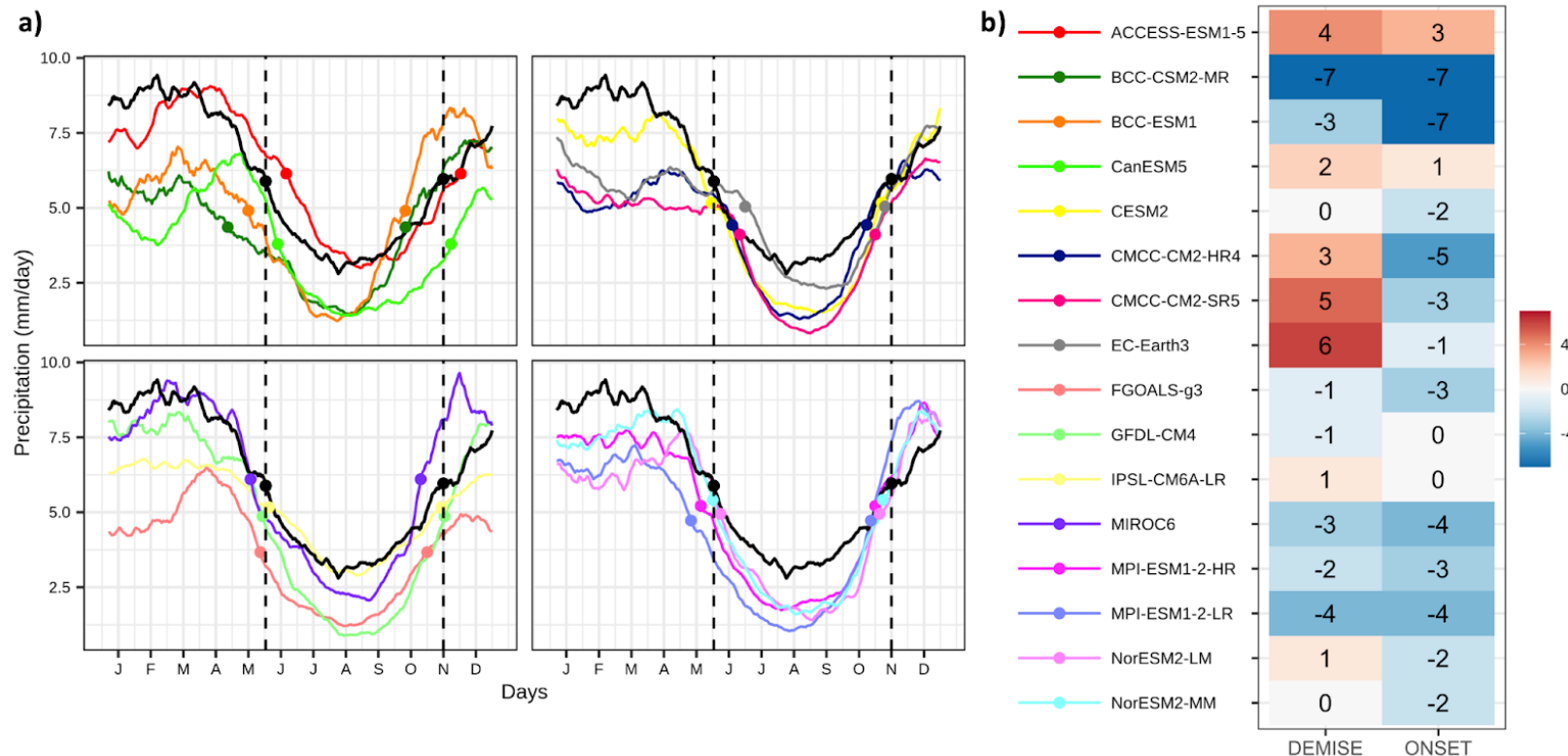


Process-based GCMs evaluation over South Tropical South America during the dry-to-wet transition season following a weather typing approach

