



# मॉनसून 2024 चर्चा Monsoon Discussion Forum

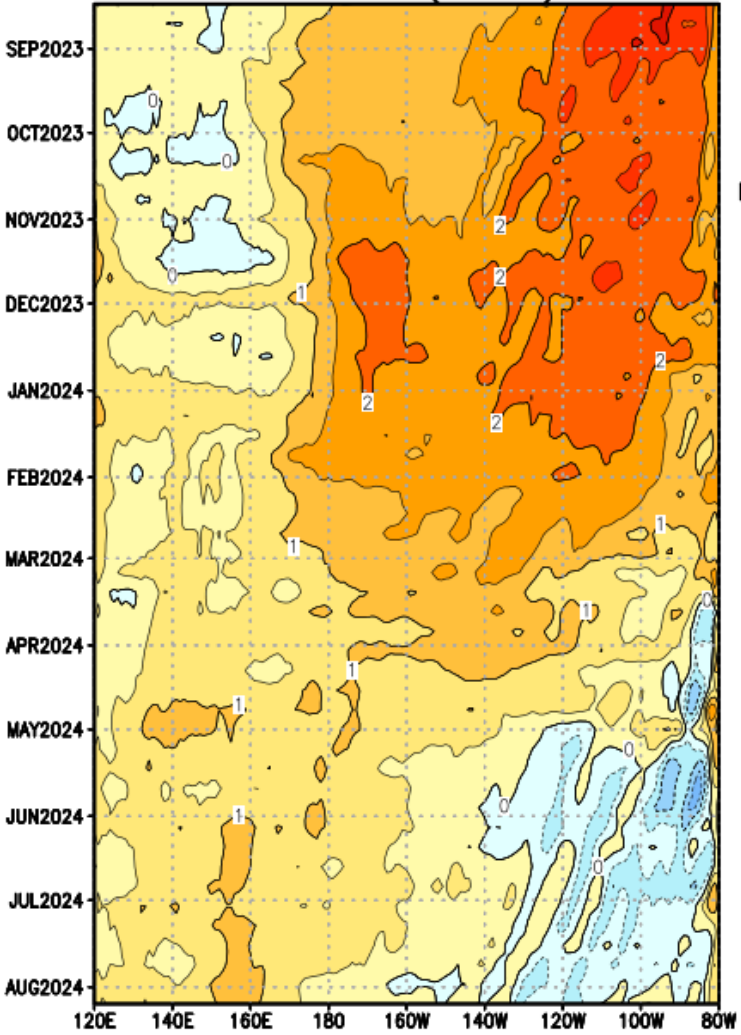
ऋतुनिष्ठ (मॉनसून-2024) पूर्वानुमान | Seasonal forecasts of Monsoon 2024

मॉनसून मिशन | Monsoon Mission

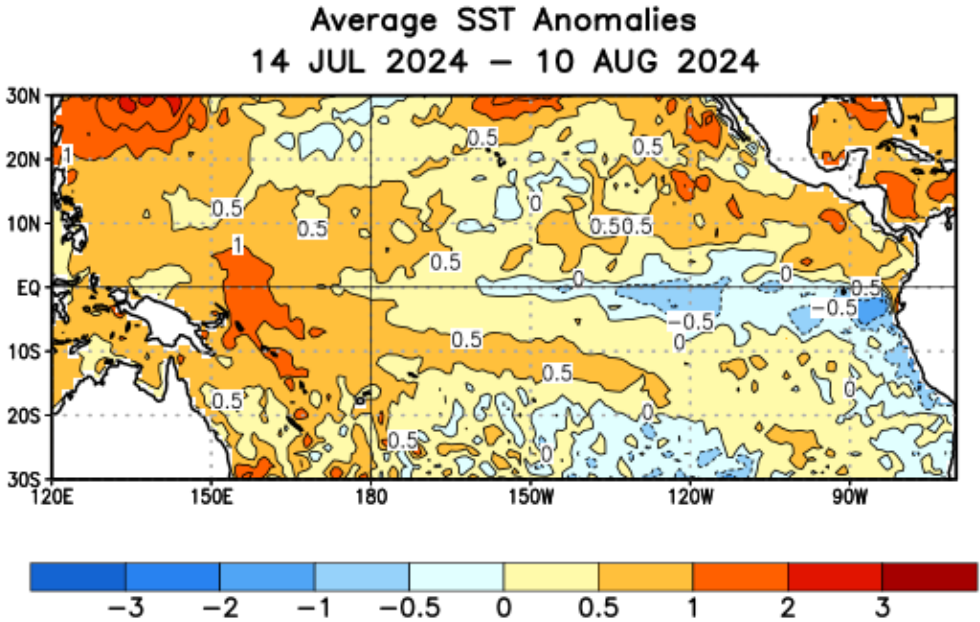
यह चर्चा पूरी तरह से वैज्ञानिक है और इसका भारत मौसम विज्ञान विभाग द्वारा जारी पूर्वानुमानों पर कोई प्रभाव नहीं पड़ता है।

Disclaimer: This discussion is purely scientific/academic and has no impact on the operational forecasts issued by the India Meteorological Department

# SST Anomalies (5N-5S)

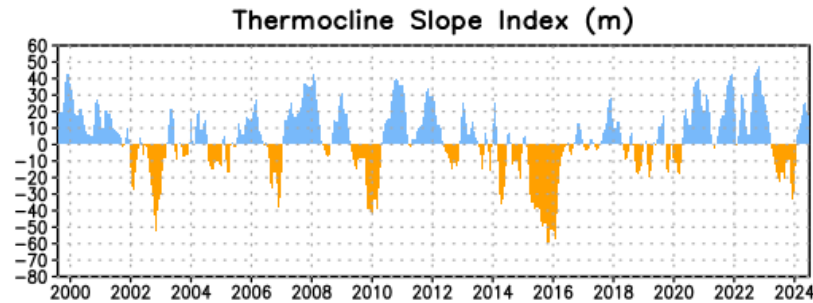
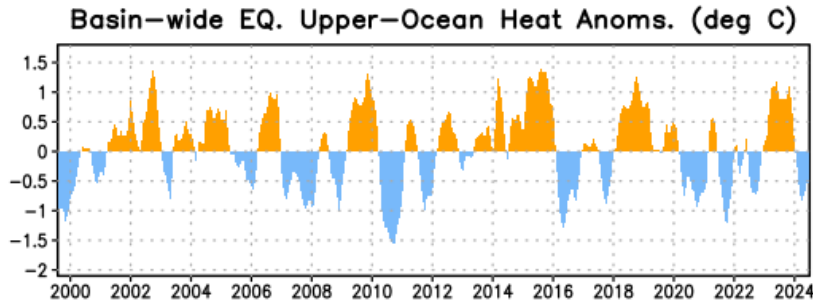
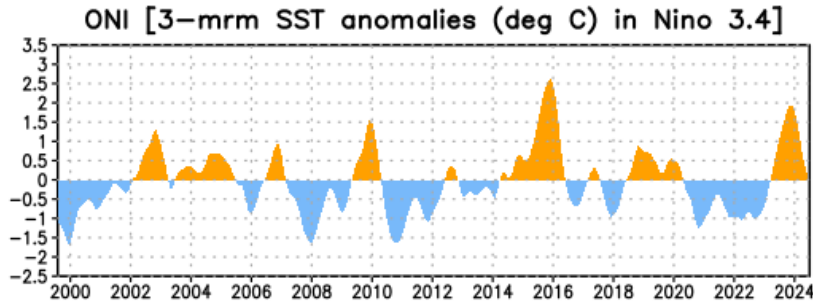


