

# NICHOLAS R. MAGLIOCCA

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<http://umbc.academia.edu/NicholasMagliocca>;  
<http://sites.google.com/site/nicholasmagliocca/>  
blog: <http://abvls.com>

## EDUCATION

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- 2012 **Ph.D. in Geography and Environmental Systems**  
Dept. of Geography and Environmental Systems  
University of Maryland, Baltimore County  
*Specialization:* Agent-based modeling of land-use change  
*Advisor:* Dr. Erle C. Ellis, Geography and Environmental Systems, UMBC  
*Dissertation Title:* Using agent-based models as virtual laboratories for exploring human-environment interactions in land-use systems
- 2009-2011 **National Science Foundation IGERT Trainee**  
Center for Urban Environmental Research and Education  
University of Maryland, Baltimore County
- 2008 **Master of Environmental Management**  
Nicholas School of the Environment and Earth Sciences  
Duke University, Durham, NC  
*Concentration:* Ecosystem Science and Conservation  
*Master's Project:* Long-term, large-scale morphodynamic effects of artificial dune construction in the Outer Banks of North Carolina.  
*Advisor:* Dr. A. Brad Murray, Earth and Ocean Sciences, Duke University
- 2006 **Bachelor of Science, cum laude**  
University of California, San Diego, La Jolla, CA  
*Major:* Environmental Systems: Ecology, Behavior, and Evolution.  
*Senior Thesis:* Managing overwhelming complexity in human-landscape interactions in the Los Angeles Basin.  
*Advisor:* Dr. Brad Werner, Scripps Institute of Oceanography, UCSD

## RESEARCH AREAS

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- Human-environment interactions; Human Dimensions of Global Change
- Coupled natural-human systems; CHANS
- Agent-based modeling; Geographic information systems; Spatial analysis

## EXTRAMURAL FUNDING

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- 2016 **The Global Land Rush: A Socio-Environmental Synthesis.** Co-Investigator with Ariane de Bremond (PI, UMD), Evan Ellicott (co-I, UMD), Klaus Hubacek (UMD), Kuishang Feng (UMD). NASA, \$747,414 (pending)
- 2016 **Modeling the impacts of trade on local livelihood sustainability at the land-energy-water nexus.** Principal Investigator with Paolo D'Odorico (co-I, U.

Virginia), Rachael Garrett (co-I, Boston U.), Heather Randell (co-I, SESYNC), Philippe Marchand (co-I, SESYNC). National Science Foundation, \$1,506,016 (pending).

- 2016 **Linking International Trade to Local Food Security and Ecological Stability.** Principal Investigator with Paolo D'Odorico (co-I, U. Virginia), Rachael Garrett (co-I, Boston U.), Kate Tully (co-I, U. Maryland), Jampel Dell'Angelo (co-I, SESYNC). National Science Foundation, \$1,799,850 (pending).
- 2016 **Human-Wildlife Coexistence.** Co-Investigator with Neil Carter (PI, BSU), Jeremy Bruskotter (co-I, Ohio State U.), Eric Lindquist (co-I, BSU). National Science Foundation, \$1,800,000 (pending).
- 2015 **Assessing global knowledge gaps in local land change studies.** Principal Investigator with Erle Ellis (co-I, UMBC), SESYNC Workshop, \$18,000 (funded)
- 2014 **How can social media can be used to explore coupled socio-environmental systems?** Principal Investigator with Andrew Crooks (co-I, George Mason U.), SESYNC Workshop, \$20,500 (funded)
- 2013 **In Hot and Harm's Way: Modeling to Promote Regional Resilience to Repeated Heat Waves and Hurricanes.** Senior Personnel (subcontract from Resources for the Future). National Science Foundation, \$130,000 (funded)

## **AWARDS AND SCHOLARSHIPS**

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- 2012 East Asia and Pacific Summer Institutes Fellowship (EAPSI China), National Science Foundation
- 2011 Integrative Graduate Education, Research, and Traineeship (IGERT) Supplemental Research Grant recipient, UMBC
- 2010 Student Travel Stipend Award for Best Student Paper, International Environmental Modeling and Software Society, Ottawa, ON, Canada
- 2009 Integrative Graduate Education, Research, and Traineeship (IGERT) Award, National Science Foundation
- 2007 Sir Geoffery Vicker's Award for best student paper, International Society for the Systems Sciences, Tokyo, Japan
- 2007 First-ever recipient of Dorothy Bertine Internship Award for outstanding project proposed, Duke University
- 2006 Nicholas School of the Environment and Earth Sciences Merit Scholarship, Duke University
- 2006 Dean's Undergraduate Award for Excellence, UCSD
- 2006 Outstanding Senior Thesis, San Diego Environmental Professionals

