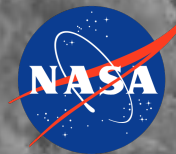
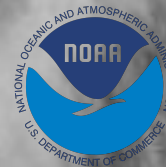
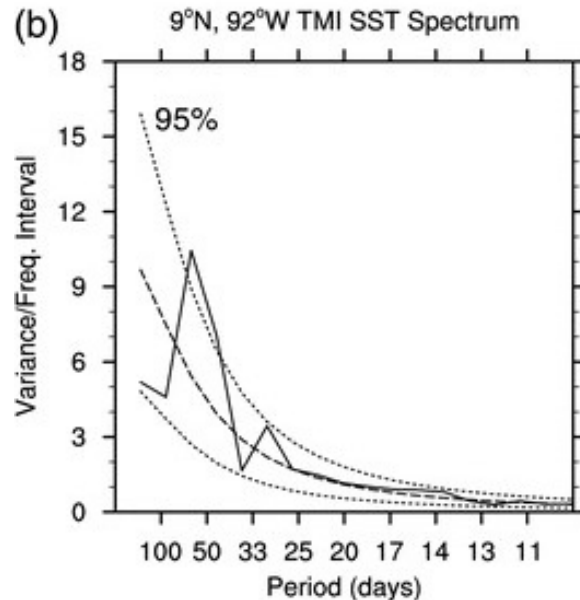
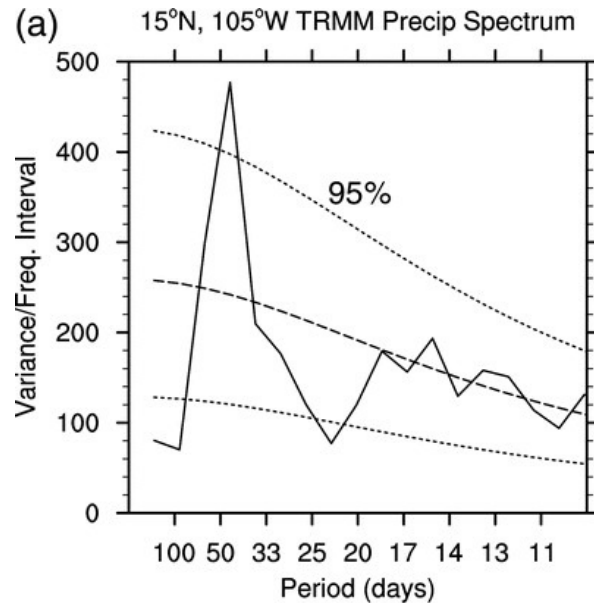


