

# Supporting Information for "A regime view of ENSO flavours through clustering in CMIP6 models"

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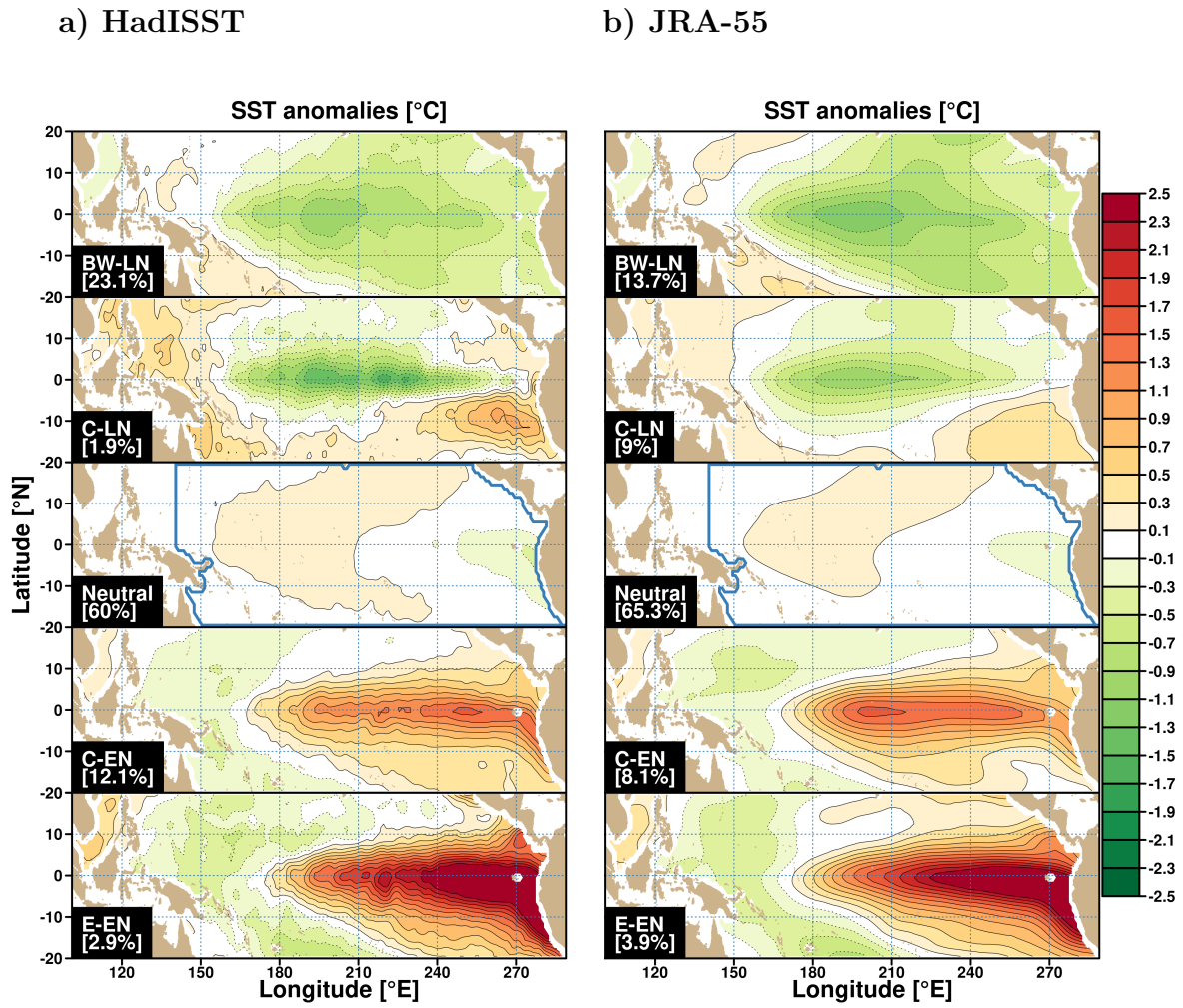
