STEVEN A. GRAY

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Education

2010	Rutgers University	PhD	Ecology and Evolution
2006	Texas State University	MS	Geography and Planning
2002	University of Texas at Austin	BA	Anthropology

Positions

2015-present	Michigan State University, *Assistant Professor* Department of Community Sustainability (tenure track)
2013-2015	University of Massachusetts, Boston, *Assistant Professor* School for the Environment (tenure track)
2011-2014	Leibniz-Institute of Freshwater Ecology and Inland Fisheries, *Visiting Scientist* IGB Fellowship, Berlin Germany
2011-2013	University of Hawaii, *Assistant Professor* Department of Natural Resources and Environmental Management (tenure track) Graduate Program in Natural Resources and Environmental Management Head, Socio-economic Division, Water Resources Research Center
2010-2011	Rutgers University/Cary Institute of Ecosystem Studies, *Postdoctoral Researcher*
2008-2011	Rutgers University, Research Assistant, Institute of Marine and Coastal Science
2008	NSF EAPSI Fellow, NSW Fisheries Research Center, Sydney Australia
2007-2009	NOAA National Estuarine Research Reserve Social Science Fellow
2007-2008	Rutgers University, Research Assistant, Department of Ecology and Evolution
2007	U.S. EPA, Environmental Management Fellow, New York City
2006	U.S. EPA, Chemist, Student Temporary Employment Program, Region 6 Houston
2005-2006	Texas State University, Research Assistant, Department of Geography
2005	U.S. EPA, Environmental Management Fellow, Radiation Laboratory Las Vegas

External Grant and Fellowships (>$3.4 million in external funding as PI or Co-PI)

2016-2018	National Academy of Sciences, Gulf Research Program *Collaborative modeling with Fuzzy Cognitive Maps: A novel approach to achieving safety culture* (co-PI with Antonie Jetter and Stephen Scyphers)	$407,113
2016-2018	NOAA *Engaging commercial, recreational, and subsistence fishers to improve management of Striped Bass fisheries in New England* (co-PI with Stephen Scyphers, Jonathan Grabowski)	$240,859
2016	Community Foundation of Greater Flint *Community-based modeling of the Flint Water* Crisis (PI)	$16,000
2015-2017	NSF Socio-Environmental Synthesis Center (SESYNC) *Public participation and participatory modeling for action-oriented outcomes* (PI with Alexey Voinov)	$86,000
2015-2017	NOAA *Predicting the social impacts of climate change on fisheries* (co-PI with Stephen Scyphers)	$298,950

2014-2016	BLM *Policy Scenarios for fire-adapted communities: understanding stakeholder risk-perceptions* (co-PI with A. Jetter and L. Ellsworth)	$181,093
2014-2015	NSF (Belmont Forum) Agriculture, Food Security & Climate Change *Sustainable Management of Agro-ecological Resources for Tribal Societies* (co-PI with C. Chan-Halbrendt, B. Sipes, and T. Idol)	$299,894
2014-2016	NOAA UH Sea Grant *Forecasting climate change impacts on coastal ecosystem services in Hawaii through integration of ecological and social models* (PI with C. Lepczyck)	$56,000
2013-2014	USGS Water Resources Research Institute Programs *Forecasting climate change impacts on watershed-based ecosystem services in Hawaii* (PI with A. Fares and C. Lepczyk)	$28,000
2012-2016	NSF Cyberlearning *Sustaining ecological community through citizen science and online collaboration* (co-PI with R. Jordan, C. Hmelo-Silver, A. Crall, G. Newman)	$1,206,384
2012-2014	USDA, *Mental Modeler: Developing a software tool to support community-based decision-making* (PI with L. Cox)	$40,000
2012-2014	Leibniz-Institute of Freshwater Ecology and Inland Fisheries Freshwater *Understanding the relationship between natural resource decision-maker mental models and sustainable natural resource management in freshwater recreational fisheries* (PI with R. Arlinghaus)	$18,000
2011-2012	NOAA Cooperative Research, Conservation Engineering *Evaluation of broad and fine scale models of butterfish biomass applied to by-catch reduction in the longfin inshore squid fishery in the Mid-Atlantic Bight* (co-PI with J. Kohut)	$299,999
2010-2012	NOAA Cooperative Research, Conservation Engineering *Integrating habitat models and stakeholder knowledge into commercial fishing to reduce by-catch* (co-PI with J. Kohut)	$217,089
2008	NSF Office of International Science and Engineering *Improving the management of data-poor fisheries: Evaluating risk and uncertainty in fisheries management in Australia and the United States* (PI with J. Scandol)	$10,500
2007-2009	NOAA National Estuarine Research Reserve Social Science Fellow *What do recreational fishermen need to know? Recommendations that foster ecosystem-based management* (PI)	$30,000
2007	U.S. EPA NNEMS Research Fellow, Region 2 New York City, NY *Implementing sustainable programs in NYC area schools: Fostering environmental stewardship in school-aged children* (PI)	$16,140
2005	U.S. EPA NNEMS Research Fellow, R&IE Nat'l Laboratory *Determining sustainable environmental management programs through community outreach and communication* (PI)	$9,500

Software Packages

Gray, S. Mental Modeler: A fuzzy cognitive mapping software for systems thinking, scenario analysis and participatory research. Lead developer, http://www.mentalmodeler.org/

Books

Gray, S. Paolisso, M, Jordan, R.C and S. Gray (Eds) *Environmental Modeling with Stakeholders: Theory, methods and applications.* Springer Publishing, New York City (2017)

Peer Reviewed Journal Articles

(co-author: graduate student, *undergraduate, [1]community partner, [†]K-12 student/teacher,)

2017

Gray, S., A., Voinov, M. Paolisso, R.C Jordan, Todd BenDor, P. Glynn, B. Hedelin, K. Hubacek J. Introne, [1]N. Kolagani, B. Laursen, C. Prell, L. Schmitt-Olabisi, A. Singer, E. Sterling, M. Zellner. Purpose, Processes, Partnerships, and Products: 4Ps to advance participatory socio-environmental modeling. *Ecological Applications.* (in press).