# Intraseasonal variability in the IAS and Its Representation in Models

Eric D. Maloney  
Colorado State University



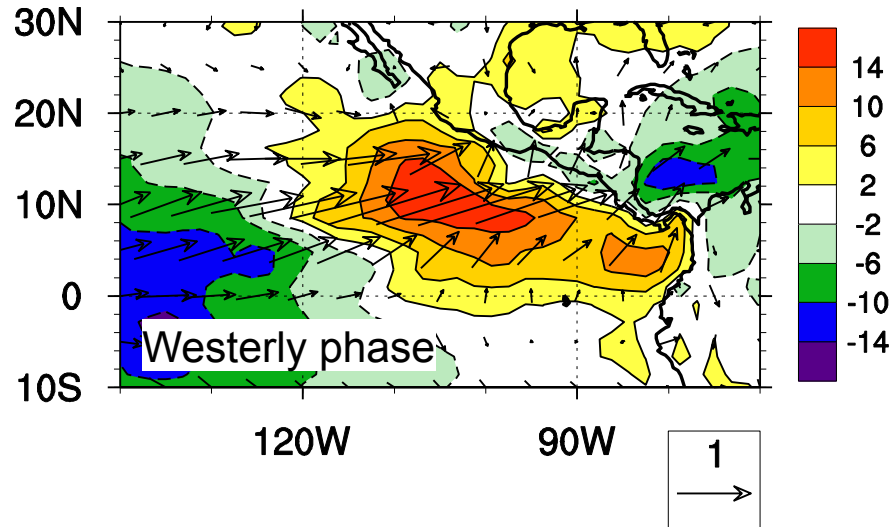
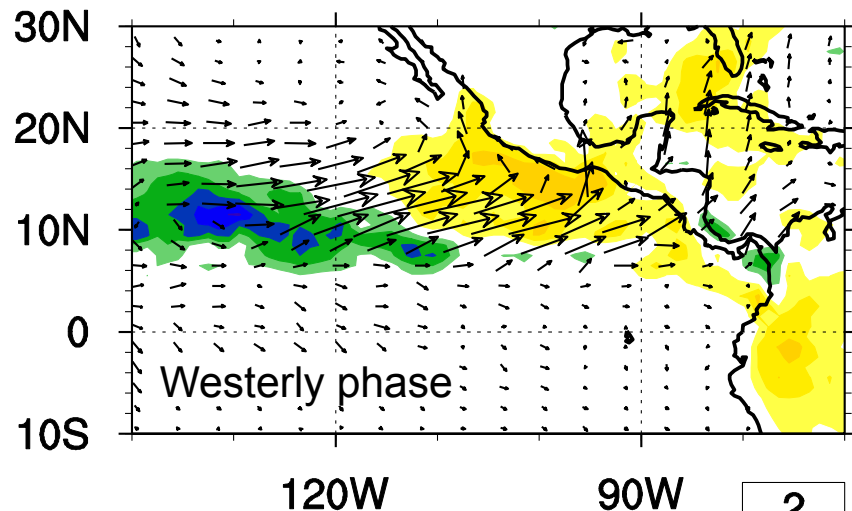
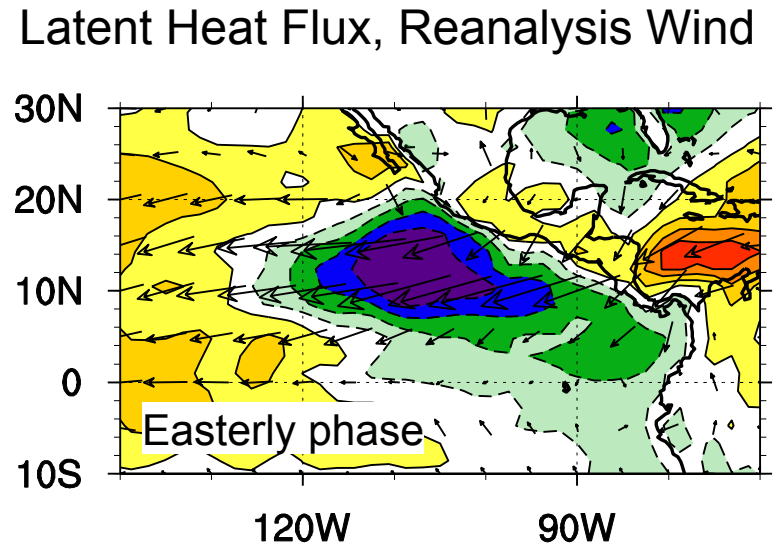
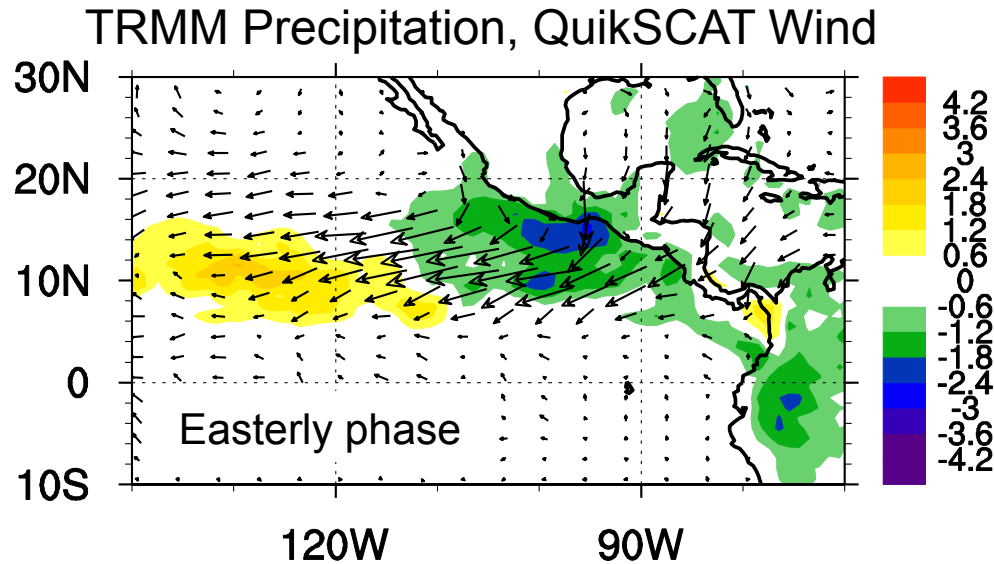
# The IAS-Region is Characterized by Prominent Intraseasonal Variability



- Particularly prominent E. Pacific ISV
- Significant 40-50 day spectral peaks during boreal summer
- Higher signal to noise ratio than Eastern Hemisphere.

