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# The Floods in Equatorial East Africa during MAM 2018 Rainfall Season

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## ABSTRACT

The floods that occurred in equatorial East Africa (EEAF) during the spring of 2018 resulted in a major humanitarian crisis with an estimated 800,000 people affected, including injuries, disease outbreaks, and fatalities. The magnitude of the floods was only comparable to that of Oct – Dec 1997 and 1961. The heavy rains occurred in the background of a weak La Nina episode. EEAF is referred to as the region between 5°N and 5°S; 30°E – 40°E. The objective of this paper is to understand the mechanisms associated with these extremely heavy rainfall events.

The rainfall in MAM 2018 was marked with a strong intraseasonal variability surpassing the 90th climatological percentile over several days during the season. Prominent MJO events with varying magnitudes straddled the globe between December 2017 and June 2018. The MJO was significantly weak in March before regaining strength and eastward propagation in much of April. In early May, another moderate MJO event reemerged in Africa, and lasted through mid-June 2018. MJO modulates EEAF rainfall such that convection is enhanced (suppressed) during phases 2 and 3 (6 and 7) of the MJO activity. Analysis shows that rainfall upticks in MAM 2018 occurred during the phases 2 to 3 of the MJO. However, there are secondary peaks that occurred in periods when the MJO was inactive.

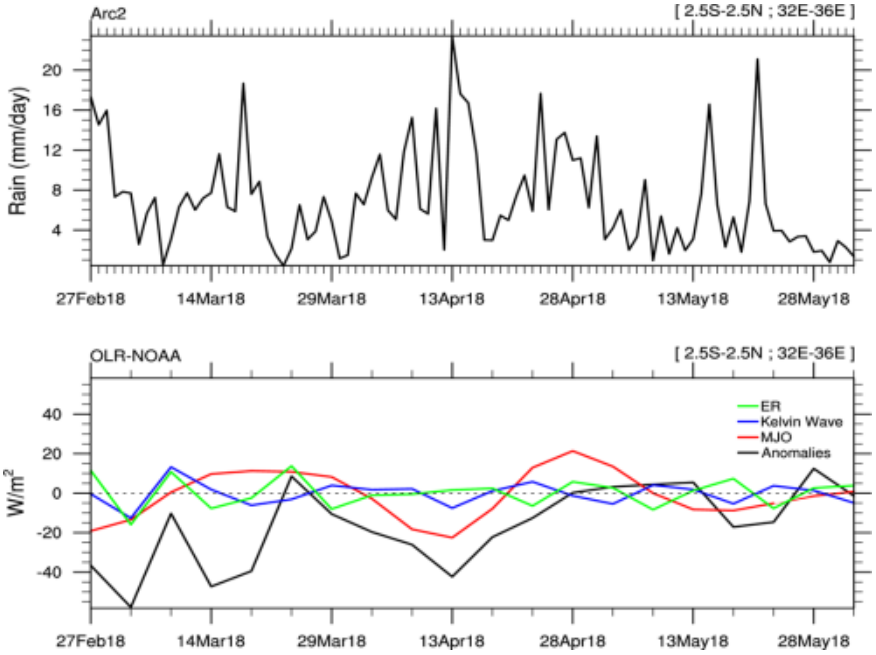


**Fig. 1** (a) Evolution of daily rainfall in EEAF, and (b) OLR anomalies and contributions from CCEWs.

To determine the contributions of modes of variability on the intraseasonal timescale, we apply a space-time bandpass filter at each grid point in the OLR anomaly field to isolate propagating signals of Convectively Coupled Equatorial Waves (CCEWs). The heavy rains in Kenya in late March – early April were modulated by the MJO, with some evidence of Kelvin wave activity during this period (Fig. 1). However, during the first half of March, it seems the rains were mostly associated with propagation in the E. Rossby (ER) wave frequency, with some modulation from Kelvin waves and possibly other local factors as well. Tropical Cyclone Sagar played a significant role in the heavy rains in May 2018.

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