

# Supplementary material for "Skilful prediction of cod stocks in the North and Barents Sea a decade in advance"

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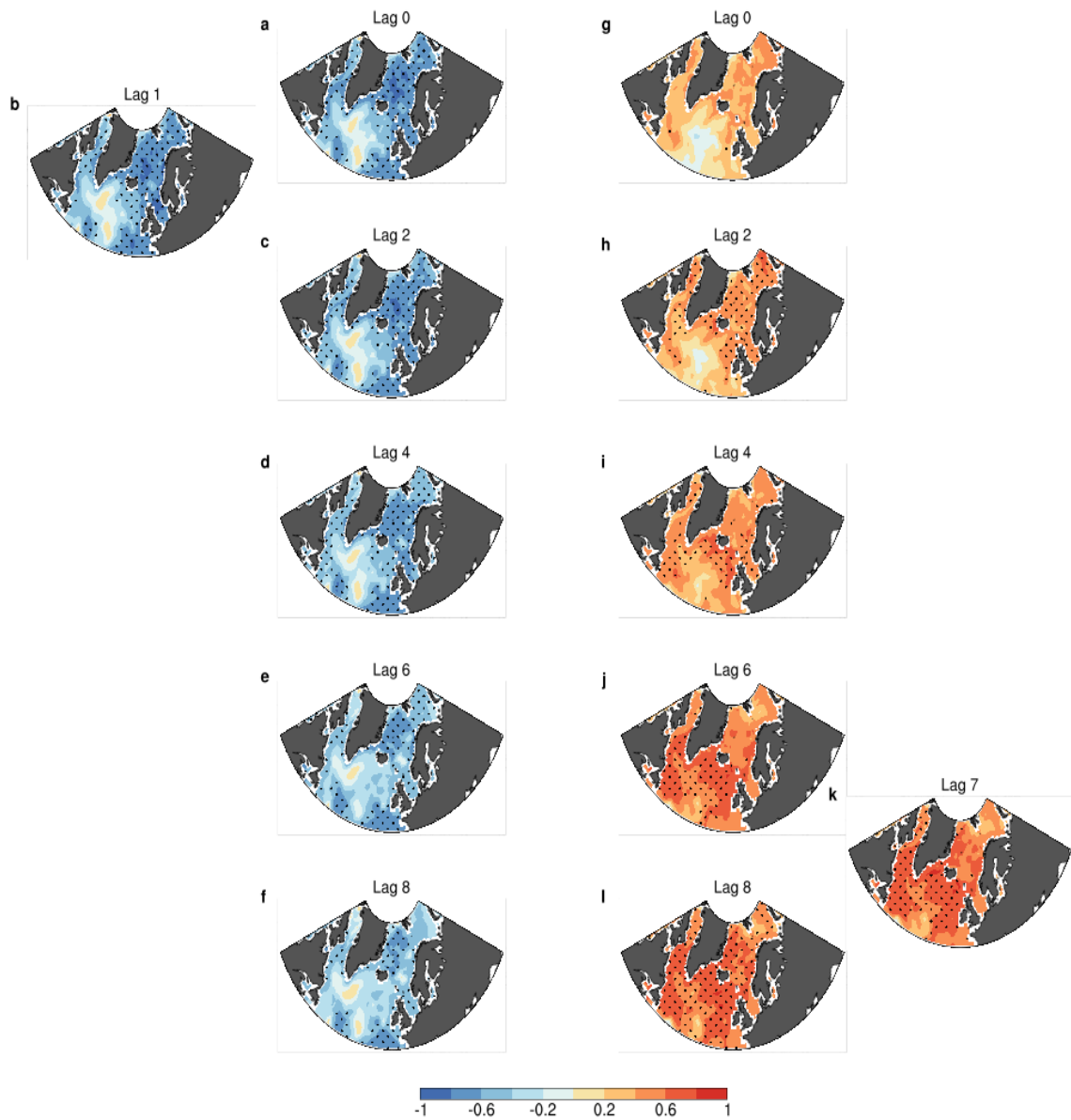
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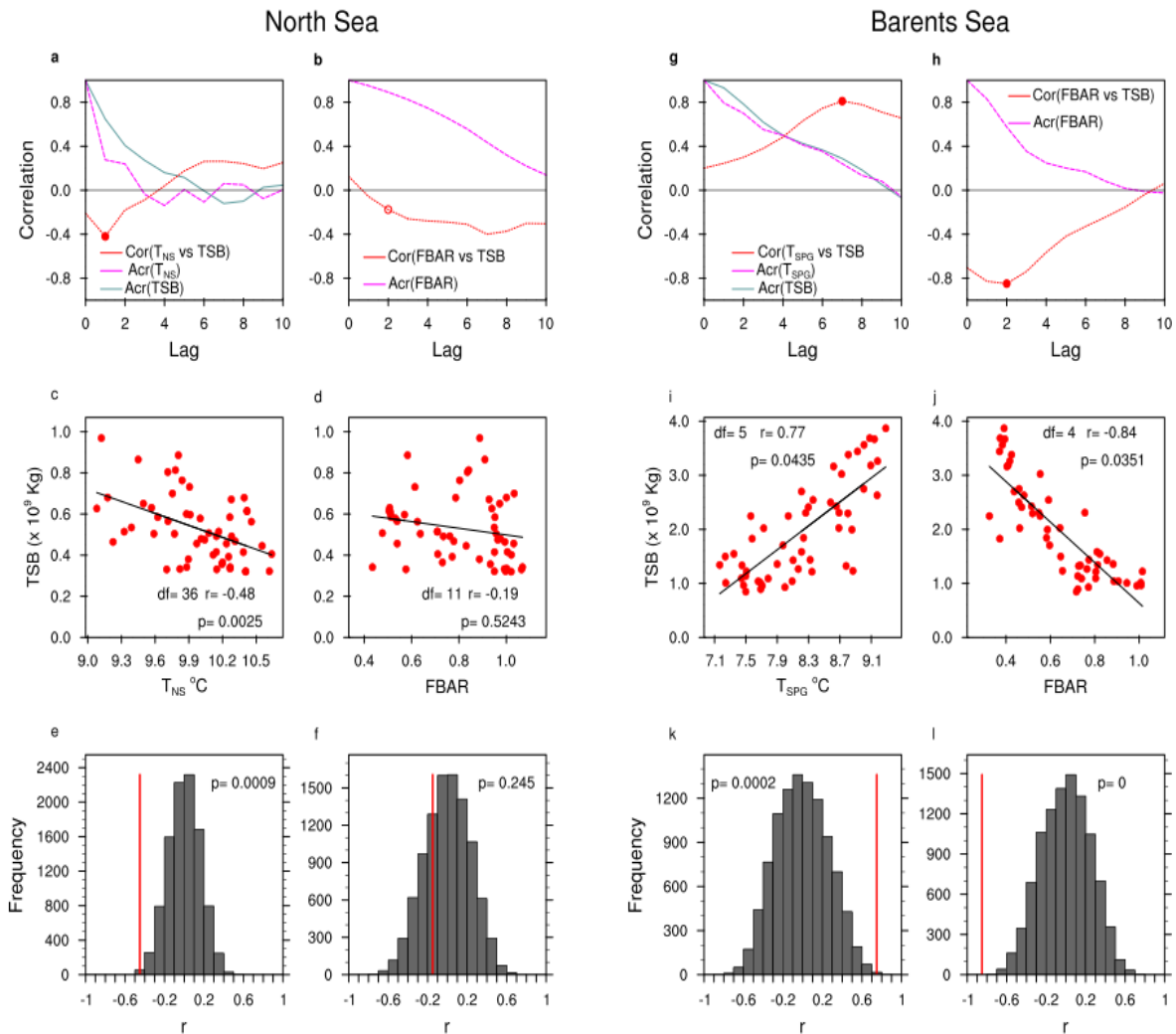
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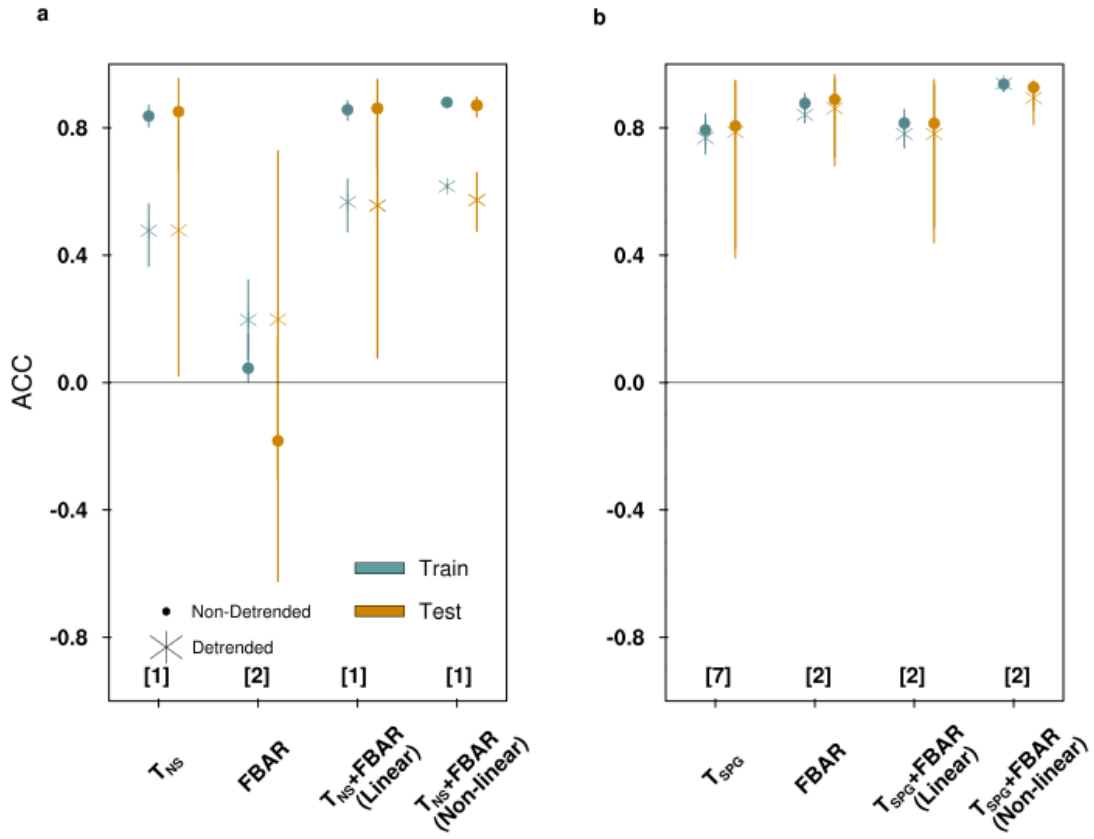
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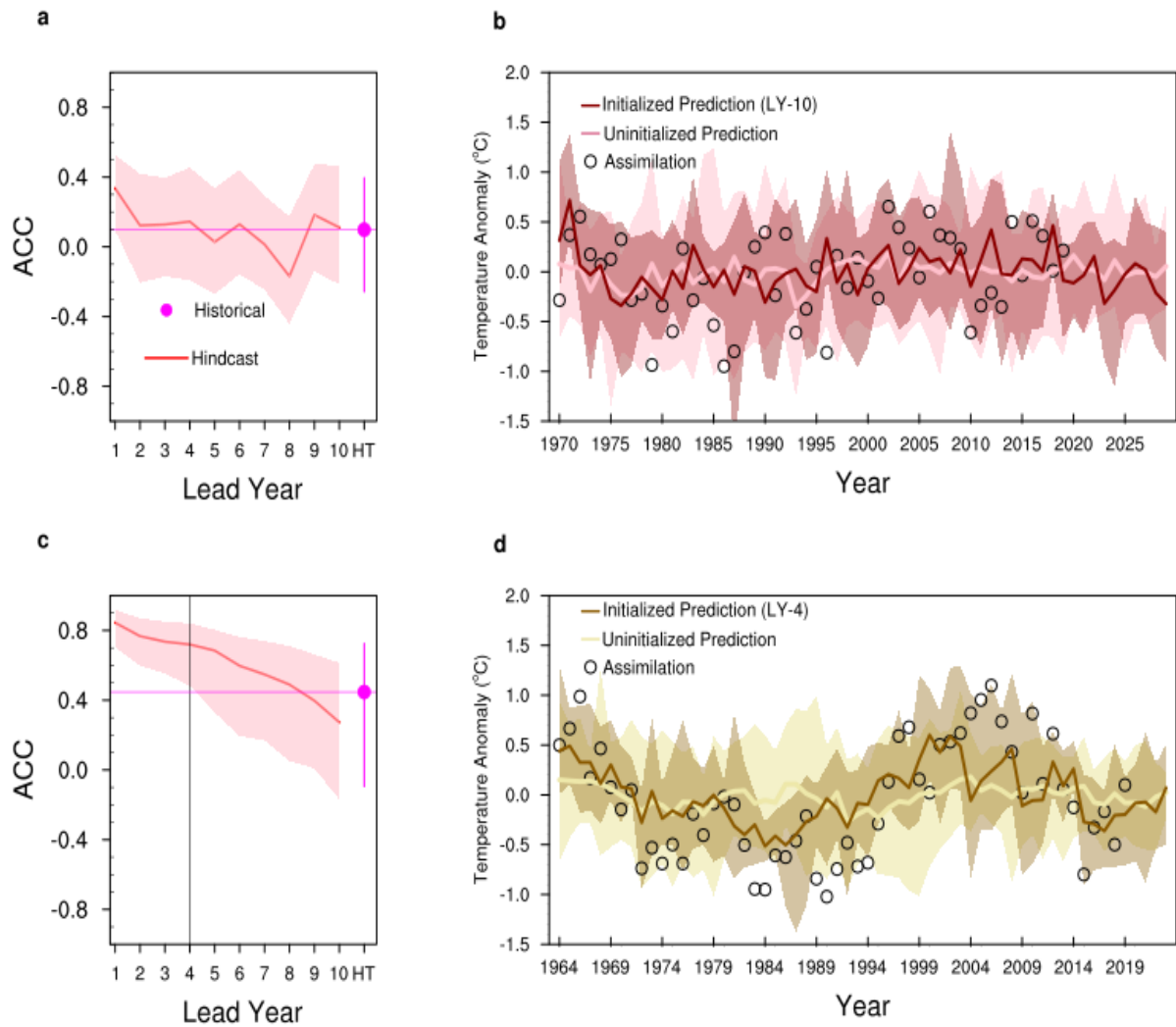
**Figure S1. Temperature-cod biomass correlation maps.** Correlation of total stock biomass and temperature at each grid point from the assimilation