Observing System Experiments focusing Monsoon Prediction

Increased frequency of El-Niño and droughts over India in the recent decade and the severity of their impact make the seasonal prediction an inherent component of mitigation and preparedness. A lot of effort is dedicated to improving the seasonal prediction of extreme events by improving dynamical models' physics, resolution, and quality, and coverage of observing networks. The predictability at seasonal time scales comes mainly from the ocean, and hence the dynamical models' capability relies on the quality of the ocean initial conditions. The prior studies have verified the sensitivity of ocean initial conditions to observations collected from various platforms, including Argos, moored buoys, expendable bathythermographs, etc. The impact of moored buoys on the ocean analysis and the sea surface temperature forecast skill has also been studied earlier. What remains unaddressed is the contribution of moored buoy observations towards the seasonal monsoon prediction. In the present study, the sensitivity of rainfall prediction over India to moored buoy observations has been tested through a couple of sensitivity experiments. The absence of tropical moored buoy observations results in large errors in ocean initial conditions that force a La-Niña type pattern over the central equatorial Pacific and modulates the monsoon rainfall to be above normal rainfall in the predictions. But the inclusion of missing moored buoy observations reduces the errors in initial conditions, which subdued the La-Niña like conditions and resulted in realistic below normal rainfall prediction. Hence moored buoys are found to be critical in order to produce quality ocean initial conditions and accurate seasonal forecast of monsoon over India.

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