Gray, S., A. Singer, L. Schmitt-Olabisi, J. Introne, and J. Handerson*, Identifying the causes, consequences, and solutions to the Flint Water Crisis through collaborative modeling. *Environmental Justice* (in press).

Sterling E, C. Filardi, J. Newell, S. Albert, D. Alvira, N. Bergamini, E. Betley, M. Blair, D. Boseto, K. Burrows, N. Bynum, S. Caillon, J.E. Caselle, J. Claudet, G. Cullman, R. Dacks, P. B. Eyzaguirre, N. Gazit, S. Gray, J. Herrera, P. Kenilorea, K. Kinney, N. Kurashima, S. Macey, S. Mauli, J. McCarter, H. McMillen, P. Pascua, P. Pikacha, A. Porzecanski, P. de Robert, M. Salpeteur, A. Sigouin, M. Sirikolo, M. H. Stege, K. Stege, T. Ticktin, A. Toomey, R. Vave, A. Wali, P. West, K. B. Winter, and S. Jupiter. Biocultural approaches to sustainability indicators: bridging local and global scales to foster human adaptive capacity and ecological resilience. *Nature: Ecology and Evolution* (in press)

Frensley, T., A. Crall, M. Stern, R.C. Jordan, S.A. Gray, M. Prysby, G. Newman, C. Hmelo-Silver. Bridging the benefits of online and community supported citizen science: A case study on motivation and retention with volunteers. *Citizen Science: Theory and Practice* (in press).

Santo, A., Guillozet, K., Sorice, M.G., Baird, T, Gray, S., and J. Donlan. Examining private landowners' knowledge systems of an invasive species. *Human Ecology* (in press).

Giabbanelli, P., S.A. Gray, and P. Aminpour. 2017. Combining fuzzy cognitive maps with agent-based modeling: frameworks and pitfalls of a powerful hybrid modeling approach to understand human-environment interactions *Environmental Modeling and Software.* 95:320-325.

Stier, A., Samhouri, J., Gray, S., Martone, R., Mach., M. Halpern, B., Kappel, C., Scarborough, C., and P. Levin. 2017. Integrating expert opinion into food web conservation and management. *Conservation Letters* 10(1), 67–76

Newman, G, B. McGreavy, M. Clyde, M. Chandler, M. Haklay, H. Ballard, S. Gray, D. Mellor, and J. Gallo. 2017. Leveraging the power of place in citizen science for effective conservation decision making. *Biological Conservation* 208, 55-64

Gray, S., R. C. Jordan, A. Crall, G. Newman, C. Hmelo-Silver , J. Huang, W. Novak, D. Mellor, T. Frensley, M. Prysby, A. Singer. 2017. Combining participatory modelling and citizen science to support volunteer conservation action *Biological Conservation.* 208, 76-86

Jordan, R.C., Gray, S., Hmelo-Silver, Sorensen, A. and G. Newman. 2017. Modeling with a conceptual representation: Is it necessary? Does it work? *Frontiers in Education*, 4,7.

2016

Htun, H., S.A. Gray, C. Lepczyk, A. Titmus, and K. Adams. 2016. Combining watershed

models and knowledge-based models to predict local-scale impacts of climate change on engendered wildlife. *Environmental Modeling and Software.* 84:440-457.

Li., O. S.A. Gray and S. Sutton. 2016. Mapping recreational fishers' informal learning of fisheries science using a fuzzy cognitive mapping approach to mental modeling. *Fisheries Management and Ecology* 23(4), 315–329.

Douglas, E., Wheeler, S., Smith, D., Overton, I., Gray, S., Crossman, N., and Doody, T. 2016. Using mental-modelling to explore how irrigators in the Murray-Darling Basin make water-use decisions. *Journal of Hydrology: Regional Studies.* 6, 1-12.

Punawai, N., S.A. Gray, C. Severance, C. Lepczyk, 2016. Mapping ocean currents through human observations: Insights from Hilo Bay, Hawai'i. *Human Ecology.* 1-10.

Jordan, R.C., A.M. Crall, S.A. Gray, La Deau, S., Sorenson, A., Hmelo-Silver, S. Newman, G., and D.T. Mellor. 2016. Studying citizen science, adaptive management, and learning feedback as a mechanism for improving conservation *Conservation Biology.* 30(3), 487-495

2015

Gray, S. A., S. Gray, J. L. De Kok, A. E. R. Helfgott, B. O'Dwyer, R. Jordan, and A. Nyaki[1]. 2015. Using fuzzy cognitive mapping as a participatory approach to analyze change, preferred states, and perceived resilience of social-ecological systems. *Ecology and Society* 20(2): 11.

Gray, S., A. McFall, J. Hilsberg, R. Arlinghaus. The impact of specialization and target species choice on the structure of mental models about fish population dynamics. 2015. *Journal of Outdoor Recreation and Tourism*. 12:1-13.

