



Supplement of

Evaluation of the CMIP5 models in the aim of regional modelling of the Antarctic surface mass balance

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Evaluation of CMIP5 models: towards regional modelling of the Antarctic surface mass balance. Supplement

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Supplement

- We show bias and crmse indexes for 31-years running periods in Fig. S1.
- As for annual *psl* in Fig. 1, we show the spatial comparison of mean climates for the 1980-2004 period for: summer and winter *ta850* (Fig. S2 and S3), summer and winter *prw* (Fig. S4 and S5), summer surface ocean temperature (Fig. S6), and winter sea-ice cover (Fig. S7).
- We compare crmse and bias indexes in Fig S8.
- We show the ranked scores and their components for each of the six selected metrics at Fig. S9 with snail plots similar as in Fig. 2.
- We compare amip and historical metrics in Fig. S10.

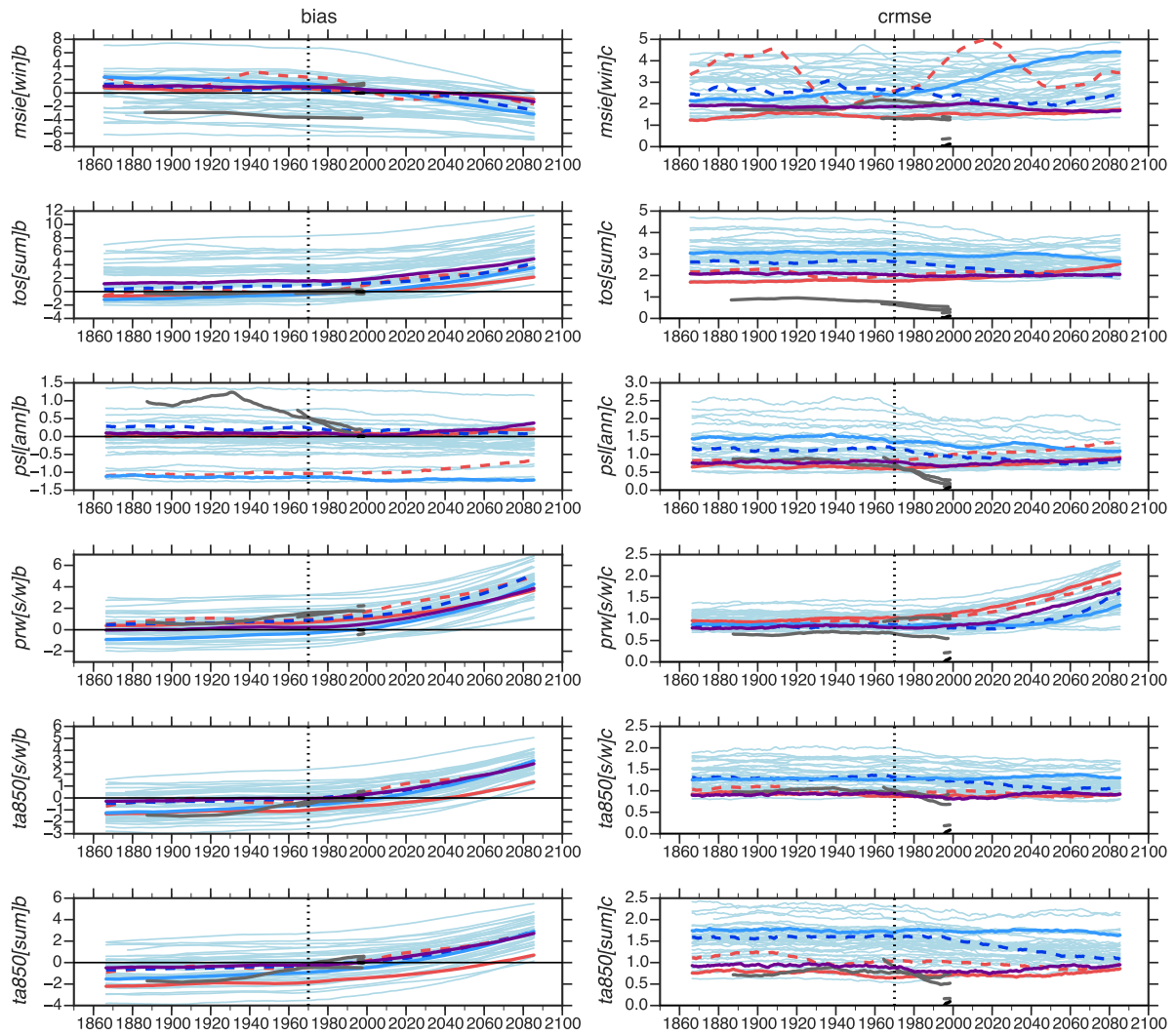


Figure S1: Bias and crmse indexes for running time-averages of 31 years between 1950 and 2100. The field of reference is ERA-Interim for the period 1980-2010. Thin light blue lines are for the 41 CMIP5 GCMs (historical+RCP85) and thick dark grey lines are for the reanalyses. The five CMIP5 GCMs with the highest scores are highlighted with thick colored lines: MIROC-ESM in sky blue, ACCESS1-3 in purple, CMCC-CM in dashed dark blue, BCC-CSM1-1-m in dashed red and NorESM1-M in red. Each point of a line is the central year of the 31-year period.