# Recent Conditions

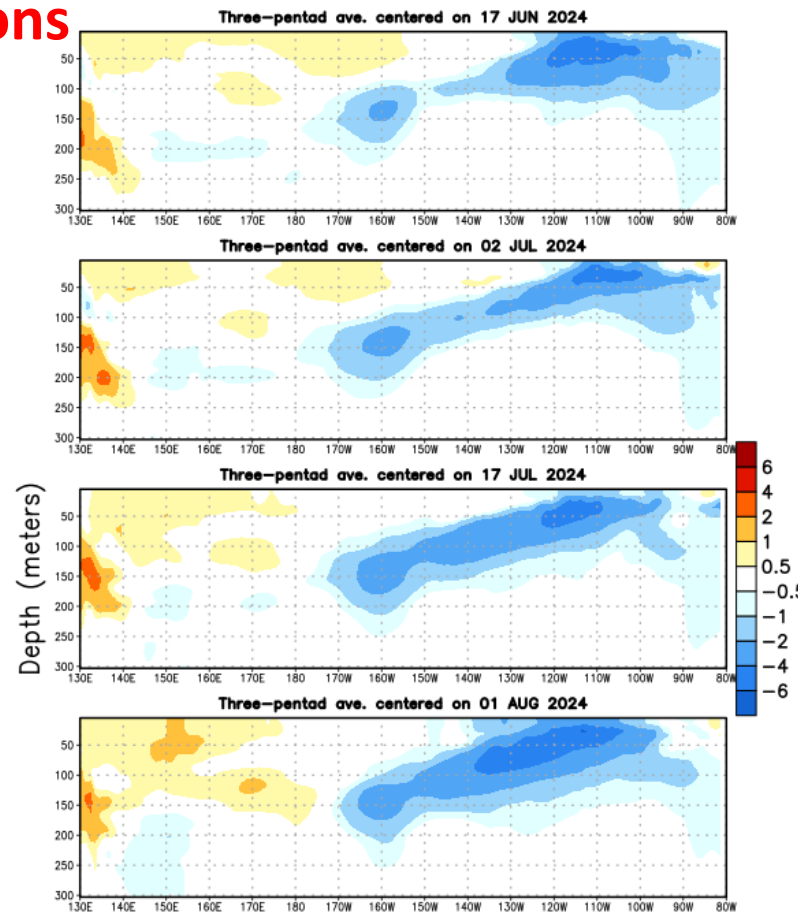


Courtesy: NOAA CPC

# Recent Conditions



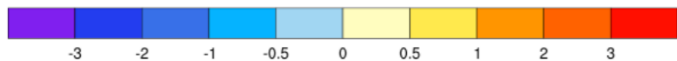
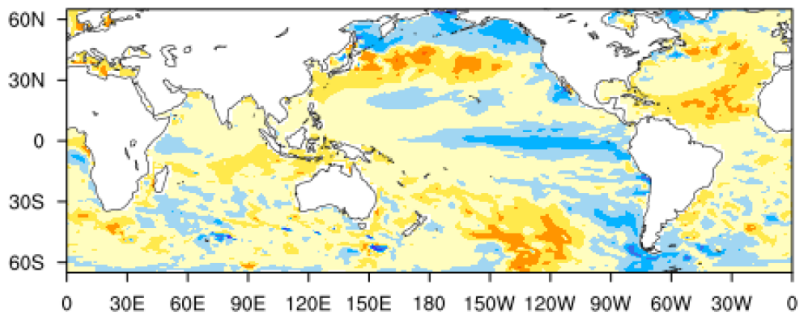
EQ. Subsurface Temperature Anomalies (deg C)



Courtesy: NOAA CPC

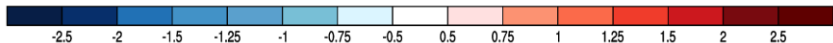
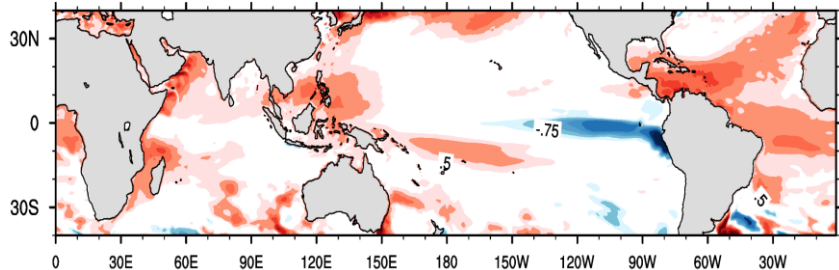
# MMCFS SST Anomaly Forecast :Jun 2024 IC

