CoMSES Digest: Spring 2025

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Editor's Note

In times of uncertainty, like many of us in science and education are facing now, it is sometimes helpful to look back on where we've come from to have a clearer vision of where we hope to go. Nearly 20 years ago, as members of a panel that met in April 2005 to review National Science Foundation proposals to the Biocomplexity in the Environment program, several us had an impromptu discussion on how new computational modeling tools could be more understandable and accessible across the social and natural sciences. We decided to seek a grant to bring together a community of domain scientists, computer scientists, and modeling platform developers to seek ways to address this issue.

In 2006 a proposal submitted to the NSF Human Social Dynamics program by Lillian Alessa, Marco Jansssen, Sander van der Leeuw, Steven Lansing, and me was successful and provided funding for a pair of community workshops. We held the first of these 18 years ago in March 2007. The most important outcome of two days of intensive discussions was that the lack of a way to share knowledge and code among pioneering scientists using computational models was significantly limiting the adoption of this powerful new technology. In the closing hours of the workshop, we decided to initiate a pilot project and website to anchor a community effort to improve knowledge sharing about modeling. One of the participants, Allen Lee, announced that the internet domain of "OpenABM.org" was available for purchase at a very modest price. We purchased the domain and adopted the name for the pilot project.

By a year later, the OpenABM.org site tracked over 7000 visits. In 2009, Lillian, Marco, Allen Lee, Lyn Mowafy, and I received a much larger Research Coordination Network grant from NSF. As we described in the proposal, the aim of the funded project was to create an international scientific network to "serve as a coordinated community of practice and a conduit to expedite knowledge exchange for computational modeling in social and ecological sciences; it also will seek to grow scientific infrastructure so as to better serve research that uses computational modeling." We called this new community the Network for Computational Modeling in Social and Ecological Sciences: CoMSES.Net.

As we reported to NSF late last year, the CoMSES Network has grown to include over 3,500 members from almost every country in the world. The network supports a very active science gateway (>28,000 visits last year) with a rich array of resources, educational materials, and numerous ways for this community to

share their knowledge. It also supports an open access online library where community members have published the code of nearly 1,200 computational models. These models have been downloaded over 400,000 times. The metrics page (https://www.comses.net/about/metrics/) charts some of the growth and reach of the network. This history demonstrates the power and impact of a global community, whose members are dedicated to open and transparent science, and making advanced technology of computational modeling accessible to everyone, everywhere in the world.

As we begin our third decade as a community of practice, we aim to continue and further expand CoMSES.Net's mission of serving science and society. In looking back, we can celebrate the value and power of united community action in CoMSES.Net's achievements. So, I want to dedicate this issue of the Digest to you, the CoMSES.Net community. You deserve to take pride in what you've accomplished and can look ahead with confidence in what we can achieve as a community in the future.

Michael Barton
Director, Network for Computational Modeling in Social and Ecological Sciences.
CoMSES.Net Spring Issue Guest Editor

CoMSES News

Message from CoMSES.Net Leadership

We're sure you have heard much news and many rumors about recent US government actions. While these are having wide-reaching impacts throughout the country and the world, we focus here on those related to science and universities. In keeping with the CoMSES.Net mission of open and transparent science, we want to use this newsletter to update you on the impacts of these actions on our organization as of the time of publication.

So far, there have not yet been any direct impacts to CoMSES.Net activities, data, or personnel. The freeze on all US federal funding issued several weeks ago has been paused by the courts, meaning that we can continue to pay salaries of students and scientists supporting CoMSES.Net. The efforts to significantly reduce overhead on current grants, which pays for university support of research, has also been paused by the courts. Arizona's Attorney General has been leading this effort, which further helps CoMSES.Net because our personnel are located in that US state. The language and legality of recent threats to university funding by the Department of Education is still being parsed by institutions and is also before the courts. While this does not have a direct impact on CoMSES.Net, there could be indirect consequences because all our personnel are employees of Arizona State University. The US National Science Foundation is reviewing all existing grants to ensure that they comply with recent Presidential Executive Orders. So far, CoMSES.Net has not been notified that it is not in compliance. NSF states that they have resumed reviewing submitted proposals after a several week pause, including any for future CoMSES.Net funding. However, NSF staffing losses could impact the review process in the future. NSF staff was recently cut by 12%; some of those were subsequently reinstated by another court order. However, more drastic staff cuts are anticipated. "Reduction in force" letters have started going out to large numbers

of employees in some government agencies, though not yet NSF as of the date of Digest publication.