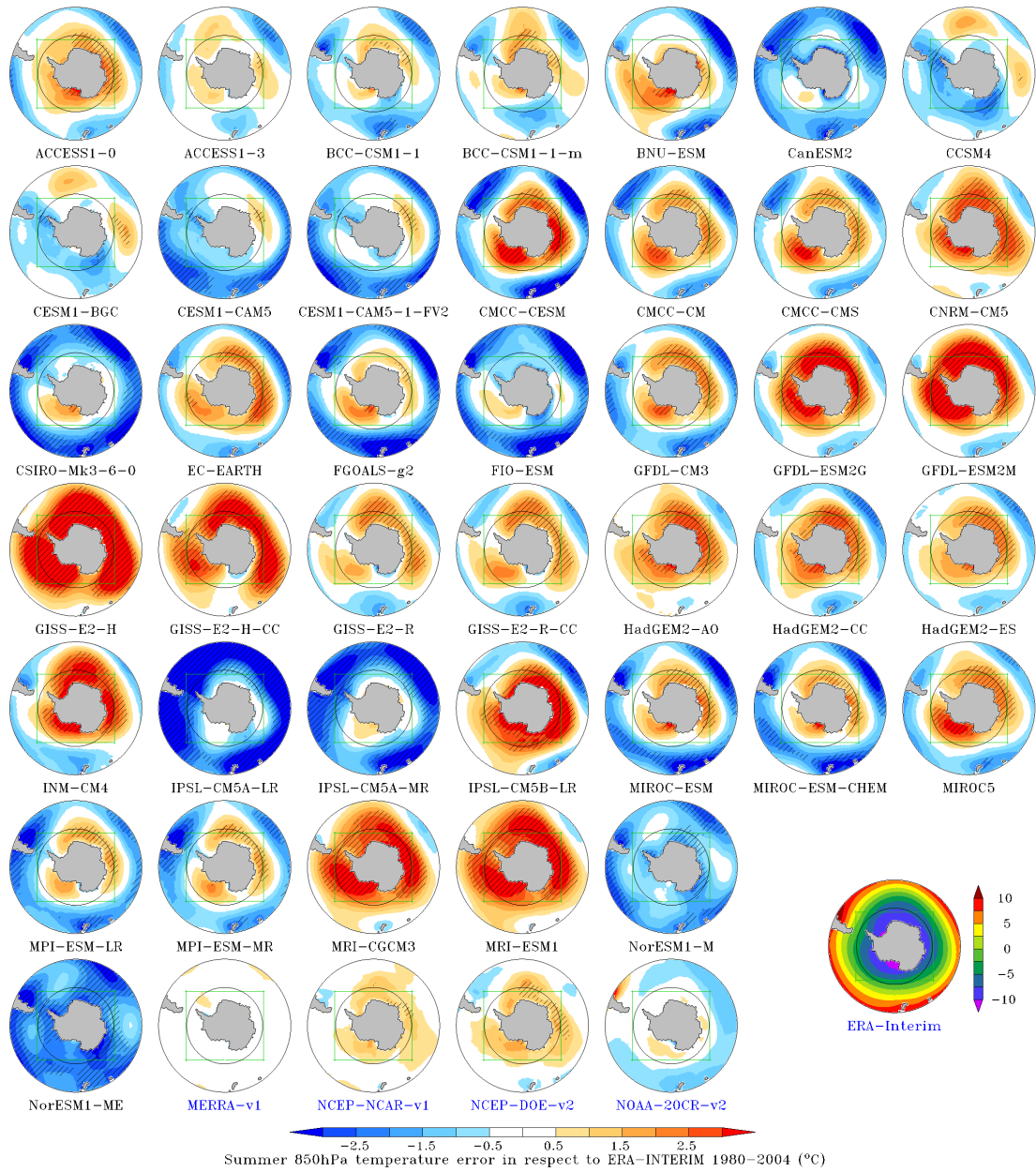


Figure S2: Same as Fig. 1 but for summer air temperature at 850hPa (in °C).