Maloney et al. (2008)

# ISO Composites: Winds, Precip, LHFLX

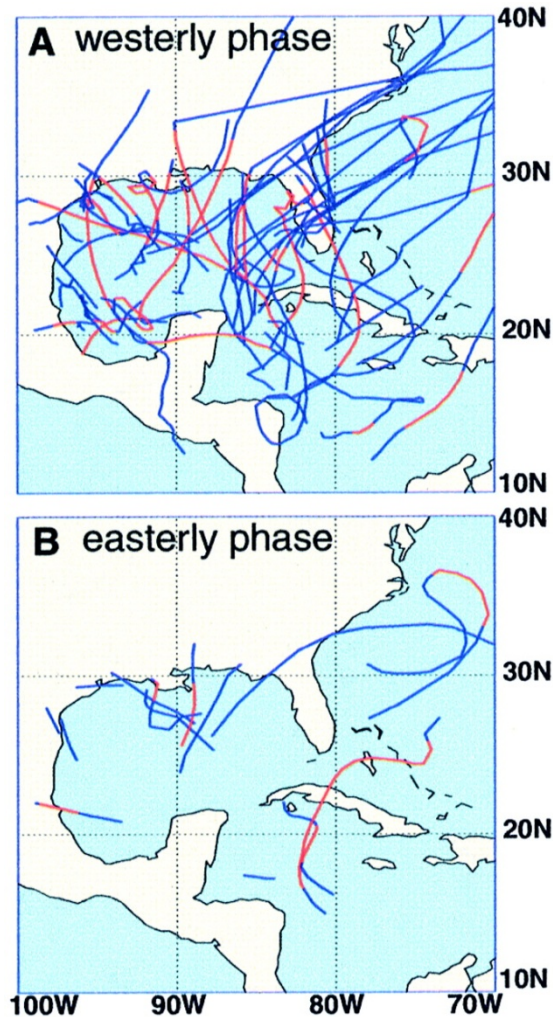


30-90 Day Anomalies

Maloney and Esbensen 2003, 2007

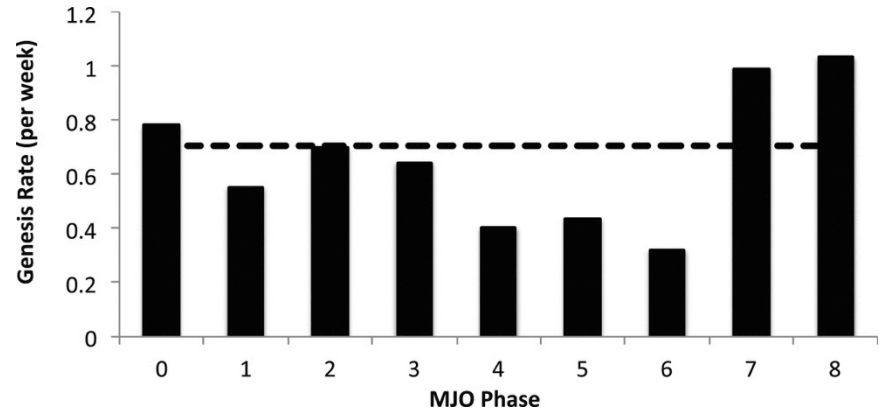


# ISV in Tropical Cyclone Activity



**Maloney and Hartmann (2000)**

## E. Pac Genesis vs. MJO Phase



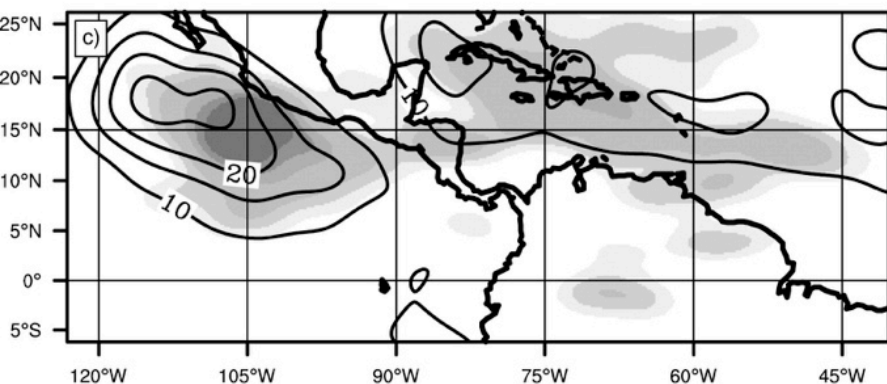
**Crosbie and Serra (2014)**

- Slade and Maloney (2013) developed a statistical prediction model using knowledge of the MJO that exhibits skill in predicting east Pacific and Atlantic cyclogenesis 3 weeks in advance

