

# Scott Curtis Merrill

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Research Assistant Professor  
Managing Director of the Social Ecological Gaming and Simulation (SEGS) Laboratory

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## Education

Ph. D., Ecology, Colorado State University, 2007  
B.S. Mathematics, University of Oregon, 1994  
B.S., Psychology, University of Oregon, 1994

## Professional Appointments

2011-present	Research Assistant Professor, Department of Plant and Soil Science, University of Vermont
2014-present	Managing Director, Social Ecological Gaming and Simulation Laboratory, University of Vermont <a href="http://www.uvm.edu/~segs">http://www.uvm.edu/~segs</a>
2018-present	Gund Fellow, Gund Institute for Environment, University of Vermont
2017-present	Adjunct Professor, Food Systems Program, University of Vermont
2011-present	Faculty Affiliate, Bioagricultural Sciences and Pest Management, Colorado State University
2015	Acting Policy and Governance Team Leader, Research on Adaptation to Climate Change. VT EPSCoR (Track 1)
2015	Acting Social Dimensions Team Leader, North East Water Resources Network. VT EPSCoR (Track 2)
2007-2011	Post-Doctoral Research Fellow, Department of Bioagricultural Sciences and Pest Management, Colorado State University
2005-2007	Research Associate, Department of Bioagricultural Sciences and Pest Management, Colorado State University
2000-2007	Ph.D. Graduate Student, Graduate Degree Program in Ecology, Colorado State University

## Professional Interests

Systems ecology, climate change, serious games, data simulation, human behavior and decisionmaking, risk communications, spatial modeling, landscape ecology, plant-insect interactions, Integrated Pest Management (IPM), biological control, agent-based modeling

## Key Recent Funded Projects and Proposals

USDA NIFA Smith, J., Merrill, S.C.,

Courses taught:

Quantitative Thinking in the Life Sciences (Fall 2022). Teaching a quantitative foundation including probability, statistics, modeling, and data simulation.

Ecological Gaming (Spring 2015, 2019, 2020 and Fall 2013). An examination of the fundamental principles of ecology through the lens of simulation game platforms.

Experimental Economics: Gaming and Simulation (Fall 2014). Facilitating a team course studying classic experimental economic games and relevant literature

Guest Lectures: Agroterrorism and Biopiracy

Advising and mentoring:

Graduate Committee: Stephen Peter Collaer Ph.D., Liam Farley, M.S., Andrea Swan, M.S., Jenny Bower Ph.D., Edward Marques Ph.D., Janica Anderson Ph.D., Elizabeth Ann Jamison (2021), Rachel Mason M.S. (Advisor, 2019), Luke Trinity M.S. (Advisor 2019), Alexandra Neidermeier M.S. (2019), Elisabeth Hodgdon Ph.D. (2019), Eric Clark Ph.D. (2018), Chase Stratton, Ph.D. (2018), Luke Motley MS. (2017), Rachel Schattman, Ph.D. (2017), Alison Adams M.S. (2016), Sam Talbot, M.S. (2016) and Jamie Ervin M.S. (2016) North East Water Resources Network Internment: Luke Trinity (2016), William Nupp (2016), Nour El Naboulsi (2015), Arkia Wynn (2015), Sophia Earll (2014) and Roberta Molokandov (2014).

Honors Thesis: Sophie Kogut (Committee: 2020), Jessica Savage (Advisor: 2019), Sam Tuckermar (Committee: 2016) and Ryan Tartré (Committee: 2016)

Social Ecological Gaming and Simulation: Undergraduate mentor: Jonas Mara (2022 Present), Sam Gusick (202-Present), Robert Beattie (2018 -Current), Jackie Urbani (2019)

Koliba, C. J, Merrill, S. C., Zia, A., Wiltshire, S., Bucini, G., Clark, E., Trinity, L., Shrum, T. and Smith, J. M. (2021) Synthesizing Micro-Macro Scales in Public Administration through Experimental Simulation Platforms: Assessing Strategic, Tactical and Operational Risk in a Livestock Production Chain

