# Session 2 - Discussion

# Theme 1 Questions

1.  How does prediction skill and fidelity change when resolution is increased in combination for the various components of the prediction system?

2.  How can we diagnose and address model behaviors that lead to the sensitivity?

3.  Are there specific or related processes in the coupled system that drive prediction error in the short-term forecast and climate simulation bias?

4.  What resolutions are necessary to adequately resolve these processes?

We also asked Team 1 participants to answer this:

With respect to each of the questions above, what are the "Prospects for Advancement" and what are the "Issues and Challenges"?

# Session 2 – Questions

- IMPORTANT: CAPT-interested participants should be considering the discussion of resolution and parameterization issues in the context of how these issues are addressed by (or inform) quantifying the hindcast bias in initialized coupled models
- Tradeoffs
  - Horizontal vs. vertical resolution; dynamical grid vs. physical grid (e.g. new ECMWF method)
  - SP vs. other choices (3X spatial resolution; 30 members in ensemble)
  - High-res vs. ensemble size vs. process inclusion
  - Resolution in different component models
- Within HPC constraints, what is best path forward?
  - New model development paradigm?
  - New model analysis (in-line) paradigm?
- Within observational data constraints, what is best path forward?
  - Do we need to observe it to resolve it?
- Science questions
  - Why is 50-km grid a "magic number" for several independent models? (effective resolution < Rossby radius?)
  - Gray zones: global atmosphere (4-10 km), PBL and clouds (1 km), ice floes (10 km),
  - Missing physics
    - anisotropy in sea ice leads – available in CICE-5
    - Subgrid variance in land surface → subgrid variance in fluxes