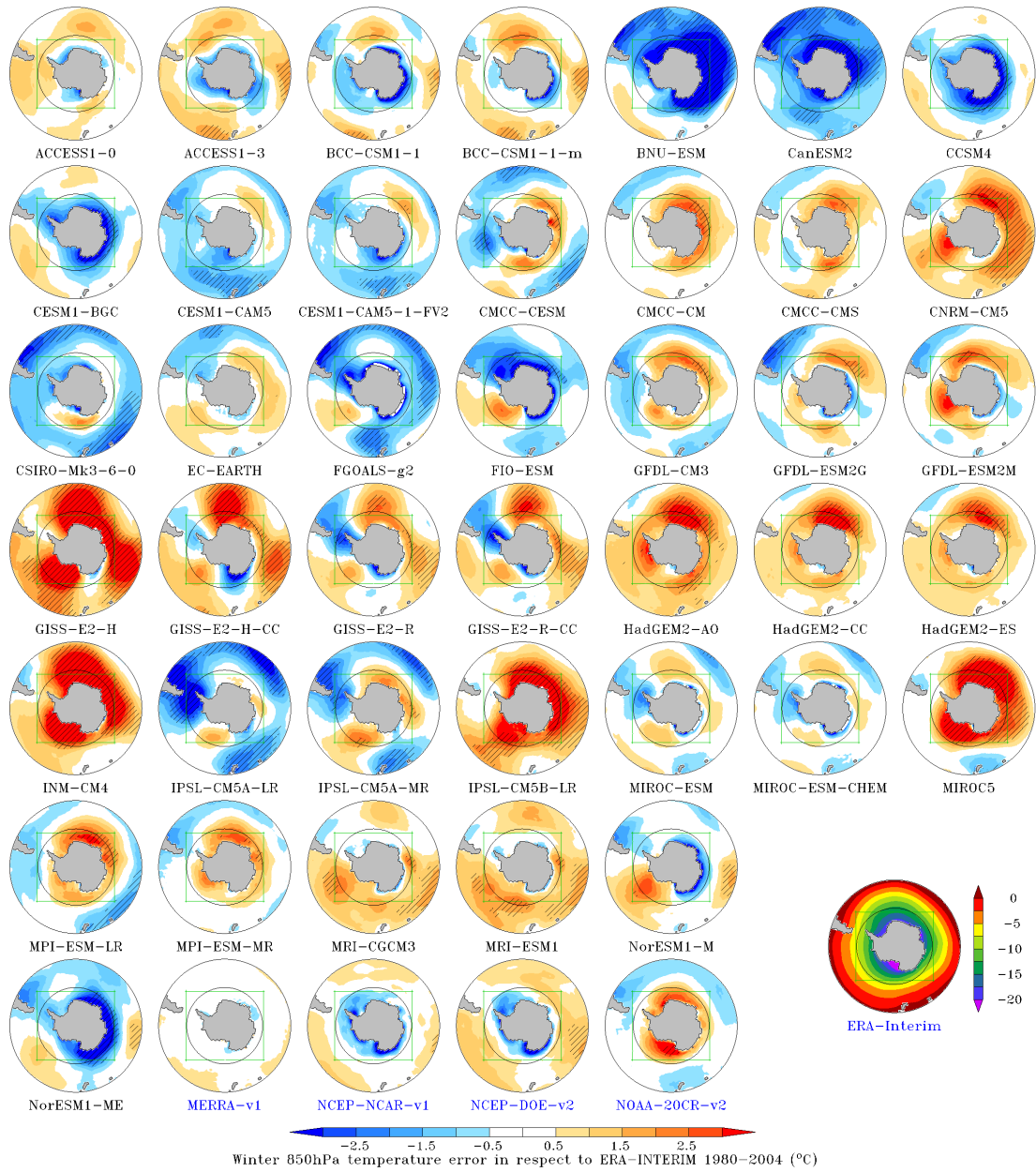


Figure S3: Same as Fig. 1 but for winter air temperature at 850hPa (in °C).

