

- **Developing Outline of GC (Paper; Papers; Next Steps)**
- **Educational Initiatives**
- **Questions**

Changing Patterns and Global Changes:

These are what we expect. And although we have ideas what they could look like, do we have the observing system in place to help us detect these changes, particularly early indicators of the most dangerous changes? (linking theory, simulation, and data)

- **How will storm tracks change in a future climate?**

(Storm Tracks are extensively studied, and basic processes well understood, but the persistence of anomalous storm track structure is not, and little research has explored the role of moist processes, the mix of which will change with a changing climate. How will the changing energetics of the storm track regions, a different mix of remote forcing, and possibly cloud radiative interactions influence the strength, position and stability of the storm track?)

- **What controls the position and strength of tropical convergence zones?**

(Many of the most important climate patterns can be interpreted in terms of the position and strength of the tropical convergence zones. How does the tropical circulation depend on the state of the climate system? What is the relative role of remote versus local influences such as cloud radiative interactions, the diurnal cycle, or the mesoscale circulations?)

- **Is convective aggregation important for climate?**

(Are processes leading to self aggregation important for large-scale properties of the climate system? The MJO, the position of the ITCZ, the Northward Extent of the African Monsoon? Is aggregation paced by temperature and can this influence the climate and hydrological sensitivity of the planet?)

- **Does convective mixing determine the strength of cloud feedbacks?**

(Clouds, particularly low clouds, are well understood to underly divergent model based estimates of climate sensitivity, but is this a proximate cause? How much of this response ultimately depends on the the representation of convective processes, both remotely (through circulation changes) and locally? Is a distorted representation of convective processes obscuring our ability to envisage other effects, i.e., high-thin, or mid-level clouds?)

Common Themes and Opportunities

Better Ideas, and Ideas are key. Emergent constraints have developed from coordinated modeling (CMIP); Computational advances are bridging scales and breaking down long-standing obstacles; Clearer ideas (Cloud-circulation interactions); A larger and better interpreted paleo record; Richer and more extensive model and experimental hierarchy (RCE, APE, process diagnostics; mechanism denial experiments); Improving observational capacity ... reenergize model development by linking it to specific scientific hypotheses; Increasing the dialog with data by linking our predictions with ideas that are testable today.