Despite the great uncertainty and risk for science in general and CoMSES.Net in particular, there are also some positive aspects we can point to. The CoMSES Model Library and the entire science gateway has been hosted for many years on servers in Canada and supported by the Digital Research Alliance of Canada (https://www.alliancecan.ca/en). We've long been grateful for this support, making CoMSES.Net a truly international initiative, and we are especially thankful now. We also have a comprehensive backup strategy that would enable the entire CoMSES digital ecosystem to be ported to another platform if necessary. Some CoMSES.Net personnel are fully funded by ASU, not NSF, and most of those supported by NSF only receive part of their salary from that source.

Finally, and most importantly, much of CoMSES.Net's success as a scientific organization is a result of the voluntary contributions by you, the members of the Network for Computational Modeling in Social and Ecological Sciences. You publish your code in the Model Library so that others can use it and learn from it, you help to review code submitted by your colleagues to ensure that it useful, you add jobs opportunities and events to the forums to encourage collaboration and next generation scientists, you share your expertise in response to questions in the forums by model users and developers, you use and contribute to the educational programming to train future scientists and stakeholders, and you serve on the Executive Board to guide the CoMSES Network. We invite you to look at the map of CoMSES.Net membership (https://www.comses.net/about/metrics/) to reflect on the global contribution and impact of this network. As long as we all continue to contribute to this international scientific network, CoMSES.Net will continue to serve the modeling community and society, regardless of the events in one country. This is the manifestation of a network that is robust to shocks, a tribute to everyone’s commitment to advancing impactful knowledge generation and dissemination through science and modeling. As much as we are global modelers, we are also global citizens. We take this opportunity to reflect on the ways in which our work is one essential part of a broader governance system, and our role as active participants shaping that system.

At this critical moment, we want to express our gratitude and that of the rest of CoMSES.Net scientists and students to you, our members, for your support over the past two decades, and urge you to work together to ensure that we continue to support transparency and reproducibility for computational models & their digital context in the coming years.

As a final note, we recognize that some of our members are US federal scientists who may have lost their jobs and access to email. If you know of someone in this situation, please forward the Digest on to them and encourage them to update their profile or contact us at editors@comses.net with another way we can reach them to let them know that they have the support of the CoMSES Network.

CoMSES.Net Executive Board: Hassan Bashiri, Roger Cremades, Önder Gürcan, Liliana Perez, Dale Rothman, and Moira Zellner
CoMSES.Net Director: Michael Barton

Feature: CoMSES Site Update

In this digest section we have typically been spotlighting potentially unknown or

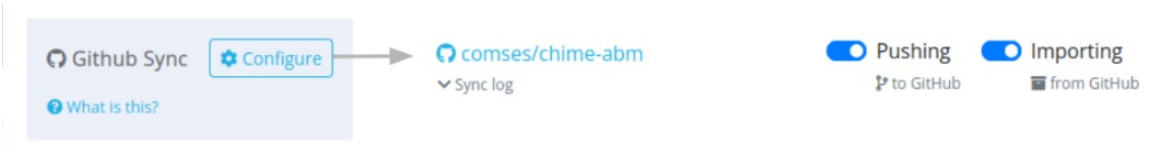
hidden areas of the CoMSES.Net Science Gateway. In our Winter issue, we showcased the newest site function - automated DOI registration for published, peer reviewed models. Now, we're excited to share an early preview of a long-planned integration between the CoMSES Model Library (CML) and GitHub called **GitHub Sync** . While still in development and subject to change, most of the difficult design challenges have already been addressed, and we are hopeful to release it in the Summer of 2025.

The integration is designed for modelers who either want an easier pathway to transition their model development workflow to GitHub, or who are already using GitHub and want to simplify their publishing process on the CML. The bi-directional sync will comprise two key processes that can be toggled on and off to suit different needs:

- **Push:** generates a Git repository based on the public version history of a model in the CML and pushes it to a repository on GitHub, creating an accessible repository for your model code that updates with new version releases.
- **Import:** automatically pulls in new releases created on GitHub, populating a CML release with source files and extracted metadata, which can then be published.

