

Science questions

- What physical mechanisms and processes underlie either the robust GCMs responses or the inter-model spread of responses?
- Are unusual feedbacks seen in some GCMs credible, and can we build a credible, high-ECS or low-ECS model?
- Can we find and test physically plausible emergent constraints?
- Can atmospheric process errors account for “enigmas” such as anomalous polar amplification of past temperature changes, or evidence of anomalous hydrological cycle changes?
- Are known model errors such as Southern Ocean cloud bias, or lack of tropical expansion, crucial to sensitivity?
- What can we learn about real clouds and responses using fine-scale models?
- Is the physics of aggregation represented properly in GCMs? Is the MJO a basic test of convective organisation? *Relevant to global sensitivity as well as A1 & A2.*
- Where causes extreme precipitation come from and are GCMs believable on this?

Other questions

- Do we use GCMs to address feedbacks? Need framework going beyond GCMs?
- Can we learn lessons from CGILS about how to use LES or test GCM low-cloud behaviour?
- Is there a way of gaining more resources, or credibility, for participation in idealised experiment inter-comparisons that are useful for developing understanding?
- How to ensure that what we learn is relevant and useful for model development.
- How to gain more resources and effort toward model development in atmospheric processes.

What would success look like in 10 yrs?

- Have multiple emergent constraints backed by tested physical mechanisms
- New questions!
- Consensus on main sources of model spread in key responses
- Have identified which model failures are significant
- Findings are leading to model improvements