

Supplementary Material for Sub-tropical Teleconnection Drives ‘Onset’ of Indian Summer Monsoon over Northeast India (NEI) in May.

Simanta Das¹, Dhruba Jyoti Goswami^{2*}, and B. N. Goswami¹

Supplementary Figures

a)

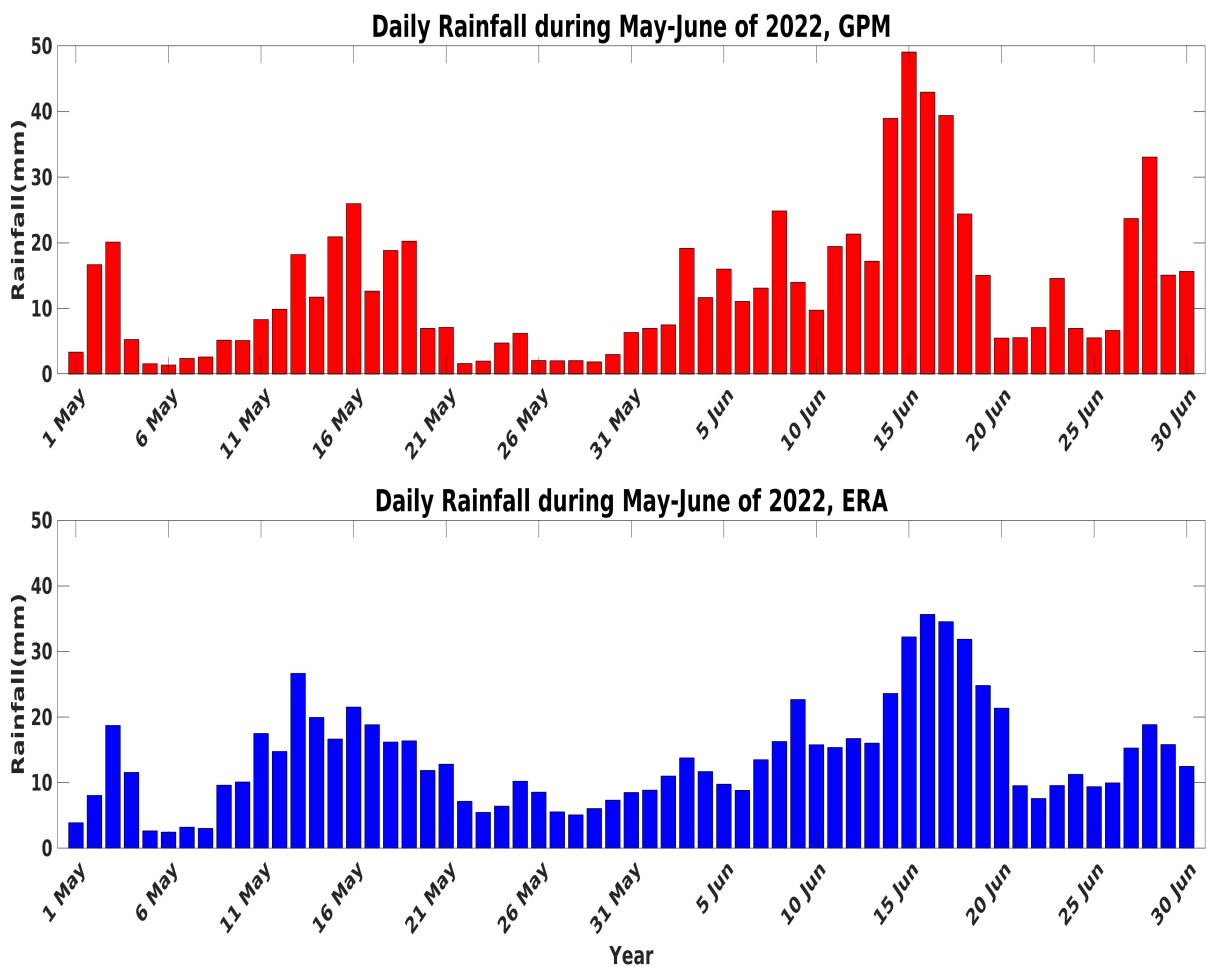


Fig. S1 a Daily rainfall during May-June of 2022 from TRMM over the NEI compared to ERA5 rainfall. Unit: mm/day.