Zia, A., Delgado, A. H., Bucini, G., Merrill, S.C., Del Rossi, G., Norby, and Smith, J.M. (Submitted) Socio-Psychological Determinants of Cattle Producers' Intent to Comply with Animal Disease Control Measures: A Structural Equation Modeling Approach *Risk Analysis*

Merrill, S. C., and Schattan, R. E. (Revise and Resubmit) Shifts in geographic vulnerability of U.S. corn crops to pests under four climate change scenarios

+ Laurent, J., Bertman, F., Alpaugh, M., Belarmino, E., Bliss, S., Malacarne, J., McCarthy, A. C., Merrill, S. C., Schattan, R. E., Yerxa, K., Niles, M. T. (2022) Change in Food Security and Health Outcomes Since the COVID-19 Pandemic in Northern New England. NFACT National Food and Covid Research Team. *Scholarworks.uvm.edu*. <https://t.co/giVnS8fzWc>

\*Niles, M., et al. (Accepted) A Multi-Site Analysis of the Prevalence of Food Security in the United States, before and during the COVID-19 Pandemic *Current Developments in Nutrition*

\*Merrill, S. C., Trinity, L., Clark, E., Shrum, T., Koliba, C. J., Zia, A., Clark, E., Bucini, G., Sellnow, T., and Smith, J. M. (2021) Message delivery strategy influences willingness to comply with biosecurity *Journal: Frontiers in Veterinary Science* Vol. 8. June 2021. DOI: 10.3389/fvets.2021.667265

\*Merrill, S.C., Bucini, G., Clark, E., Koliba, C.J., Trinity, L., Zia, A., LeGillon, O., Cheney, N., Shrum, T.R., Sellnow, T., Sellnow, D.D., and Smith, J.M. (2021). Why we need to account for human behavior and decisionmaking to effectively model the nonlinear dynamics of livestock disease. Proceedings of the International Crisis and Risk Communication Conference, Volume 4 (pp.23-28). Orlando FL: Nicholson School of Communication and Media. <https://doi.org/10.30658/icrcc.2021.06>

+Niles, M. et al (2021) Food Insecurity Prevalence

and Water Conservation. *Journal of Soil and Water Conservation* 76 (1), 1074A DOI: <https://doi.org/10.2489/jswc.2021.0917A>

\*Clark, E., Merrill, S. C., Trinity, L., Bucini, G., Chendy, N., Chimal, O., Koliba, C. J, Zia, A., Shrum, T. and Smith, J. M. (2021) Emulating Agricultural Disease Management: Comparing Risk Preferences Between Industry Professionals and Online Participants Using Experimental Gaming Simulations and Paired Lottery Choice Surveys *Frontiers in Veterinary Science*. 18 January 2021 <https://doi.org/10.3389/fvets.2020.556668>

\*Mason, R., Merrill, S.C, Gorres, J., Faulkner J, and Niles, M. (2021) Agronomic and environmental performance of dairy farms in a warmer, wetter climate *Journal of Soil and Water Conservation* 76 (1), 7688. <https://doi.org/10.2489/jswc.2021.00169>

\*Mason, R., Mendez, E. White, A., Anderzen, J., Bucini, G., and Merrill, S.C. (2020) Evolving Landscape of Agroecological Research *Agroecology and Sustainable Food Systems*. 4 (45)pp. 551-591. <https://www.tandfonline.com/doi/full/10.1080/21683565.2020.184527>

\*Anderzen, J., Guzmán Luna, A., Gonzalez D.V.L., Merrill, S.C., Caswell, M., Mendez, E., Jonapá R.H., and Mier y Terán, M. (2020) Effects of on-farm diversification strategies on smallholder coffee farmer food security and income sufficiency in Chiapas, Mexico *Journal of Rural Studies* 77: 3346. DOI: 10.1016/j.jrurstud.2020.04.001

\*Mason, R., Gorres, J., Niles, M., Faulkner J, and Merrill, S.C (2020) Calibrating the APEX model for simulations of environmental and agronomic outcomes on dairy farms in the northeast US: A step-by-step example *Applied Engineering in Agriculture*. 36(3): 284301. doi: 10.13031/aea.13679