Olmo ME, Espinoza JC, Bettolli ML, Sierra JP, Junquas C, Arias PA

DISPLAY MATERIAL

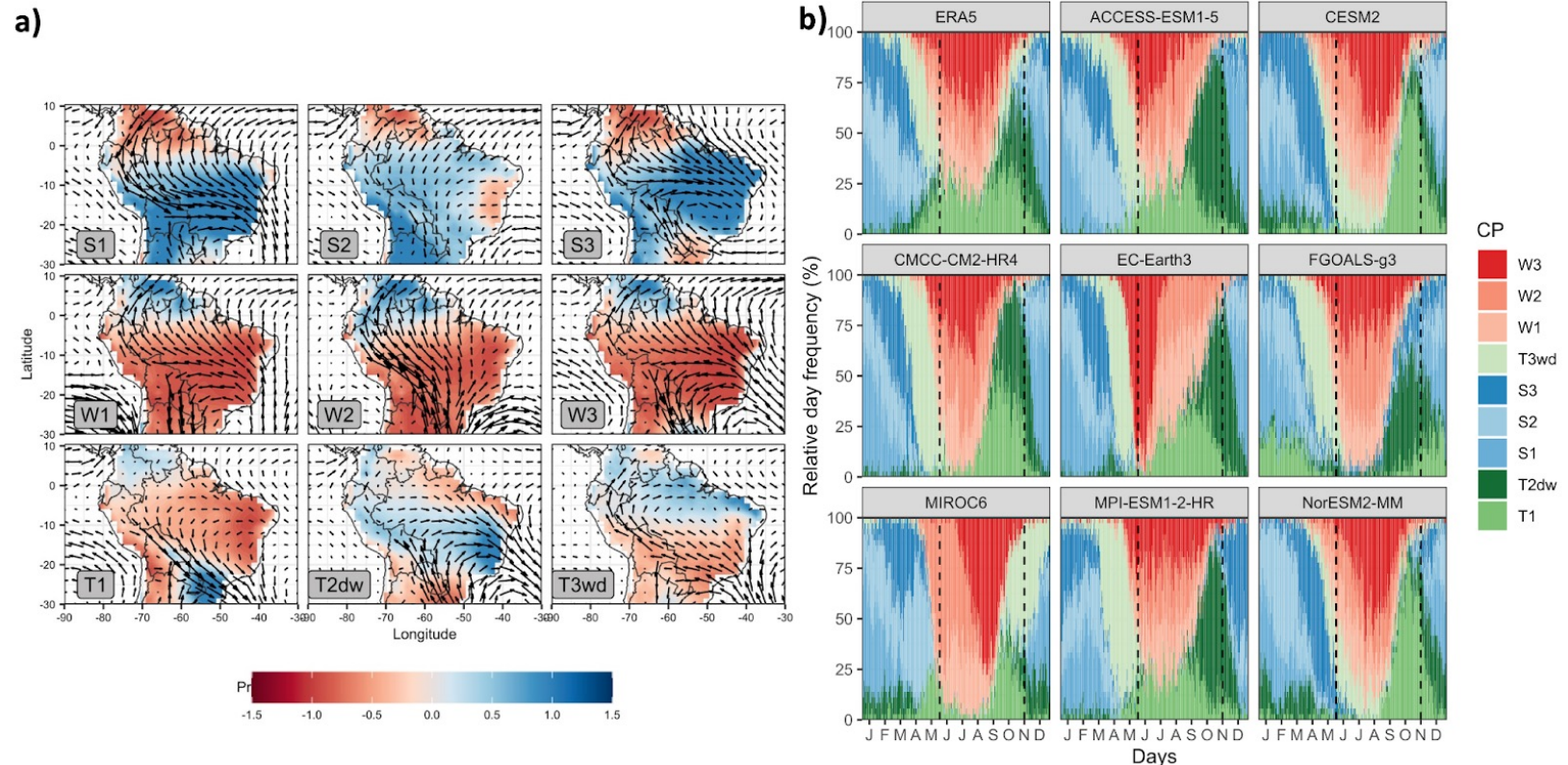
a) Precipitation annual cycles over a part of the southern Amazonia (between 15°S-5°S and 50°W-70°W), expressed in days and smoothed using a 5-day moving window. The black lines indicate the CHIRPS reference dataset and the colours indicate the different GCMs. The SAMS onset and demise in each dataset are highlighted with dots; **b)** Differences in the SAMS onset and demise between the CHIRPS reference dataset and the GCMs quantified as the number of pentads.



