

## **Supplementary Material**

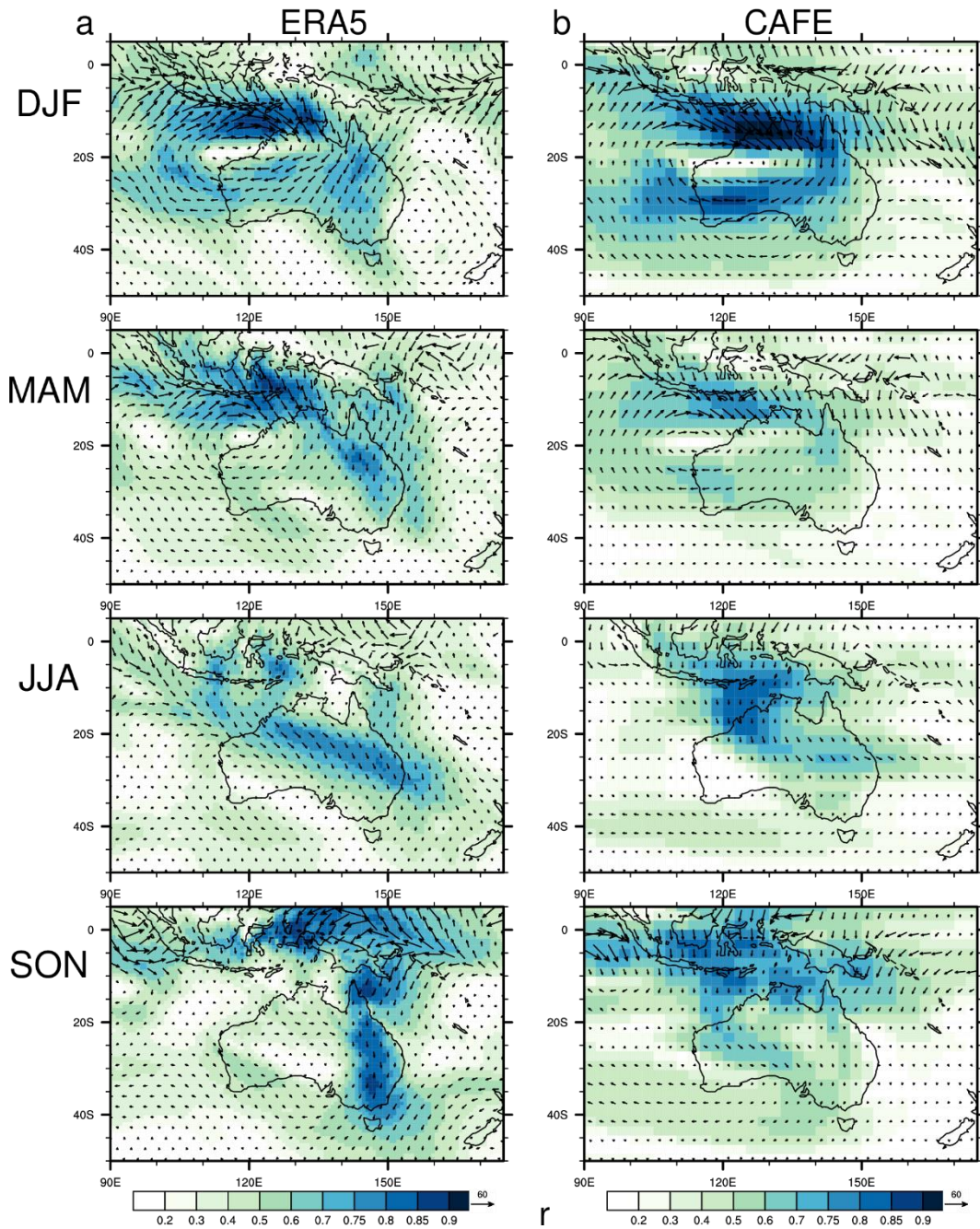
### **Australian rainfall anomalies and Indo-Pacific driver indices: links and skill in 2-year-long forecasts**

