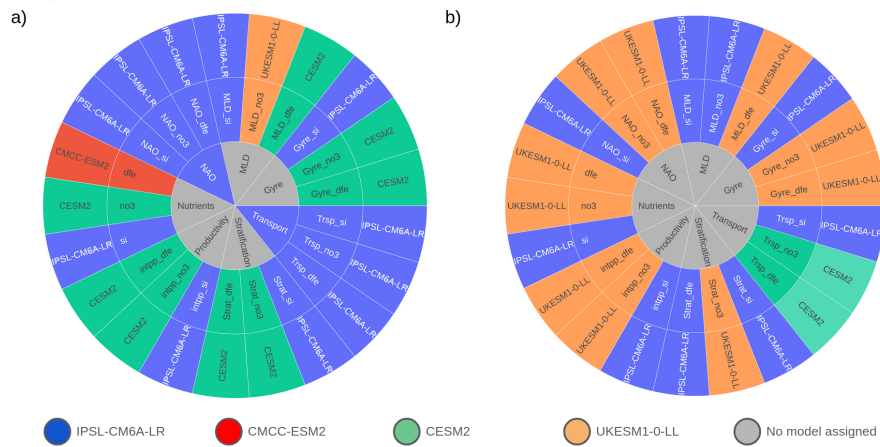
Figure S5: Same as S3 but for CCCma.
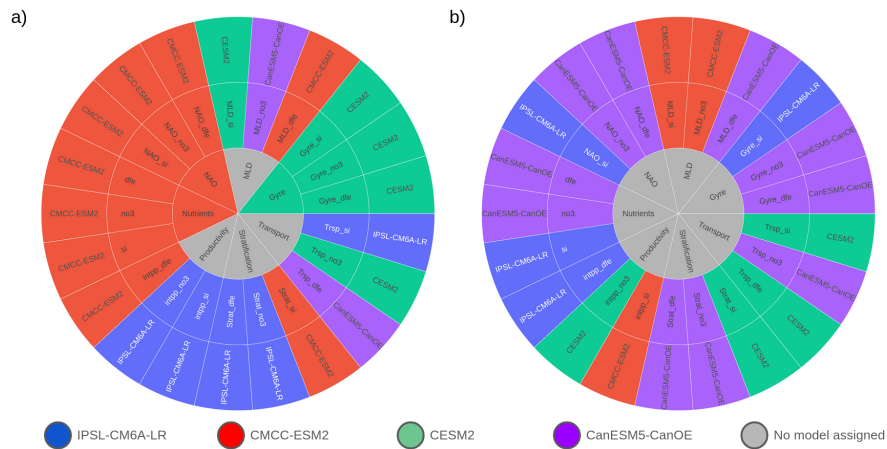
Figure S6: Same as S3 but for MOHC.
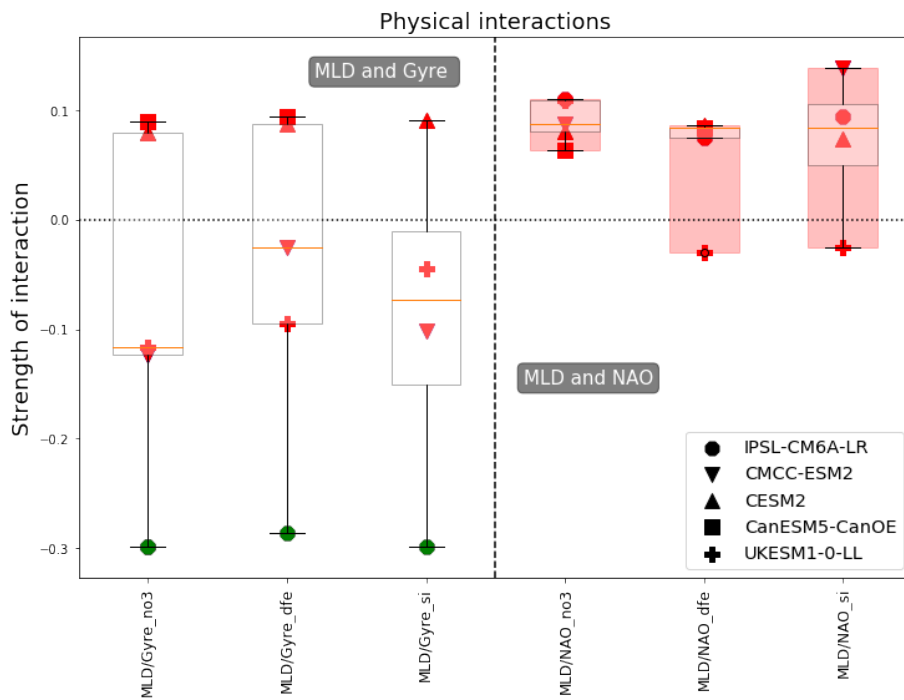
Figure S7: Additional physical interactions: Strength of links for each model with median and quartile values (boxplot). Each model is represented with a different marker and the color of the marker shows the significance of the link according to PCMCI+ (green for significant and red for not significant). Boxplots highlighted in red indicate model agreement.