# Electronic Supplementary Material to:
# The Month-to-Year Precursory and Synchronous Inherent Connections between Global Oceanic Modes and Extreme Precipitation over China*

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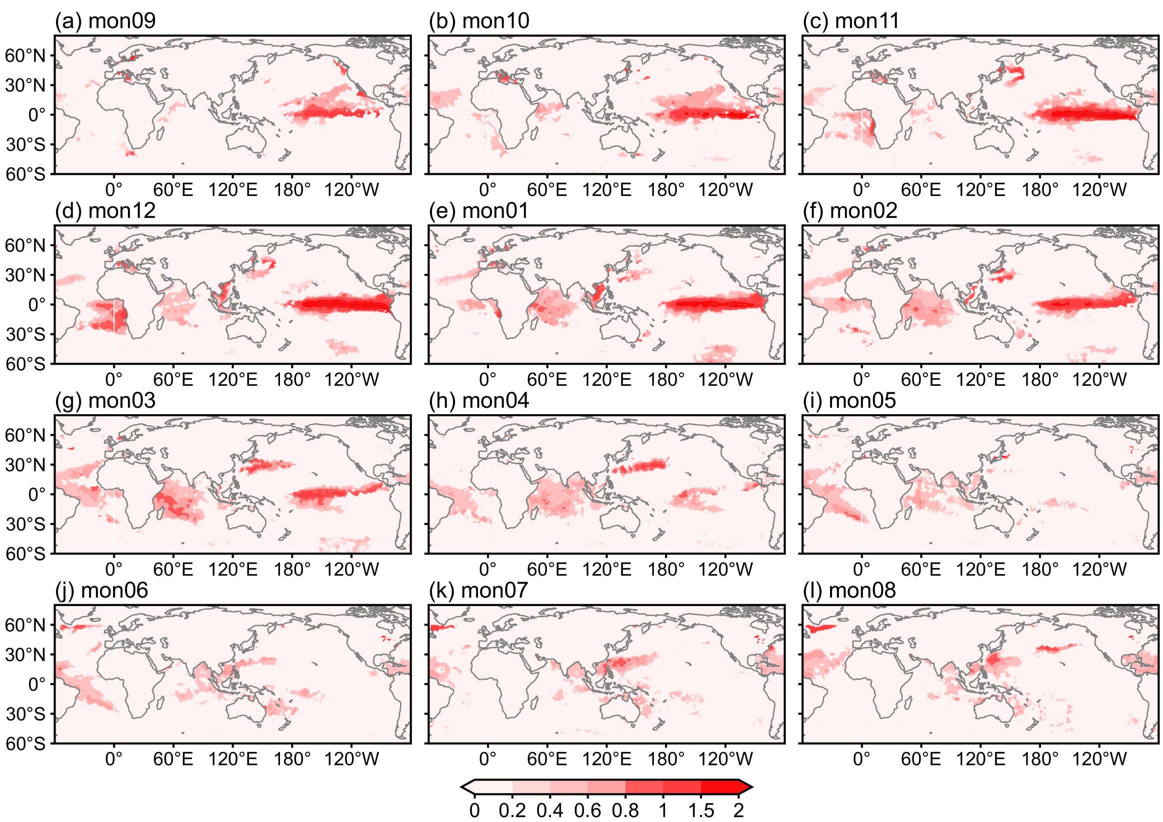


**Fig. S1.** SST (units: °C) forcing in AGCM experiments from the preceding 12 months to the concurrent month.

*The online version of the original article can be found at https://doi.org/10.1007/s00376-024-4306-4.

