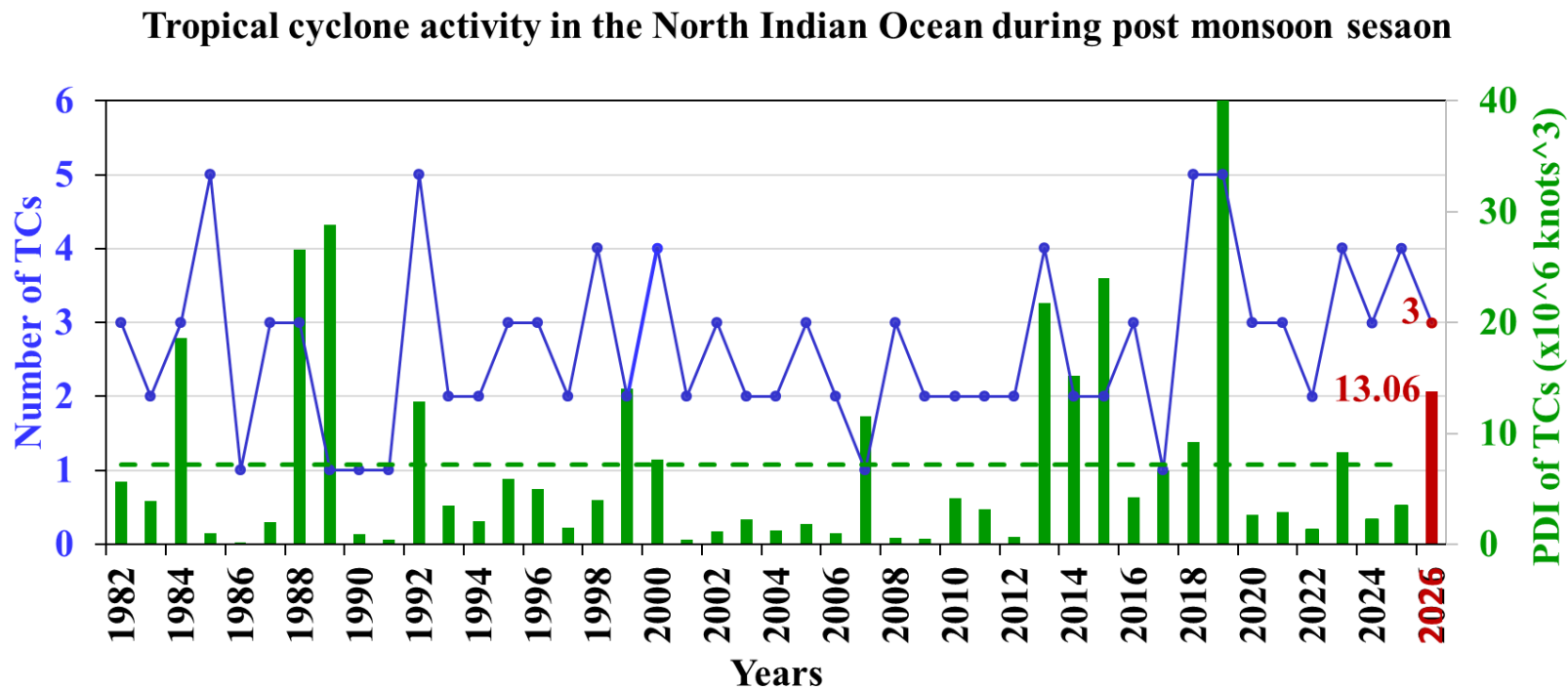


Seasonal Prediction of Tropical Cyclones in the North Indian Ocean

In the year 2026 during October-December months there is a possibility of formation of three tropical cyclones in the North Indian Ocean with power dissipation index (PDI) of $13.06 \times 10^6 \text{ knots}^3$, which is higher than the mean of the last 44 years ($7.15 \times 10^6 \text{ knots}^3$)



Post monsoon season of the year 2026 may experience **three tropical cyclones** with annual **power dissipation index of $\sim 13.06 \times 10^6 \text{ knots}^3$** .