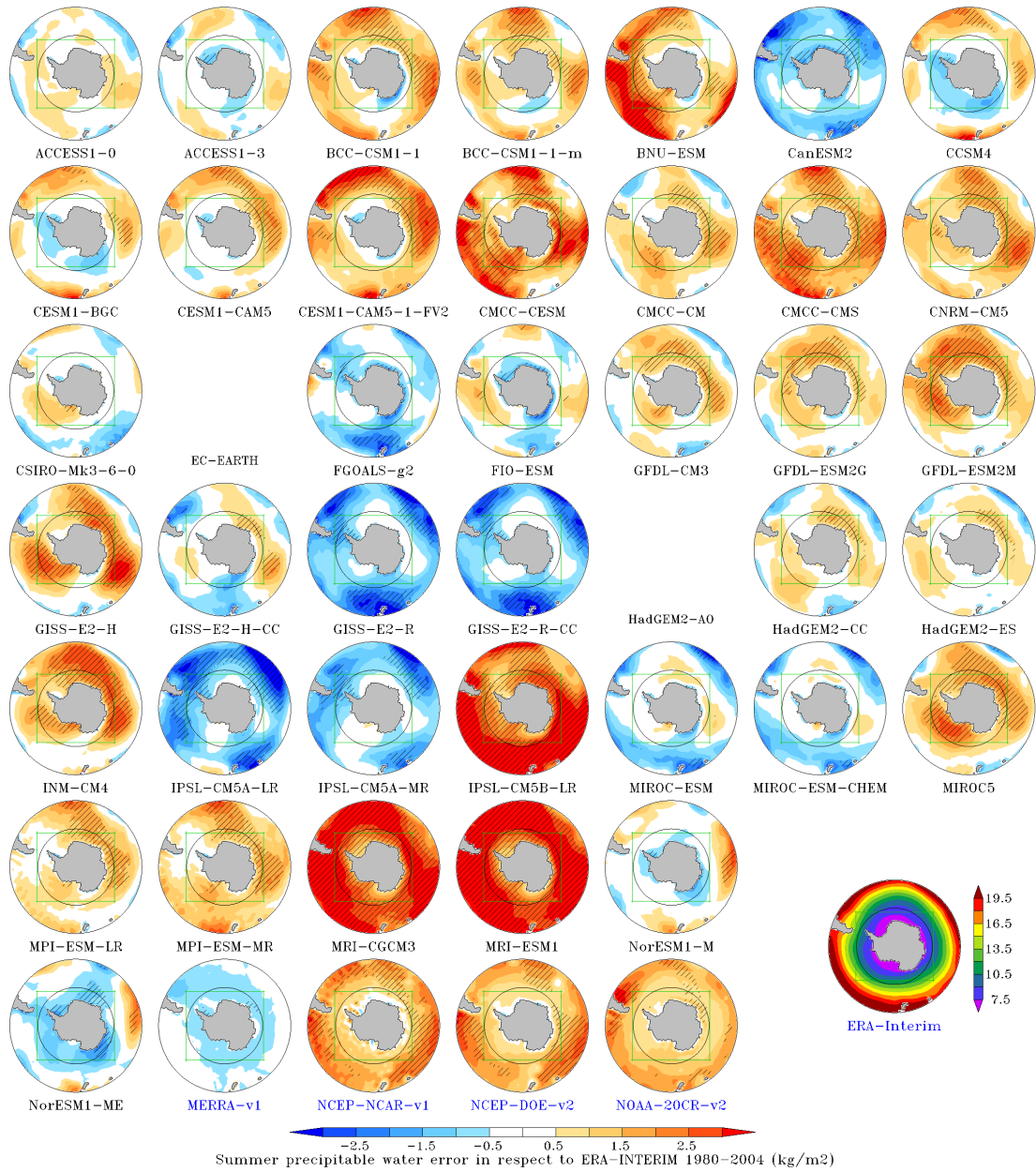


Figure S4: Same as Fig. 1 but for summer precipitable water (in kg m⁻²).

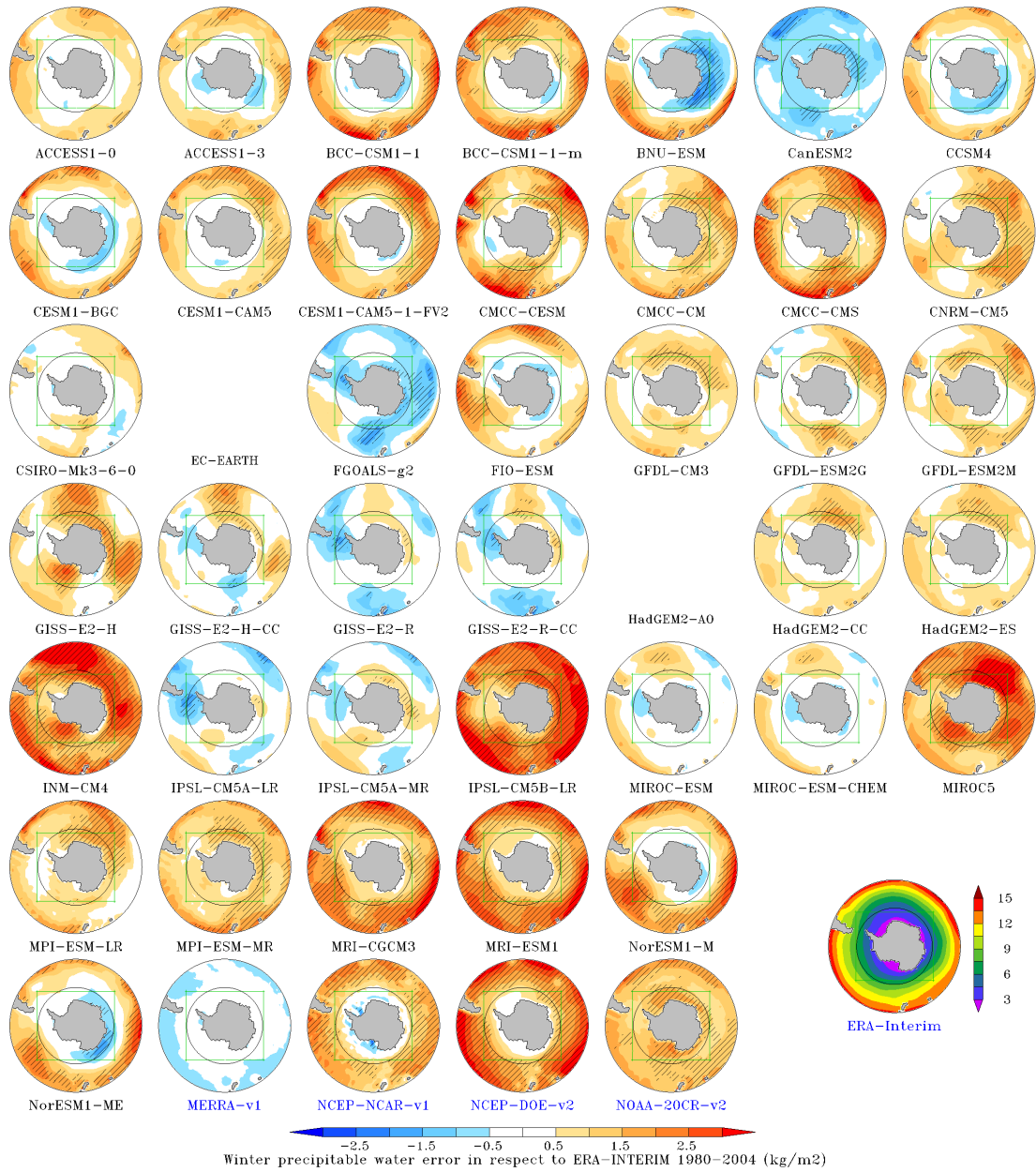


Figure S5: Same as Fig. 1 but for winter precipitable water (in kg m⁻²).