Jordan, R.C., Brooks, W., Delisi, J., Gray, S., and A. Berkowitz. 2015. Ecology nature of science: shared discussions and practices among ecologists and high school teachers. *Ecosphere*. 6(11): 1-17.

Barnes-Mauthe, M. Gray, S., Arita, S., Lynham, J., P. Leung. 2015 What determines social network capital in a social-ecological system? *Environmental Management.* 55:392-410.

Henly-Shepard, S., Gray, S., and Cox, L. 2015. Facilitating community adaptation through participatory modeling and social learning. *Environmental Science and Policy.* 45:109-122.

Jordan, R., A Crall, S Gray, T Phillips, D Mellor. 2015. Citizen science as a distinct field of inquiry. *BioScience* 65 (2), 208-211.

Hmelo-Silver, C., Liu, L., Gray, S., Jordan, R. 2015. Using representational tools to learn about complex systems. *Journal of Research in Science Teaching*
Cover Article for January 2015

Mellor, D. W. Brooks, S, Gray, and RC Jordan. 2015. Troubled transitions into college and the effects of a small intervention course. *Journal of College Student Retention: Research, Theory & Practice.* 17 (1), 44-63.

2014

Halbrendt, J., Gray, S., Radovich, T., Crow, S., Kimura, A. 2014. Differences in farmer and expert beliefs about the perceived impacts of conservation agriculture. *Global Environmental Change* 28: 50-62.

[1]Nayaki, A., Gray, S., Lepczyk, J. Skibins, D. Rentsch. 2014. Understanding the hidden drivers and local-scale dynamics of the bushmeat trade through participatory modeling *Conservation Biology* 28(5) 1403-1414.

Pleasant, M, Gray, S., Lepcyzk, C. Fernandez*, A., Hunter*, N., and D. Ford* 2014. Managing

cultural ecosystem services: Local management yields large-scale benefits. *Ecosystem Services.* 8: 141-147.

Halbrendt, J., Gray, S., Radovich, T., and Kimura, A., Reed, B., and Tammang, B. 2014 Implications of conservation agriculture for men's and women's workloads among marginalized farmers in the Central Middle Hills of Nepal. *Mountain Research and Development.* 34(3) 214-222.

Punawai, N., Canale, L., Haws, M., Potemra, J., and Gray, S. 2014. Development of a GIS-based tool for aquaculture siting. *International Journal of Geo-Information.* 3:800-816.

Nicosia† K, S. Daaram†, B. Edelman†, L. Gedrich†, E. He†, S. McNeilly†, V. Sheno†, A. Velagapudi†, W. Wu† ,L. Zhang†, A. Barvalia†, V. Bokka†, B. Chan†, J. Chiu†, S. Dhulipalla†, V. Hernandez†, J. Jeon†, P. Kanukollu†, P. Kravets†, A. Mantha†, C. Miranda†,V. Nigam†, M. Patel†, S. Praveen†,T. Sang†, S. Upadhyay†, T. Varma†, C. Xu†, B. Yalamanchi†, M. Zharova†, A. Zheng† ,R. Verma†, J. Vasslides†, J. Manderson, R.C. Jordan, and S.A. Gray. 2014. Determining the willingness to pay for ecosystem service restoration in a degraded coastal watershed: A ninth grade investigation. *Ecological Economics*.104: 145–151.

Gray, S., Gagnon, A.,Gray, S., Mahony, C., Muir, D., Falaleeva, M. 2014. Are local coastal managers detecting the problem? Assessing stakeholder perception of climate vulnerability using Fuzzy Cognitive Mapping. *Ocean and Coastal Management.* 94:74-89.

2013

Jordan, R.C., Brooks, W., Gray, S., Delisi, J., and A. Berkowitz. 2013. Rising to the challenge of 'broader impacts' *Frontiers in Ecology and the Environment* 11(5) 234-235.

Barnes-Mauthe, M., S. Arita, S. D. Allen, S. A. Gray and P. Leung. 2013. The influence of ethnic diversity on social network structure in a common-pool resource system: Implications for collaborative management. *Ecology and Society* 18 (1): 23

Sinha, S., Gray, S., Hmelo-Silver, C.E., Jordan, R.C., Eberbach, C., Goel, A., and S. Rugabar 2013. Conceptual representations for transfer A case study tracing back and looking forward. *Frontlines in Learning Research* 1(1) 3-24.

Jordan, R.C., C. Hmelo-Silver, L. Liu, and S. Gray. 2013. Using a complex system ontology to foster ecosystem learning. *Applied Environmental Education and Communication* 12(1) 55-64. .

Jordan, R.C., DeLisi, J., Brooks, W., Gray, S., Alvarado, A., Berkowitz, A. 2013. A collaborative model of science teacher professional development. *International Journal of Modern Education Forum* 2(2) 31-41.

Jordan, R.C., Gray, S., Brooks, W., Hemlo-Silver, C.E., Honwad, S. 2013. Process-based thinking in ecological science. *Natural Sciences Education* 42(1): 68-74.

2012

Gray, S., Chan, A.*, Clark, D.* and R.C. Jordan. 2012. Modeling the integration of stakeholder knowledge in social-ecological system decision-making: Benefits and limitations to knowledge diversity. *Ecological Modeling* 229, 88-96.

Gray, S., R. Shwom, R. C. Jordan 2012. Understanding factors that influence stakeholder trust of natural resource science and institutions *Environmental Management* 49, 663-674.

