SESSION 4: BREAKOUT SESSION: BRIDGING THE GAP BETWEEN PREDICTABILITY AND CURRENT SKILL

Chair: Kinter
Rapporteur: Tippett
Focus Questions

1. What are the most important scientific questions that need to be answered to bridge the gap between current and potential skill for sub-seasonal timescales?

2. Without resource limits, how would you approach answering those questions?

3. How would a multi-model ensemble re-forecast contribute to answering those questions?

4. Within resource limits, what system improvements (e.g. horizontal resolution, stratospheric vertical resolution, ensemble size, initialization) are most likely to cost-effectively improve sub-seasonal skill?
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Summary of Talks So Far

• Predicting the predictors (role of bias?)
  – MJO
  – Sudden Stratospheric Warming
  – SST (ENSO)
  – Soil moisture and snow
  – Sea ice

• Predicting the impact of the predictors (role of bias?)
  – MJO $\rightarrow$ NAO, tornadoes & severe wx
  – SSW $\rightarrow$ NAO
    • May be better to just predict NAO – higher S/N; predictable component?
  – Soil moisture and veg. phenology $\rightarrow$ contribute to precip. and circulation forecast skill
  – Ocean eddies $\rightarrow$ A-PBL and O-PBL forecast skill
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• Modeling issues
  – Spatial resolution (and re-tuning methodology?)
  – Ocean-atmosphere coupling (eddy-resolving ocean?)
  – Lead-time dependent bias
  – Coupled DA and initialization (eddy too?)
  – Ensemble generation
  – Spread/skill relationship
  – Verification (flow dependence; precip., ensembles)
  – Benefit of MME
  – Reforecast ensemble size and length (quality of initial states)
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Balancing Demands on Resources

Data Assimilation

Data and HPC Resources

Resolution

Complexity

Duration and/or Ensemble size

- Atmospheric Physics/Dynamics
- Ocean Dynamics
- Terrestrial Energy/Weather
- Global Warming
- CO2
- Biogeochemical Cycles
- Tropospheric Chemistry

External forcing

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