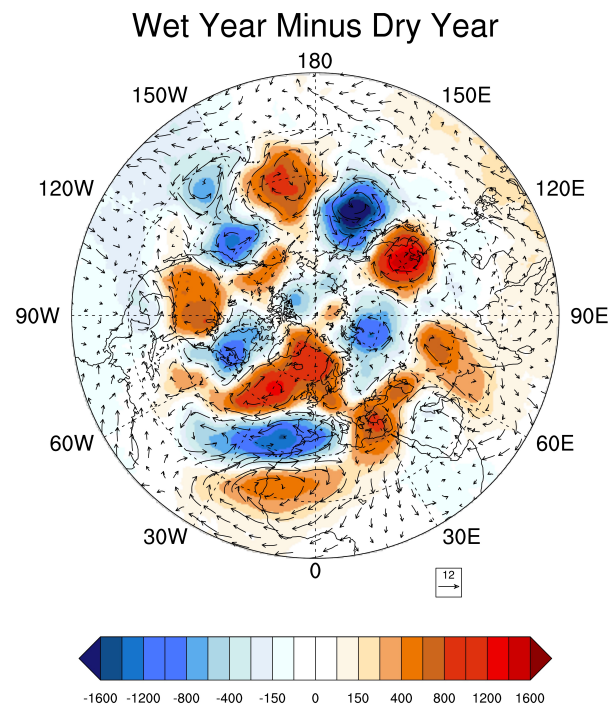


Fig. S2 Composite of geopotential and wind anomalies at 200 hPa for ‘wet’ years ($> +1$ s.d.) over the NEI minus composite of geopotential and wind anomalies for ‘dry’ years (< -1 s.d.) over the NEI. Units: m, m/s.

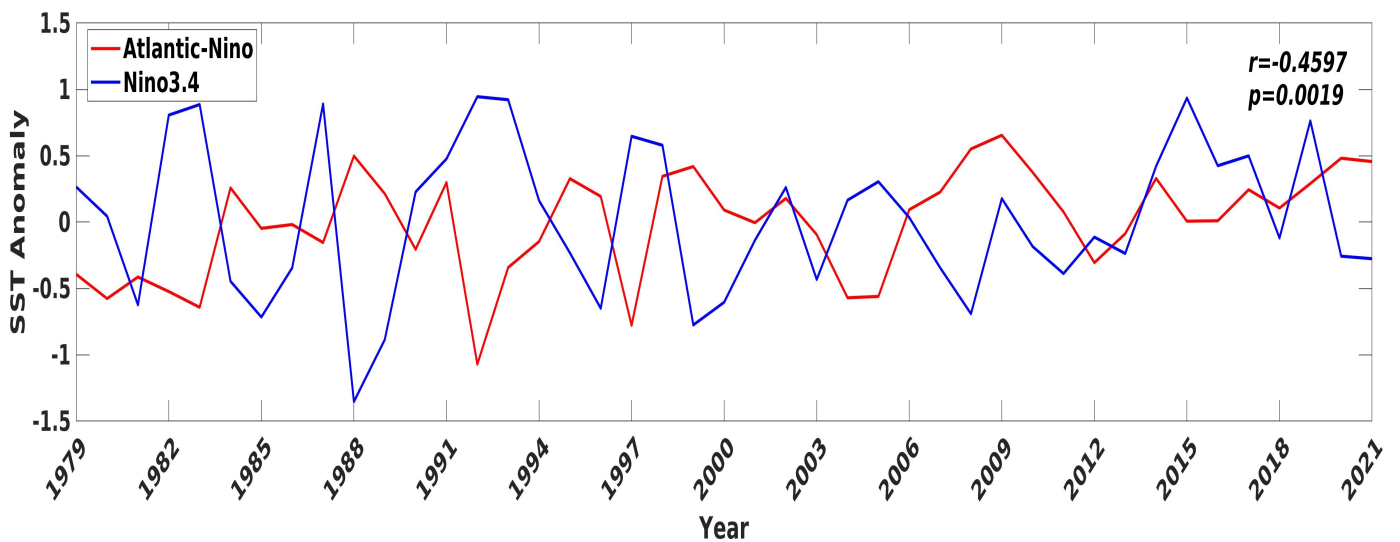
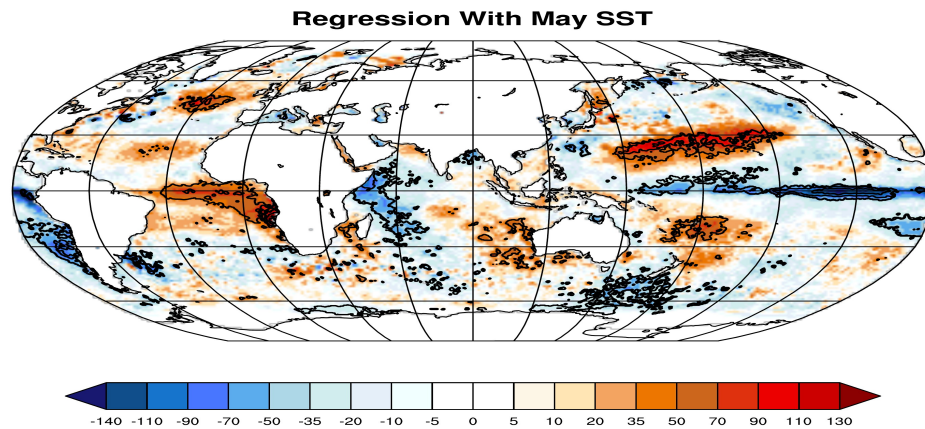
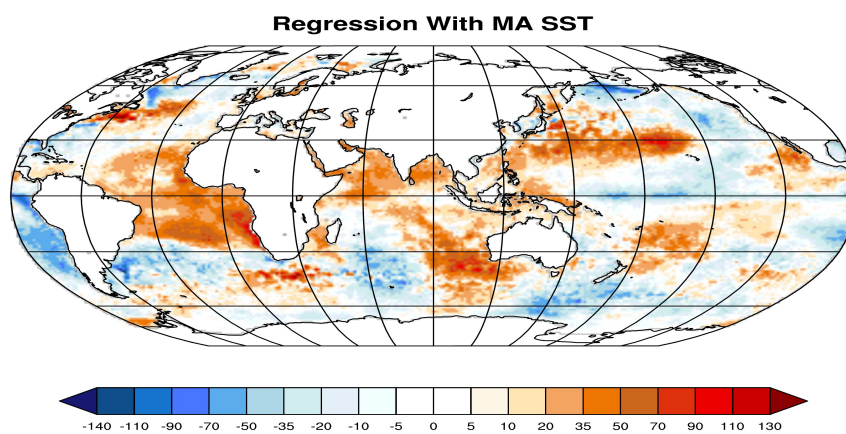