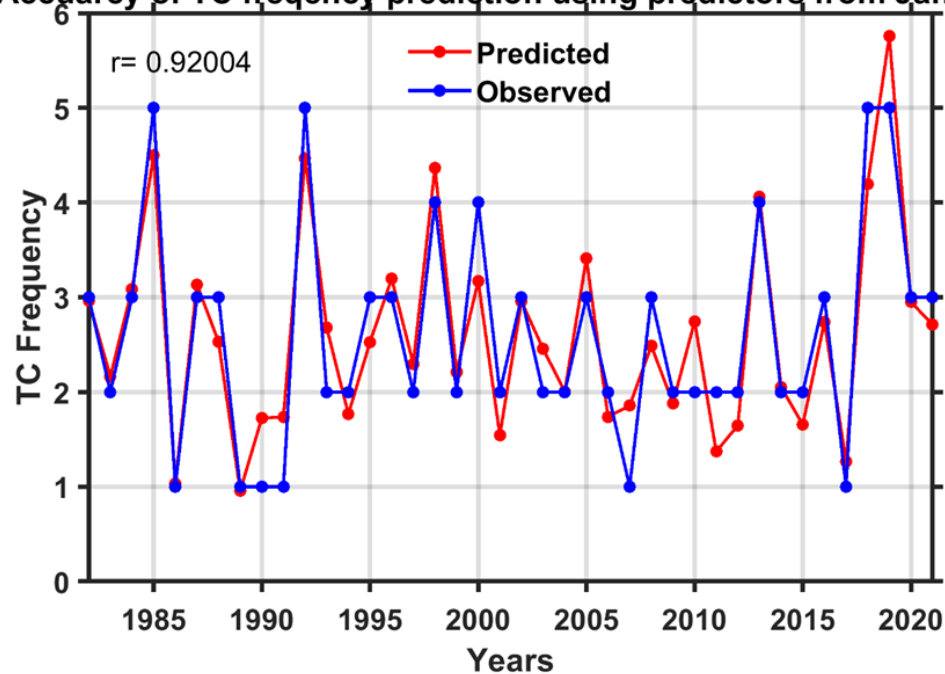
(PDI is a function of the intensity, lifetime and annual frequency of TCs)

Observed Frequency (blue lines) and Power dissipation index (green stacks) of NIO TCs during post monsoon years 1982-2025. Green dashed line shows the 44 years mean PDI value ($7.15 \times 10^6 \text{ knots}^3$). **The predicted number of TCs (3) and its PDI ($13.06 \times 10^6 \text{ knots}^3$) is shown in the red colour**

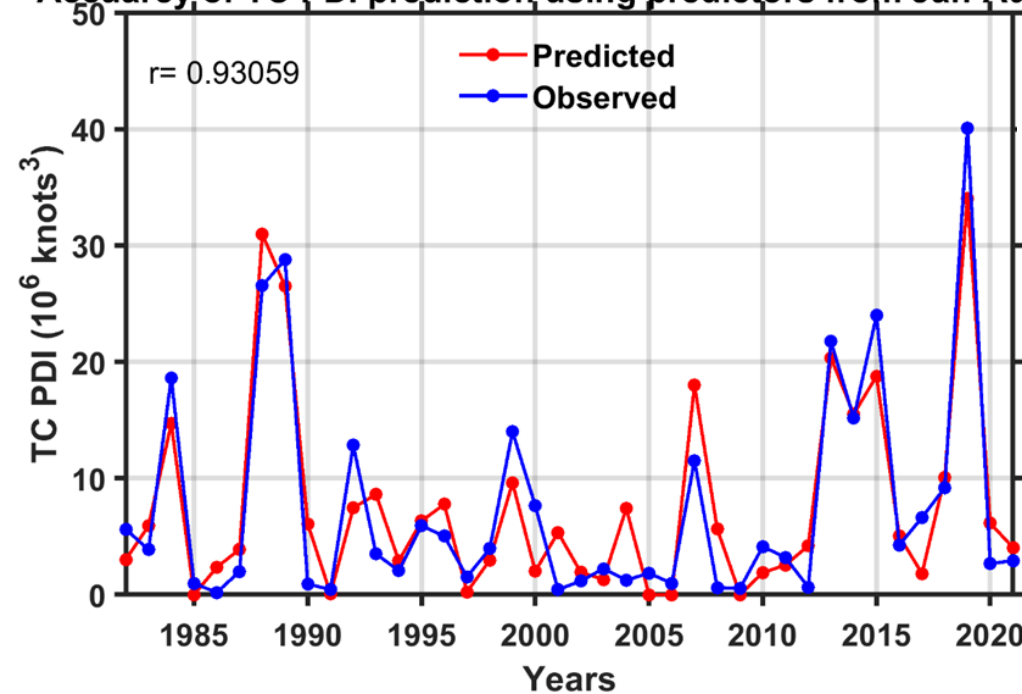
Seasonal prediction of Tropical Cyclones in the North Indian Ocean

- For the coastal population, tourism, decision-makers, and the government to plan ahead to handle the disaster, long-range forecasts of tropical cyclones (TCs) in the north Indian Ocean (NIO) are crucial.
- To predict the seasonal activity of TCs in the NIO a study has been attempted using the last 40 years global reanalysis data (ERA5) of atmospheric and oceanic parameters that influence TC activity.
- Global atmospheric and oceanic parameters are analysed to identify the potential predictors for the model to predict TC frequency and destructiveness in terms of power dissipation index (PDI) with enough lead time.

Accuracy of TC frequency prediction using predictors from Jan-Aug



Accuracy of TC PDI prediction using predictors from Jan-August



$$PDI = \sum_{i=0}^N \sum_{j=0}^T V_{max}^3$$

Where V_{max} is TC maximum sustained wind speed. 'T' is lifetime of TC at 6-h increments and 'N' is a number of TCs in a year

Observed and predicted TC frequency (left) and TC PDI (right) during post monsoon season of the years 1982-2021 using the final model developed for the predictors from January-August months.