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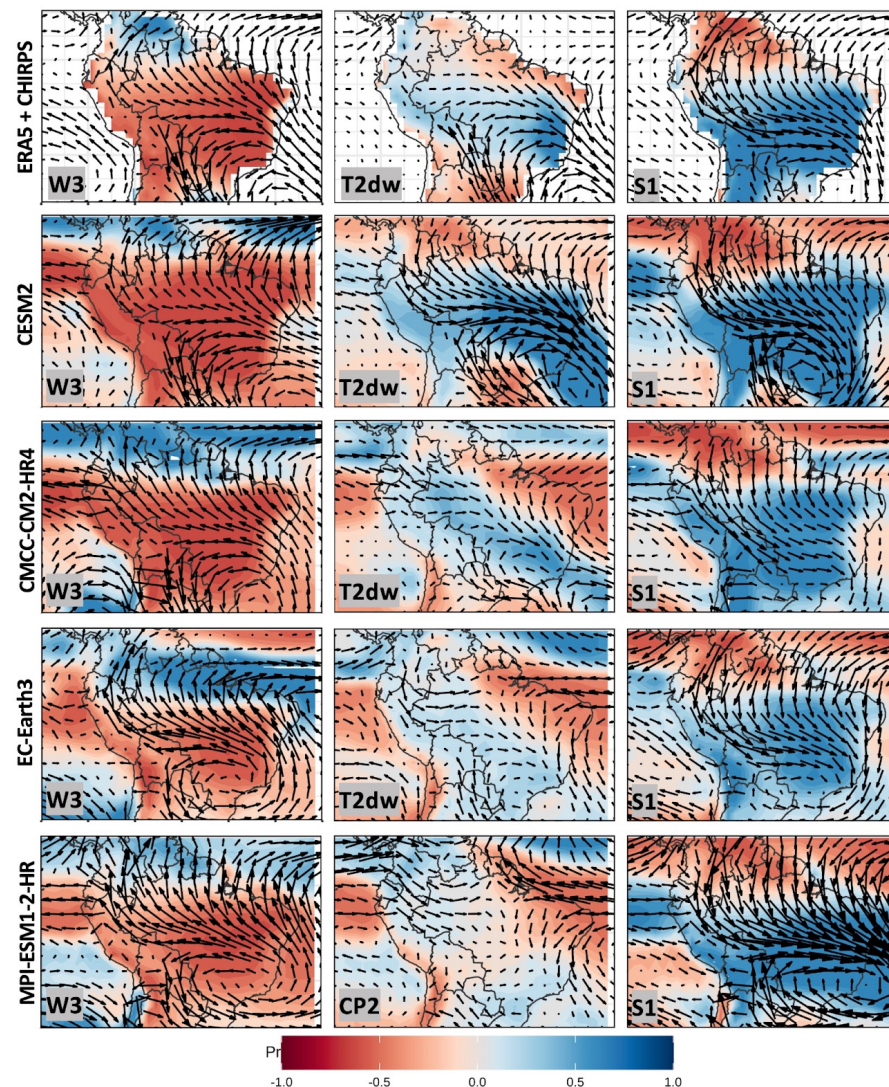
a) Spatial patterns of low-level wind and rainfall anomalies (in m/s and mm/day vs. the annual mean) for the nine CPs as depicted by the ERA5 reanalysis. Adapted from [Espinoza et al. \(2021\)](#), who identified three “winter” CPs (W1, W2 and W3), three “summer” CPs (S1, S2 and S3) and three “transitional” CPs (T1 and T2dw mostly for the dry-to-wet transition season and T3wd for the wet-to-dry transition season). Vectors indicate wind anomalies at 850 hPa and shaded colours refer to CHIRPS rainfall anomalies; **b)** Seasonal cycle of the nine CPs as depicted by the ERA5 reanalysis and selected GCMs. The x-axis displays the 365 days of the year, while the y-axis indicates the relative mean daily frequency of each CP.