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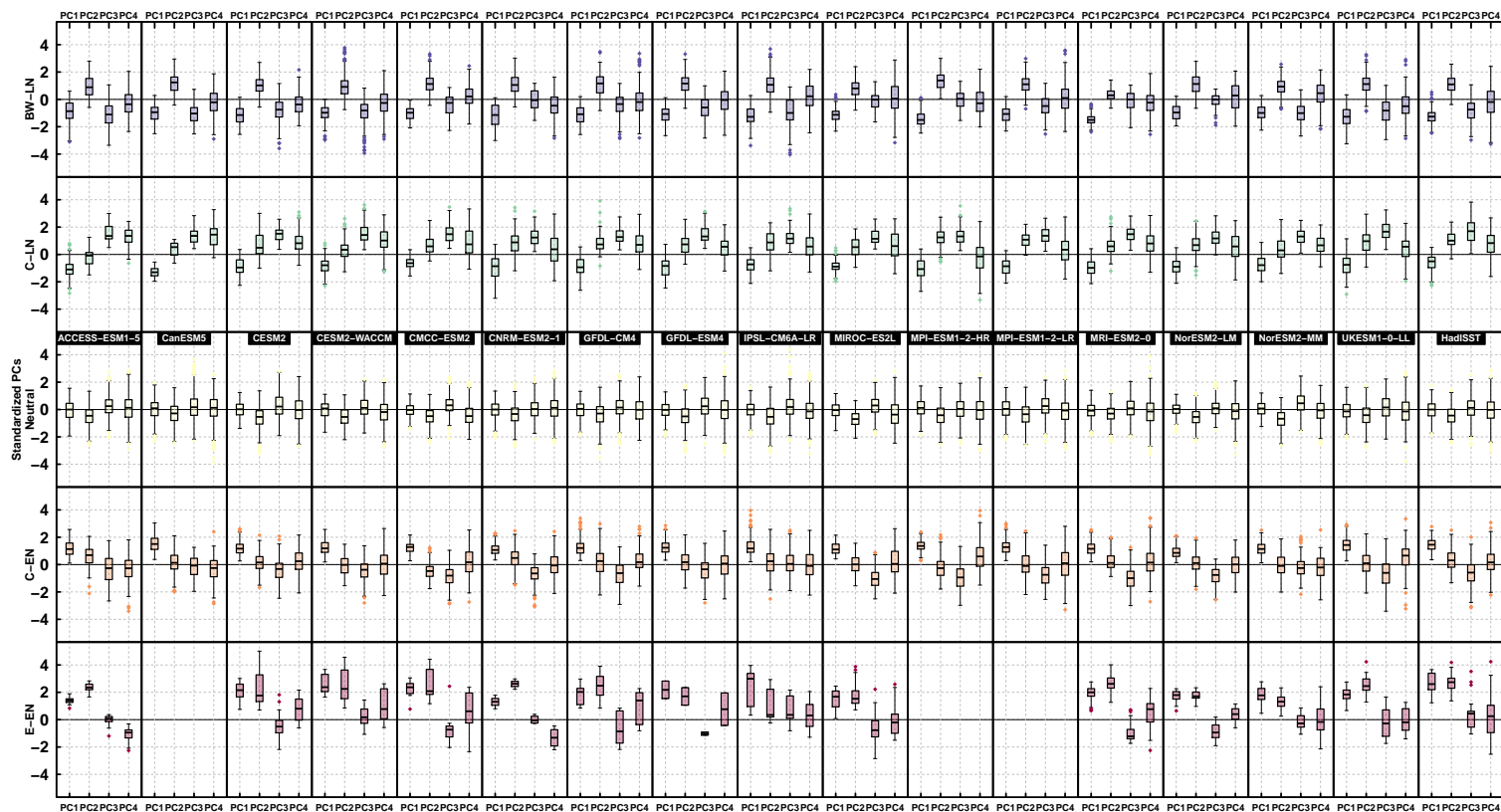
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1. Figures S1 to S7

