

Connection between Seasonal and Future Precipitation Sensitivity

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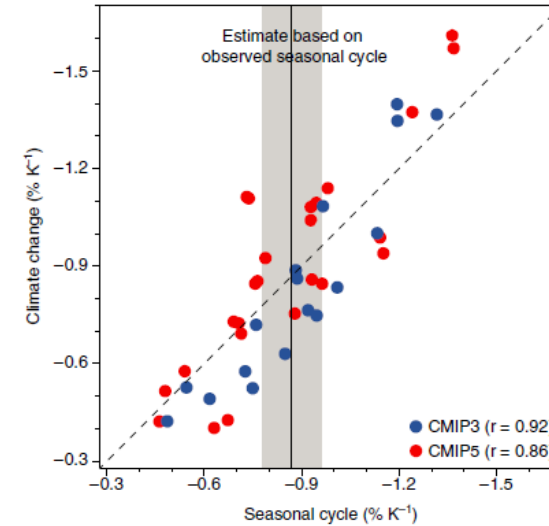
Department of Atmospheric and Oceanic Sciences,
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DOE RGMA Meeting, Oct 14, 2020



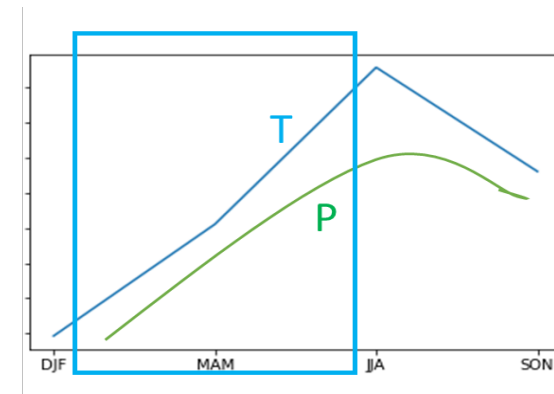
This research is in line with PCMDI SFA's goal of diagnosing the complex behavior of model simulations and reducing uncertainties in current ESMs.

Challenges and Current Research in RGMA



Motivation

Use precip. **seasonal cycle** to narrow uncertainty in **climate change** precip. sensitivity



Seasonal

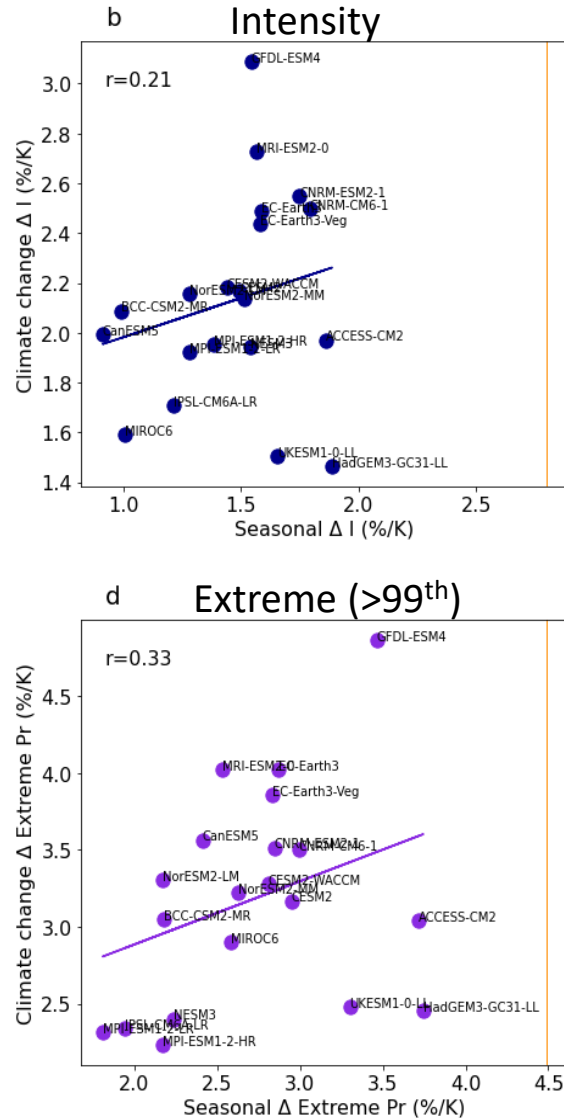
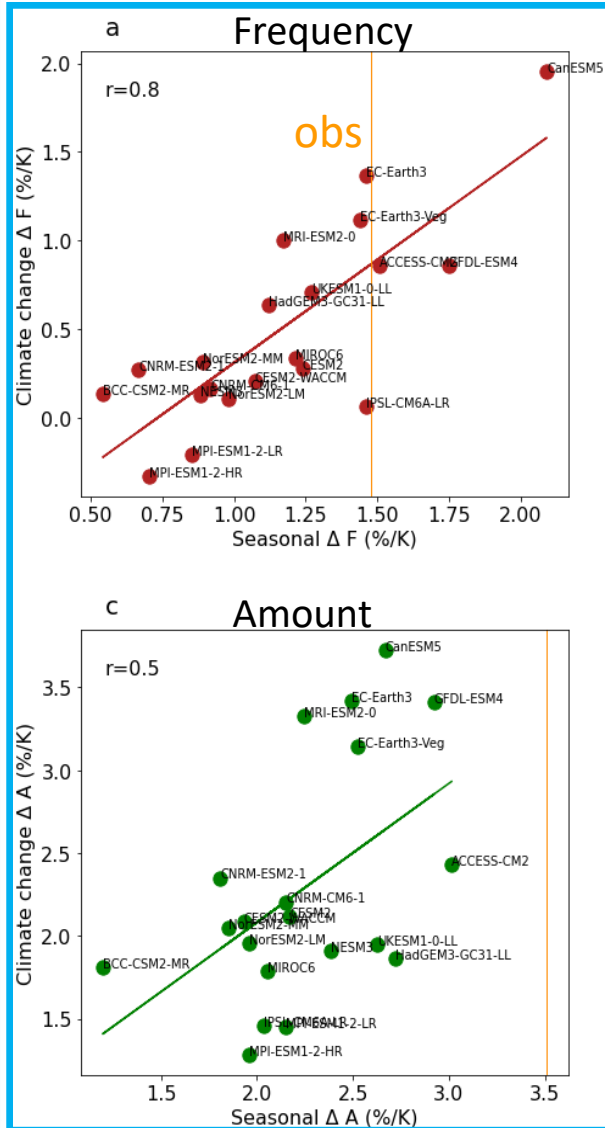
Climate change