(a) JAS 2024

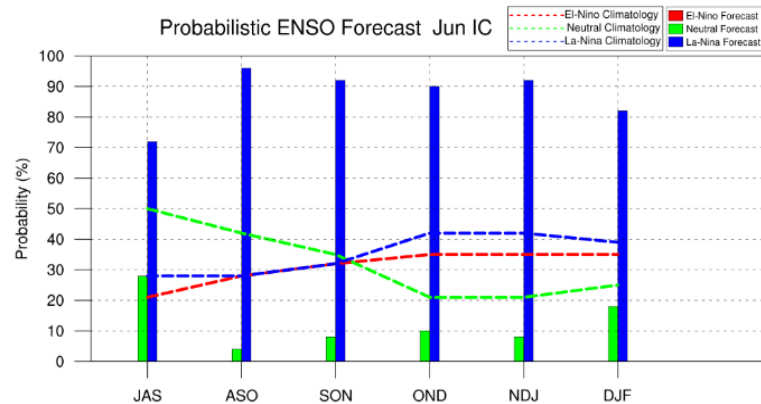


## MMCFSv2

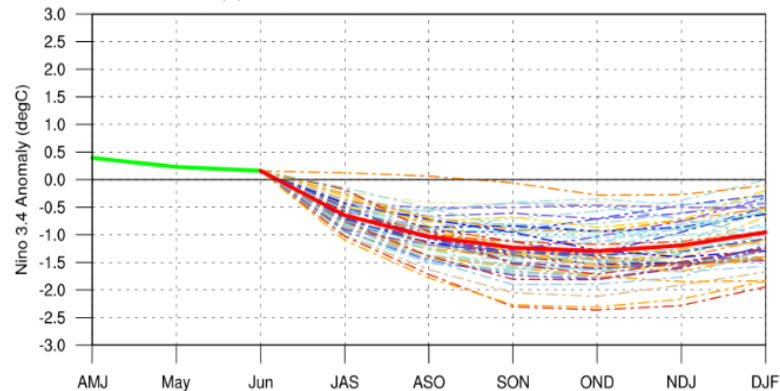
2024 - CLIM



Probabilistic ENSO Forecast Jun IC

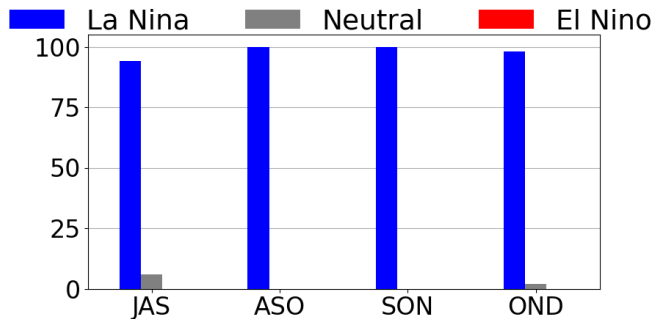


(a) Plume of Nino 3.4 Model Forecast - Jun IC

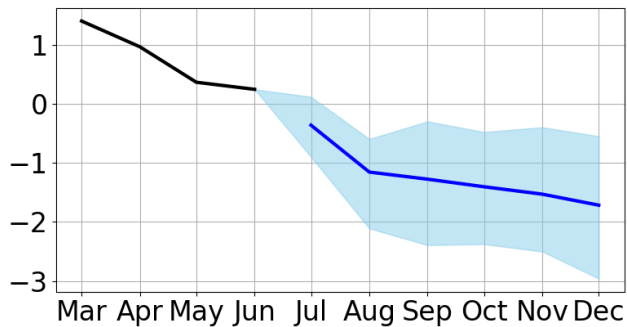


June IC MMCFS plume forecast suggests a transition from ENSO neutral conditions to La Niña conditions by the end of the JAS season.

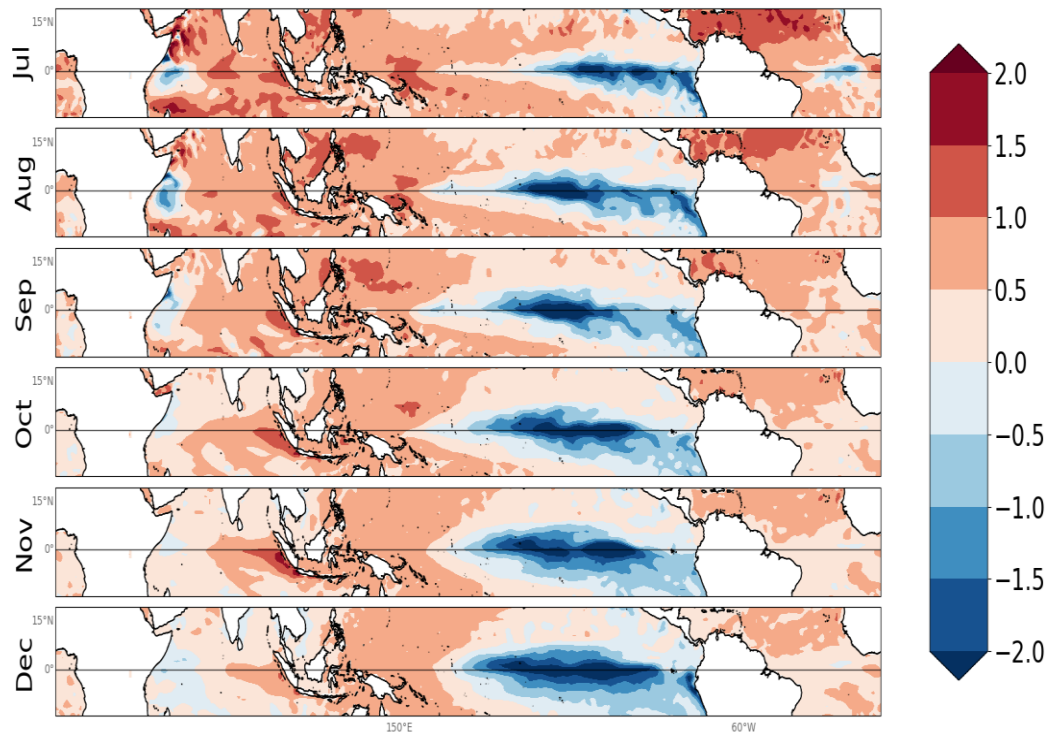
## Probability of occurrences (with +/-0.5 °C thresholds)



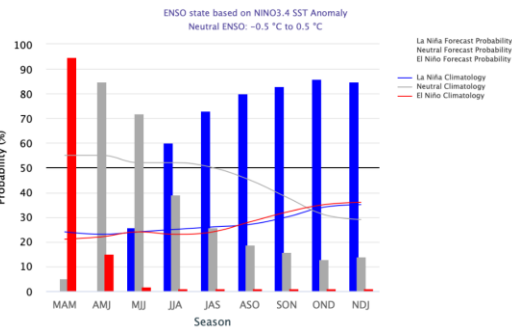
## Plume of Nino 3.4 SSTs



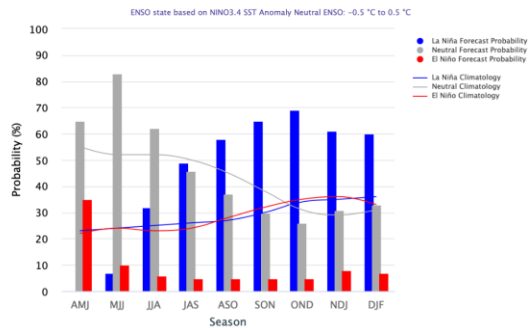
## NCMRWF forecast from June IC



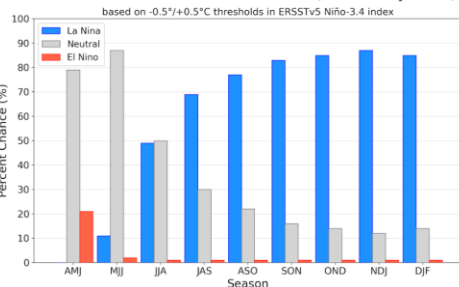
Early-April 2024 CPC Official Probabilistic ENSO Forecasts



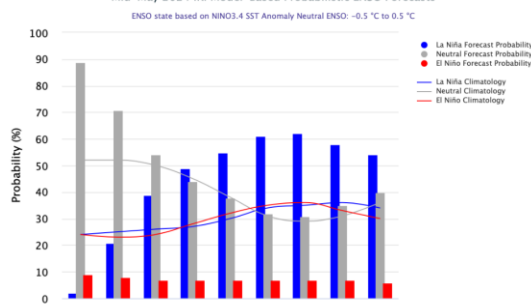
Mid-April 2024 IRI Model-Based Probabilistic ENSO Forecasts



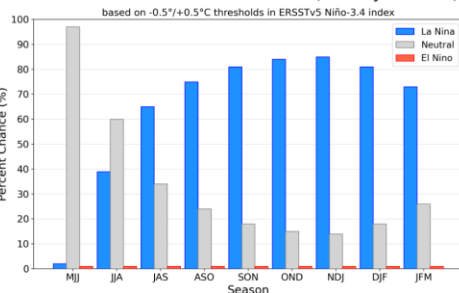
Official NOAA CPC ENSO Probabilities (issued May 2024)



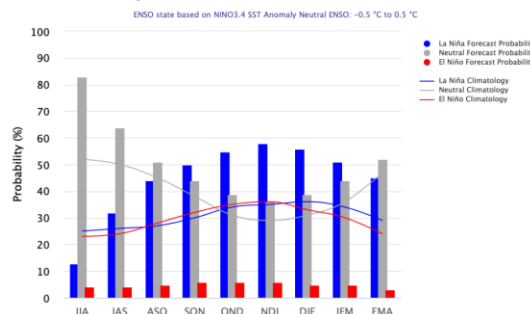
Mid-May 2024 IRI Model-Based Probabilistic ENSO Forecasts