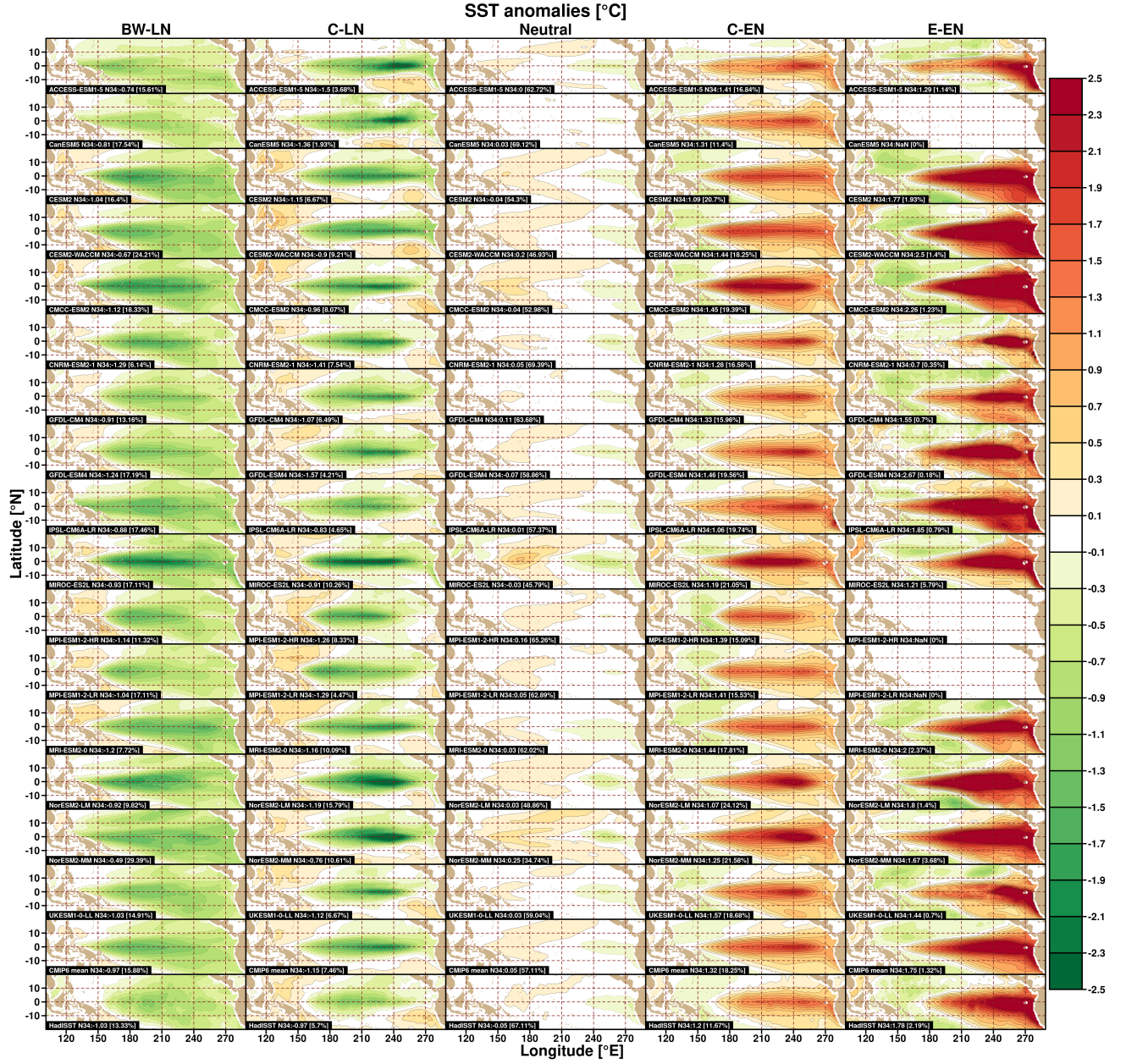
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**Figure S1.** Same as Figure 1a) but for a) HadISST taken over the 1950-2014 period and b) JRA-55 over the 1958-2019 period.