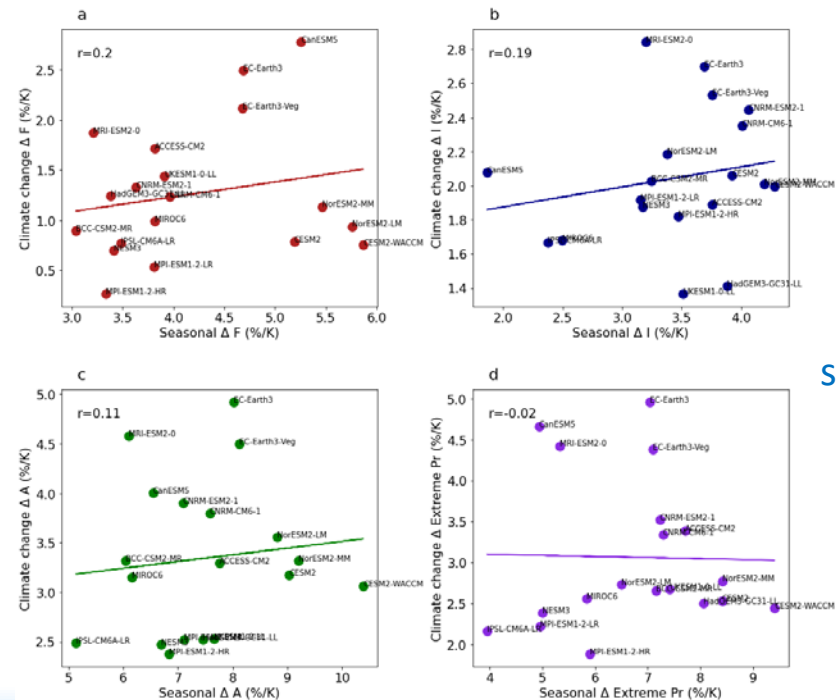
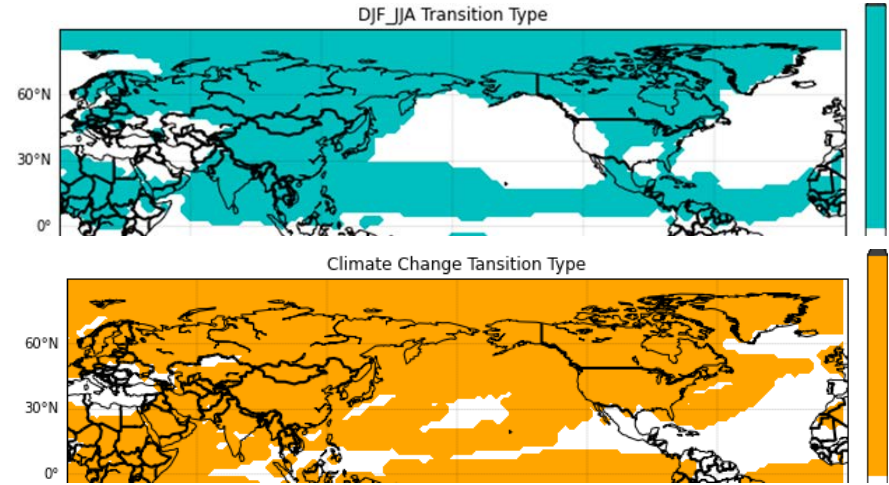
$$\frac{\Delta Pr}{Pr} / \Delta T \text{ (%/K)}$$