Gray, S., Nicosia†, K.; and Jordan, R. C. 2012. Lessons learned from citizen science in the classroom. *Democracy and Education*, 21(1) 14.

Palarama, L., Manderson, J., Kohut, J., Oliver, M., Gray, S. and Goff, J. 2012 Improving habitat models by incorporating pelagic measurements by coastal ocean observatories. *Marine Ecology Progress Series* 447, 15-30.

2011 and prior

Jordan, R.C., S. Gray, D. Howe, W. Brooks, and J. Ehrenfeld. 2011. Knowledge gain and behavior change in citizen-science programs. *Conservation Biology.* (25) 1148-1154.

Vattam, S., Goel, A., Rugaber, S., Hmelo-Silver, C., Jordan, R., Gray, S., Sinha, S., 2011 Understanding complex natural systems by articulating Structure-Behavior-Function models. *Educational Technology and Society* 14(1) 66-81. (IF: 1.32)

Gray, S., M. Ives, J. P. Scandol, and R.C. Jordan. 2010. Categorizing the risks in fisheries management. *Fisheries Management and Ecology.* 17(6) 501-512. (IF: 1.76)

Gray, S. and R.C. Jordan. 2010. Ecosystem-based angling: Incorporating recreational fishermen into ecosystem-based management. *Human Dimensions of Wildlife.* 15(4) 233-246.

Jordan, R.C., S. Gray, C. Hmelo-Silver, M. Demeter, and L. Lui. 2009. An assessment of students' understanding of ecosystem concepts: Conflating ecological systems and cycles. *Applied Environmental Education and Communication.* 8(1) 40-48.

Jordan, R.C., S. Gray, and R. Golan-Duncan. 2008. Teachers and scholarship: Self-definition of teachers in the scientific enterprise. *Education and Society,* 26(3) 33-44.

Currently in review or revision

Gray, S., Sterling, E., Wei, C., Akabas, S., Singer, A., Giabbanelli, P., Jordan, R., and J. Hodbod. Teaching (social-ecological) systems thinking. *BioScience.* (in review)

Gray, S., A. Jetter, L., Ellsworth, A. Singer, O. Laraichi, and P. Zheng. Avoiding Fussy Cognitive Maps: Measuring diversity in natural resource stakeholder knowledge. *Society and Natural Resources* (in review)

Singer, A., S. Gray, [1]A. Sadler, L. Schmitt Olabisi, K. Metta, [1]R. Wallace, M. Claudia Lopez, J. Introne, M. Gorman*, and J. Henderson*. Translating community narratives into semi-quantitative models to understand the dynamics of socio-environmental crises *Environmental Modeling and Software.* (in revision)

Metzger, A., S.A. Gray, A. Jetter, and E. Papageorgiou. Typologies and Tradeoffs: A standardized approach to creating participatory Fuzzy Cognitive Maps In. *Innovations in Collaborative Modeling* Eds: McNall, M. and L. Schmitt-Olabisi, Michigan State University Press. (in revision)

Jordan, R.C., Sorensen, A, Gray, S. Ebert-May, D. Shwom, R. Isenhour. C. Meta Robinson, J. and M. Nucci. Advancing Climate Literacy: Building trust and motivation by engaging learners in authentic scientific experiences. *Journal of Environmental Studies and Sciences* (in review).

Peer Reviewed Book Chapters, Proceedings, Technical Reports and Other Publications

Gray, S.A. and S. Scyphers. 2017. Innovations in Collaborative Science: Advancing citizen science, crowdsourcing and participatory modeling to understand and manage marine social-ecological systems. In Levin, PS and M. Poe Editors. *Conservation in the Anthropocene Ocean: Interdisciplinary Science in Support of Nature and People*. Elsevier, San Diego

Gray, S. A., Paolisso, M., Jordan, R., & Gray, S. 2017. Introduction to Environmental Modeling with Stakeholders. *Environmental Modeling with Stakeholders: Theory, methods and applications.* Springer Publishing, New York City (in press)

Gray, S., Sadler[1], A., Brown, R., Alison, S., Schmitt-Olabisi, L., Lopez, M., Henderson*, J., Gorman*, M., Wallace[1], R., & Kaplowitz, M. 2016. Voices of Flint: Flint resident perceptions about the causes, consequences, and solutions to the Flint Water Crisis. CFGF Report

Singer, A., Jetter, A. Ellsworth, L., Gray, S., Zhang, P., and O. Lariarchi, 2017. Policy Scenarios for Fire-Adapted Communities: Understanding Stakeholder Risk Perceptions in Ashland, Oregon. BLM Report

Crall, A., Mellor, D., Gray, S. and Newman (in review) Collecting high quality data: begin with the end in mind. In *Citizen Science for Practitioners*. Eds: Lepczyk, C. University of California Press.

Jordan, R.C., Sorenson, A. and Gray, S. (in review) Undertaking program evaluation. In *Citizen Science for Practitioners*. Eds: Lepczyk, C. University of California Press.

Gray, S., Gray S., and Zanre, E. 2014. Fuzzy Cognitive Maps as representations of mental models and group beliefs: theoretical and technical issues. In *Fuzzy Cognitive maps for Applied Sciences and Engineering –From fundamentals to extensions and learning algorithms* Ed: Elpiniki I. Papageorgiou. Springer Publishing. pp 29-48.