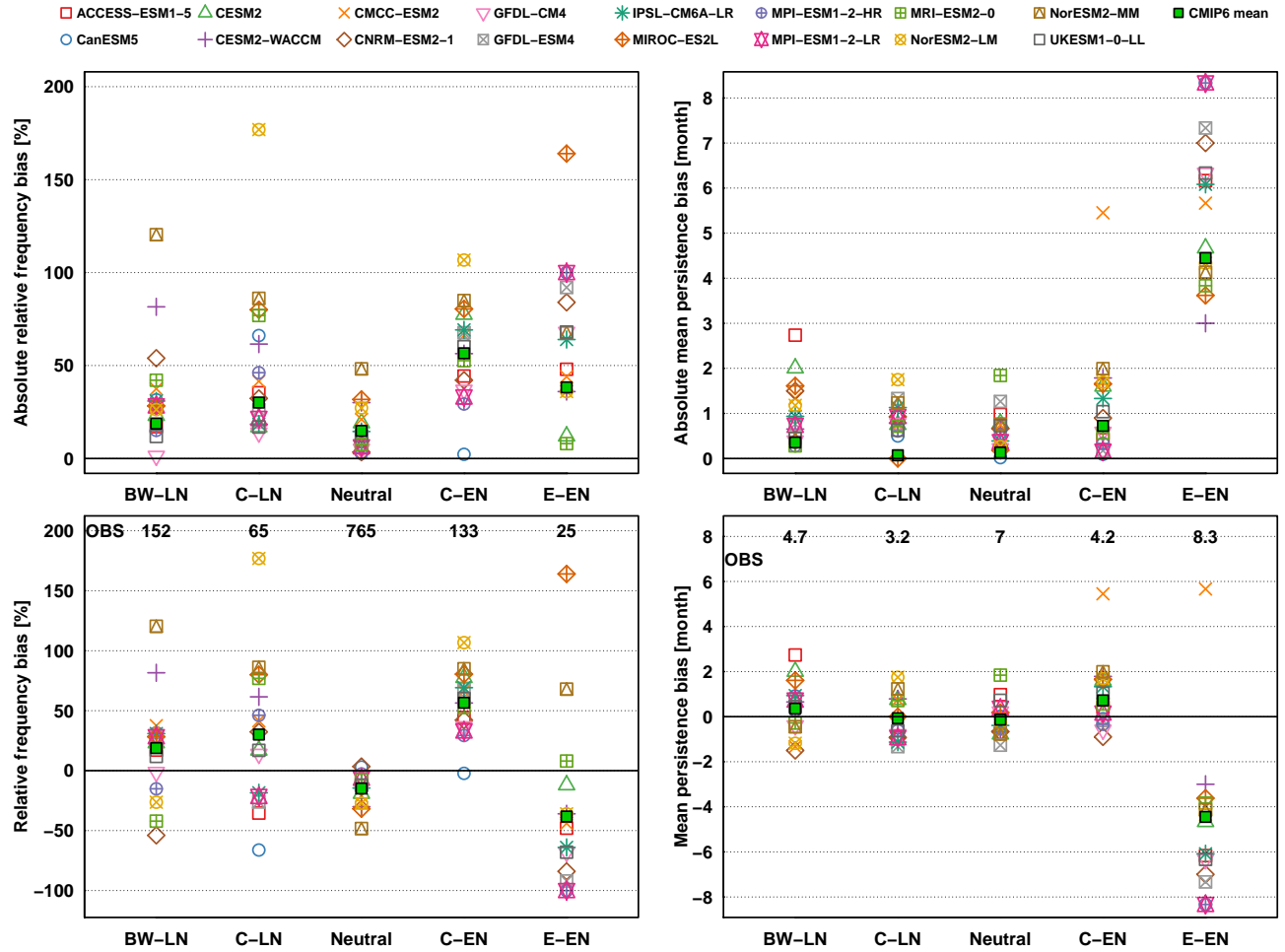


**Figure S2.** Same as Figure 1c) but for all CMIP6 models over the historical 1920-2014 period.

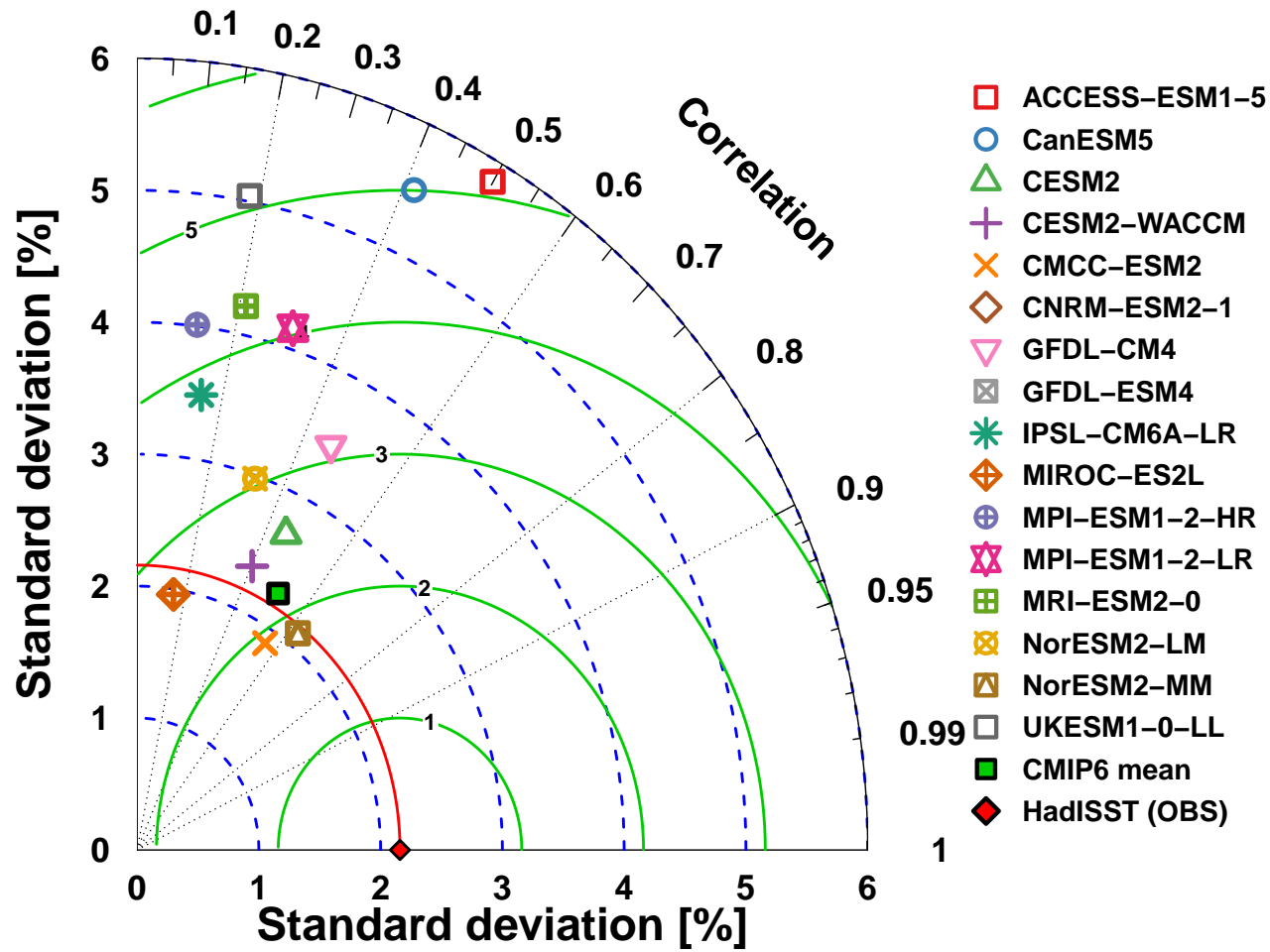


**Figure S3.** Average SSTA (in °C) maps over the historical 1920-2014 period of the five regimes (one per column) for each one of the 16 ESMs (one per row), the average of the models and HadISST (last row). The frequency (in %) of occurrence of each ENSO regime and the average Niño3.4 index of each regime are also given along at the bottom of each panel.