\*Clark, E., Merrill, S. C., Trinity, L., Bucini, G., Chendy, N., Chimal, O., Koliba, C. J, Zia, A., Shrum, T. and Smith, J. M. (2020) Using experimental gaming simulations to elicit risk mitigation behavioral strategies for agricultural disease management *PloS One* 15(3): e0228983. <https://doi.org/10.1371/journal.pone.0228983>

\*Trinity, L., Merrill, S.C, Clark, E., Bucini, G., Kalish, C., Zia, A., and Smith (2020) Effects of Social Cues on Biosecurity Compliance in Livestock Facilities: Evidence from Experimental Simulations *Frontiers in Veterinary Science*. 7(130). doi: 10.3389/fvets.2020.00130

\*Zia, A., Ding, S., Messer, K., Mih, S., Suter, J., Fooks, J., Guilfoos, T., Trandafir, S., Uchida, E., T3.(hida, E g ic outc)C q 0.00000912 0 612 792 re W\* n BT /F1 12 Tf 1 0 0 1 72 673.32 Tm 0 g 0



\*Merrill, S. C. and F. B. Peabody (1917) Temperature variability is a key component to accurately

- \*Merrill, S. C., T. O. Holtzer, and F. B. Peairs (2010) Examining spatial correlation between fall and spring population densities of the Russian wheat aphid (Hemiptera: Aphididae). *Colorado State Univ. Agric. Exp. Sta. Tech. Rep.* TR1015
- \*Merrill, S. C. and T. O. Holtzer (2010) Estimating Russian wheat aphid (Homoptera: Aphididae) overwintering success using weather data. *Colorado State Univ. Agric. Exp. Sta. Tech. Rep.* TR1014
- \*Merrill, S. C., T. O. Holtzer, F. B. Peairs, and P. J. Lester (2009) Spatial Variation of Russian Wheat Aphid Overwintering Population Densities in Colorado Winter Wheat. *Journal of Economic Entomology* 102(2): 533-541 DOI: 10.1603/029.102.0210
- \*Merrill, S. C., T. O. Holtzer, and F. B. Peairs (2009) Russian Wheat Aphid (*Uromyza noxia* (Kurdjumov)), Reproduction and Development with a Comparison of Intrinsic Rates of Increase to Other Important Small Grain Aphids: A Meta-analysis. *Environmental Entomology* 38(4): 1061-1068 DOI: 10.1603/022.038.0413
- \*Merrill, S. C., C. B. Walker, F. B. Peairs, T. L. Randolph, S. D. Haley, and R. Wharton (2009) Displacement of Russian wheat aphid, *Uromyza noxia* (Kurdjumov) Biotype 1 in Colorado by Russian wheat aphid biotypes virulent to the wheat resistance gene *Dn4*. *Colorado State Univ. Agric. Exp. Sta. Tech. Bull.* TB0901, 19 pp.
- \*Randolph, T. L., S. C. Merrill, and F. B. Peairs (2008) Reproductive Rates of Russian Wheat Aphid (Hemiptera: Aphididae) Biotypes 1 and 2 on a Susceptible and a Resistant Wheat at Three Temperature Regimes. *Journal of Economic Entomology* 101 (3): 955-958.
- \*Merrill, S. C., T. Randolph, C. B. Walker, and F. B. Peairs (2008) 2007 Russian wheat aphid biotype survey results for Colorado. Pp. 434-439 in Johnson, J. J., ed. 2008. Making better decisions: 2007 Colorado wheat variety performance trials. *Colorado State Univ. Agric. Exp. Sta. Tech. Rep.* TRdrB 0.003u BT.sea



\*Merrill, S. C., T. L. Randolph, C. B. Walker, and F. B. Peairs (2007) 2006 Russian wheat aphid biotype survey results for Colorado. *High Plains Journal*. April.  
<http://www.hpj.com/archives/2007/apr07/apr30/2006Russianwheataphidbiotyp.cfm>

\*Randolph, T. L., F. B. Peairs, S. Merrill, M. Koch, and C. B. Walker (2007) Response to Russian Wheat Aphid (Homoptera: Aphididae) in Mixtures of Resistant and Susceptible Winter Wheats. *Southwestern Entomologist*. March. 32 (1): 7-15.

