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: F. Energy, Water, and Land System Transitions

Room / Location: Forest Glen Room

Breakout Chairs: C. Adam Schlosser, MIT (casch@mit.edu); Peter E. Thornton, ORNL (thorntonpe@ornl.gov)

Topic Leads: Karen Fisher-Vanden, Penn State; Jen Morris, MIT; Marshall Wise, PNNL; Naresh Devineni, CCNY/CUNY; Eva Sinha, PNNL; Thomas Wild, UMD; Qing Zhu, LBNL

Note: This session will focus on **three topical themes**:

1. Understanding transitions at different scales
2. Energy-Water-Land-Climate: Dynamics of interacting systems and impacts
3. Transition uncertainties and risks, and strategies for understanding and navigating them

Breakout Session Agenda

Zoom Monitors (2) – TBD
Rapporteurs (2) – TBD

1:00-1:10 p.m.: Introduce session, themes, and goals - Peter Thornton, ORNL
1:10-1:30 p.m.: Theme 1 featured oral presentations (*Understanding transitions at different scales*)

- Power Systems Analysis to Support MSD Research: Balancing Computational Speed and Fidelity – Jordan Kern, North Carolina State University
- Future spatially explicit patterns of land transitions in the United States with multiple stressors – Angelo Gurgel, MIT

1:30-1:50 p.m.: Theme 1 Discussion
Moderator: Peter Thornton
1:50-2:10 p.m.: Theme 2 featured oral presentations (*Energy-Water-Land-Climate: Dynamics of interacting systems and impacts*)

- Regional Teleconnections and Multisector Dynamics: insights from ongoing research and future directions – Gokul Iyer, PNNL
- Statistical Learning Applied to Climate-Water-Energy Impacts Scenarios – Mort Webster, Penn State University

2:10-2:30 p.m.: Theme 2 Discussion
Moderator: Adam Schlosser
2:30-2:45 p.m.: Break
2:45-3:05 p.m.: Theme 3 featured oral presentations (*Transition uncertainties and risks, and strategies for understanding and navigating them*)

- How does crop production adapt with groundwater restrictions in the West? – Femeena Pandara Valappil, Pennsylvania State University
- Uncertainty exploration with GCAM – Abigail Snyder, PNNL

3:05-3:25 p.m.: Theme 3 Discussion
Moderator: Peter Thornton
3:25-4:00 p.m.: Discussion: Session synthesis and grand challenges
Moderator: Adam Schlosser
4:00 p.m.: Adjourn

Wednesday Poster Session

- #045 The modeling of critical mineral demand and supply in energy system evolution – Yang Qiu, PNNL
- #046 Wind Energy Contributions to Net Zero – Xin Zhou, Cornell University
- #047 Designing Resilience for Multi-System Dynamics of Future Transportation – Sergey Paltsev, MIT
- #049 Discovering Human and Earth System Drivers of Future Global Peak Groundwater Withdrawals – Thomas Wild, University of Maryland
- #050 Optimizing Transmission Expansion: The Benefits of Cooperative Planning in the Face of Climate Change and Extreme Weather Events – Kerem Ziya Akdemir, PNNL
- #051 Exploring the Role of Future Reservoir Storage Expansion on the Evolution of Multi-Sector Systems Globally – Mengqi Zhao, PNNL
- #052 Modeling the Impact of Energy, Water, and Land System Transitions on Power Plant Landscape Evolution – Kendall Mongird, PNNL
- #053 Testing the conditional skill of a hydro-economics model system for food, land, and water sustainability research – Shan Zuidema, University of New Hampshire
- #054 Disentangling the Changing Nature of Water Quality, Availability, and Equity in the United States – C. Adam Schlosser, MIT
- #055 Assessment of the impacts of adaptive human decisions in multi-sector evolution – Pranab K. Roy Chowdhury, PNNL
- #056 The value of food storage in mitigating the crop production impacts of extreme weather events – Stephanie Waldhoff, PNNL
- #057 Superwell: Integrating Groundwater Cost and Supply into Multisector Dynamics – Hassan Niazi, PNNL
- #058 Exploring Energy-Water-Land System Dynamics Under Climate and Socioeconomic Uncertainties with GCAM-USA – Hamza Ahsan, PNNL

- #048 Economic Impact on Residents from Public Safety Power Shutoffs (PSPSs) - Tiemeng Ma, Pennsylvania State University
- #059 The future evolution of global natural gas trade - Brinda N. Yarlagadda, PNNL