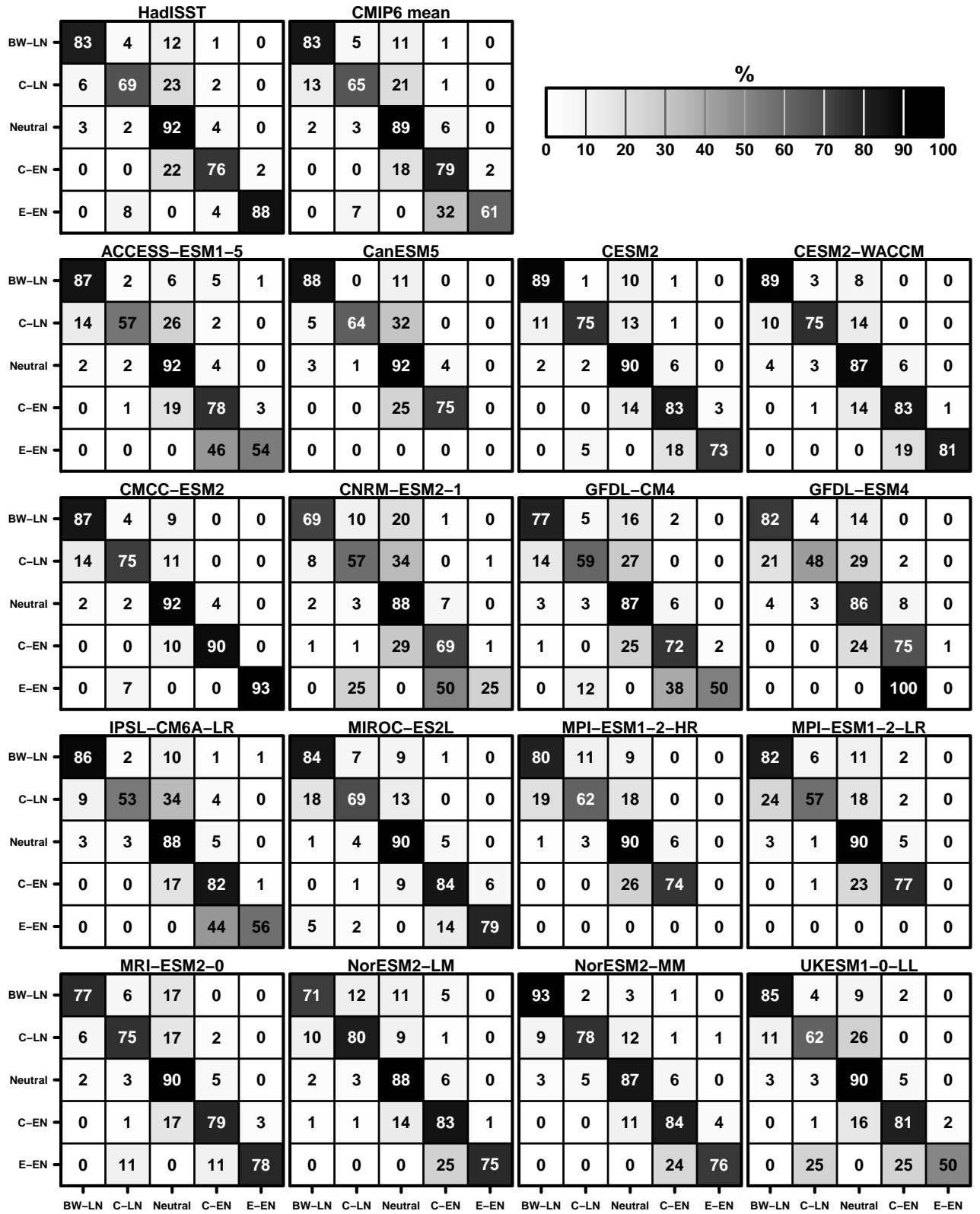




**Figure S4.** Absolute relative frequency bias (in %, *top left*) and absolute mean persistence bias (in month *top right*). *Bottom* figures give the corresponding bias values. Observed frequencies and average persistence are given in bottom panels.