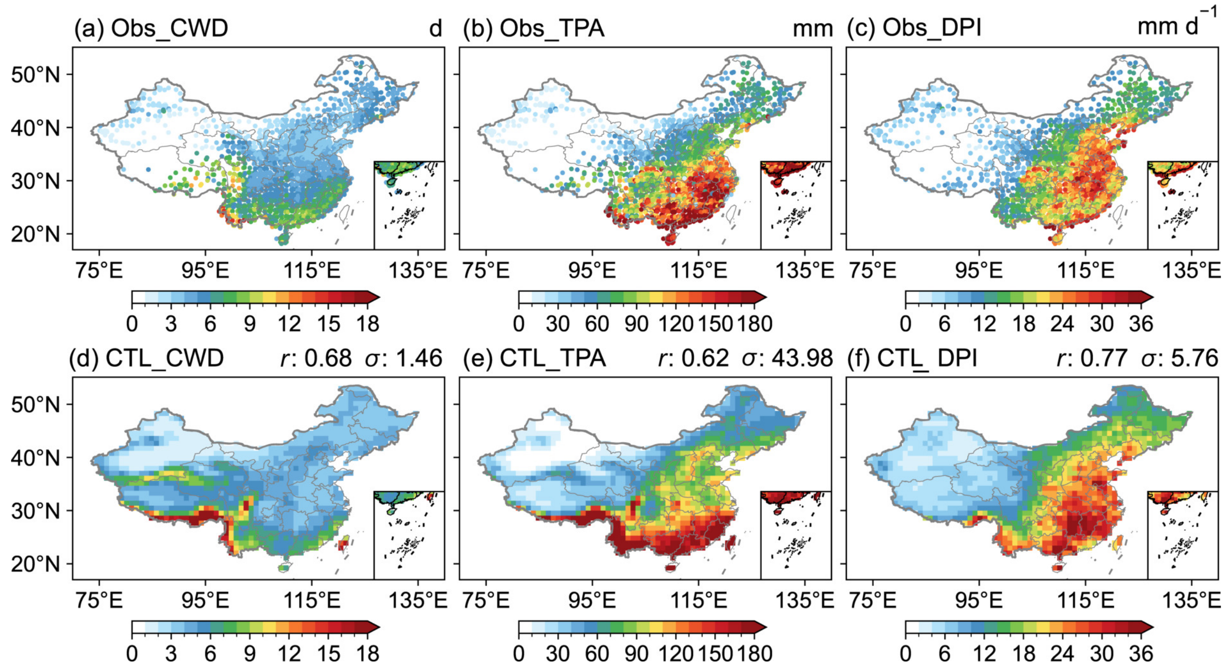


**Fig. S2.** Spatial distribution of summer climatology for (a, d) CWD, (b, e) TPA, and (c, f) DPI based on (a–c) station data and (d–f) the control experiment during 1979–2020 in China. The $r$ and $\sigma$ in the top right represent Pearson's correlation coefficient and the RMSE, respectively. All $r$ values are significant at the 5% level.