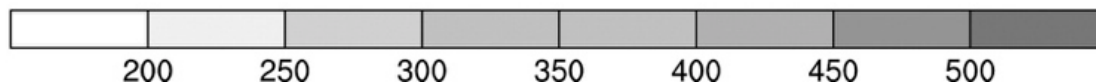
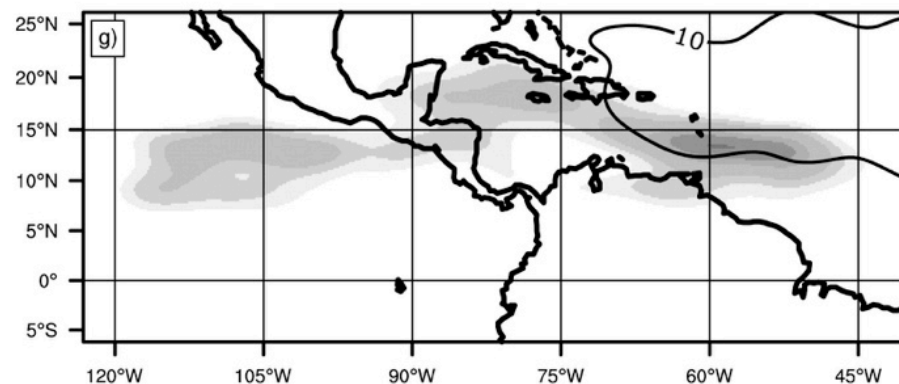
# ISV in Easterly Wave Activity

TD-filtered OLR variance (shading) and 700 hPa EKE

MJO Active/Westerly



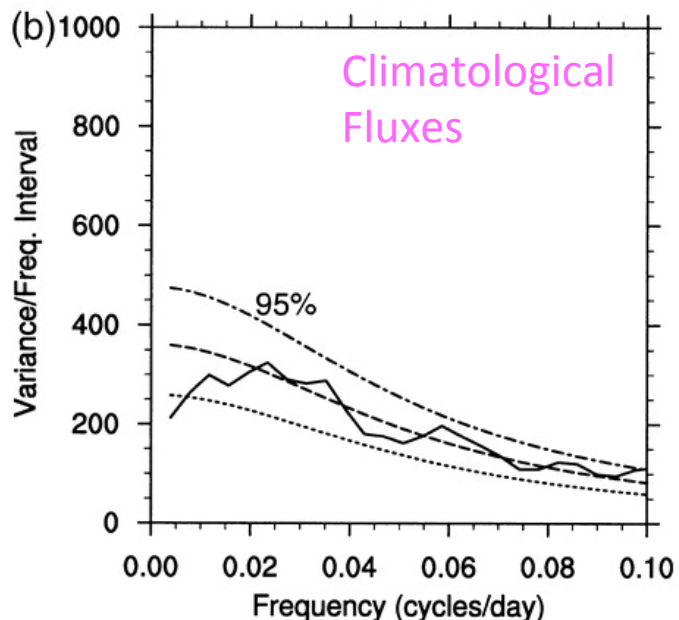
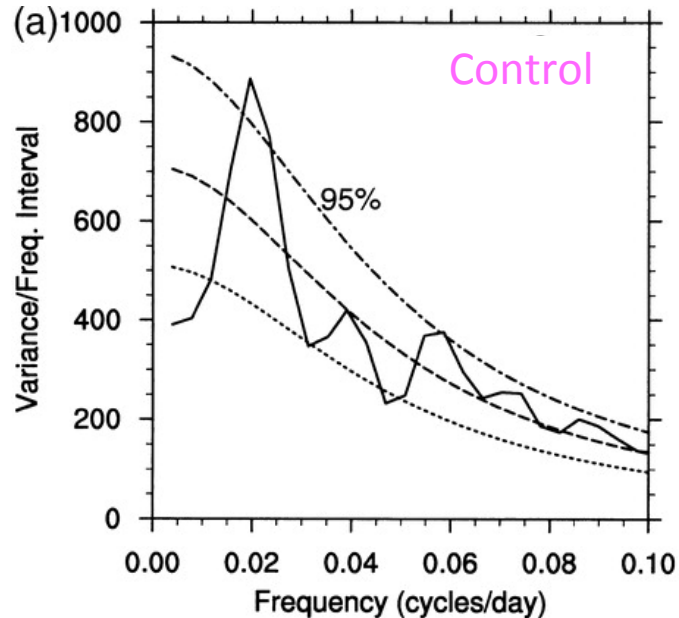
MJO Suppressed/Easterly