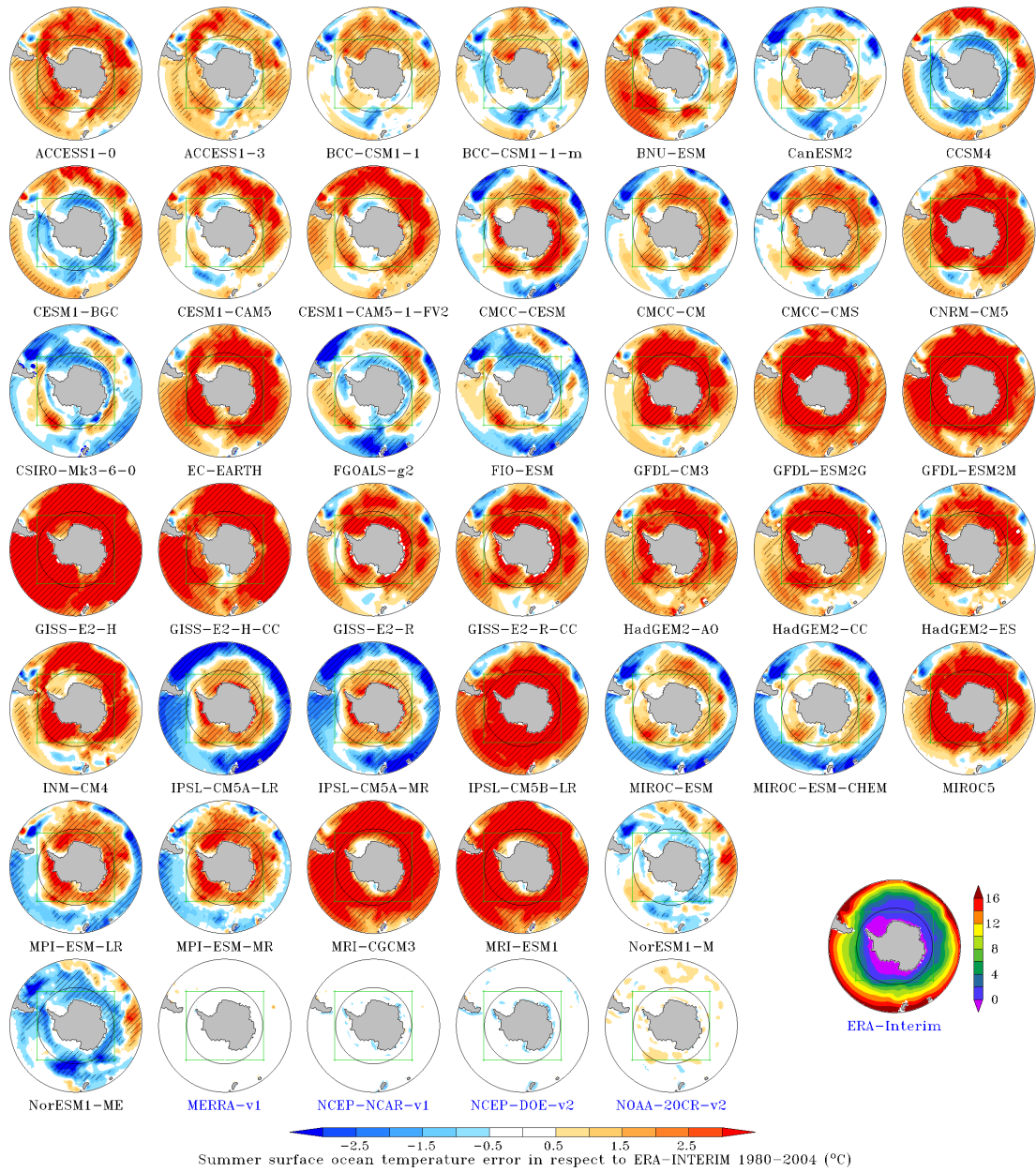


Figure S6: Same as Fig. 1 but for summer sea surface temperature (in °C).