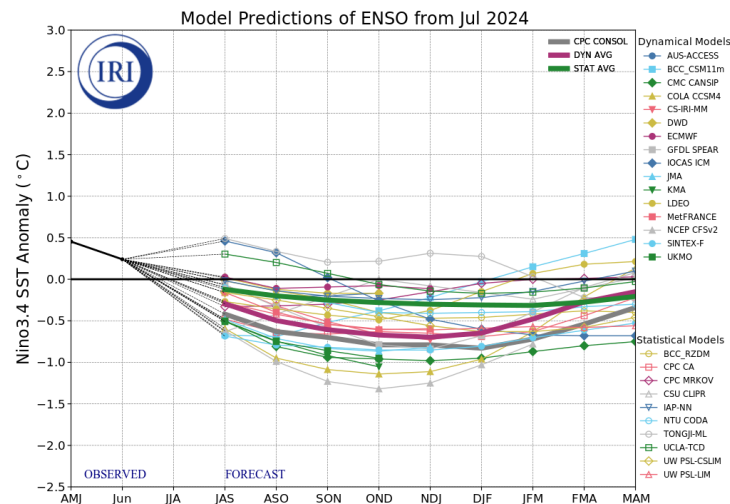
Official NOAA CPC ENSO Probabilities (issued June 2024)



Mid-June 2024 IRI Model-Based Probabilistic ENSO Forecasts

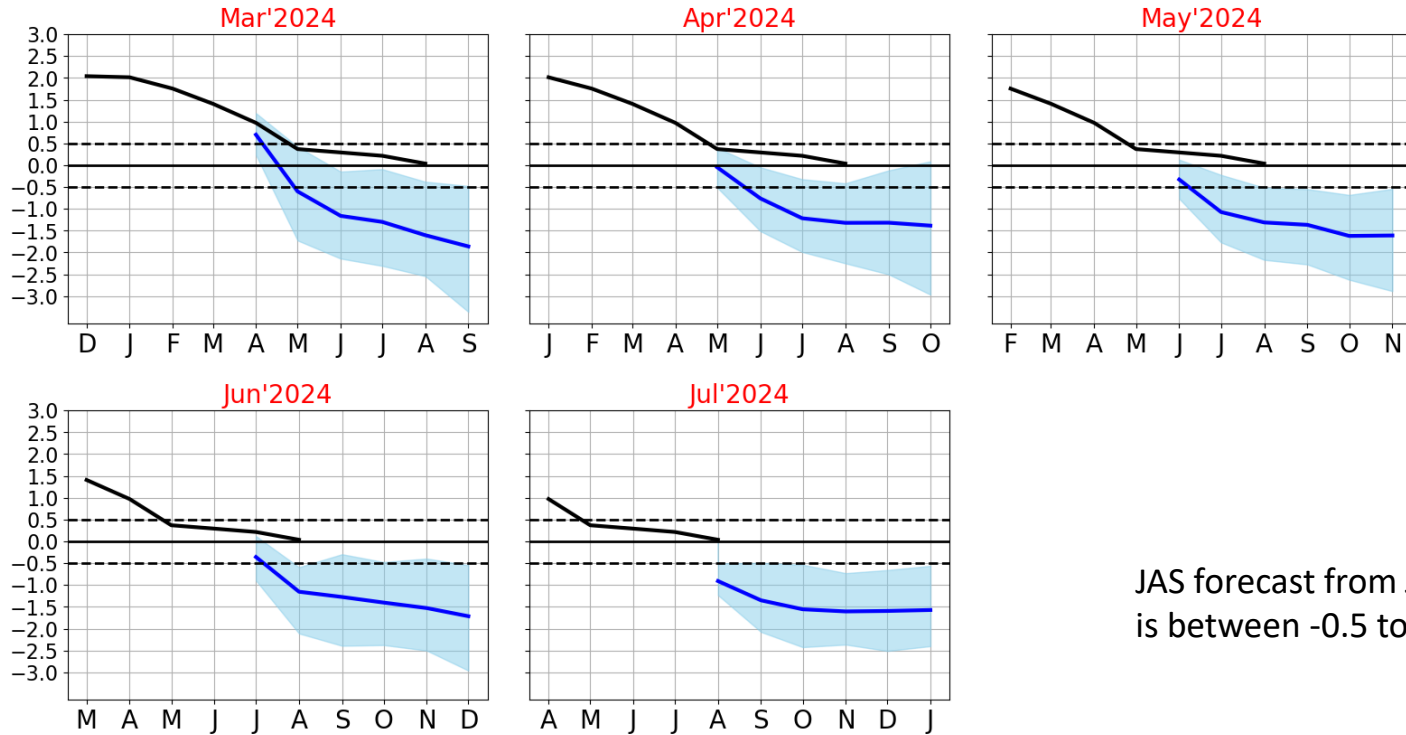


- MMCFS, NOAA/CPC forecasts indicate a higher probability of transition to La-Niña state towards the end of 2024.
- While the IRI forecasts indicate a comparatively lower La-Niña probability.

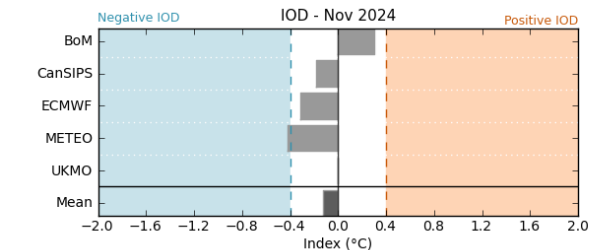
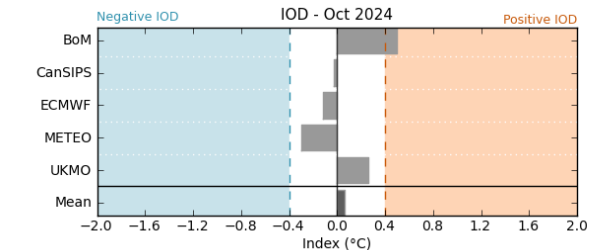
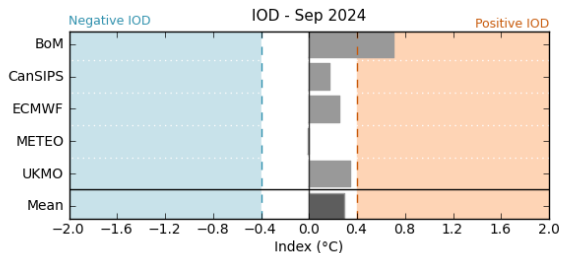




# Nino 3.4 Verification

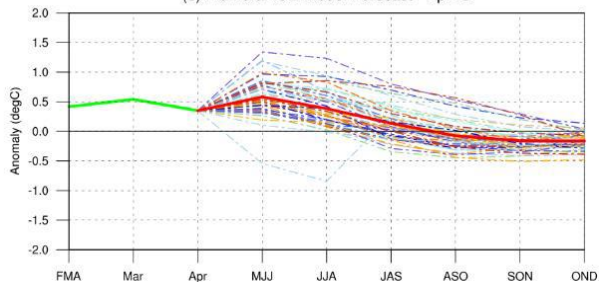


JAS forecast from June ICs is between -0.5 to -1 C.

