

MultiSector Dynamics Community

Welcome to the newsletter of the MultiSector Dynamics Community

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Hello MultiSector Dynamics (MSD) Community!

This newsletter will be published on an as-needed basis to communicate items of general interest to the community and is part of a broader communications strategy.

In this issue we are highlighting some of the research emerging in our community, and providing some more details on the upcoming request for working group proposals.

At the end of this document you'll also find links to register at our website and to provide feedback on this newsletter.

www.multisectordynamics.org

Community engagement through our website

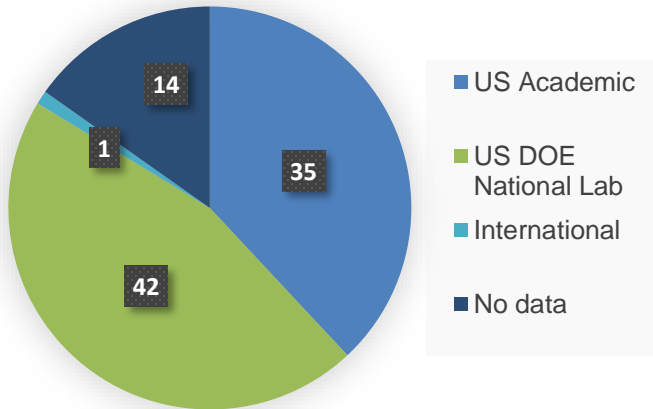
The website for this community of practice is now fully functional at www.multisectordynamics.org.

We have been posting and will be regularly updating select MSD publications on the website, under the [Publications](#) page. If you have any publications you would like us to highlight, please email contact@multisectordynamics.org.

We will be transitioning all our future communications and distributed materials to this website, in an effort to simplify operations as our community grows. We invite everyone to register with the website to continue to receive future communications from us. By joining, you can also register your interest with our current and future working groups.

[Register here](#)

April webinar participation



Our most recent webinar on April 14th was attended by 92 people, primarily from US DOE National Labs and Universities. The website covered the emerging science framework of the MSD Community of Practice and introduced the three established Working Groups.

If you missed the webinar or would like to revisit the presented slides, you can find them posted on our [Webinars archive](#) on the MSD website.

New Request for Working Group Proposals

The Community of Practice Scientific Steering Group is pleased to announce the solicitation of proposals for new MSD Working Groups (WGs).

We ask that you submit a letter of intent (LOI) for MSD WG proposals by **May 8, 2020, 6:00pm Pacific Time** using the [MSD WG letter of intent Google Form](#).

In order to improve the coordination of MSD WG proposals, we ask that you identify your new WG idea on the [MSD WG Google Sheet database](#) ahead of the submission of your letter of intent.

Letters of intent will be reviewed and evaluated on the following criteria:

- scientific priority and merit
- potential for capacity building
- potential for leveraging resources available

Letters of intent will be used to identify similar WG proposals and encourage mergers, to provide feedback and improve the overall quality of the full proposals, and to identify the number of expected full WG proposals to better prepare the review process.

You can expect encourage/discourage decisions to submit full WG proposals by mid-May 2020.

The full proposals must be submitted by **June 1, 2020, 6:00pm Pacific Time**.

Questions regarding MSD WG proposals and letters of intent should be addressed to Erwan Monier (emonier@ucdavis.edu) and Antonia Hadjimichael (ah986@cornell.edu).