Integrating with GitHub not only provides immediate benefits including improved accessibility and use of the rich collaborative environment, but also sets the stage for us to develop tools of particular use for modelers, such as metadata management, automated testing, code analysis, and HPC integration.

When the integration launches, you'll be able to configure a new synced repository on an existing model or when archiving a model, if you already have a GitHub repository.



Setting up the sync will only require you to have a GitHub account linked with comses.net and install a GitHub App on the repository in question that will allow the CML to push and watch for new releases.

We aim to make this feature as beneficial as possible to those we serve, so, as always, your feedback is highly valuable–please let us know what you would like to see.

CoMSES Executive Board Election Results

At the end of 2024 and into the beginning of 2025 CoMSES undertook our annual Executive Board Election for two of our six Executive Board positions. It was a very close election between the three possible candidates, and a well attended election, with 'number of votes cast' up on previous years.

For the 2025-2027 electoral term CoMSES.Net is excited to announce the results of this election. We see the return of long serving CoMSES Board member, and guest editor of this digest issue, Moira Zellner, and we also welcome a new face to the Executive Board, Önder Gürcan. You can learn more about the successful

candidates from their linked profile pages.

Virtual Seminar on Machine-Actionable Data and Software Citations - Thanks to AGU and Partners - March 27th

Many of you have asked for more insight into the inner workings of data and software citation through the journal production process to ensure that your role in publishing peer-reviewed papers supports the proper linkage of data and software citations to the publication. You are invited to attend this “first ever” seminar to take a deep-dive on the steps necessary for proper machine-actionable data and software citations that result in data and software creators receiving automated attribution when a new peer-reviewed paper is published.

AGU has made significant progress on this challenge by working with our authors, staff, editors, and reviewers – as well as the journal infrastructure with our publishing partner Wiley, and our many collaborators in the Coalition for Publishing Data in the Earth and Space Sciences (COPDESS). AGU journal’s data citations have increased from 1% in 2019 to 72% in 2024 (and rising). Software citations have increased from 0.2% to 25% in the same time period. Data citations are mandatory for AGU journals, where software citations are only required by some journal editors depending on the research.

This year there has been greater interest from researchers to ensure that data and software citations are properly included, formatted, and machine actionable. As institutional promotion and tenure policies shift to include data and software sharing, the importance of reliable machine-actionable linkage between research data and software to the research outcomes is accelerating. Funder requirements have also shifted to require data sharing and citation in papers. The interlinking of these research objects is becoming a critical component of assessing impact, funding prospects, and career advancement for authors.

In this 90-min seminar [**Held Thursday March 27th at 10am EST, 9am CDT, 7am AZ/PST**] you will be introduced to the leading practices for:

- ensuring authors include properly formatted data and software citations,
- journal staff actions to ensure submitted papers include the proper information,
- guidance to editors and reviewers on techniques for engaging their authors on including and improving the needed data and software citations, and
- requirements in publisher production workflows and down-stream infrastructure that enables the automated attribution and linkages of digital objects to publications.

We will use real-world examples to demonstrate properly prepared data and software citations as well as what happens when things go awry.
Objectives:

- For journals: editors, staff, reviewers, and the journal production team will find the recommended guidance immediately applicable for all disciplines.
- For researchers: leading practices in preparing your data and software citations such that they are managed properly by your journal, machine-actionable, and properly linked to the paper. We will also demonstrate ways to check our published papers to validate proper processing.

There is no cost for this seminar.

If you are interested but can't make the session, please register to get a link to the slides and recording.

Registration Link: https://agu.zoom.us/meeting/register/HzdM0H92R1yS1GRyp-dy2g

The materials for the session were developed from two primary resources:

1. Stall, S., Bilder, G., Cannon, M. et al. Journal Production Guidance for Software and Data Citations. Sci Data 10, 656 (2023). https://doi.org/10.1038/s41597-023-02491-7
2. AGU's Data and Software Citation Pilot project which concluded in 2023, educating editors, reviewers, and staff on data and software citations and how to support authors to ensure their manuscripts include proper data and software citations. In 2024, over 72% of AGU published papers included a data citation, and 25% had a software citation (Vrouwenvelder, 2024). This is an incredible increase from 2019 where only 1% of papers include a data citation, and 0.2% a software citation. The pilot project was partially funded by an NSF grant.