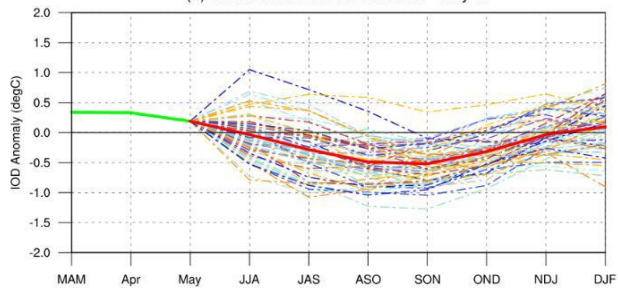


- The Indian Ocean Dipole (IOD) is currently neutral.
- No strong consensus amongst climate-models, IOD neutral conditions are expected to be present during JJAS 2024.
- MMCFS forecasts for DMI are most skillful with May/June ICs; and they indicate weak negative IOD conditions during JAS.

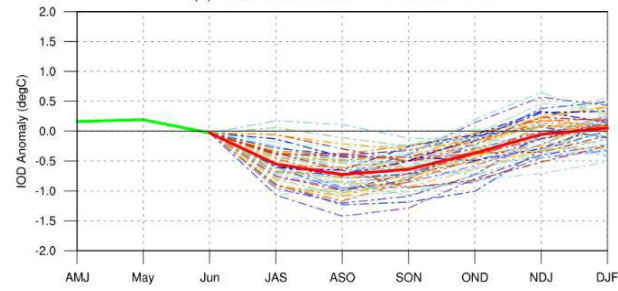
(b) Plume of IOD Model Forecast - Apr IC



(b) Plume of IOD Model Forecast - May IC



(b) Plume of IOD Model Forecast - Jun IC



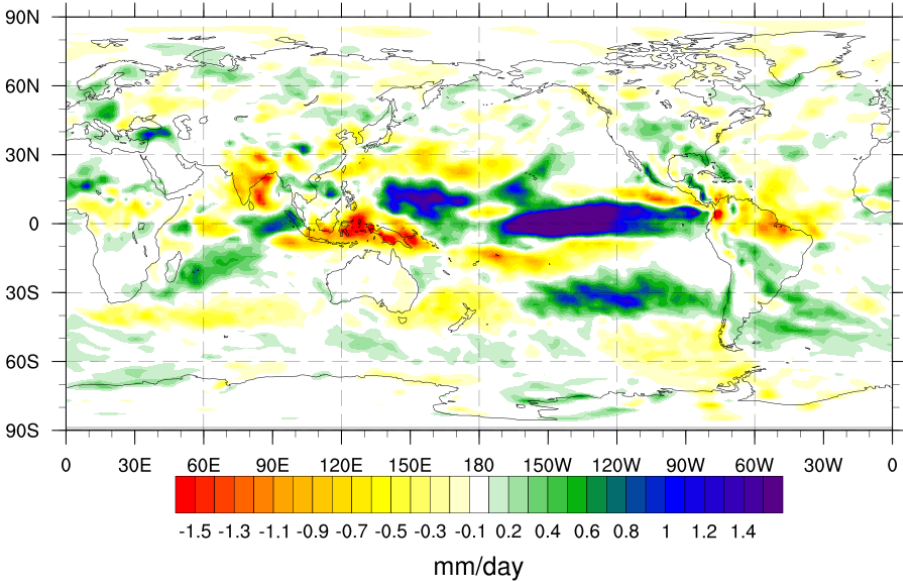


# Composites of boreal summertime precipitation during ENSO years

NCEP/NCAR Reanalysis

El Nino: May to Sep 2015, 1997, 1987, 1982, 1972, 1965, 1957, 2002, 2009, 1963

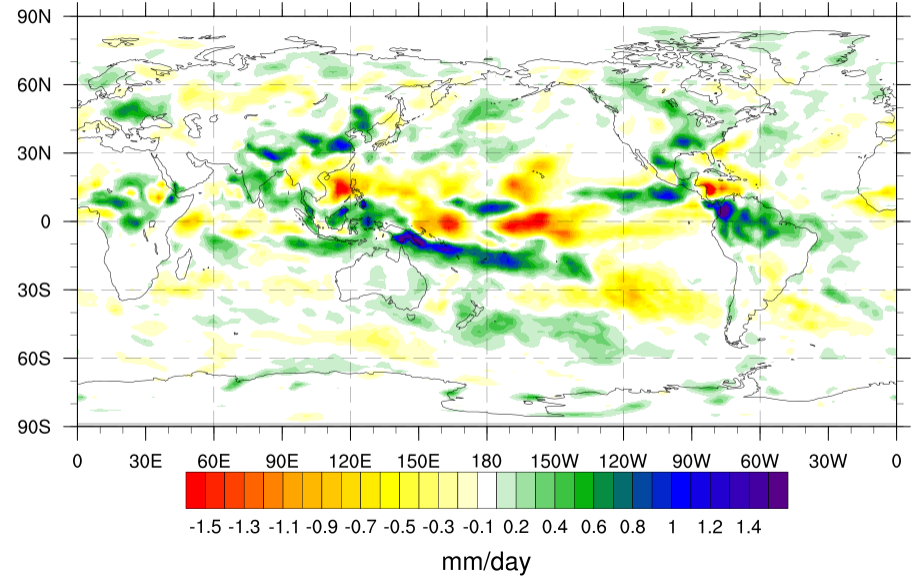
Precipitation Rate Anomaly 30 year centered climatology on event year