Fig. S3 Normalized time series of May Nino3.4 index and May Atlantic Nino index. The correlation between the two time series is also shown. Unit: $^{\circ}\text{C}$

a)



b)



c)

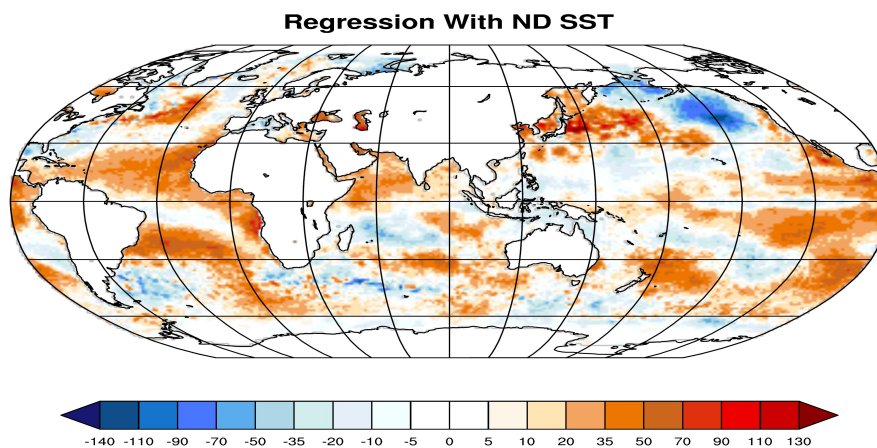


Fig. S4 **a** Regression of May NEI rainfall with global May SST. Contours area are the regions where the regressions are significant at 95% confidence level. **b** Regression of May rainfall over NEI with global March-April (MA) SST of the same year. **c** Regression of May rainfall over the NEI with November-December (ND) of previous year. Unit: $^{\circ}\text{C}/(\text{m}.\text{day}^{-1})$