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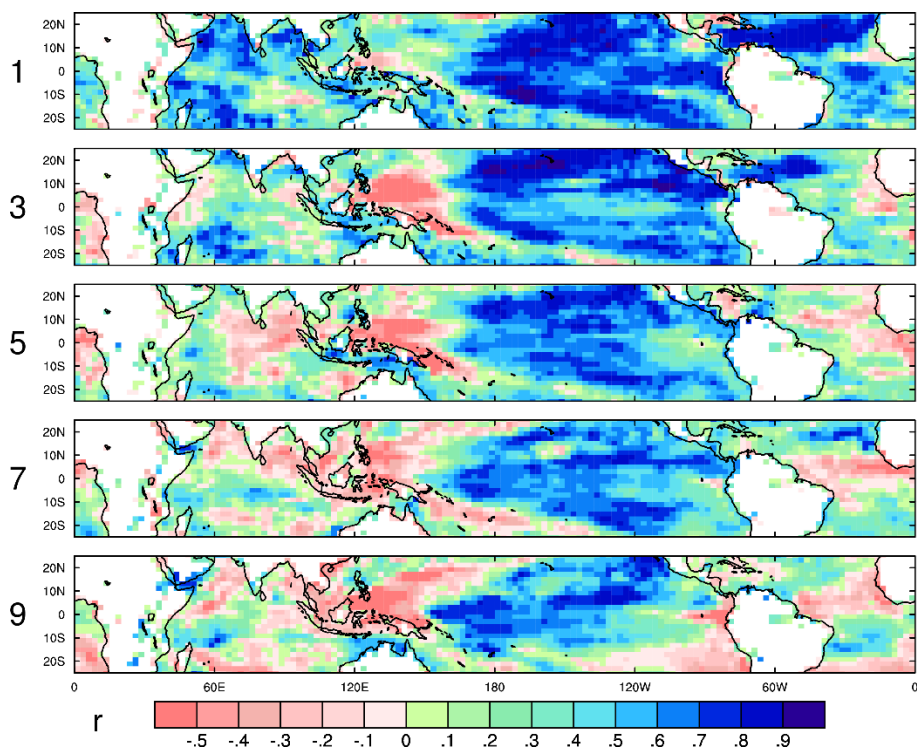
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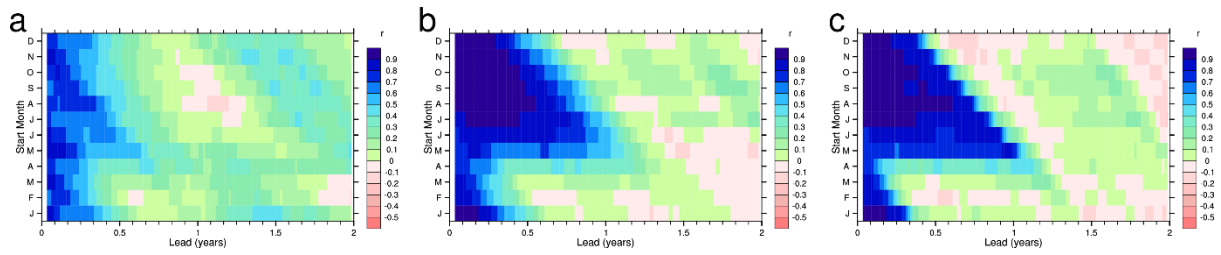


**Fig. S1.** Relationship between seasonal All-Australia rainfall and vertically-integrated horizontal moisture flux in (a) ERA5 (using AGCD AApr), and (b) the CAFE control run. At a selection of grid points, a vector shows the regression coefficient (for 1 SD of AApr) at the direction for which the component of the flux vector has a maximum correlation. Shading shows the field of maximal correlation for (top to bottom) December-February (DJF), March-May (MAM), June-August (JJA), and September-November (SON).

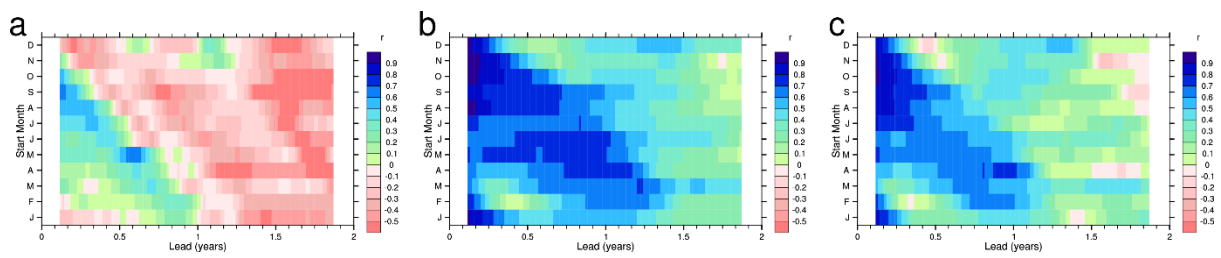
Note: The maximal (positive) correlation at each grid point was determined from the regression for the flux component at each of 90 two-degree steps from 0 to 178°. The vectors in the equatorial band tend to be less zonal than those formed with the coefficients for the northward and eastward fluxes, calculated individually, as shown by Watterson (2020, Figures 4b-7b).



**Fig. S2.** Fields of correlation between monthly mean CAFE ensemble average forecast values of surface temperature and SST from ERA5 at grid points in the tropics. The start month, labelled 1, is June, and the following months in two-month steps are labelled 3, 5, 7, and 9.



**Fig. S3.** Time series of correlation between the persisting month-1 CAFE ensemble average index and observational running monthly index, from all 12 starting months, as a function of lead time (or time after start): (a) PID, (b) NINO4, and (c) NINO34. Note the monthly tick marks on the x-axis.



**Fig. S4.** Time series of correlation between the CAFE and observational running seasonal means of (a) IOD, (b) NINO4, and (c) NINO34 from all 12 starting months, as a function of lead time, and using the model ensemble average forecast.