- Easterly waves are much more active during the ISO westerly phase

Crosbie and Serra (2014)

## CAM-R Precipitation Spectrum



## Sensitivity to Wind-Induced Flux Feedbacks

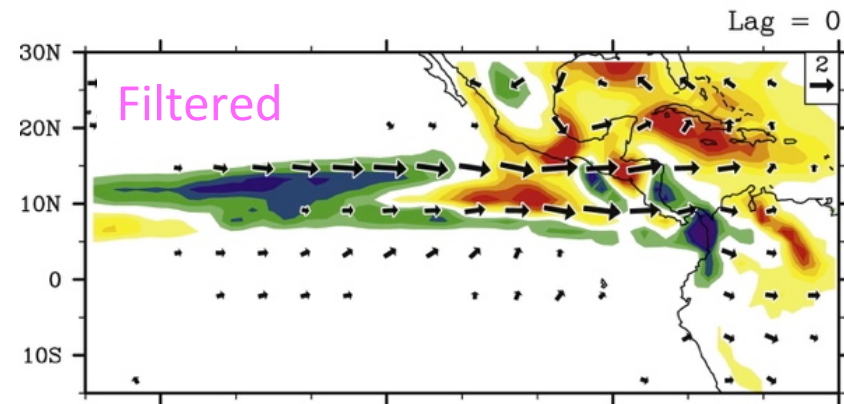
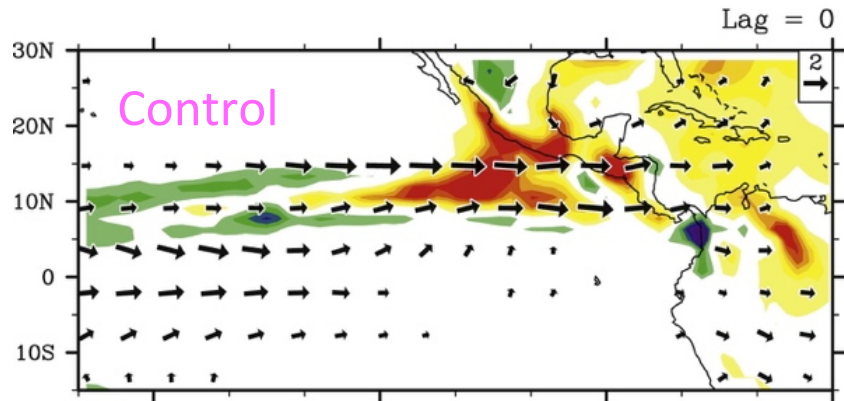
- Some modeling and observational evidence indicates the importance of wind-induced flux feedbacks to the MJO

$5^\circ \times 5^\circ$  averaging box centered at  $14^\circ\text{N}$ ,  $102^\circ\text{W}$

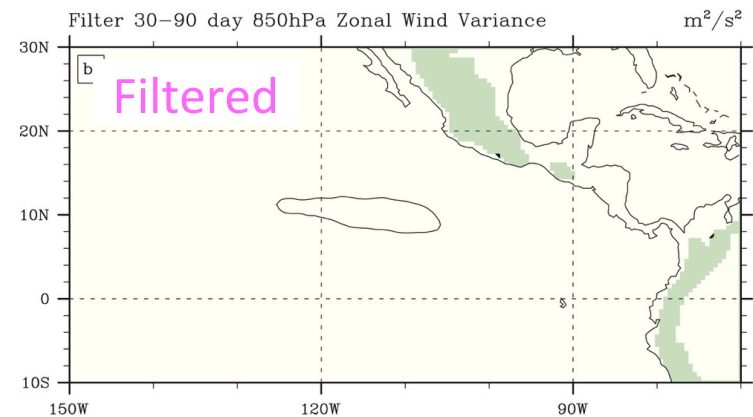
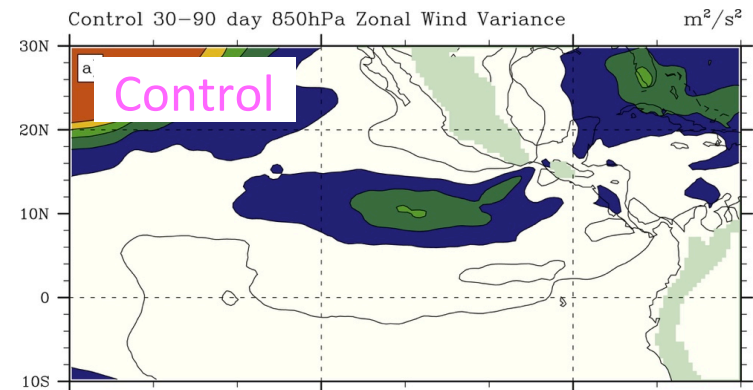
Maloney and Esbensen (2005)