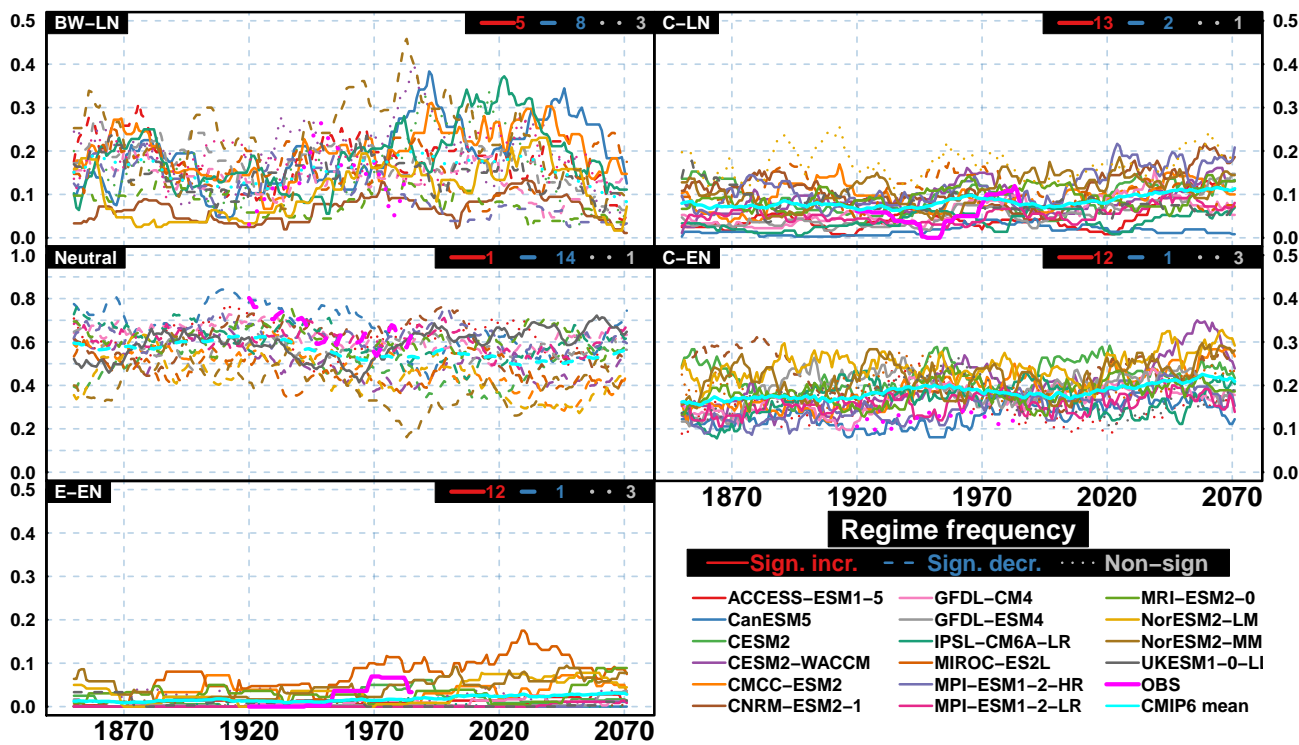


**Figure S5.** Taylor digram for the seasonal occurrence of regime. CNRM-ESM2-1 and GFDL-ESM4 are not represented for visualisation purposes; they fall out of the radius of the Taylor diagram.



**Figure S6.** Transition probability table from one regime to another for HadISST and CMIP6 models. Transition starting regime are read in rows and the ending ones are in columns. Each row add-up to 100%.

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**Figure S7.** ENSO regime frequency for the CMIP6 models and observations. A 30-year running mean has been applied to the time-series. Continuous lines indicate time-series with significant increasing linear trends, dashed lines indicate a significant decreasing trend and dotted lines stand for non-significant trends. The number of models with increasing, decreasing and no trends are given in red, blue and grey respectively for each regime.