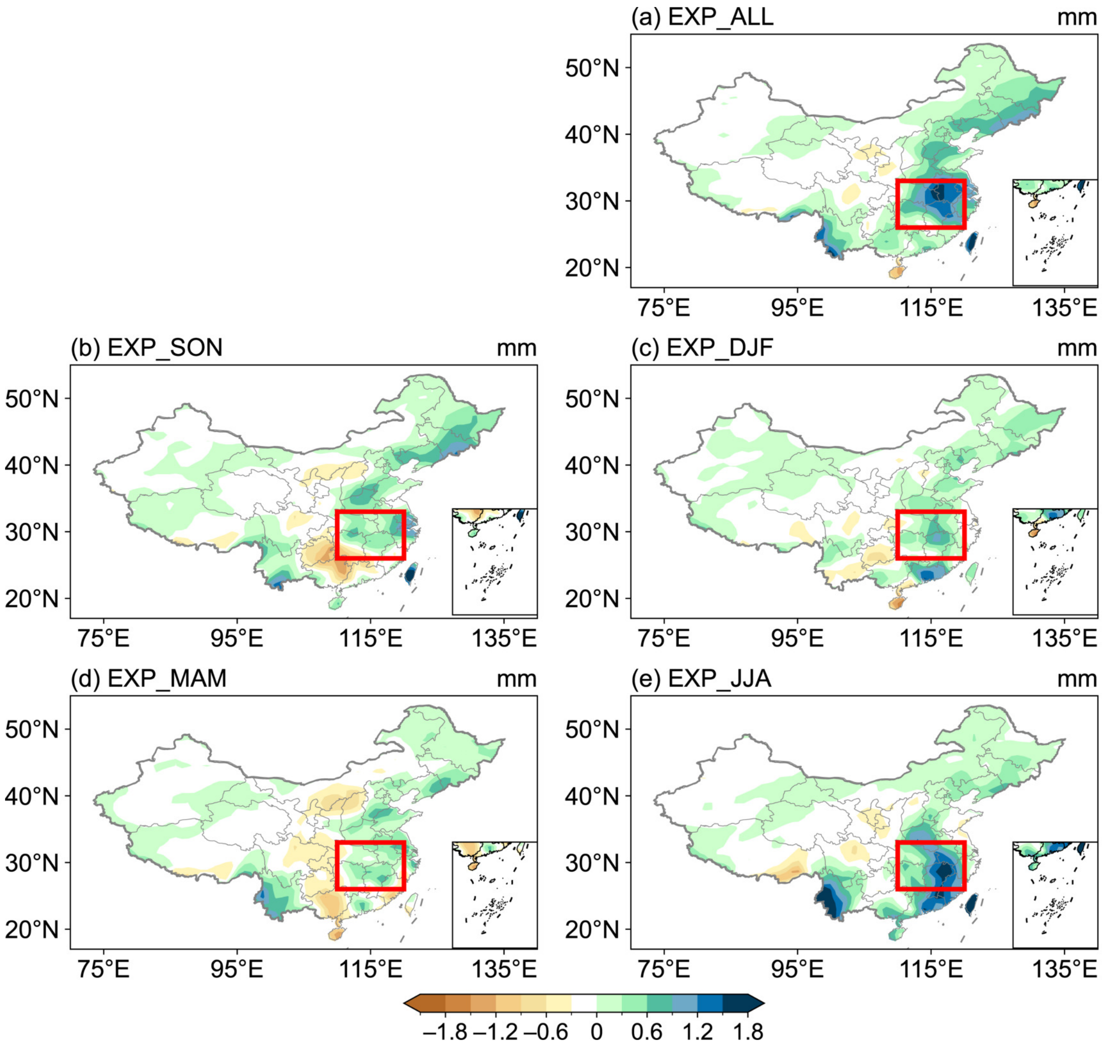


**Fig. S3.** Differences in the spatial distribution of summer climatology for precipitation between five sensitivity experiments and the control experiment during 1979–2020 in China: (a) EXP_ALL, (b) EXP_SON, (c) EXP_DJF, (d) EXP_MAM, and (e) EXP_JJA. The red box is the same as in Fig. 5.