# Can an East Pacific 40-50 Day Mode Exist Independently of the MJO?: Conflicting Evidence

CAMR: Yes

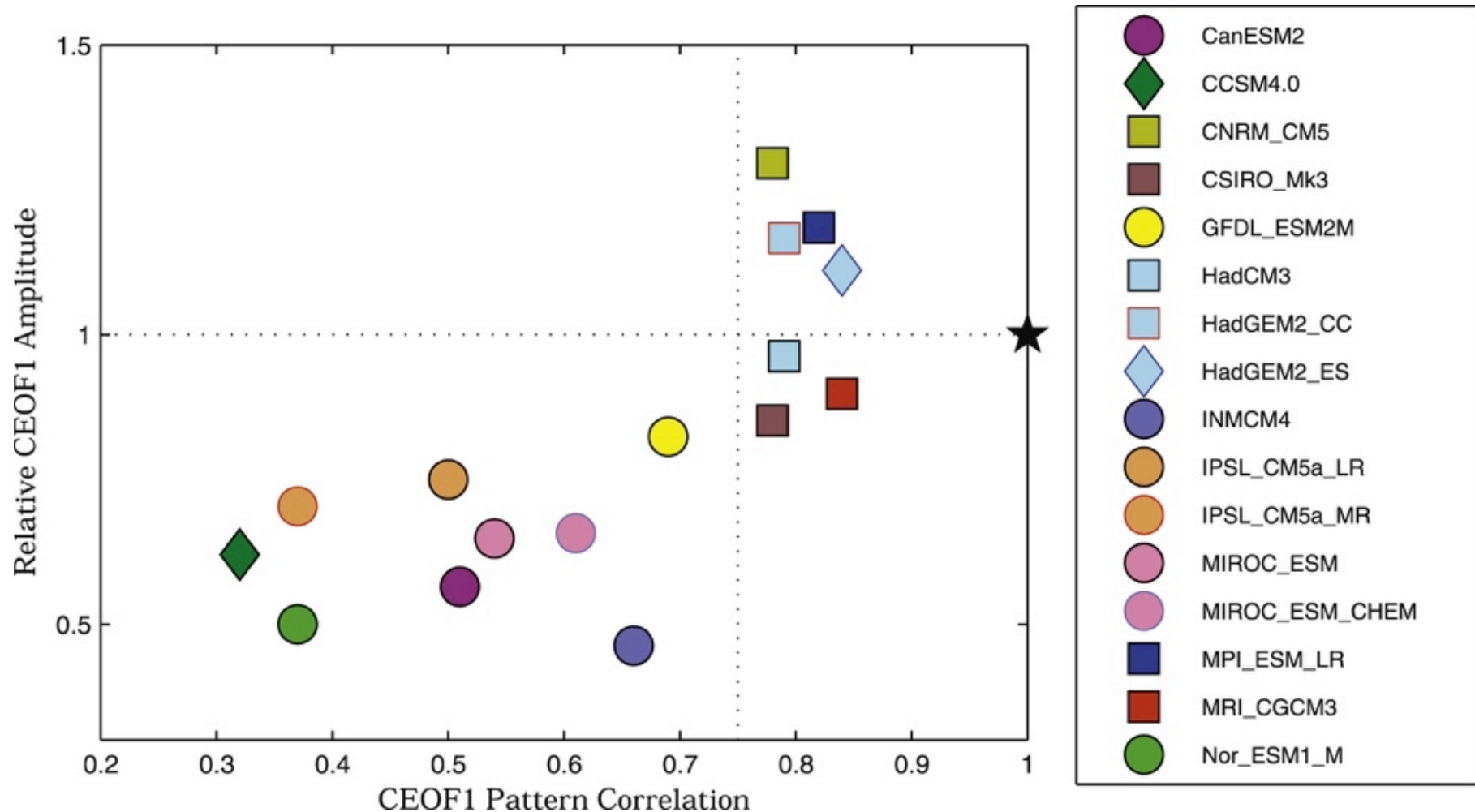


IRAM: No



Rydbeck et al. (2013)

