How does the MJO affect extreme rainfall around the (sub)Tropics?

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MJO affects heavy rain events more in the subtropics than the tropics.
Method

• 5-day running means of NASA IMERG rainfall
• Calculate annual max at each gridpoint for 2001–2019
  – Use median as 2-year event
  – Use 80th percentile as 5-year
• Bin events based on the MJO phase during middle of pentad if MJO amplitude >1
Two-year Events by Season

- **DJF**
- **JJA**
- **MAM**
- **SON**

Events per season

[Map showing distribution of events per season for different regions.]
Five-year Events by Season

Methods

Global DJF

Seasons

Regions
Anomalies from Mean (DJF)
Percent of Normal (DJF)
Two-year Events (DJF)

- Phases 1-2
- Phases 5-6
- Phases 3-4
- Phases 7-8

% change in occurrence

100 200 300 400 500
Five-year Events (DJF)
Two-year Events (DJF)

Phases 1-2

Phases 5-6

Phases 3-4

Phases 7-8

% change in occurrence
Two-year Events (MAM)
Two-year Events (JJA)
Two-year Events (SON)
Two-year Events (All Months)
North Africa and Middle East (DJF)

Phases 1-2

Phases 5-6

Phases 3-4

Phases 7-8

% change in occurrence

5 10 25 50 75 100 125 150 200 300 500
Australia (DJF)
MJO affects heavy rain events more in the subtropics than the tropics.
Future Work

• Spatial Aggregation
• Other MJO indices and subseasonal modes
• Model diagnostics
  – Can models replicate this?
  – Can we forecast events from model RMM forecasts?
• Your ideas!!!