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Biases and errors in S2S predictions may be attributed to three important sources related to biases in simulating the climate mean
states, the S2S modes of variability (MoV), and the relationships between the MoV and surface climate and extreme events.
Improving S2S predictions requires improved understanding and quantification of these biases as well as better constraining the
models to reduce such biases. In this presentation, I will highlight several research efforts focusing on these aspects of modeling
using the Energy Exascale Earth System Model (E3SM). (1) To understand and constrain biases in simulating the climate mean
states, we explore the use of short, perturbed parameter ensemble simulations of E3SM at standard resolution (100 km) and
storm-resolving resolution (3 km), combined with an uncertainty quantification framework to understand how modeling of
atmospheric fast physics influences the climate mean state and using AI/ML for calibration of model parameters. (2) To diagnose
model biases and improve modeling of MoV and its relationship with surface climate and extreme events, we leverage a broad set
of model diagnostics and metrics developed by the community to inform model development. (3) We also explore the use of data
assimilation to examine the impacts of model initialization on model's ability to reproduce teleconnections relevant to S2S
predictions.1
Presentation file
Leung-Ruby.pdf
Meeting homepage
S2S Community Workshop
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