Gray, S., D. Mellor, D, RC Jordan, and G. Newman. 2014. Modeling with citizen scientists. *Proceedings of the International Environmental Modelling and Software Society (iEMSs)* 7th Intl. Congress on Env. Modelling and Software, San Diego, CA, USA, Daniel P. Ames, Nigel W.T. Quinn and Andrea E. Rizzoli (Eds.) http://www.iemss.org/society/index.php/iemss-2014-proceedings

Gray, S. Gray, S., Cox, L., and Henly-Shepard, S. 2013 Mental modeler: A fuzzy-logic cognitive mapping modeling tool for adaptive environmental management. *Proceedings of the 46th International Conference on Complex Systems*. 963-973

Kohut, J. Palarama, L., Bochenek, E., Jenson, O., Manderson, J. Oliver, M., Gray, S., and C. Roebuck[1] 2012. Using ocean observing systems and local ecological knowledge to nowcast butterfish bycatch events in the Mid-Atlantic Bight longfin squid fishery. *Oceans*, 1-6

Jordan, R.C., Ehrenfeld, J., Gray, S., Brooks, W. & C.E. Hmelo-Silver. 2012 Cognitive considerations in citizen science. Eds: R. Bonnie J. Dickenson. In *Citizen Science: Public Participation in Environmental Research*. Cornell University Press

Gray, S. and L. L. Gray. 2011. LEED Standards. In: *Green Energy Considerations. Green Society: Towards a Sustainable Future*. Eds. D. Mulvaney and P. Robbins.SAGE Publishing. Thousand Oaks, CA. pp 277-283

Sinha, S., Gray, S., Hmelo-Silver, C.E., Jordan, R.C., Honwad, S. 2010, Appropriating conceptual representations: A case of transfer among middle school science teachers *Proceedings of the 9th International Conference of the Learning Sciences*.(1) 834-841

Gray, S. 2010 Are robots and satellites the future of fisheries management? *Fisheries*. 35(1) 48.

McCay, B.J., C.F. Creed, and S. Gray. 2009. Fish or Cut Bait: How to participate in the Fisheries Management System, 3rd revised edition. Fort Hancock, NJ: New Jersey Marine Sciences Consortium. (12pp)

Gray, S. Ives, M., Scandol, J., and Jordan, R 2009. Classifying the risk in fisheries management in Australia and the U.S. Atlantic coast. In: *Scandol JP, Ives MC and Lockett MM Development of national guidelines to improve the application of risk-based methods in the scope, implementation and interpretation of stock assessments for data-poor species.* Final report to the Fisheries Research & Development Corporation for Project No.

2007/016.3 Industry & Investment NSW Final Report Series No. 115. Cronulla Fisheries Research Centre of Excellence, NSW, Australia pp 164-179.

Gray, S., C. E. Hmelo-Silver, L. Liu, R.C. Jordan, H. Jeong. 2008. Learning with ecosystem. models. *Proceedings of the 8th International Conference of the Learning Sciences* (1) 289-296.

Gray, S. 2009. William D. Ruckelshaus. Ed: George Cevasco. In *The Modern American Environmentalist*. Johns Hopkins University Press. Baltimore MD. Pp 448-452.

Gray, S**.,** R.C. Jordan, and D. V. Howe. 2008. Oceanic Changes. *The Encyclopedia of Global Warming and Climate Change*. Ed: S. George Philander. Sage Publications.

Jordan, R.C., S. Gray and D.V. Howe. 2008. Atlantic Ocean. *The Encyclopedia of Global Warming and Climate Change*. Ed: S. George Philander. Sage Publications.

Hmelo-Silver, C. R. C. Jordan, L. Lui, S. Gray**,** M. Demeter, S. Rugaber, S.Varrtam, and A. Goel. 2008. Focusing on function: Thinking below the surface of complex natural systems *Science Scope*, 31: 27-35

Jordan, R.C., S. Gray, M. Demeter, L. Lui, and C. Hmelo-Silver. 2008. Quick fix: Don't forget behavior in systems thinking! *American Biology Teacher*, 70: 329-330.

Presentations

2017 (invited) University of Hawaii, "Modeling social-ecological systems with Fuzzy Cognitive Mapping" (**invited for FCM workshop and research talk)** Honolulu, HI

2017 (keynote) Columbia University**.** Teaching and Learning about Food Systems Conference **(invited plenary presentation, panel discussion, and workshop)** New York

2017 Michigan State University**,** Conference on Teaching and Learning**.** Measuring Systems Thinking with Mental Modeler**,** East Lansing**,** MI

2017 (invited) Autonomous National University of Mexico, Applied Mathematics and Systems Research Institute**, (invited for FCM workshop and research talk)** Mexico City

2016 American Geophysical Union, "4Ps to improve collaborative socio-environmental modeling" San Francisco CA **(presentation and invited panel discussion)**

2016 (invited) Stanford University and University of Minnesota (Natural Capital Project) "Collaborative modeling to understand social-ecological systems"

2016 (keynote) The Ohio State University School of Social Work- Research Conference 2016 "Participatory modeling for wicked problems" Columbus OH

2016 (invited) Northern Illinois University, Department of Computer Science, "Crowdsourcing platforms to understand wicked problems: is the crowd wise?" Dekalb, IL

2016 Collaborative Modeling 2016. East Lansing, MI

(a) "The Participatory Modeling Toolbox" **(invited plenary panel)**
(b) "Review of FCM Typologies for Collaborative Modeling" (co-author)
(c) "4 Ps for Participatory Modeling" (co-author)
(d) "An introduction to Mental Modeler" (90 minute workshop)
(e) "Collaborative modeling of wildfire" (co-author)

2016 (invited) MSU Extension Community and Natural Resources Development Association Annual Conference, "Systems thinking tools for extension and outreach"