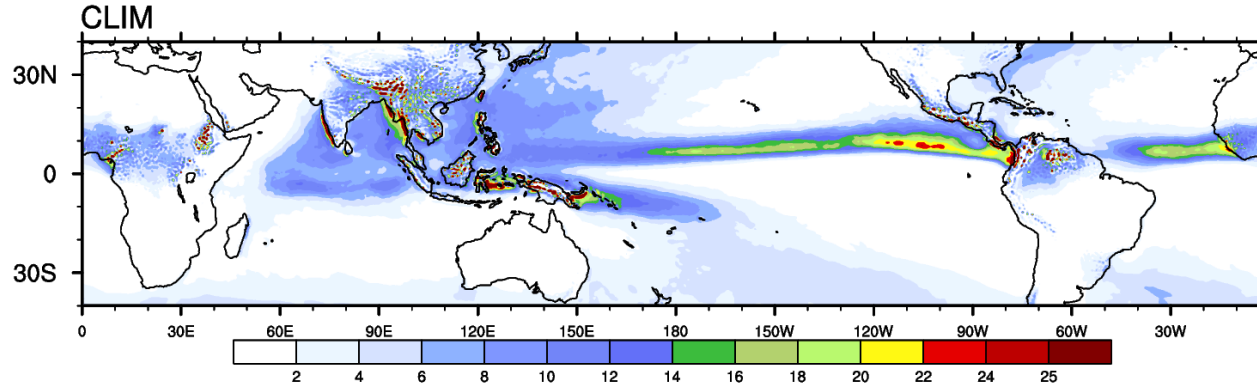
NCEP/NCAR Reanalysis

La Nina: May to Sep 1988, 1975, 1955, 1973, 1950, 2010, 1991, 1954, 1956, 1964

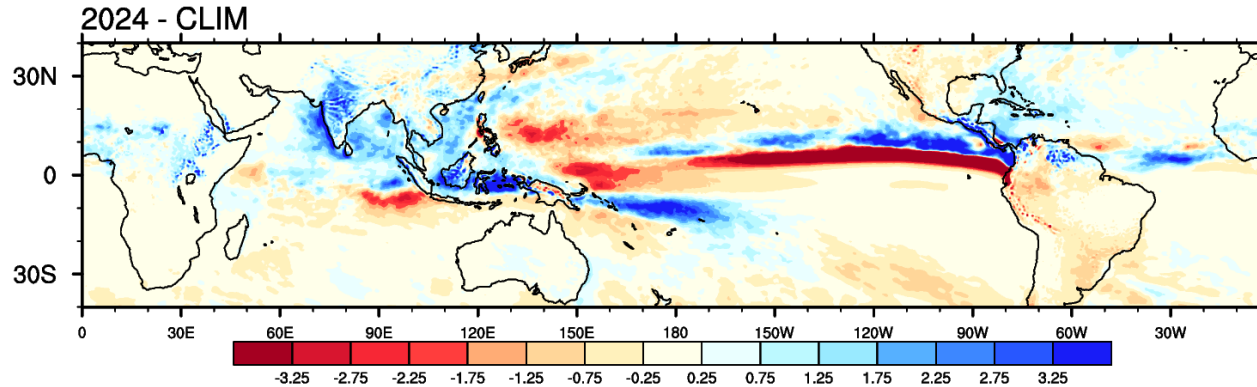
Precipitation Rate Anomaly 30 year centered climatology on event year



# MMCFsv2 - 2024 Rainfall and Anomaly

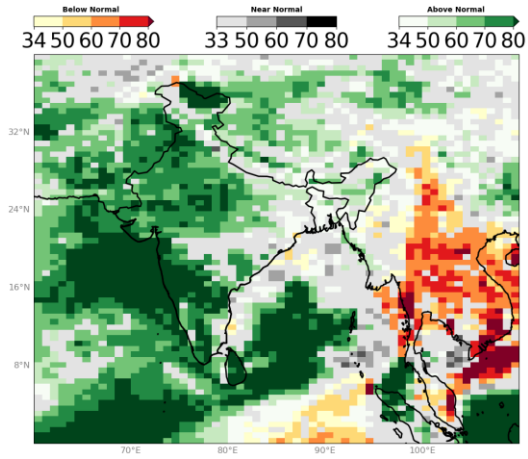


2024 Rainfall = 6.9mm/day  
Clim = 5.95  
Departure = +16%



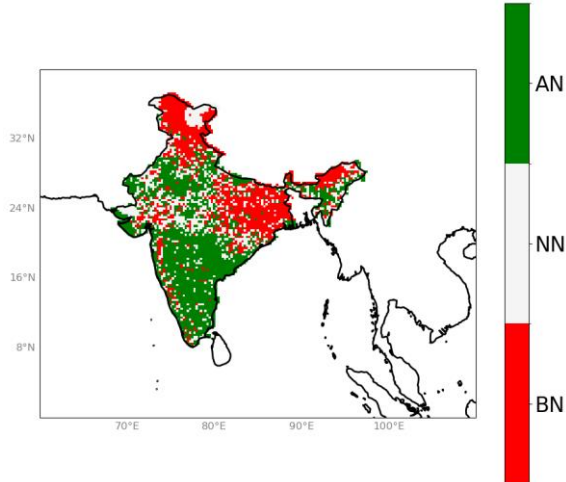
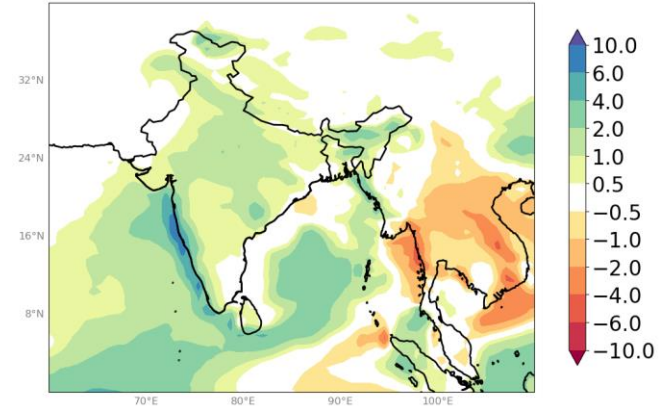
# NCMRWF MJJ 2024 forecast from April ICs

## Probabilistic forecast

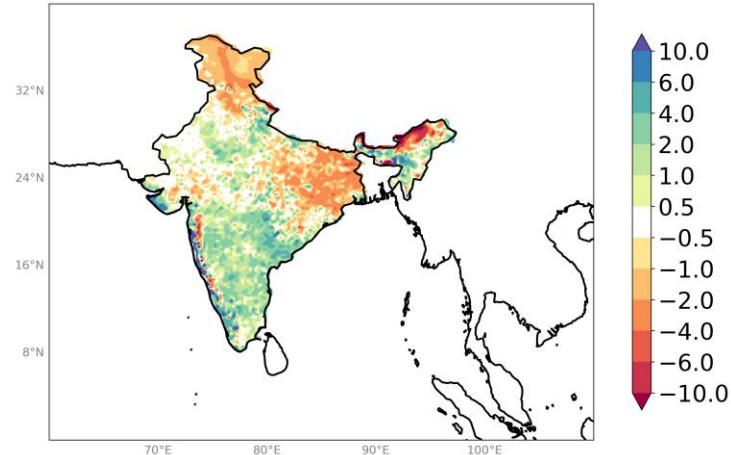


Model

## Anomaly (mm/day)



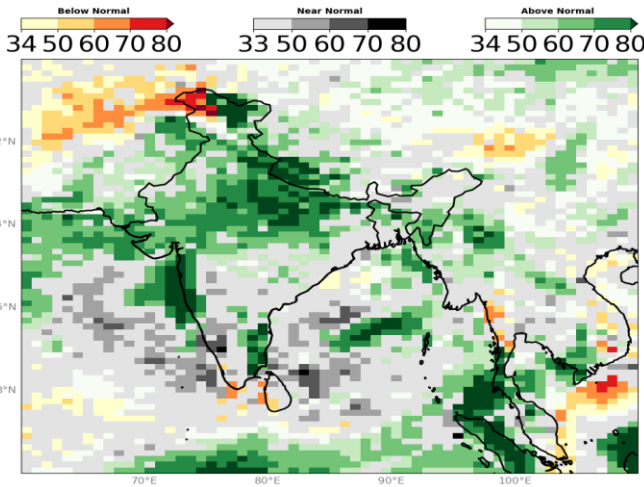
Observations



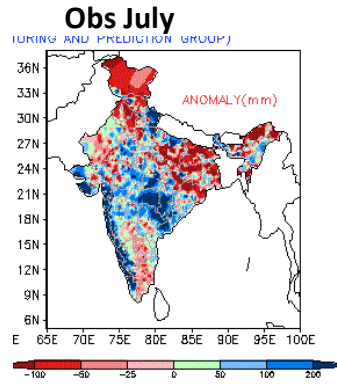
# NCMRWF JAS 2024 forecast from June ICs