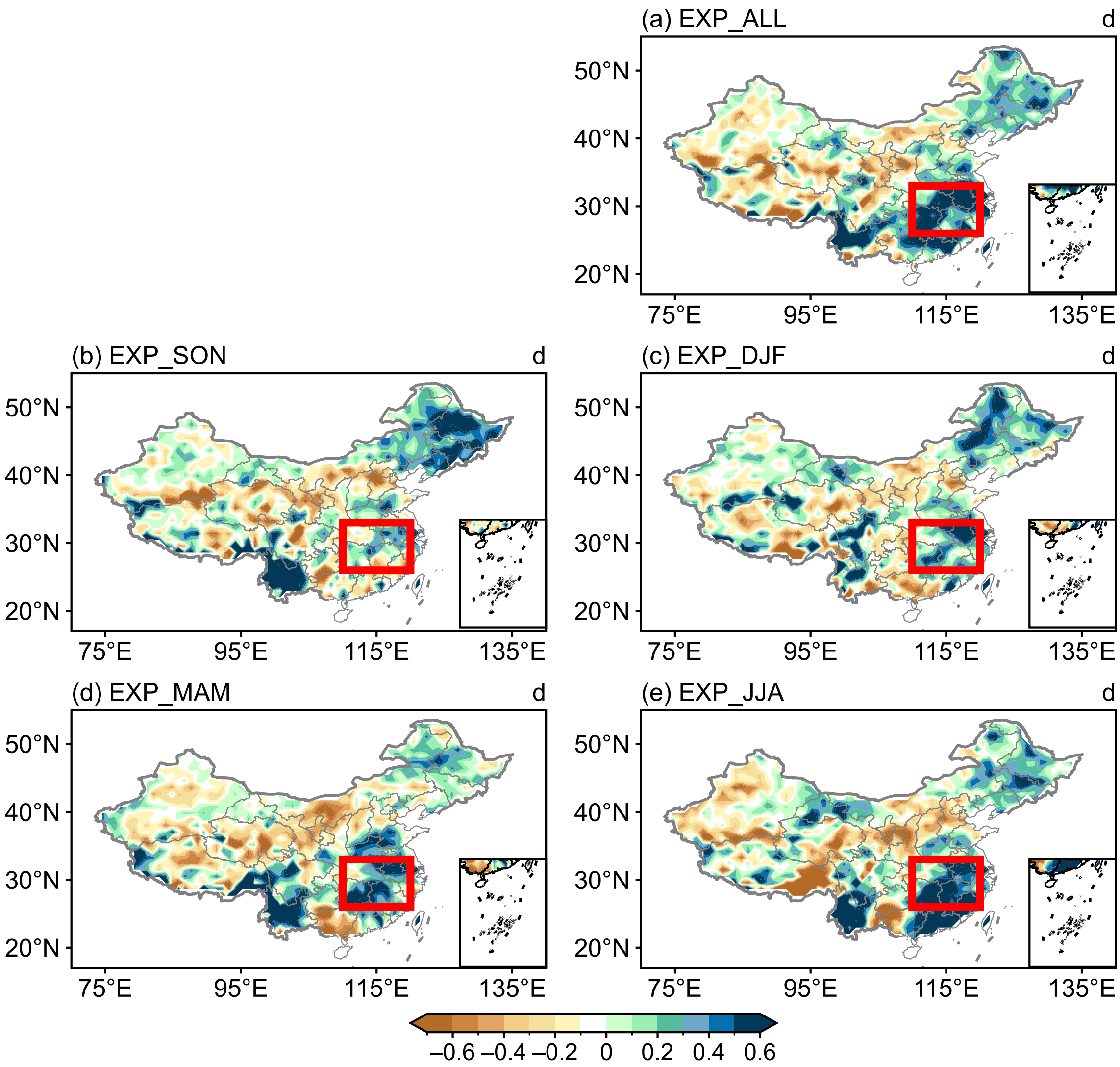


**Fig. S4.** As in Fig. S3 but for CWD.

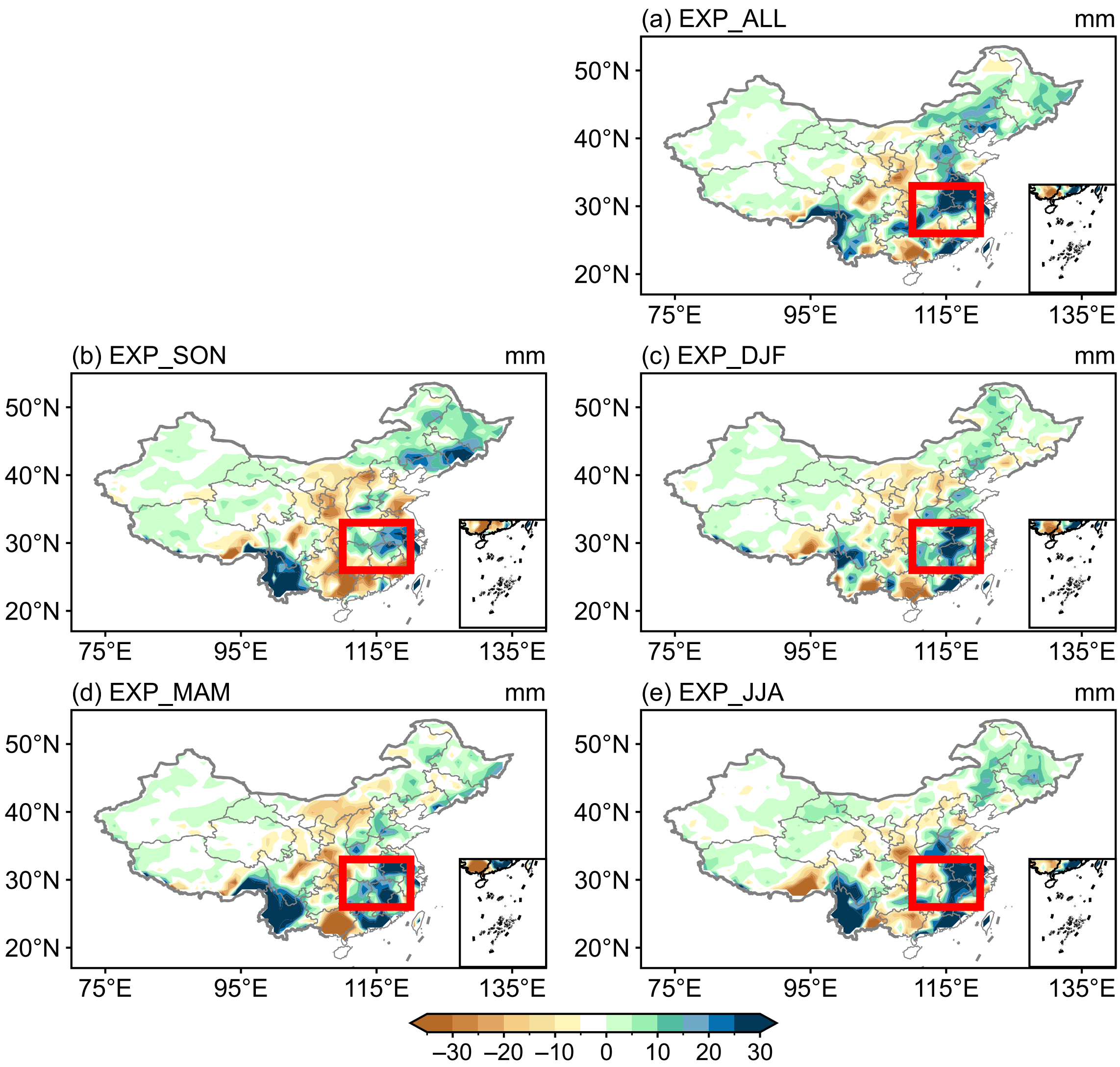


**Fig. S5.** As in Fig. S3 but for TPA.

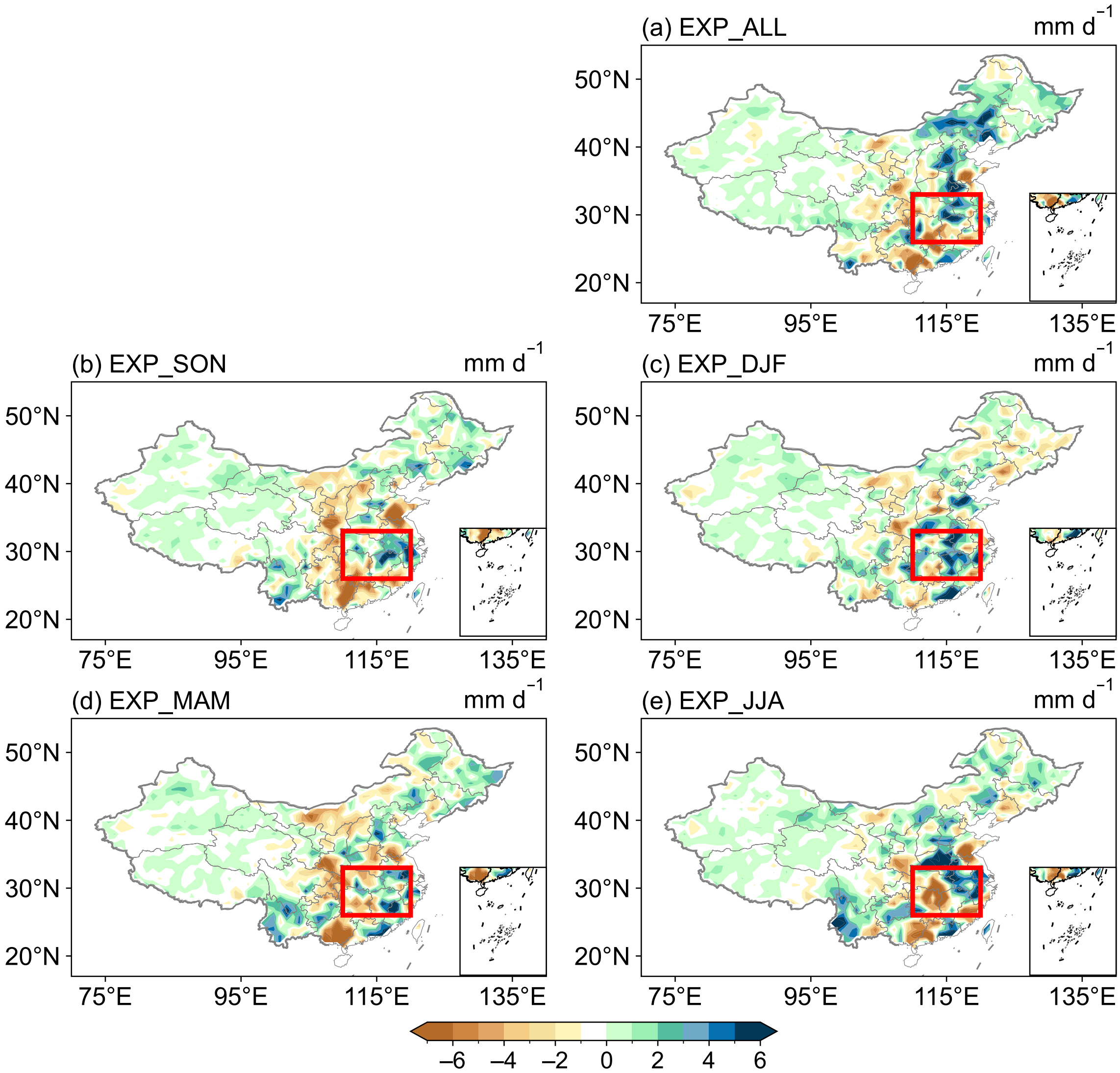


**Fig. S6.** As in Fig. S3 but for DPI.

**Table S1**. Positive and negative anomaly years based on a threshold of 1.5 standard deviations in three indices.

| Precipitation index | Positive anomalous years | Negative anomalous years |
|---|---|---|
| CWD | 1973, 1982, 1997, 1998, 1999, 2010, 2020 | 1972, 1990 |
| TPA | 1969, 1991, 1998, 2010, 2020 | 1978 |
| DPI | 1969, 1991, 1998, 2010, 2020 | 1963, 1978, 1984, 1985 |
| Total | 1969, 1973, 1982, 1991, 1997, 1998, 1999, 2010, 2020 (9) | 1963, 1972, 1978, 1984, 1985, 1990 (6) |