2016 (organizer) International Congress on Environmental Modeling Society, "Participatory Modeling Workshop" (with A. Voinov and N. Kolagani) Toulouse. France

2015 (invited) Conference on Conservation Science, "Modeling social-ecological systems" (training workshop), New York, NY

2015 ICES, “How the sausage is made: when public/science partnerships decrease trust of science”, Copenhagen, Denmark

2015 International Congress for Conservation Biology, "Collaborative modeling for conservation" Montpellier, France

2015 Western Economic Association International. "Probability of adoption: Using mental models of farm dynamics and perception of environmental change to understand farming practices in rural India" Honolulu, HI

2015 (invited) Socio-Environmental Synthesis Center. "Mental Modeler: An overview for measuring learning about social-ecological systems" Annapolis, MD

2015 Collaborative Modeling 2015. East Lansing, MI

(a) "Using FCM to measure change, resilience and preferred states of socio-ecological systems"

(b) "Linking products, people, and process in participatory modeling" (Invited plenary panel discussion)

(c) "An introduction to Mental Modeler" (90 minute workshop)

(d) "Flood models that matter: integrating FCM and ABM" (co-author)

2015 (invited) Michigan State University. Department of Community Sustainability. "A cognitive approach to understanding human-environment interactions" East Lansing, MI

2015 (invited) Auburn University. School of Forestry and Wildlife Science. "Using mental models to understand human-wildlife interactions" Auburn, AL

2015 Citizen Science 2015, San Jose, CA

(a) "Modeling with citizen scientists: Using community-based modeling tools to develop citizen-science projects resulting in resource management outcomes"

(b) "How the sausage is made: When public participation in science leads to decreased trust of scientific assessment"

(c) "Determining the Willingness to Pay for Ecosystem Service Restoration: A High-School Citizen Science Project" (co-author)

(d) "The Challenges with Training Outdoor Enthusiasts" Online (co-author)

(e) "Citizen Science Learning and Epistemology in Socio-Ecologically Oriented Projects" (co-author)

2014 (invited) University of Nebraska. Water Resources Research Institute/Department of Natural Resources: “Using mental models to understand human-environment interactions” Lincoln, NE

2014 Japan Society for International Development “Cognitive considerations in conservation agriculture” Osaka, Japan (part of our Belmont Forum Symposium)

2014 Human Ecology, "A FCM-based software for measuring perceptions of the environment" Bar Harbor, ME

2014 International Symposium on Society and Resource Management, “Using mental models to understand conservation related attitudes and policy preferences: an empirical study of anglers and stocking” Hanover, Germany

2014 International Congress on Environmental Modelling and Software (iEMSs) San Diego, CA

(a) “Predicting local scale climate change impacts on endangered birds by integrating watershed models and expert knowledge-based models for decision-support”.
(b) “Modeling with citizen scientists”

2014 Resilience 2014: Session Chair/Organizer “Fuzzy-logic Cognitive Mapping as a tool to understand change and transformation in social-ecological systems” Montpellier, France
(a) “What is FCM?”
(b) “A FCM software tool for research and planning”
(c) “Case study: Coastal sustainability from the waterfront view of homeowners” (Steven Scyphers, lead author)

2014 (keynote) NOAA Ecosystem Modeling Workshop “Mixed models/mixed messages” Seattle, WA.

2014 Citizen Cyber-Science Summit, “Modeling with citizen scientists.” London

2013 Hawaii Conservation Congress. “Coupling watershed modeling and knowledge-based modeling to understand climate change impacts on endangered birds on Kauai. Honolulu, HI

2013 University of Massachusetts, School for the Environment, “Using mental models to understand human-environment interactions.” Boston, MA

2013 US Fish and Wildlife. Decision-support software for federal natural resource management agencies. (webinar)

2013 International Symposia on Society and Resource Management. “A fuzzy-logic based software tool for resource management.” Estes Park, CO

2013 (invited) Colorado State University, Department of Human Dimensions, “Mental models as a human dimension” Fort Collins, CO

2013 Hawaii International Conference on Complex Systems, “Mental Modeler: A participatory fuzzy-logic cognitive mapping software for adaptive environmental management, Maui, HI

2012 Human Dimensions of Fisheries and Wildlife, Breckenridge CO
(a) “Understanding factors that influence stakeholder trust of natural resource science and institutions”
- (b) “The influence of specialization and target species choice on anglers' mental models of fish ecology”
- (c) “Mental Modeler: Incorporating individual and group stakeholder understanding into natural resource decision-making through a fuzzy-logic cognitive mapping software tool”
- (d) “Comparing the structure and function of mental models of fishery scientists and angling experts related to pike (Esox lucius) ecology and management”

2012 Ecological Society of America annual meeting in Portland OR
- (a) “Examining the relationship between ecosystem service characteristics and their management: A case study of Hawaii’s watersheds and coasts”
- (b) “Why and how should high school students learn about the ecology-nature of science?”
- (c) “Lessons from implementing a model-based pedagogy in the K12 classroom”

2012 (invited) Leibniz Institute for Freshwater Ecology and Inland Fisheries: "Toward Collaborative Conservation: Integrating social science, natural science and participation in US fisheries management." Berlin Germany

2012 (invited) University of Massachusetts, Environment, Earth, and Ocean Sciences Department, Boston, MA "Managing the social-ecological ocean"

2011 (invited) University College Cork, Department of Geography, Cork, Ireland "Integrating social and natural science to develop natural resource policy"