# CMIP5 Performance in Simulating Leading 40-50 Day Mode

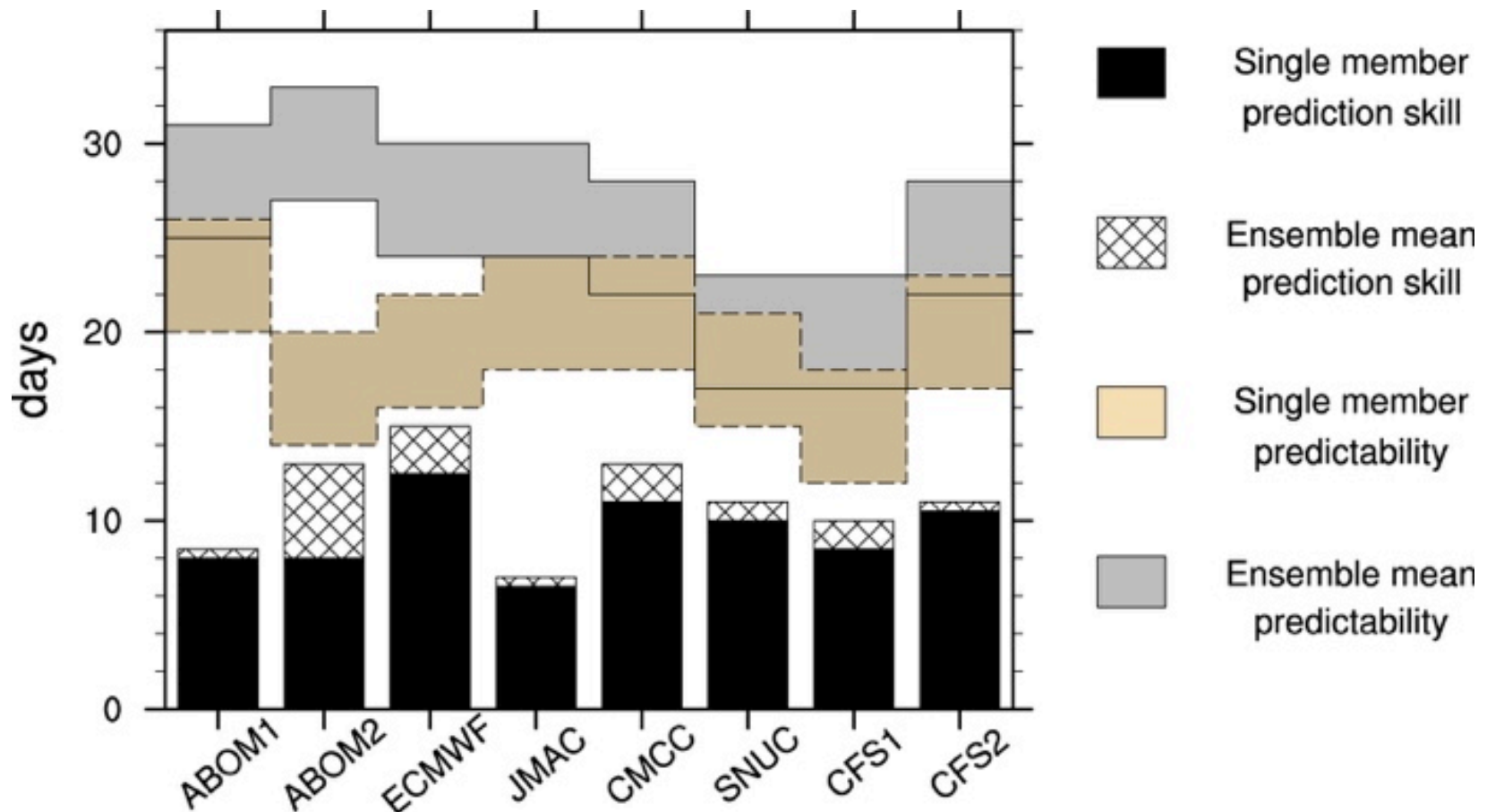


Models with Better Variability have  
Better Mean State Winds

Jiang et al. (2013)