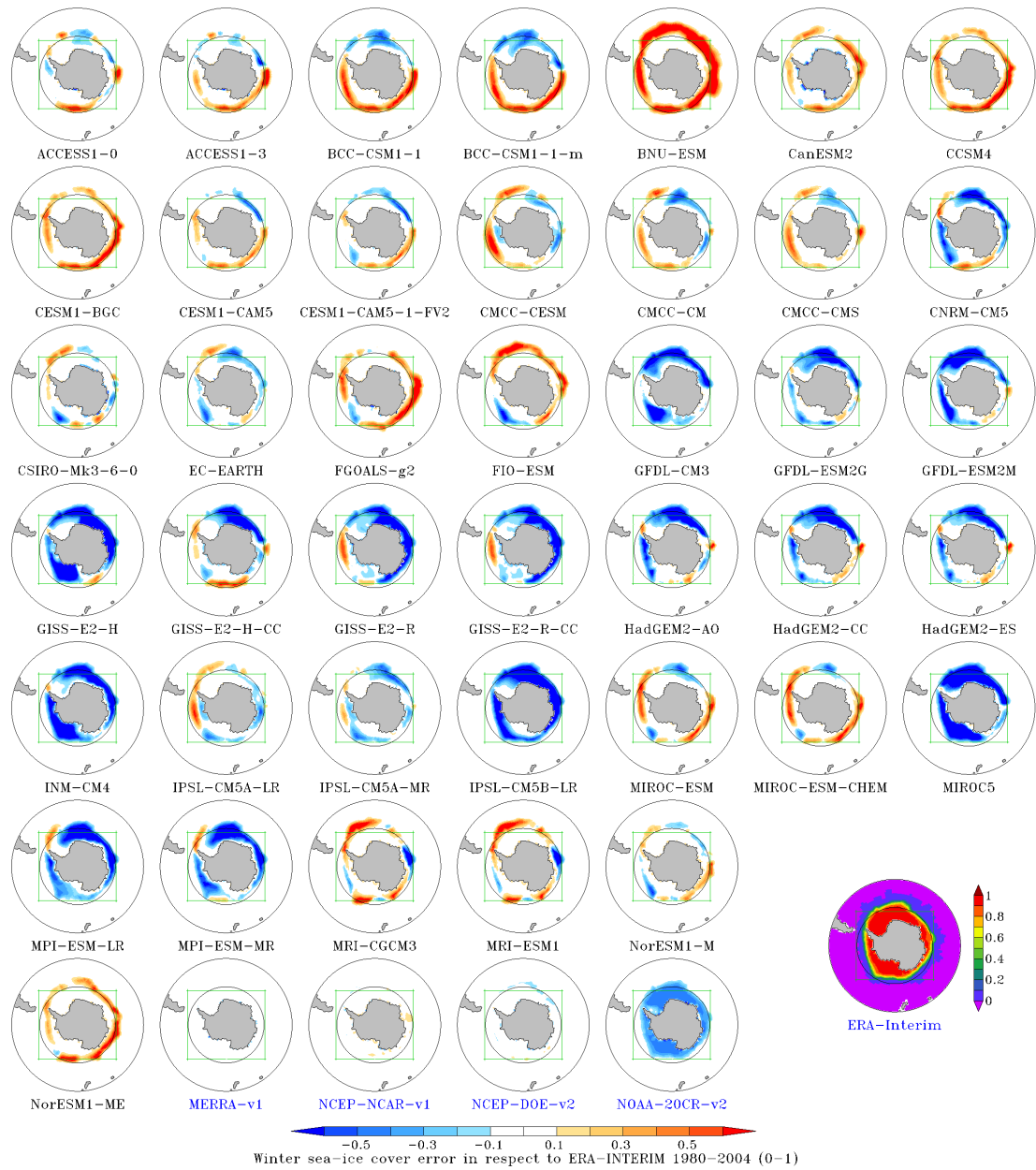


Figure S7: Same as Fig. 1 but for winter sea-ice concentration.