2011 (invited) University of Hawaii, Department of Natural Resources and Environmental Management, Manoa, HI, "What are the human dimensions of natural resources"

2011 (invited) State University of New York, Environmental Science and Forestry, Syracuse, NY, Department of Environmental Studies "Developing methods for integrating stakeholder knowledge in participatory management"

2011 American Educational Research Association, New Orleans, LA "Understanding learning as an outcome of modeling"

2011 (invited) Saint Peters College, Department of Biology, Jersey City, NJ "Managing marine fisheries as a social-ecological system"

2011 Resilience 2011: Resilience, Innovation, and Sustainability, Tempe, AZ "Integrating stakeholder knowledge into social-ecological decision-making"

2011 (invited) International Council for the Exploration of the Seas (ICES) Halifax, NS "Integrating social datasets into an ecosystem assessment for the North Atlantic"

2011 (invited) University of Illinois, Department of Natural Resources and Environmental Science, Urbana, IL, "Managing marine fisheries as a social-ecological system"

2011 (invited) Science and Policy Advisory Panel for the Barnegat Bay Partnership, Tom's River, NJ, "Developing an integrated social-ecological assessment model for Barnegat Bay"

2010 (invited) American Geophysical Union, San Francisco, CA, "Structure, Behavior, Function as a conceptual framework for teaching and learning about complexity in ecosystems"

2010 (invited) Ecosystem Planning Committee, Mid-Atlantic Fisheries Management Council, Norfolk, VA, "What makes some parts of the ocean sticky to fish? Ocean observing for marine habitat science and ecosystem management"

2010 (invited) Colby College Department of Environmental Studies, Waterville, ME "Integrating natural and social science to develop marine policy"

2010 Human Dimensions of Fisheries and Wildlife, Estes Park, CO, "Benefits and limitations to knowledge diversity in social-ecological decision-making"

2010 (invited) NOAA NMFS Howard Marine Laboratory, Sandy Hook, NJ "Integrating stakeholder knowledge into the management of marine fisheries"

2009 (invited) NOAA Office of Ocean and Coastal Management, Washington D.C. "Characterizing recreational anglers and as a component of social-ecological systems: friend or foe to conservation?"

2009 Mid-Atlantic American Fisheries Society, New Jersey "Developing ecological indicators for fisheries management using IOOS defined habitat characteristics in the mid-Atlantic Bight" (winner, best student presentation)

2009 Ecological Society of America Annual Meeting, Albuquerque, NM "Combining fuzzy logic cognitive mapping & resilience theory to understand coupled social-ecological system dynamics: a case study of the summer flounder fishery" poster

2009 Ecological Society of America Annual Meeting Albuquerque, NM "Assessment methods for interdisciplinary ecological dissertation research" (workshop)

2009 Mid-Atlantic Fisheries Management Council meeting New York City, "Developing ecological indicators for fisheries management using IOOS defined habitat characteristics in the mid-Atlantic Bight"

2009 Society for Conservation Biology International Marine Conservation Congress. Washington D.C "Identifying the risks in fisheries management"

2009 American Educational Research Association (AERA) Annual Meeting. San Diego, CA, "Modeling practices as function of task structure"

2008 (invited) National Estuarine Research Reserve Systems (NERRS) Annual Meeting, Monterrey, CA "How can social science help the NOAA NERRS: Implications for ecosystem-based management"

2008 North American Association of Environmental Educators Annual Research Symposium. Wichita, KS "A characterization of ecology and ecosystem understanding: a call for targeted instruction"

2008 NJ Biology Teachers' Association at the New Jersey Science Teacher's Convention. Somerset, NJ, "Thinking below the surface: using aquaria to teach about systems"

2008 Proceedings of the International Conference of the Learning Sciences: Utrecht, the Netherlands, "Learning with ecosystem models: A tale of two classrooms"

2008 National Science Teacher Association National Conference Boston, MA "Representational tools to support learning about complex systems"

2008 American Educational Research Association (AERA) Annual Meeting, New York, NY, "An integrated framework for bridging diverse analytical tools for understanding technology-mediated learning about complex natural systems"

2007 (invited) Rutgers Marine Field Station, NOAA Review, Tuckerton, NJ, "Developing costal training programs built around recreational fishermen for the Jacques Cousteau NERR"

2005 (invited) U.S. EPA National Radiation and Indoor Environment Laboratory, Las Vegas, NV, "Sustainable environmental management programs through community outreach and web communication"

Teaching Experience

2017 Michigan State University, CSUS 899: Special Topics: *Modeling Social-ecological Systems with Fuzzy Cognitive Maps*
Michigan State University, CSUS 834: *Survey Methods*

2016 Michigan State University, CSUS 200: *Introduction to Sustainability*

2015 University of Massachusetts, EEOS 604: *Coasts and Communities* (Graduate cornerstone II)

2014 University of Massachusetts, EEOS 603: *Coasts and Communities* (Graduate cornerstone I);
University of Massachusetts, EEOS 122: *Introduction to Environmental Policy*
University of Massachusetts, EEOS 476: *Capstone*
University of Massachusetts, EEOS 699: *People and Protected Areas*

2012-2013 University of Hawaii, Capacity Building Grant Awarded ($50,000 as PI) Creating Virtual Calculus: Distance Learning for NREM 203: *Applied Calculus*

2012 University of Hawaii, *Applied Calculus for the Life and Social Sciences*
University of Hawaii, *Environmental and Natural Resource Policy*
2010-2011 Rutgers University, *Portal to Academic Student Success (PASS)*
2008-2009 Rutgers University, *Politics of Environmental Issues (teaching assistant)*