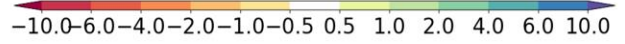
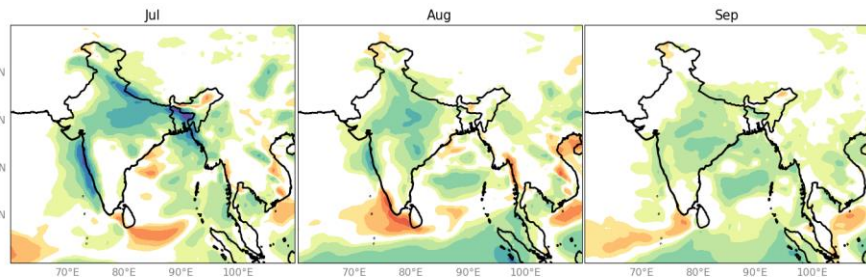
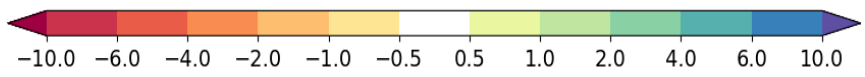
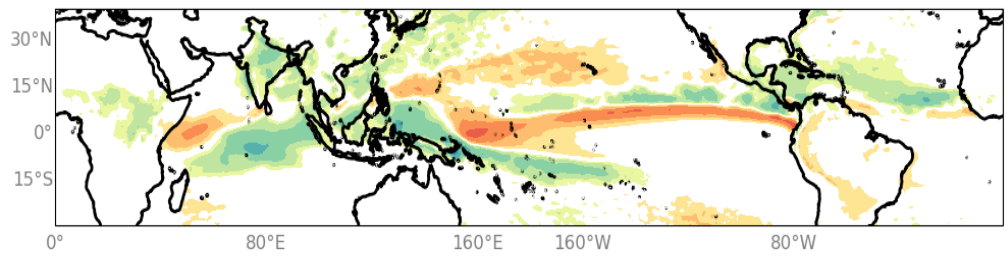
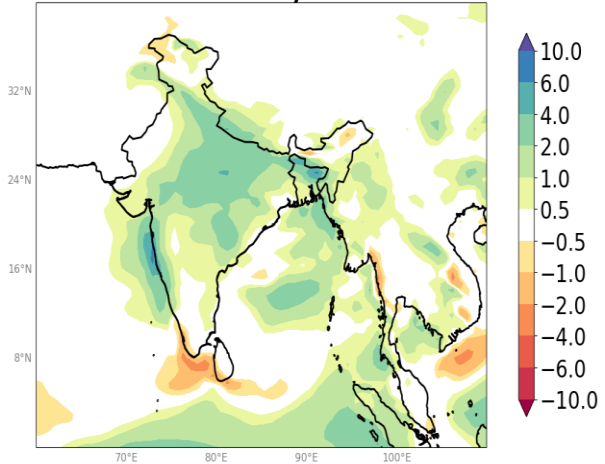
Probabilistic



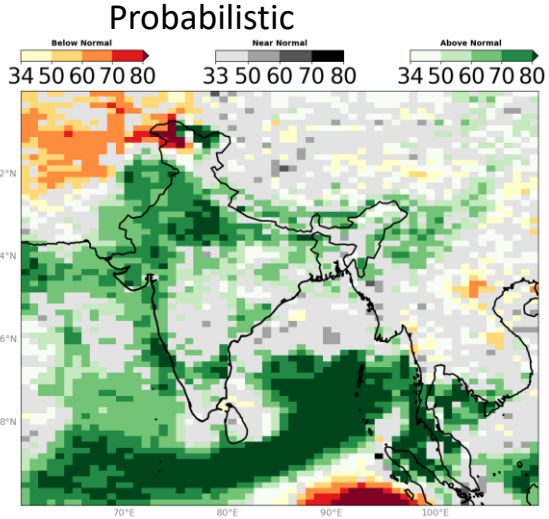
Precipitation (mm/day)



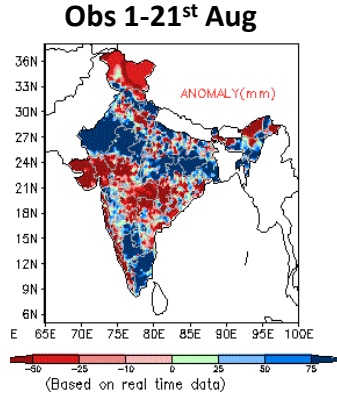
Anomaly



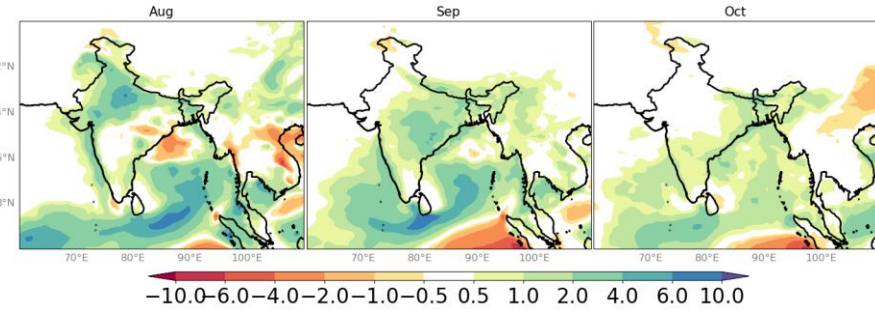
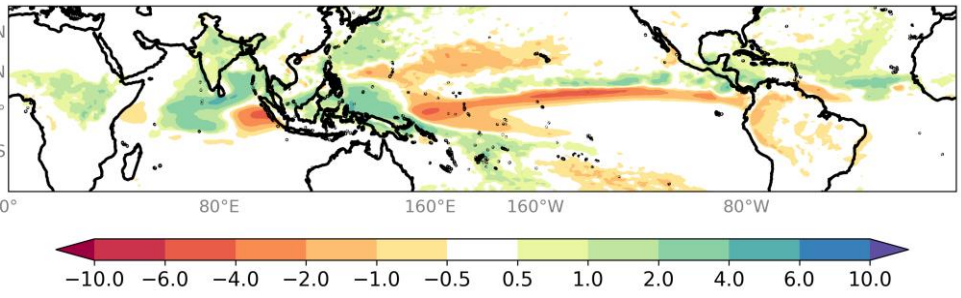
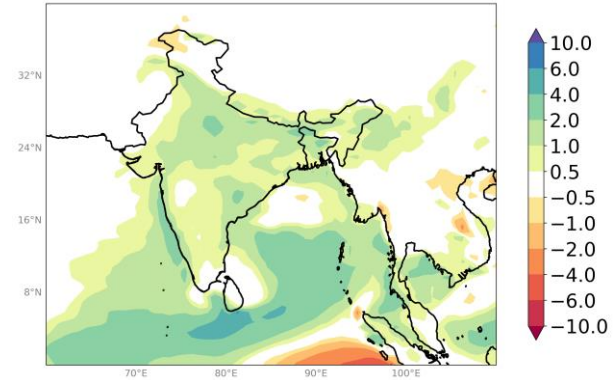
# NCMRWF ASO 2024 forecast from July ICs