**Table S2**. Multicollinearity test results for the oceanic mode indices for the GLM.

| Oceanic mode index | VIF | | | |
|---|---|---|---|---|
| | SON | DJF | MAM | JJA |
| PDOI | 1.633 | 1.301 | 1.378 | 1.294 |
| NINO34 | 3.361 | 3.095 | 2.829 | 1.601 |
| TSAI | 1.385 | 1.701 | 1.561 | 1.521 |
| TNAI | 2.451 | 1.357 | 1.405 | 1.869 |
| IOBI | 4.549 | 5.741 | 5.741 | 2.653 |
| WNPI | 4.487 | 2.986 | 2.899 | 2.674 |

**Table S3**. Contribution rates for the oceanic mode indices for the GLM.

| Oceanic mode index | Contribution rate (%) | | | |
|---|---|---|---|---|
| | SON | DJF | MAM | JJA |
| PDOI | 7.6 | 11.7 | 16.1 | 0.2 |
| NINO34 | 18.6 | 36.4 | 7.1 | 13.9 |
| TSAI | 17.6 | 21.6 | 7.9 | 20.0 |
| TNAI | 30.2 | 14.7 | 13.4 | 7.4 |
| IOBI | 2.4 | 14.0 | 38.0 | 3.0 |
| WNPI | 23.5 | 1.7 | 17.5 | 55.6 |

$$\mathrm{DPI_{SON}} = 0.0 + 0.1\mathrm{PDOI} + 0.24\mathrm{NINO34} + 0.23\mathrm{TSAI} + 0.39\mathrm{TNAI} - 0.03\mathrm{IOBI} - 0.3\mathrm{WNPI} \tag{S1}$$

$$\mathrm{DPI_{DJF}} = 0.0 - 0.17\mathrm{PDOI} + 0.54\mathrm{NINO34} + 0.32\mathrm{TSAI} + 0.22\mathrm{TNAI} - 0.21\mathrm{IOBI} + 0.03\mathrm{WNPI} \tag{S2}$$

$$\mathrm{DPI_{MAM}} = 0.0 - 0.23\mathrm{PDOI} + 0.1\mathrm{NINO34} + 0.11\mathrm{TSAI} + 0.19\mathrm{TNAI} + 0.54\mathrm{IOBI} - 0.25\mathrm{WNPI} \tag{S3}$$

$$\mathrm{DPI_{JJA}} = 0.0 - 0.0\mathrm{PDOI} - 0.13\mathrm{NINO34} - 0.18\mathrm{TSAI} + 0.07\mathrm{TNAI} + 0.03\mathrm{IOBI} + 0.5\mathrm{WNPI} \tag{S4}$$