Challenges and Current Research in RGMA

N.H. Mid-latitude (35N~65N) Land

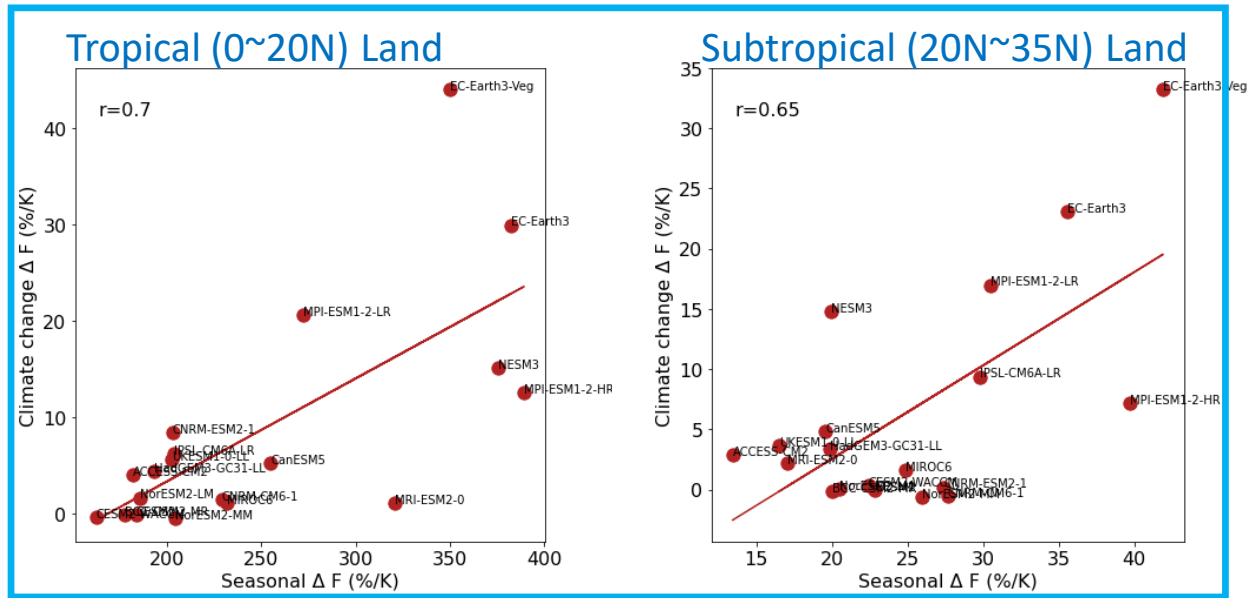


Gaps in Current Research

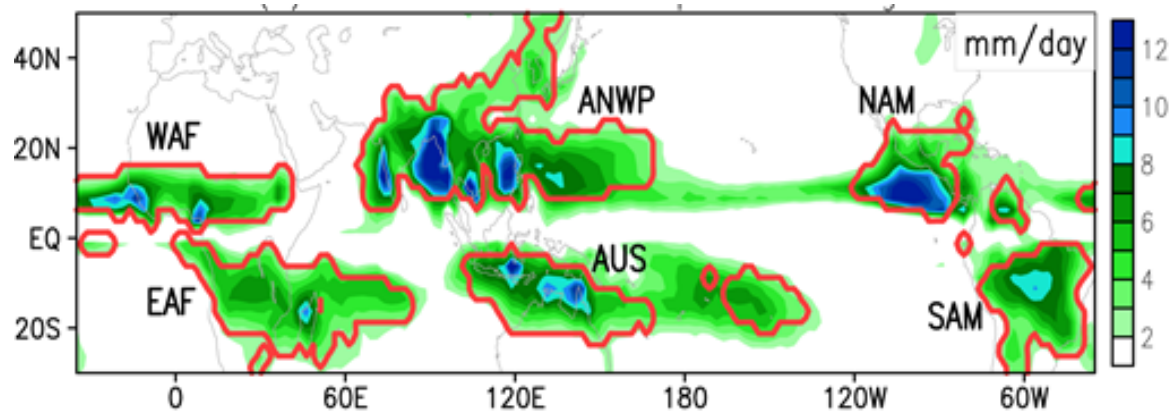


Not significant!

Gaps in Current Research



Monsoon influence?



Summary & Gaps

- Seasonal precip. sensitivity appears to have connection with climate change precip. sensitivity
- Mid-lat vs. Tropics & Subtropics: contrasting inter-model relationship. Physical mechanisms not analogous?
- Lack of observational ensembles

Future Directions

- Study other seasonal transitions, e.g., DJF-MAM, MAM-JJA transitions...
- Utilize reliable observations to constrain model uncertainties
- Better understand physical basis of such connection