Earth & Environmental Systems Modeling

2024 EESM PI Meeting

August 6-9, 2024
Bethesda North Marriott Hotel & Conference Center
Rockville, Maryland, USA

Date and Time: Wednesday, August 7, 2024, 1:00-4:00 p.m.

Session Name: I. Modes of Variability and Teleconnections, Trends

Room / Location: Glen Echo Room

Breakout Chairs: Paul Ullrich, LLNL (ullrich4@llnl.gov) and Gerald Meehl, NCAR (meehl@ucar.edu)

Topic Leads: Wuyin Lin, BNL; Jim Benedict, LANL; Samson Hagos, PNNL; Shineng Hu, Duke; Jian Lu, PNNL; Yaga Richter, NCAR; Abigail Swann, University of Washington; Hsi-Yen Ma, LLNL; John Fasullo, NCAR

Breakout Session Agenda

1:00-1:05 p.m.: Introduce session organization and goals

Topic #1: Disentangling influence of aerosol forcing, GHG forcing, natural variability and model uncertainty

1:05 p.m.: Persistent Differences in Simulated and Observed Tropical Tropospheric Warming – Stephen Po-Chedley, LLNL

1:08 p.m.: No Response of Pacific Decadal Variability to Historical External Forcing – Chen Xing, UC Santa Barbara

1:11 p.m.: Climate Responses to Recent Major Wildfires as Simulated in E3SM2 and CESM2 – John Fasullo, NCAR

1:14 p.m.: Australian bushfire smoke, multi-year La Nina, and implications for the Interdecadal Pacific Oscillation (IPO) – Gerald Meehl, NCAR

1:17 p.m.: Response of the surface climate to anthropogenic forcing in two coupled models – Aixue Hu, NCAR

1:20 p.m.: Topical Discussion

- Lightning talk: The role of sulfate aerosol forcing and atmosphere / ocean feedbacks in generating strong seasonality of climate change over the mid-latitude oceans, Daniel Vimont, University of Wisconsin-Madison

Topic #2: *Tropical-extratropical connections and dynamical understanding*

1:35 p.m.: Modes and Mechanisms of Pacific Decadal-Scale Variability – Emanuele Di Lorenzo, Brown University

1:38 p.m.: Separate the Role of Southern and Northern Extra-tropical Pacific in Tropical Pacific Climate Variability – Yingying Zhao, Brown University

1:41 p.m.: Interactive Cloud Feedback Dampens the Memory and Predictability of the Propagating Southern Annular Mode – Jian Lu, PNNL

1:44 p.m.: Connecting Variability in the Tropical ENSO Column Response and the Remote Pacific Response in E3SM and CESM Large Ensembles – Richard Neale, NCAR

1:47 p.m.: Topical Discussion

- Lightning talk: Variations in ocean-driven dynamics in the Kuroshio Extension and their representation in high-resolution climate models – Se-Yong Song, UC Santa Barbara

Topic #3: *Quasi-Biennial Oscillation and Madden-Julian Oscillation*

2:02 p.m.: Tropical subseasonal convection representation in E3SM versions 2 and 3 – James Benedict, LANL

2:05 p.m.: Improving the QBO forcing by resolved waves with vertical grid refinement in E3SMv2 – Wandi Yu, LLNL

2:08 p.m.: The mechanisms in regulating the quasi-biennial oscillation in E3SM version 2 – Yuanpu Li, NCAR

2:11 p.m.: Exploring key processes underlying interactions between the Madden-Julian Oscillation and the Maritime Continent in an idealized GCM and the DOE's SCREAM – Xianan Jiang, UCLA, Cal Tech

2:14 p.m.: Topical Discussion

- Lightning talk: MJO Diversity in E3SMv2 – Kai Huang, NCAR
- Lightning talk: Missing QBO-MJO Connection in the QBOi Phase2 Climate Models with a Nudged Stratosphere – Kai Huang, NCAR

2:30-2:45 p.m.: Coffee Break

Topic #4: Predictability from modes of variability

2:45 p.m.: Subseasonal Predictability of North American Winter Weather Regimes – Jason Furtado, University of Oklahoma

2:48 p.m.: Simulation of ENSO teleconnections in a resolved scales hierarchy of earth system models – Salil Mahajan, ORNL

2:51 p.m.: Topical Discussion

- Lightning talk: Elevated Land Surface Heat Anomalies as Sources of U.S. Summer Hydroclimate Predictability: E3SMv2 Low-Level Jet and Precursor Event Sensitivities – Ryan Torn, State University of New York

Topic #5: Capturing the full range of variability

3:06 p.m.: Overview of E3SM Version 3 Coupled Historical Large Ensemble – Wuyin Lin, BNL

3:09 p.m.: Trends and Climate Variability in the Energy Exascale Earth System Model and Other Large Ensembles – Samantha Stevenson, UC Santa Barbara

3:12 p.m.: Topical Discussion

Topic #6: Understanding future change in modes of variability
3:27 p.m.: Understanding the robust strengthening of ENSO and more frequent extreme El Niño events under global warming – Alexey Fedorov, Yale University
3:30 p.m.: Tropical thermocline helps power Pacific equatorial upwelling – Noel Brizuela, Columbia University
3:33 p.m.: Topical Discussion
3:45 p.m.: General Discussion
4:00 p.m.: Adjourn

Wednesday Poster Session

- #097 Improving the QBO forcing by resolved waves with vertical grid refinement in E3SMv2 – Wandi Yu, LLNL
- #099 MJO Diversity in E3SMv2 – Kai Huang, NCAR
- #103 Variations in ocean-driven dynamics in the Kuroshio Extension and their representation in high-resolution climate models – Se-Yong Song, UC Santa Barbara
- #098 Elevated Land Surface Heat Anomalies as Sources of U.S. Summer Hydroclimate Predictability: E3SMv2 Low-Level Jet and Precursor Event Sensitivities – Ryan Torn, State University of New York
- #102 Missing QBO-MJO Connection in the QBOi Phase2 Climate Models with a Nudged Stratosphere – Kai Huang, NCAR
- #101 Simulation of ENSO teleconnections in a resolved scales hierarchy of earth system models – Salil Mahajan, ORNL
- #104 The role of sulfate aerosol forcing and atmosphere / ocean feedbacks in generating strong seasonality of climate change over the mid-latitude oceans — Daniel Vimont, University of Wisconsin-Madison

Thursday Poster Session

- #097 Persistent Differences in Simulated and Observed Tropical Tropospheric Warming – Stephen Po-Chedley, LLNL
- #098 Connecting Variability in the Tropical ENSO Column Response and the Remote Pacific Response in E3SM and CESM Large Ensembles – Richard Neale, NCAR