#### Manuscripts in Revision or Preparation

Merrill, S.C., Nowak, S., Shrum, T., Clark, E., Hanley, J., Koliba, C. J., Zia, A., Fredrickson, L.,

Sellnow, D., Merrill, S. C., Sellnow, D., Bucini, G., Clark, E., Smith, J. (2018) Tackling the Risk of Swine Diseases Biosecurity Compliance Communication Workshop at Holden Farms, Northfield, MN. August 1, 2018

Koliba, C., Merrill, S. C., Bucini, G., Zia, A., Clark, E., Moegenburg, S. M., and Smith J., (2018) *ADB-CAP Game and Simulation Tuning and Scenario Development Workshop*. University of Central Florida, Orlando, FL. January 10, 2018

Merrill, S. C., Koliba, C., and Zia, A. (2017) *Addressing Wicked problems: What tools are in*

Clark, E. M., G. Bucini, S.C. Merrill, O. Langle Chimal, C. Koliba, L. Trinity, N. Cheney, T. Shrum, A. Zia, and J.M. Smith (2021) Linking experimental games with agent based models to quantify agricultural outbreak dynamics. *Conference of Research Workers in Animal Disease (CRWAD)*. December 2021. Chicago, IL

Merrill, S.C., Schattman, R., Trinity, L., and Clark, E. (2021) Factors of agricultural conservation practice adoption. Vermont EPSCoR Annual Meeting. August 2021. Burlington, Vermont.

Trubek, A., Merrill, S.C., Morgan, C. (2021) Invited talk: Raging Rot: Supplying Food Deserts. Middlebury College panel discussion. Virtual. May 4, 2021

Merrill, Scott C., Gabriela Bucini, Eric M. Clark, Christopher J. Koliba, Luke Trinity, Asim Zia, Ollin Langle Chimal, Nicholas Cheney, Timothy Sellnow, Dean Hase and Julia M. Smith (2021) Why we need to account for human behavior and decision making to effectively model the non-linear dynamics of livestock diseases. International Crisis and Risk Communication Conference (March 2021) Online Orlando Florida March 8-10, 2021. Oral poster presentation

Merrill, S.C. (2021) An introduction to R: Opening the door to a friendly and useful software package. American Dairy Science Association Graduate Student Division Statistics Webinar Series March 2021

Merrill, S.C. (2021) *Why should you use R?* University of Vermont Food Systems Brownbag lunch series. January 2021

Merrill, S. C., Clark, E., Bucini, G., Koliba, C., Trinity, L., Cheney, N., Changle, O. D., Sellnow, T., Sellnow, D., Zia, A., Shrum, T., Bear, R., Urbani, J., Wiltshire, S., and Smith J. M. (2020) Invited Talk: *Systems Approach to Understanding Biosecurity Decision-Making*. ASAS CSAS WSASAS Virtual Annual Meeting & Trade Show, July 2020





Bucini, G, S Wiltshire, S Merrill, A Zia, C Koliba, E Clark, L Trinity, S Moegenburg, J Smith. (2017) "Where will the Infection Spread? Effects of Movement Networks and Human Risk Attitude on Spread of Swine Disease." Agent-based Modeling ABM17 A Symposium that advances the science of ABMs. San Diego, California. April

Zia, A., Merrill, S. C., Koliba, C. J., Moegenburg, S., Wiltshire, S., Barkin, E.G. and Smith, J. M. (2017) Are Human Agents Myopic or Frighted Under Differential Conditions of Risk and Ambiguity? A Bayesian Network Model of Biosecurity State Transitions in a Sequential Decision Experiment. Conference on Complex Systems, September 2017

Koliba, C, A. Zia, S. Merrill, S. Wiltshire, J. Smith, G. Buccini, S. Moegenburg Utilization of computer simulation and serious games to inform livestock biosecurity policy and governance. Public Management Research Conference, Washington, DC. June-30, 2017.

Bucini, G., S. Merrill, C. Koliba, A. Zia, S. Wiltshire, E. Clark, L. Trinity, S. Moegenburg, and J. Smith. (2017) Hog production chain biosecurity model. Northeast Conference on Public Administration. November 3, 2017, Burlington, Vermont.