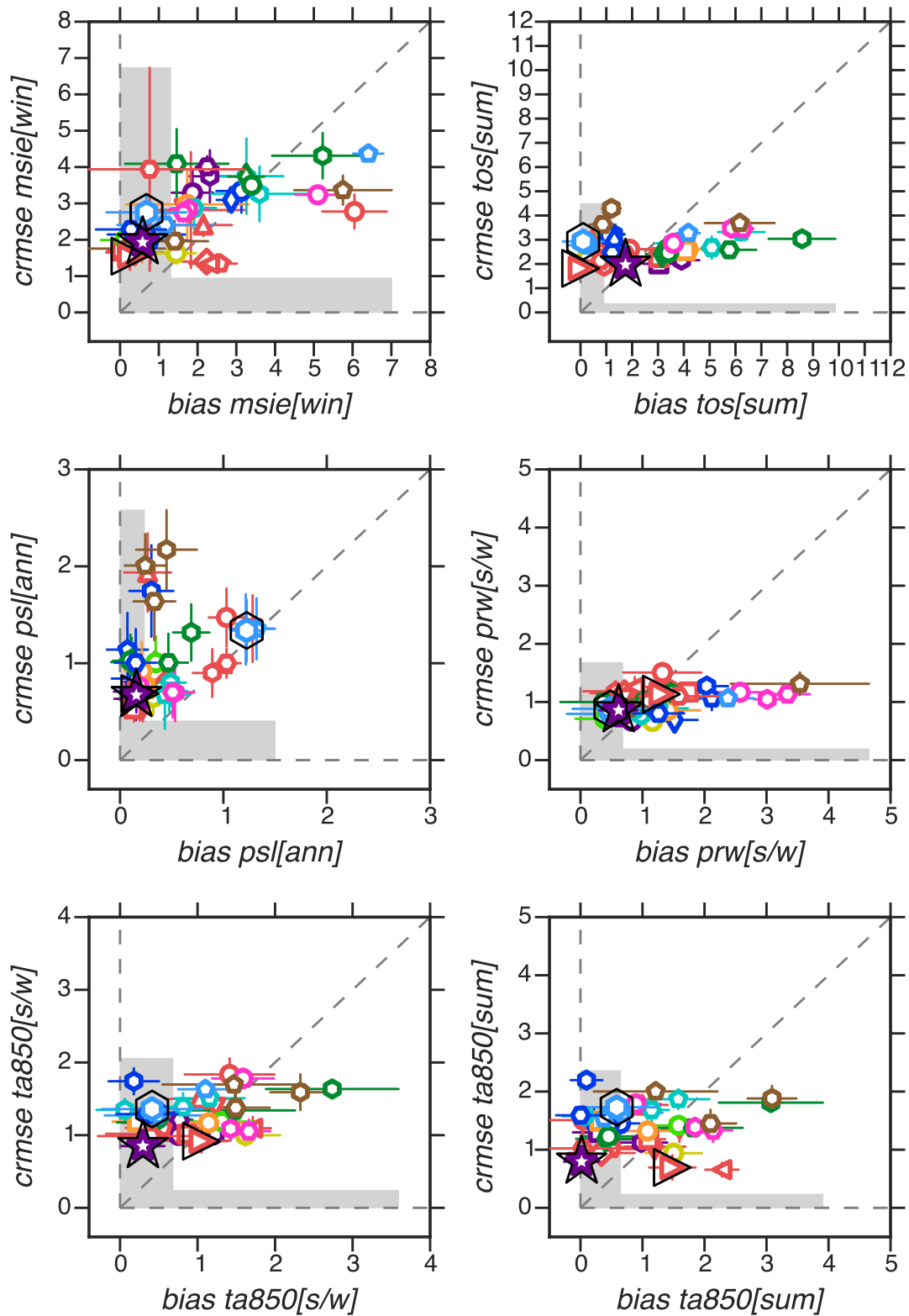


Figure S8: Comparison of crmse indexes (y-axis) versus bias indexes (x-axis) for the 41 CMIP5 GCMs and the 1980-2010 period, for winter *msie*, summer *tos*, annual *psl*, summer/winter *prw*, summer/winter *ta850* and summer *ta850*. Marker colors and shapes are the same as in Fig. 3. Coloured lines are two time the multi-decadal variability of the index. Grey boxes along axes show maximal values of the indexes (box length along axis) and the 90th percentile of CMIP5 multi-decadal variabilities of the indexes (box width).