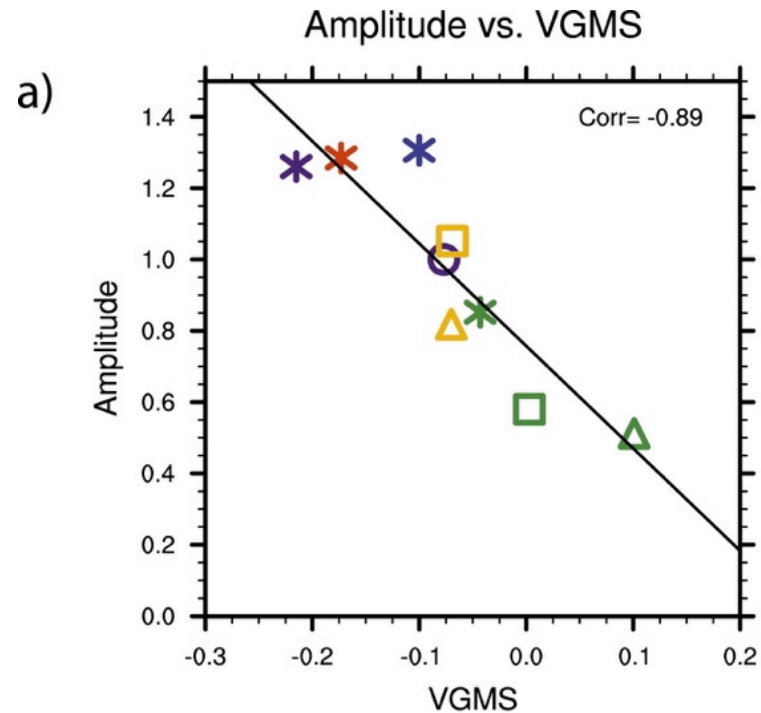
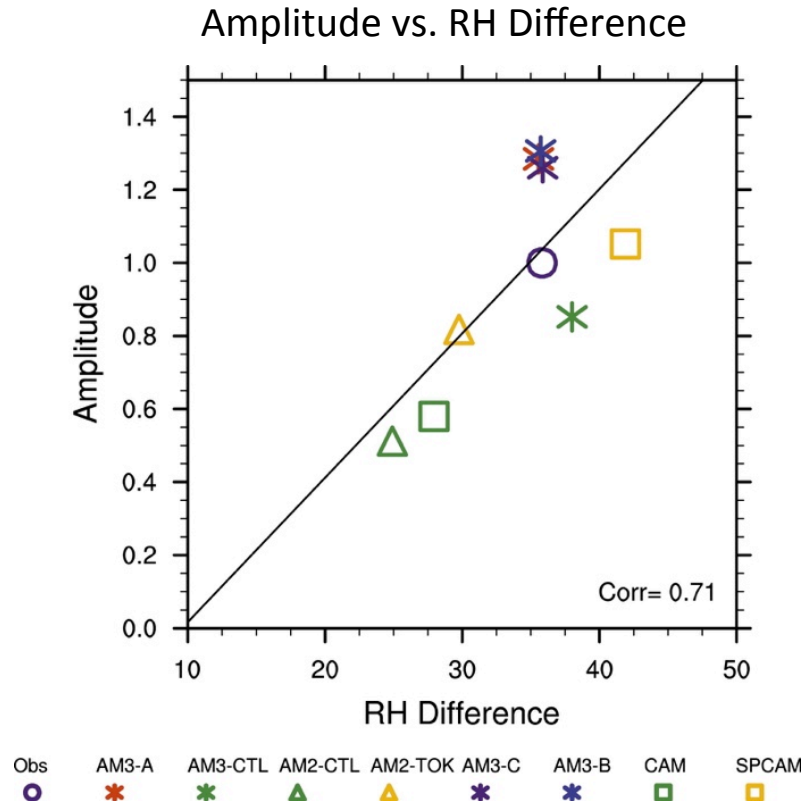


# East Pacific ISO Predictability and Prediction Skill



- Lower prediction skill and predictability than for the MJO
- Prediction skill higher when MJO active

# Keys to Successful East Pacific ISO Simulation



Maloney et al. (2014)

- Amplitude versus RH Difference Between Top 5% and Bottom 10% of Precip Events
- Amplitude versus vertical component of gross moist stability (GMS)
- GMS: partial measure of efficiency of convective moisture discharge from column

# Outstanding Science Questions

- To what degree is east Pacific ISV independent of the MJO?
- What are the local destabilization processes for east Pacific ISV (surface flux and radiative feedbacks, convective heating profiles)?
- How can simulations and forecasts of east Pacific ISV be improved without degrading other aspects of the simulation?
- How does easterly wave variability feedback to influence east Pacific ISV?
- Is easterly wave formation and subsequent tropical cyclogenesis predictable based on knowledge of the state of the MJO and its regional manifestations?
- **Proposed OTREC (Organization of Tropical East Pacific Convection) east Pacific field program might help answer some of these questions.**

A satellite image of a hurricane with a well-defined eye and spiral cloud bands. A semi-transparent rectangular box is overlaid on the lower half of the image, containing the word "Thanks!" in red. A blue line, likely a coastline, runs diagonally across the upper right portion of the image.

Thanks!