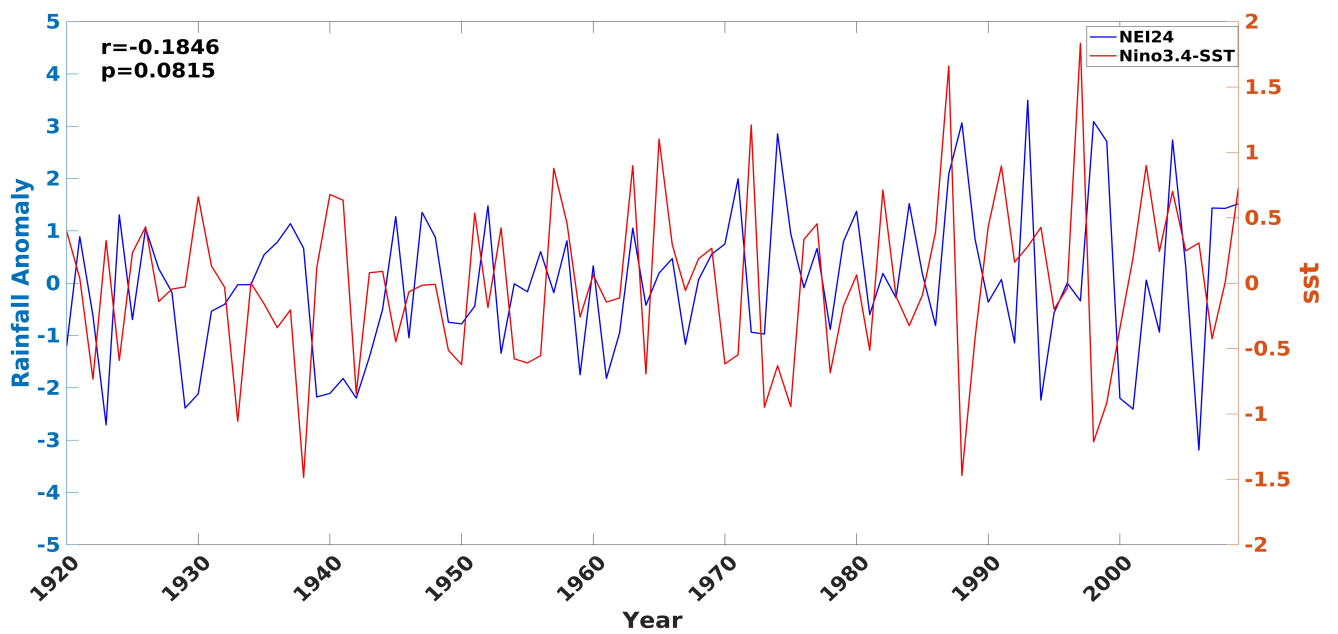


Fig. S5 Comparison of July-August rainfall anomaly over the NEI from NEI24 station dataset and Nino3.4 SST anomaly from 1920-2009. Units: mm/day, °C

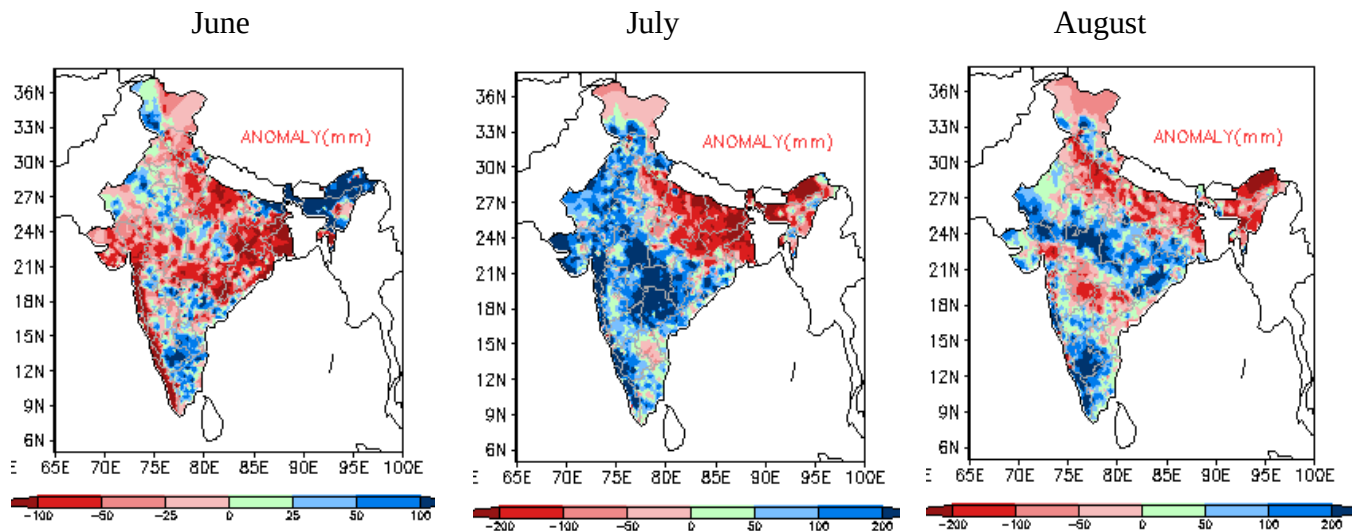


Fig. S6 Observed rainfall anomaly over the India during June, July and August of 2022 as indicated by the India Meteorological Department. (Source: IMD)