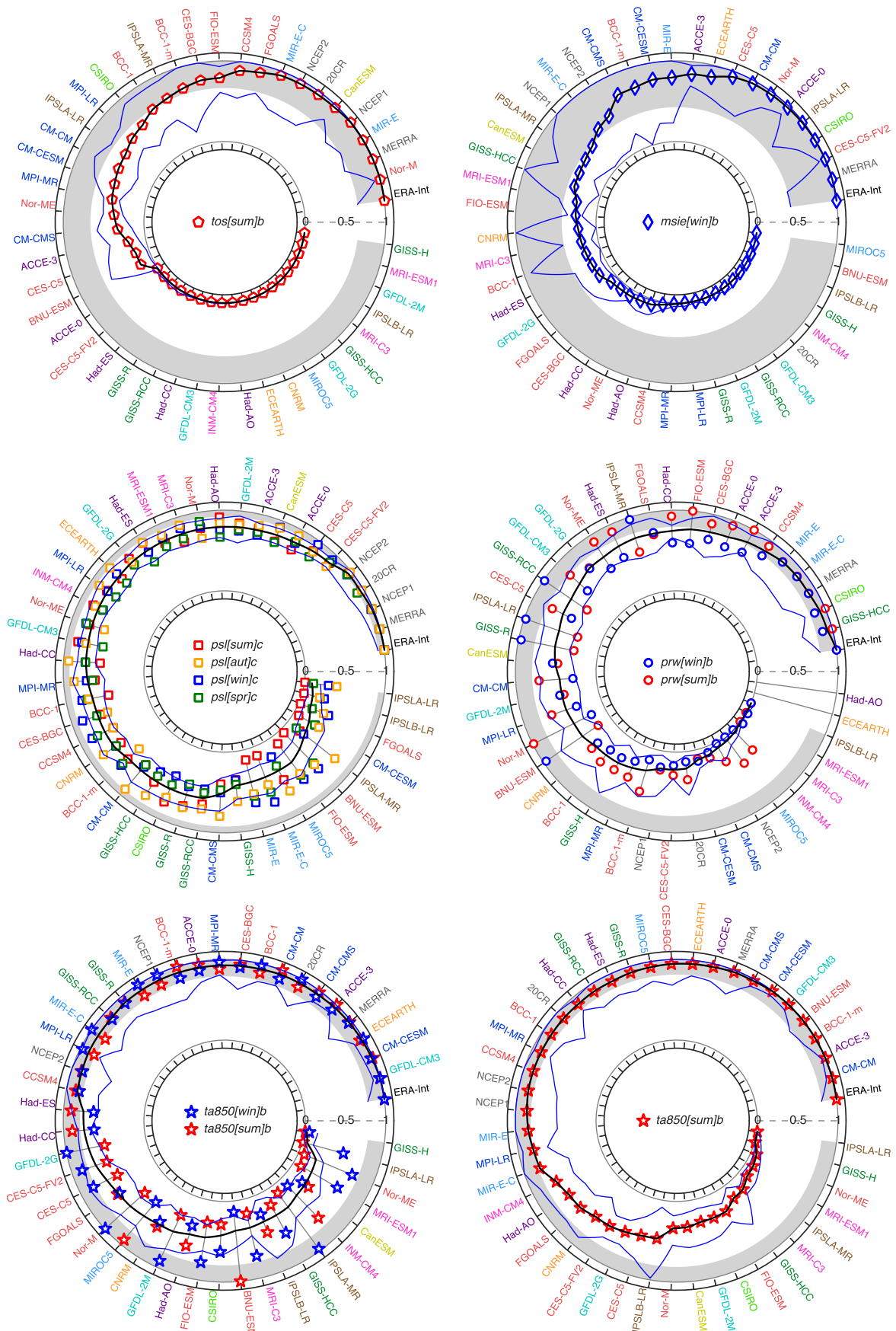


Figure S9: Same as Fig. 2 but for each variable.

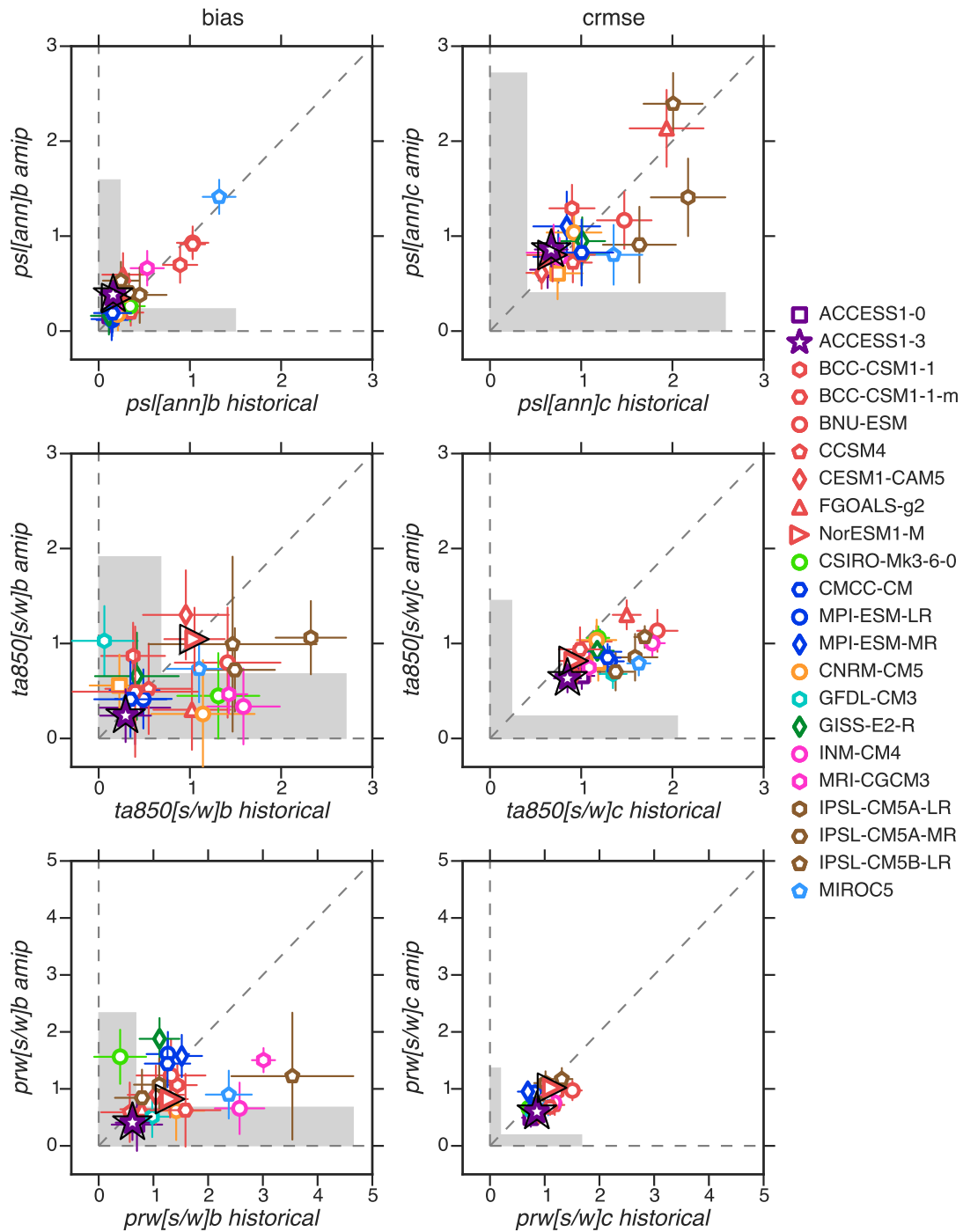


Figure S10: Comparison of amip (y-axis) versus historical (x-axis) for the six selected metrics. For amip, the averaged period is 1980-2008 (29 years) whereas for ERA-Interim and historical runs the averaged period is 1980-2010 (31 years). Coloured lines are two time the multi-decadal variability of the index. Grey boxes along axes show maximal values of the metrics (box length along axis) and the 90th percentile of CMIP5 multi-decadal variabilities of the metrics (box width).