experiment at various lags (cod lags temperature) for (a-f) North Sea cod and (g-l) Northeast Arctic cod. The stippling indicates statistically significant correlation at 95% confidence. Linear trend was not removed prior to calculating correlation coefficients.



**Figure S2. Statistical relationships.** Auto correlation of cod-biomass, temperature and fishing mortality, and cross correlations between cod-biomass and two explanatory variables, temperature and fishing mortality for cod in **a, b** the North and **g, h** Barents Sea. For Barents Sea (i.e. Northeast Arctic cod), SPG-temperature is used as an explanatory variable. The red dots show the lag at which correlation is maximum, except for **b** where lag-1 is chosen based on **h** because none of the lag correlations in **b** are statistically significant. Scatter plot for **c** temperature versus cod-biomass and **d** fishing mortality versus cod-biomass for the North Sea, and **i, j** for the Barents Sea. Distribution of 10000 bootstrapped correlations between **e** temperature and cod-biomass and **f** fishing mortality and cod-biomass for the North Sea, and **k, l** for the Barents Sea from a random chance model. The vertical red line is the real correlation between respective variables. Linear trend was removed from each variable prior to calculating auto and cross correlations.



**Figure S3. Statistical cod prediction.** Same as Figure 2a,b in the main text but now with skill for detrended variables also shown.



**Figure S4. Dynamical prediction of detrended temperature.** Retrospective dynamical prediction of North Sea and Subpolar gyre surface temperatures anomalies (with respect to 1970-2019 mean), same as Figure 3 in the main text but with linear trend removed. The vertical line in **c** shows the lead year beyond which the hindcast skill is not significantly different from the skill in historical simulation at 95% confidence level.