Earth & Environmental Systems Modeling

2024 EESM PI Meeting

August 6-9, 2024

Bethesda North Marriott Hotel & Conference Center

Rockville, Maryland, USA

Date and Time: Thursday, August 8, 1:00-4:00 p.m.

Session Name: 3. Methods in Model Integration, Hierarchical Modeling, Model Complexity

Breakout Chairs: Ruby Leung, PNNL (ruby.leung@pnnl.gov) and Jennie Rice, PNNL (jennie.rice@pnnl.gov)

Topic Leads: Rob Jacob, Ian Kraucunas, Jonathan Lamontagne, Jian Lu, Brian O'Neill, Scott Painter, Claudia Tebaldi, Chris Vernon

Room / Location: Linden Oak Room

Session Organization: This breakout session is designed to facilitate discussion organized around the three themes of the session.

- Theme A: Model Integration
- Theme B: Hierarchical Modeling
- Theme C: Model Complexity

Breakout Session Agenda

- Moderators: Ruby Leung and Jennie Rice
- Zoom Monitors (2) – Rob Jacob and Jian Lu
- Rapporteurs (2) – Brian O'Neill and Scott Painter

1:00 p.m.: Session Goals and Topic Overview – Ruby Leung and Jennie Rice, PNNL

Theme A: Model Integration

1:05 p.m.: Lightning talk 1 – Toward efficient coupled Earth system model initialization for E3SM version 3 – Shixuan Zhang, PNNL
1:11 p.m.: Lightning talk 2 – Reproducible integrated modeling: it takes a village … and a mayor – Jennie Rice, PNNL
1:17 p.m.: Spark talk 1 – Simulation of compound flooding using river-ocean two-way coupled E3SM ensemble on variable-resolution meshes – Dongyu Feng, PNNL
1:20 p.m.: Q&A and discussion

Theme B: Hierarchical Modeling

2:00 p.m.: Lightning talk 1 – E3SM's sensitivity to ocean heat transports strength: a slab ocean model study – Yemi Garuba
2:06 p.m.: Lightning talk 2 – Climate change increases the cost of electricity system decarbonization – a case study in the use of model hierarchies for climate risk propagation – Andrew Jones, LBNL
2:12 p.m.: Lightning talk – 3: Improving process representations of clouds and aerosols in Earth system models using AI/ML – Andrew Gettelman, PNNL
2:18 p.m.: Spark talk – 1: Mapping the sensitivity of AMOC in a hierarchy of configurations – Alice Barthel, LANL
2:21 p.m.: Coffee Break
2:36 p.m.: Q&A and discussion

Theme C: Model Complexity

3:15 p.m. Lightning talk – 1: Constraining cloud feedbacks and the pattern effect using perturbed parameters ensembles – Cristian Proistosescu, University of Illinois-Urbana Champaign
3:21 p.m. Lightning talk – 2: Bridging the gap between land and food: leveraging food balance sheets to enhance understanding and modeling of the food system – Xin Zhao, PNNL
3:27 p.m. Spark talk – 1: Modeling the impact of storage on the US power sector in a long-run multisector dynamic context – Pralit Patel, PNNL
3:30 p.m. Q&A and discussion
4:00 p.m. Adjourn

Thursday Poster Session

- #133 Mapping the sensitivity of AMOC in a hierarchy of configurations – Alice Barthel, LANL
- #134 Bridging the gap between land and food: leveraging food balance sheets to enhance understanding and modeling of the food system – Xin Zhao, PNNL
- #135 Climate change increases the cost of electricity system decarbonization – a case study in the use of model hierarchies for climate risk propagation – Andrew Jones, LBNL
- #136 Modeling the impact of storage on the US power sector in a long-run multisector dynamic context – Pralit Patel, PNNL
- #138 Simulation of compound flooding using river-ocean two-way coupled E3SM ensemble on variable-resolution meshes – Dongyu Feng, PNNL
- #139 Toward efficient coupled Earth system model initialization for E3SM version 3 – Shixuan Zhang, PNNL

- #140 E3SM's sensitivity to ocean heat transports strength: a slab ocean model study – Yemi Garuba
- #141 Constraining cloud feedbacks and the pattern effect using perturbed parameters ensembles – Cristian Proistosescu, University of Illinois-Urbana Champaign