CoMSES.Net on LinkedIn

CoMSES leadership is excited to announce the launch of our new LinkedIn profile. We encourage all digest readers to please follow us on LinkedIn, and share our posts as appropriate. While the page is a little empty right now, we have BIG plans for 2025, and can't wait for you to see what we have in store.

Keep Your CoMSES Profile Updated

Please consider keeping the CoMSES community informed by updating your user account on CoMSES Net! Let fellow researchers and modelers get to know you by including a biography, research interests, and/or institutional affiliation.Click here to edit your profile and while you are at it, why not link your account to GitHub and ORCID! As always, feel free to join the conversation by visiting the Forums tab , or by starting a discussion on a specific model, event, or job posting. If you register your affiliation on your profile page it will help us fill out our new member profile map from CoMSES Net student dev Charles Sheelam and Scott Foster at https://www.comses.net/about/metrics!

Calendar of Events

Follow the links to the local event organizers for the latest information or go to https://comses.net/events/ for a listing of all recent events. You can also subscribe to new events by following us on Twitter/X or subscribing to our RSS feeds.

Upcoming Deadlines

Social Simulation Conference 2025: Social simulation in a socio-technical context: embracing societies' complexities

Dates: August 25-29, 2025; Submission Deadline April 11, 2025

The 20th annual Social Simulation Conference (SSC 2025) will take place from 25th to 29th August 2025 at Delft University of Technology, the Netherlands. The conference is one of the key activities of the European Social Simulation Association (ESSA), aimed at promoting social simulation in Europe and elsewhere. This year's special theme is "Social simulation in a socio-technical context: embracing societies' complexities." A theme fitting to an engineering university that, through the faculty Technology, Policy and Management, bridges engineering to the many disciplines that are present in the ESSA community. Being open minded to other perspectives is in our DNA. In other words: we welcome you wholeheartedly to Delft!

FRCCS: France's International Conference on Complex Systems

Dates: May 21, 2025 - May 23, 2025; Submission Deadline March 30, 2025; Registration Deadline April 17, 2025

FRCCS 2025 is the 5th edition of the France's International Conference on Complex Systems. It aims at bringing together the International scientific community working in complex systems.
We encourage researchers from various disciplines supporting interdisciplinary exchanges to respond to this call (archaeology, biology, computer science, economics, geography, history, linguistics, management, mathematics, medicine, physics, statistics, sociology, …). FRCCS 2025 is an opportunity to promote the cross-fertilization of ideas by presenting recent research work, industrial developments, and original applications. Special attention is given to research topics with a high societal impact from the perspective of complexity science from the complexity science perspective.

Model Library

Newly Reviewed

3 models passed CoMSES's peer review process this quarter!

CoMSES is always looking for new model reviewers! As such we welcome your self nomination. If you would like to join our reviewer network, we invite you to do so by creating a peer reviewer profile under "Edit Profile" on your comses.net account.

New Model Uploads

Twenty one new models were published in the CoMSES Model Library on a wide variety of topics that illustrate the depth and breadth of our community. These include:

- Simulating household-based water consumption and demand within urban environments
- Examining the evolution of conditional cooperation as impacted by factors such as spatial structure
- Investigating cultural impacts on vaccination opinion polarization

- Representing agricultural stakeholder networks and their performance over mixed landscapes

These models and more can be discovered at the CoMSES Model Library - you can also keep up-to-date with newly published models on our Twitter/X and RSS feeds.

Most Downloaded Models

Published models were downloaded a total of 1914 times this quarter, across 560 unique codebases. Here are the top five:

1. Dawkins Weasel by Kristin Crouse (262 downloads)
2. Evolution of Sex by Kristin Crouse (235 downloads)
3. Household Energy Retrofit Behavior ABM by Lars Even Egner (19 downloads)
4. Behavioral Dynamics of Epidemic Trajectories and Vaccination Strategies: An Agent-Based Model by Ziyuan Zhang (18 downloads)
5. Co-adoption of low-carbon household energy technologies by Mart van der Kam (18 downloads)

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Arizona State University

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The School of Complex Adaptive Systems
College of Global Futures