LIVE WEBCAST
Confronting Issues of Scale in
Socio-Environmental Systems Modeling

MON. 28 JUNE 2021, 15:00 – 16:30 (EDT UTC -4)
MON. 28 JUNE 2021, 21:00 – 22:30 (CEST UTC +2)
TUES. 29 JUNE 2021, 05:00 – 06:30 (AEST UTC +10)

Hosted by:
The Integrated Assessment Society
The National Socio-Environmental Synthesis Center
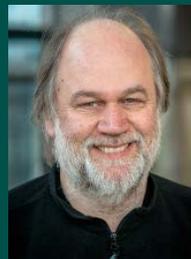And the journal, *Socio-Environmental Systems Modeling*

Sondoss El Sawah
Welcome & Moderator

Val Snow   **Derek Robinson**   **Volker Grimm**

Hsiao-Hsuan 'Rose' Wang
Presenter

Panelists

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The development and use of socio-environmental systems (SES) modeling has become increasingly common and useful to solve urgent problems in recent years. Most often, several models from different scientific disciplines are integrated with the aim of providing a single, holistic model that can be used to help inform the decision-making process of resource managers or policy makers. However, the integration of models representing different kinds of systems developed by scientists with different disciplinary backgrounds is not a trivial task.

This is the third in a series of webcasts based on the 2020 article "Eight grand challenges in socio-environmental systems modelling" by Sondoss El Sawah and colleagues. This webcast will explore the types of scale issues likely to arise in each modeling phase, while highlighting how to deal with them, based on the 2021 article "Socio-technical scales in socio-environmental modeling: Managing a system-of-systems modeling approach." It is intended for practitioners and scholars who commission, sponsor, or use SES models. It will begin with a pre-recorded presentation by the author, Hsiao-Hsuan 'Rose' Wang, briefly describing the scale issues and paths forward. Comments from each panelist and then an open discussion will follow. Viewers may post questions and comments.

PROGRAM

Welcome and Introduction: Sondoss El Sawah, Associate Professor, Engineering Management, University of New South Wales, Canberra, Australia

Pre-Recorded Presentation: "Confronting Issues of Scale in Socio-Environmental Modeling"
Hsiao-Hsuan 'Rose' Wang, Senior Research Scientist, Ecological Systems Laboratory, Department of Ecology and Conservation Biology, Texas A&M University, USA (20 mins.)

Q&A: Presenter responds to questions from the participants (10 mins.)

Panel Session: (Responses 10 mins. per panelist)
Val Snow, Agroecosystem Modeler and Senior Scientist, AgResearch Ltd., New Zealand
Derek T. Robison, Associate Professor of Geography and Environmental Management, University of Waterloo, Canada
Volker Grimm, Researcher, Department of Ecological Modelling, Helmholtz Center for Environmental Research – UFZ, Leipzig and Professor at the University of Potsdam, Germany

Questions to the Panelists: (10 mins.)

Open Discussion: (20 mins.)

PRESENTER & PANELISTS BIOS

Dr. Sondoss El Sawah is an Associate Professor in the School of Engineering and Information Technology at the University of New South Wales, Australia, and leads the modeling and simulation effort in the Capability Systems Centre. Her research focuses on the behavior of large complex problems and systemic risks arising from interactions between social, ecological, and technological systems. She is Editor of the journal *Environmental Modeling and Software* and has published over 90 journal articles, three of which are Web of Science high-impact papers. Her research and leadership have been recognized with eight awards and fellowships, including the Early Career Research Award by the International Environmental Modelling & Software Society and election as Fellow of the Modelling & Simulation Society of Australia and New Zealand.

Dr. Hsiao-Hsuan 'Rose' Wang is in the Ecological Systems Laboratory, Department of Ecology and Conservation Biology, at Texas A&M University, USA. Her research focuses on the assessment of potential impacts of changes in climate and policy on resilience and sustainability of the system-of-interest using SES models. She has served as a member of the Editorial Advisory Board, Subject Editor (theoretical and mathematical modeling), and Associate Editor of the international journal *Ecological Modelling*, and currently serves as co-Editor-in-Chief of *Ecological Modelling* and Associate Editor of two international journals *Biological Invasions* and *Plant Ecology*. She has organized modeling symposia sponsored by the International Society of Ecological Modelling (ISEM) in the USA and Austria, and has collaborated with multinational modeling groups sponsored by the National Socio-Environmental Synthesis Center (SESYNC) and by the National Institute for Mathematical and Biological Synthesis (NIMBioS), both based in the USA, and by the Lorentz Center based in the Netherlands.

Dr. Val Snow is an agroecosystem systems modeller and Senior Scientist at AgResearch in New Zealand. Her research focuses on: the development and use of models and tools to support land use policy development and implementation; innovation and sustainability in pastoral agricultural systems; and resilience in agri-food systems. She co-leads Pohewa Pae Tawhiti (loosely translated as Visualising Distant Horizons), which is developing a method that will allow decision-makers to compare land-use options for their likely effects on the four wellbeings in ways that make personal and group biases explicit and promotes dialogue and reflection on personal worldviews. Val is Editor-in-Chief of the journal *Agricultural Systems* and serves on the Editorial Board of *Environmental Modelling & Software*. Her research and leadership have been recognised with an award of a Biennial Medal from the International Environmental Modelling and Software Society in 2018 and in 2019 with a Fellowship of the Modelling & Simulation Society of Australia and New Zealand.

Dr. Derek T. Robinson is Associate Professor of Geography and Environmental Management at the University of Waterloo, Ontario, Canada. His research program seeks to improve our understanding about highly integrated natural and human processes within the context of Land-System Science. Currently, he is using novel data collection methods (e.g., remotely piloted aircraft) to collect very high-resolution spatio-temporal data that enable the calibration and validation of natural system models at the scale of the decision-maker. With a history of designing and using agent-based models to formalize and test our understanding of land management decisions, Robinson is improving the justification for the coupling of natural and human system models and seeking ways to scale these models to large spatial extents while retaining environmental and human heterogeneity.

Dr. Volker Grimm conducts research at the UFZ in Leipzig and is Professor of Theoretical Ecology at the University of Potsdam in Germany. He is a world-renowned leading expert in the field of ecological and agent-based modeling. He has pioneered the application of agent-based modeling in ecology and contributed to its conceptual and practical development, including the development of standard formats for model description (ODD) and model development (TRACE) and a general strategy to make models structurally realistic (pattern-oriented modeling). He has been involved in the development of more than 50 ecological models, mainly in population ecology, and has contributed to the conceptual framework of ecology, concerning the concepts of stability and resilience.