### Precipitation (mm/day)

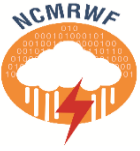


### Anomaly



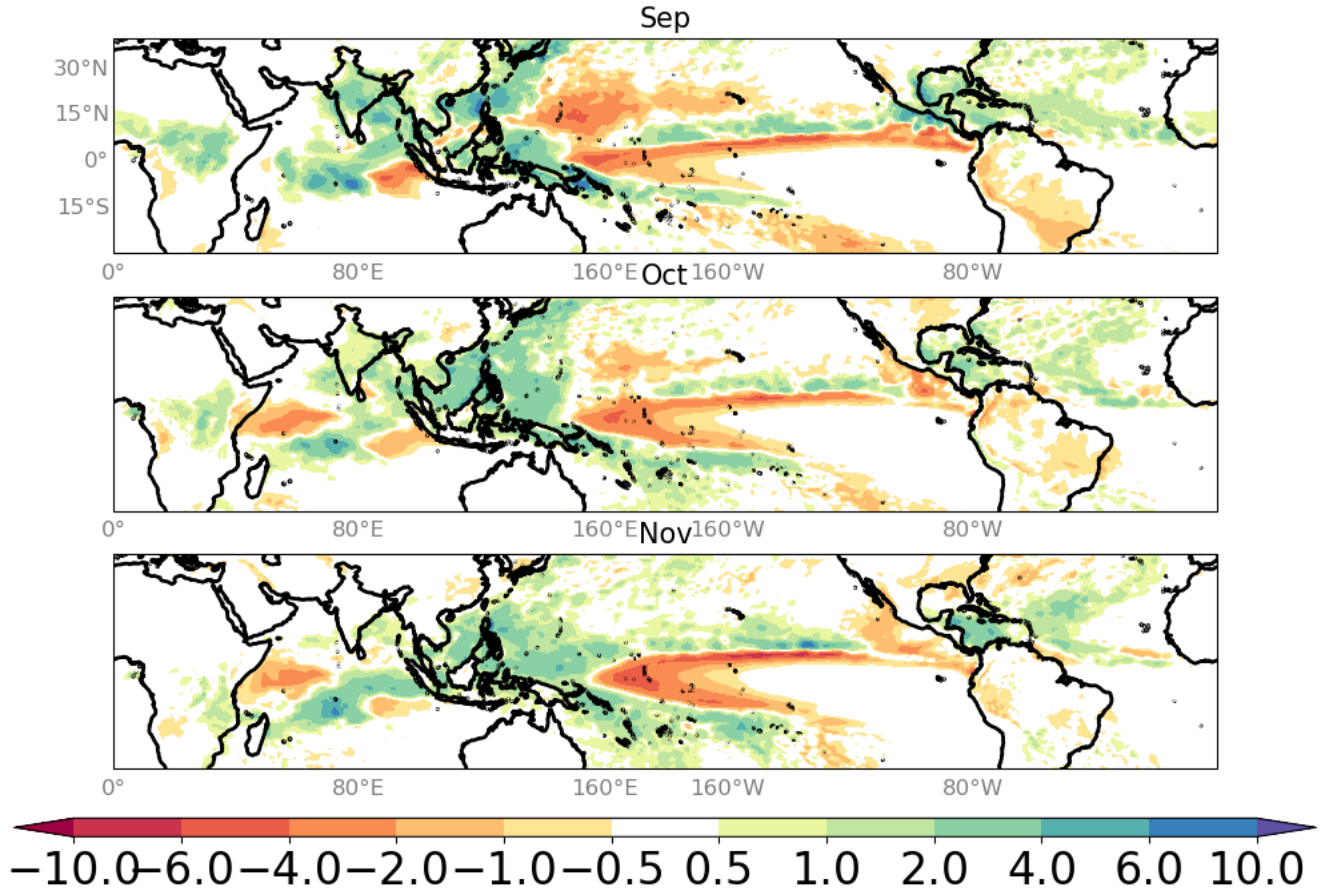


# NCMRWF SON 2024 forecast from August ICs



Precipitation  
(mm/day)

Anomaly

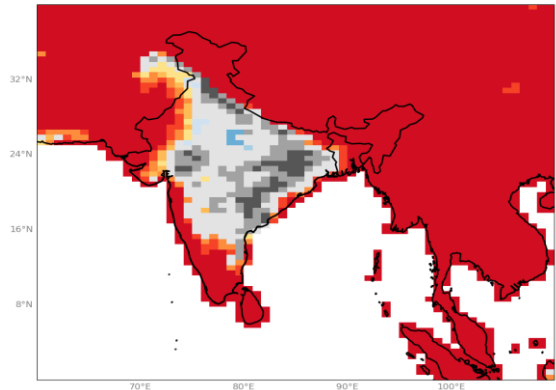




# NCMRWF Temperature ( $^{\circ}\text{C}$ ) forecast

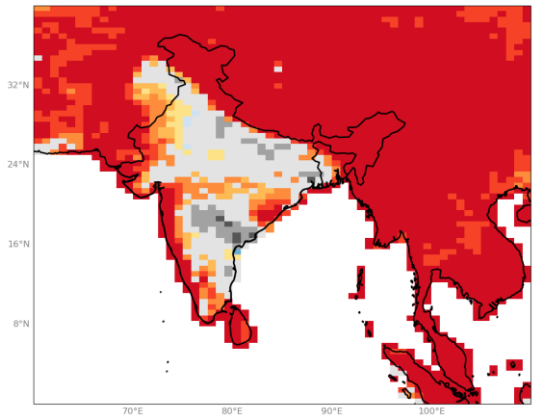
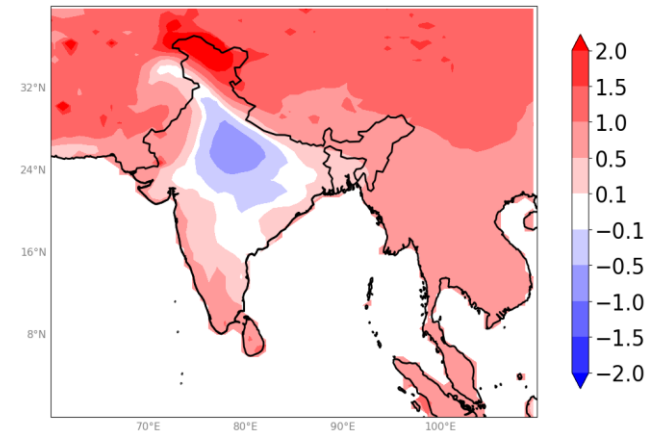


Probabilistic

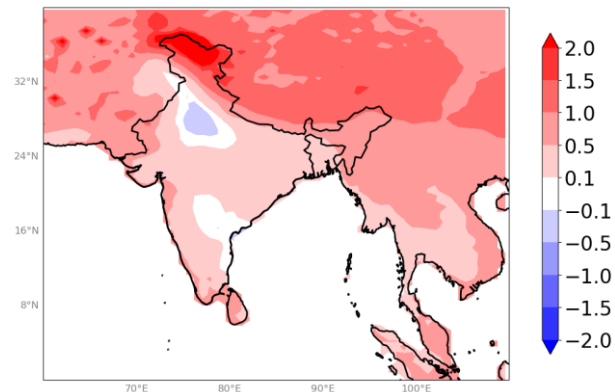


JAS,  
June IC

Anomaly



ASO,  
July IC



# Summary

- Models were showing transition to La-Nina in August, but current conditions are ENSO-neutral
- Models are now indicating transition to La-Nina in September, with La-Nina strengthening & persisting in boreal winter
- Neutral IOD conditions prevailing with no consensus on forecasts
- Most models correctly indicated above normal rainfall for JJA & JAS, with the exception of –ve July rainfall observed over Bihar-Jharkhand.
- Models indicate above normal rainfall for September and October

Thanks