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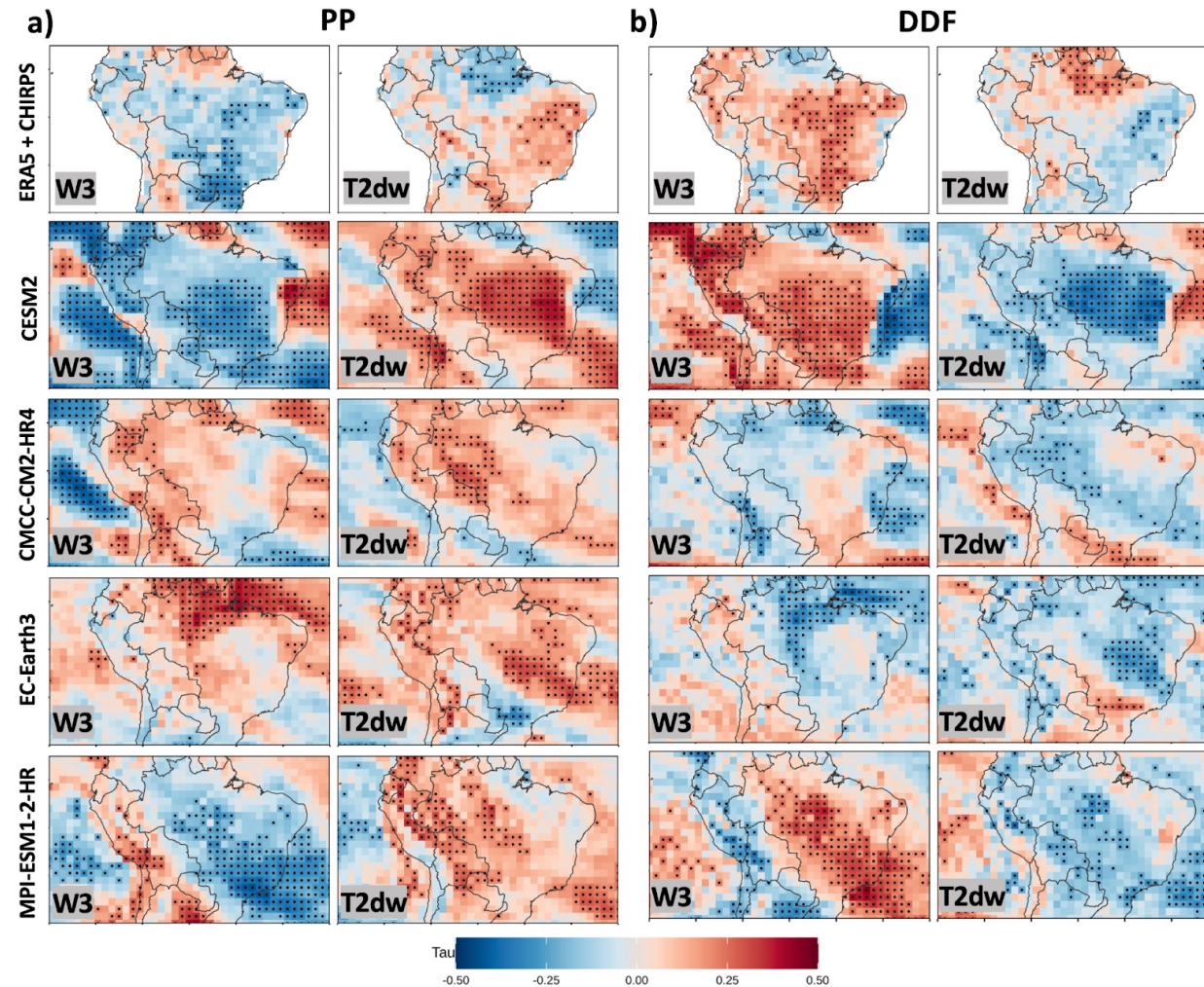
Spatial patterns of 850 hPa wind and rainfall anomalies for W3, T2dw and S1 - representing the winter conditions that precede the SAMS onset, the SAMS early initiation and its mature phase, respectively - as depicted by the ERA5 and CHIRPS reference datasets and a few selected GCMs. Vectors indicate wind anomalies at 850 hPa and shaded colours refer to rainfall anomalies vs. each GCM and ERA5 long-term means.



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Kendall-Tau correlation values between the interannual time series during the dry-to-wet transition season (July to October, 1979-2014) of the frequency of W3 and T2dw and: **a)** the mean seasonal rainfall (PP); **b)** the dry-day frequency (DDF). Results are shown for the ERA5+CHIRPS reference and a few selected GCMs. Grid cells with significant correlation values are marked with dots.



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Kendall-Tau average correlation values between the interannual time series during the dry-to-wet transition season (July to October, 1979-2014) of the frequency of W3 and T2dw and: **a)** the mean seasonal rainfall (PP); **b)** the dry-day frequency (DDF). Averages were estimated for the set of 16 GCMs and for the 3-best GCMs (CESM2, CMCC-CM2-HR4 and MPI-ESM1-2-HR), separately. Grid cells with model agreement in the sign of the correlation values above 75% (considering the complete 16 GCMs set) are marked with dots.