Service and Working Groups

Editorial Board

Editorial Board, Socio-ecological Systems Modeling (founding board member, 2017)

Proposal Review Panels

EU European Research Council (ERC), Consolidator Grants, invited review panel
NOAA NERR Collaborative Science, invited review panel
NSF Coupled Natural and Human Systems (CNHS) invited review panel

Working Groups and Science Advisory Panels

NSF National Ecological Synthesis Center (NCEAS) workshop participant, Biocultural indicators for resilience
NSF Socio-Environmental Synthesis Center (SESYNC) workshop PI, Participatory modeling of action-oriented outcomes
NSF Socio-Environmental Synthesis Center (SESYNC) workshop participant, Teaching about socio-environmental systems
NSF National Evolutionary Synthesis Center (NaESCent) workshop participant, Anthropogenic Sensory Stimuli as Drivers of Evolution: A conceptual synthesis and roadmap for an integrated citizen-science research network
NSF Socio-Environmental Synthesis Center (SESYNC) workshop participant, Climate Social Science Literacy
NOAA National Ecosystem Modeling working group member
International Council for the Exploration of the Seas (ICES) Social Science Advisory Panel

Journal Reviewer

Neurocomputing, Biological Conservation, Ecological Engineering, Ecological Modeling, Ecology and Society, Environmental Management, Environmental Modeling and Software, Land Use Policy, Sustainability, Annals of Fuzzy Mathematics and Informatics, PLoS One, Tropical Ecology, Journal of Agricultural Extension and Rural Development, Environmental Education Research

Student Advising

Graduate (Chair)

2017-present Laura Young, (MSU, MS)
2016-present Payam Aminpor, (MSU, PhD)
2016-present Noleen Chikawore (MSU, PhD)
2015-present Allison Singer, (MSU, PhD)
2014-present Alexander Metzger, (UMass, PhD)
2012-2015 Noelani Puniwai, (UHawaii, PhD), assistant professor, University of Hawaii
2011-2014 Jackie Halbrendt, (UHawaii, PhD), postdoc, Wageningen University
2012-2014 Molly Miller, (UHawaii, MS), PhD student, University of Maine
2011-2013 Angela Nyaki, (UHawaii MS), reserve manager, Tanzania National Parks
2011-2013 Mary Younkin, (UHawaii, MS), research Coordinator, Oregon Sea Grant

Graduate (Committee)

2017-present Adam Lyman (MSU, MS)
2017-present Chris Henderson (MSU, PhD)
2016-present Emily Koryto (MSU, MS)
2016-present Natalia Ocampo Dias (MSU, MS)
2015-present Bethany Laursen (MSU, PhD)
2016-present John Olwande, (MSU, PhD)
2012-2017 Hla Htun, (UHawaii, PhD
2015-2016 Zak Mertz (UMass, MS)
2014 Jennifer Ly (UMass, MS)
2011-2016 Rusyan Jill-Mamitt (UHawaii, PhD)
2013-2014 Vijaylaxsmi Kesavan, UMass, MS)
2011-2013 Sarah Henly-Shepard (UHawaii, PhD)
2011-2012 Michele Barnes (UHawaii, MS)
2011-2012 Kara Miller (UHawaii, MS)
2011-2012 Cheryl Lohr (UHawaii, PhD)

Undergraduate

2016-present Raisa Lenau, (MSU, AFRE)
2015-present Maddie Gorman (MSU, CSUS)
2015-present Caite Reza (MSU, Zoology)
2015-present Degen Gemarowski, (MSU, Plant Science)
2015-2017 Jane Henderon (MSU/U of San Diego) PhD student at UC Berkley
2014-2017 Rachel Robers-Toler, (UMass, SFE) environmental consultant
2014-2015 Emily True, (UMass, SFE) MS student at Duke University
2014-2015 Alexander Berry, (UMass, SFE)
2014-2015 Faynshteyn,Nickolas, (UMass, SFE) MS student at Northeastern University
2012-2013 Nate Hunter, (UHawaii, NREM)
2011-2013 Anthea Fernandez, (UHawaii, Biology) Ernst and Young
2011-2012 Derek Ford, (UHawaii, NREM)
2010-2011 Alicia Raeburn, (Rutgers Marine Science and Policy) NRDC
2010-2011 Kathryn Gardella, (Rutgers Human Ecology) MS student at UMiami
2010-2011 Samantha Paeswak, (Rutgers Marine Science and Education)
2009-2010 Amanda Gettlefinger, (Rutgers Environmental Policy) PS&S Consulting
2009-2010 Dan Clark, Rutgers Ecology, MS, Purdue, PhD student Rutgers
2009-2010 Alex Chan, Rutgers Mathematics and Biology (medical school 2010)

Awards

2016 Elinor Ostrom Young Scholar Award (International) nominee
2013 Leibniz-Institute of Freshwater Ecology and Inland Fisheries Fellowship
2013 Mentor of the Year, University of Hawaii, NREM Graduate Student Organization
2010 Rutgers University Research Award
($1000 prize, 1 of 6 students awarded from university-wide competition)
2009 American Fisheries Society Student Writing Award
2009 American Fisheries Society (Mid-Atlantic) Best Student Presentation
2008 Australian Academy of Sciences EAPSI Recipient

2006 U.S. EPA STEP Program (3 month award)
2005 U.S. EPA Environmental Scholar Award, Radiation National Laboratory