Koliba, C., A. Zia, S. Merrill, G. Bucini, E. Clark, S. Moegenburg, and J. Smith. (2017) Addressing wicked problems: What tools are in the toolbox? Serious gaming and system simulation. Northeast Conference on Public Administration. November 3, 2017, Burlington, Vermont.

Zia, A, C Koliba, S Merrill, E Clark, G Bucini, J Smith, S Moegenburg (2017) Using Agent-based



Merrill, S. C. (2005) Modeling overwintering densities of Russian wheat aphid Department of Bioagricultural Sciences and Pest Management Seminar series. Colorado State University. November. Fort Collins, CO

Merrill, S. C. (2005) Modeling overwintering Russian wheat aphid densities in a cropping system



Scheinert, S., Koliba, C., Zia, A., Tsai, Y., Merrill, S. C., and Coleman, B. (2015) The Meso and Micro level scales of social complexity with a Social Ecological System. NSF EPSCoR National Conference, Portsmouth, NH. November 3, 2015. Poster Presentation.

Merrill, S. C. and F. B. Peairs (2011) The perils of linear thinking: modeling the effects of climate change on insect pest dynamics. Entomological Society of America Annual Meeting. November. Reno, NV

Randolph, T. L., C. Walker, C. Merrill, M. Koch and F. B. Peairs (2011) Regulation of Russian wheat aphid (*Diuraphis noxia*) populations with natural enemies present in the wheat system. Entomological Society of America Annual Meeting. November. Reno, NV

Merrill, S. C. and F. B. Peairs (2010) How will climate change affect the risk of crop infestation by the Russian wheat aphid. USDA Agriculture & Food Research Initiative. Arthropods & Nematodes Biology & Management Programs Awards Workshop. December. San Diego, CA

Merrill, S. C. and F. B. Peairs (2010) How will climate change affect the risk of crop infestation by the Russian wheat aphid. Entomological Society of America Annual Meeting. December. San Diego, CA

Merrill, S. C. and F. B. Peairs (2010) Developing Outbreak Prediction Models to Improve Russian Wheat Aphid Pest Management Strategy. USDA Agriculture & Food Research Initiative. Arthropods & Nematodes Biology & Management Programs Awards Workshop. March. Washington, DC

Merrill, S. C. (2006) Developing Site Specific Insect Management Zones, Loss Factors, Economic Injury Levels for Economically Important Pests of Corn in Colorado. Proceedings of the Eighth International Conference on Precision Agriculture and Precision Resources Management. Eighth International Conference on Precision Agriculture and Other Precision Resources Management. July. Minneapolis, MN

Merrill, S. C., P. J. Lester, T. O. Holtzer, J. E. Cipra, F. B. Peairs and J. Norman (2003) overwintering success of the Russian wheat aphid. Proceedings of the International Association of Landscape Ecologists. IALE Meeting April 2003. Barfada

#### Media

Scientia global. Outreach publication describing the Animal Disease Biosecurity project.

ADBCAP: A Human Approach to Improving Biosecurity

<https://www.scientia.global/adbcap-human-approach-to-improving-biosecurity/>

<https://www.scientia.global/wpcontent/uploads/ADBCAP/ADBCAP.pdf>

Audiobook: <https://www.scipod.global/adbcap-human-approach-to-improving-biosecurity/>

Associated with the Social Ecological Gaming and Simulation lab

Associated with Deutsch et al 2018 " Insect metabolic and population growth rates predict increasing crop pest pressure under climate warming" *Science*:  
EurekAlert! Global warming: More insects, eating more crops  
[https://eurekalert.org/pub\\_releases/2018](https://eurekalert.org/pub_releases/2018)

WCAX, Cat Viglienzoni reporting <https://www.wcax.com/content/news/How-video-games-could-help-protect-the-agriculture-industry-512271911.html>  
USDA NIFA website:  
<https://content.govdelivery.com/accounts/USDANIFA/bulletins/24f4150>  
University of Vermont EMC /P <</MCID of Vermont