Emerging Research Highlight: Human System representation in MSD models



By Jim Yoon and Nathan Urban

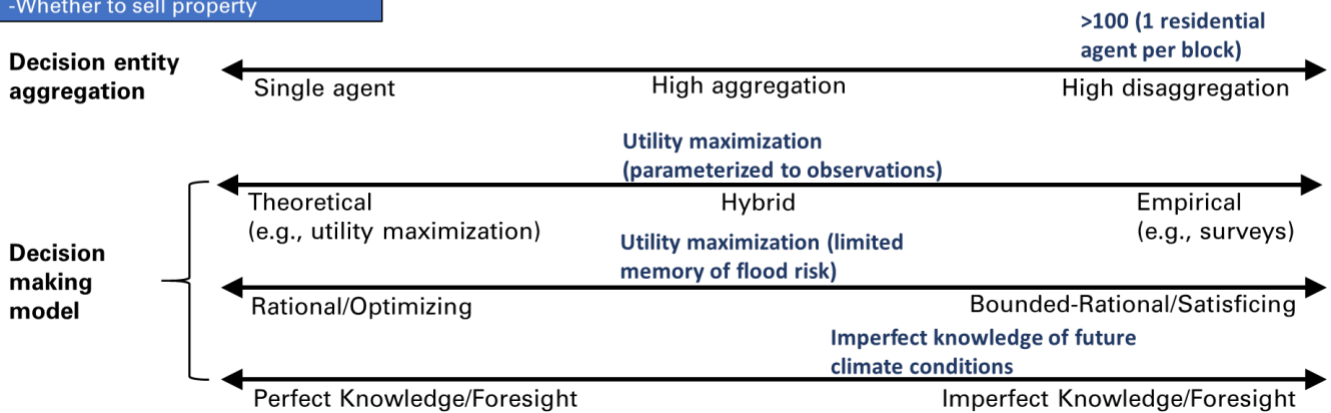
We are excited to announce our inaugural MSD working group on the representation of human systems in MSD models. Our group is working to address what we consider a critical gap in MSD research: the limited representation of dynamic, adaptive human decision making and action in response to changing environmental and socioeconomic conditions in MSD models. For example, many MSD models often simplistically assume human resource demands that are fixed relative to exogenous drivers such as population or technology input and that are uniform across demographic characteristics. Additionally, MSD models tend to largely ignore or highly abstract institutional dynamics in resource systems, commonly adopting fixed allocation rules that implicitly presume centralized, non-adaptive management of resources and infrastructure.

These critical gaps translate into a set of inter-related science questions that drive our discussions: How does individual human adaptation, which is embedded in broader institutional and societal contexts, influence the co-evolution of coupled human-natural systems? How can human actions, defined broadly from short-term consumer adaptation to long-term societal transitions, be effectively represented in multi-sector models? How should the representation of these human decisions be tailored for the specific use-case of the model (e.g., whether the model is intended for prescriptive versus descriptive purposes)?

Agent Type: Residents (Households, Businesses, etc.)

Near-term candidate actions:
 -Purchase insurance (Haer, Dubbel)
 -Whether to elevate/dry-proof/repair

Long-term candidate actions:
 -Where to reside/settle/relocate
 -Whether to sell property



A snippet from the initial working typology applied towards conceptualizing residential actors making urban settlement decisions in a coastal environment (for an effort underway as part of the MSD ICoM project).

How sensitive are our modeling outcomes and diagnoses of vulnerability to the representation of these human decisions? To address these science questions, our working group is exploring state of the art modeling methods that can improve representation of human decision making and adaptation in the MSD context, drawing from advances across disciplines. We are investigating a range of modeling techniques, including agent-based, bioeconomic, equilibrium, computable general equilibrium, game-theory, dynamic spatial simulation (e.g., network and cognitive mapping), stochastic optimization / dynamic programming, and cellular automata approaches towards simulating human decisions in multi-sector systems.

In 2020, our primary working group activity centers around a monthly interactive webinar, in which we are working towards the development of a white paper setting forth a new typology for characterizing coupled human-natural system (CHNS) applied in the MSD arena, highlighting the human decision making aspects of the models and the interface of those decisions with the physical system. The goal of the typology is to facilitate systematic discussion around the use of CHNS models in MSD, elucidating the unique capability of and complementary insights gained from different modeling approaches and identifying opportunities for enhancing the state of knowledge in MSD through diverse yet concerted CHNS model development and application.

As part of the webinar series, we welcome members of the MSD community to present their own research on CHNS models, particularly sharing their work in the context of an initial working typology. Our goal will be to use these discussions to iterate and improve upon the design of the typology itself as we trial its utility in describing a wide range of human systems modeling approaches adopted in MSD research. If you're interested in presenting your work at a webinar or participating in group discussions, please contact us via the [MSD website](#) or e-mail one of us directly. We also encourage you to stay on the lookout for the MSD Human Systems Modeling session at AGU and welcome your submissions once announced. We look forward to engaging with you all as we explore an exciting research frontier in human systems modeling in MSD!

Jim Yoon (jim.yoon@pnnl.gov) is a scientist at Pacific Northwest National Laboratory in the Hydrology group. His research focuses on the development and application of advanced modeling techniques to simulate coupled human-natural systems, with a particular focus on complex water and coastal system dynamics under both short and long-term change.

Nathan Urban (nurban@lanl.gov) is a staff scientist at Los Alamos National Laboratory in the Computational Physics and Methods group. His research interests include coastal natural-human systems modeling, decision making under uncertainty, integrated Earth system predictive uncertainty quantification, information fusion, machine learning, and large-scale stochastic optimization.

This newsletter has been edited by Antonia Hadjimichael and the Community of Practice Facilitation Team. This and all previous newsletters can be accessed at the [Newsletters](#) page of our website. If you have any suggestions, concerns or other feedback about this newsletter or the MSD website, please email contact@multisectordynamics.org.