Table S1 From the **Fig. 5** we have extracted the dry and wet rain spells lasting more than 5 days as below. We have considered the days as a spell which lasts for 5 days above (below) 0.75 standard deviation continuously.

Wet Spells	Dry Spells
1. 1980 - 5 - 9	1. 1979 - 19 - 31
2. 1984 - 6 - 14	2. 1980 - 20 - 24
3. 1988 - 19 - 29	3. 1982 - 17 - 27
4. 1991 - 5 - 11	4. 1983 - 25 - 31
5. 1993 - 1- 6	5. 1986 - 19- 31
6. 1996 - 7- 14	6. 1987 - 10- 16 and 26 - 31
7. 2000 - 22- 29	7. 1993 - 21- 26
8. 2001 - 7- 12	8. 1995 - 26- 30
9. 2006 - 26- 31	9. 1996 - 20 -25
10. 2013 - 3- 9	10. 1997 - 11 - 15
11. 2022 - 13- 19	11. 1998 - 12 - 17
	12. 2004 - 3 - 8
	13. 2012 - 5 - 11 and 18 - 22
	14. 2014 - 16 - 21

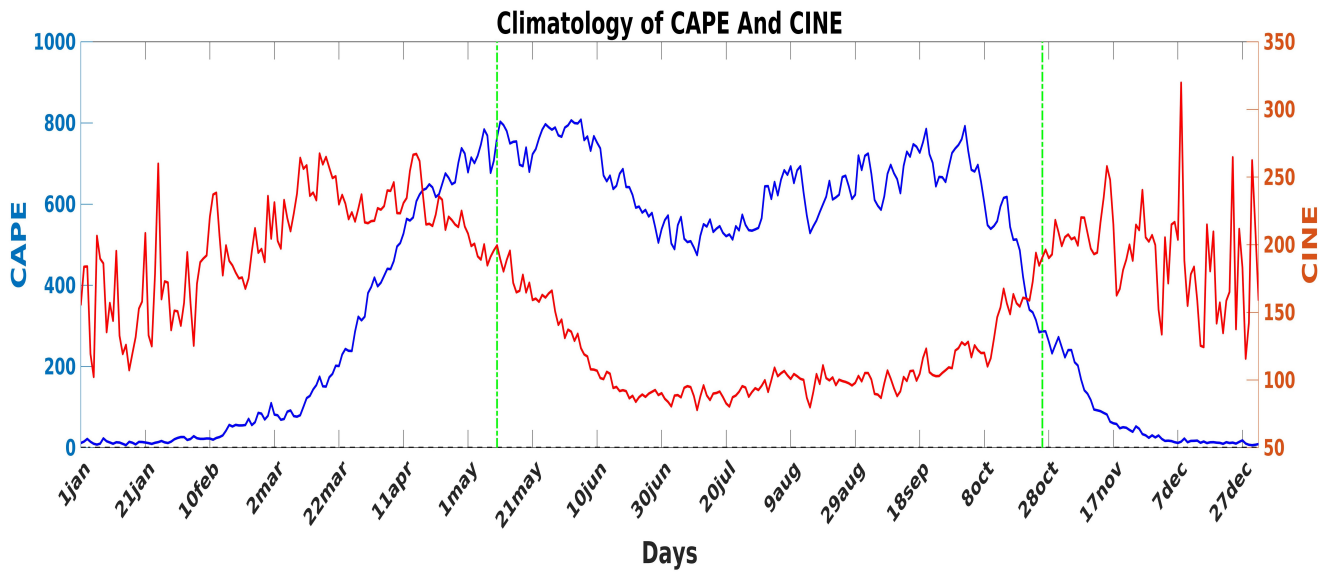


Fig. S7 Daily climatology of Convective available potential energy (CAPE) and Convective Inhibition (CINE) during the period 1979 to 2022. CAPE and CINE is calculated over the box 88°E to 100°E and 22°N to 29.5°N for the mentioned period. The unit of CAPE and CINE is Jkg⁻¹.