## **TEACHING AND PROFESSIONAL EXPERIENCE**

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- 2015-Present **Assistant Research Professor**  
The National Socio-Environmental Synthesis Center (SESYNC), University of Maryland
- 2013-2015 **Computational Research Fellow**  
The National Socio-Environmental Synthesis Center (SESYNC), University of Maryland
- 2012-2013 **Postdoctoral Research Associate**  
University of Maryland, Baltimore County

- GLOBE Project, funded by NSF's Cyber-Enabled Discovery and Innovation Program, under the direction of Dr. Erle C. Ellis
- 2012 **Undergraduate Research Internship Instructor**, UMBC, Baltimore, MD  
Instructor for GES 497; an undergraduate research internship that supports the NSF-funded GLOBE project and provides high quality undergraduate students with instruction in and experience with scholarly research methods.
- 2010-2012 **Teaching Assistant**, UMBC, Baltimore, MD  
Teaching assistant for GES 600: Anthropogenic Biomes, GES 120: Introduction to Environmental Science, GES 305: Landscape Ecology
- 2011-2012 **Guest Lecturer**, UMBC, Baltimore, MD  
Designed and delivered lectures covering earth systems science, ecology, and biology in GES 120 "Introduction to Environmental Science".
- 2011 **Visiting Scholar**, University of Michigan, Ann Arbor, MI  
Contributed to the development of the developer decision-making module in the SLUCE 2 project.
- 2008-2010 **Research Assistant**, Resources for the Future, Washington, D.C.  
As part of a research team, conceptualized and created an economic model of agent-based land and housing markets. The project was motivated by the investigation of transferrable development rights to control urban sprawl, and funded by an EPA STAR grant.
- 2006-2008 **Biocomplexity Researcher, Complex Systems Laboratory** of Dr. A. Brad Murray, Dept. of Earth and Ocean Sciences, Duke University, Durham, NC
- 2005-2006 **Wildland Fire Researcher, Complex Systems Laboratory** of Dr. Brad Werner Scripps Institute of Oceanography, UC San Diego, La Jolla, CA

## PUBLICATIONS

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**Magliocca, N.R.** and Ellis, E.C. (in review). Evolving Human Landscapes: A Virtual Laboratory Approach. *Journal of Land Use Science*.

Sun, Z., Lorscheid, I., Millington, J.D., Lauf, S., **Magliocca, N.R.**, Groeneveld, J., Balbi, S., Nolzen, H., Müller, B. Schulze, J., Buchmann, C.M. (in review). Simple or complicated agent-based models? A complicated issue. *Environmental Modelling & Software*.

Marchand, P., Carr, J., Dell'Angelo, J., Fader, M., Gephart, J., Kummu, M., **Magliocca, N.R.**, Porkka, M., Puma, M., Ratajczak, Z., Rulli, M.C., Seekell, D., Suweis, S., Tavoni, A., D'Odorico, P. (in review). Reserves and trade jointly determine exposure to food supply shocks. *Environmental Research Letters*.

Fader, M., Rulli, M.C., Carr, J., Dell'Angelo, J., D'Odorico, P., Gephart, J., Kummu, M., **Magliocca, N.R.**, Porkka, M., Prell, C., Puma, M.J., Ratajczak, Z., Seekell, D.A., Suweis, S., Tavoni, A. (2016). Past and present biophysical redundancy of countries as a buffer to changes in food supply. *Environmental Research Letters*, 11(5), 055008. DOI:10.1088/1748-9326/11/5/055008

Margulies, J., **Magliocca, N.R.**, Schmill, M.D., and Ellis, E.C. (2016). Ambiguous geographies: Connecting case study knowledge with global change science. *Annals of the Association of American Geographers*, 106(3): 572-596. DOI:10.1080/24694452.2016.1142857

van Vliet, J., Verburg, P.H., **Magliocca, N.R.**, Ellis, E.C., Buchner, B., Cook, E., Benayas J.R., Heinimann, A., Keys, E., Lee, T.M., Liu, J., Mertz, O., Meyfoidt,

- P., Moritz, M., Poelau, C., Robinson, B., Seppelt, R., and Seto, K. (2015). Meta-studies in land use science: current coverage and prospects. *AMBIO*. DOI: 10.1007/s13280-015-0699-8.
- Magliocca, N.R.** (2015). Model-based synthesis of locally contingent responses to global market signals. *Land*, 4(3), 807-841. DOI:10.3390/land4030807.
- Magliocca, N.R.**, van Vliet, J., Brown, C., Evans, T.P., Houet, T., Messerli, P., Messina, J.P., Nicholas, K.A., Ornetsmüller, C., Sagebiel, J., Schwiezer, V., Verburg, P.H., Yu, Q. (2015). From meta-studies to modeling: Using synthesis knowledge to build process-based land change models. *Environmental Modelling & Software*, 72: 10-20. DOI: 10.1016/j.envsoft.2015.06.009
- Magliocca, N.R.**, Rudel, T.K., Verburg, P.H., McConnell, W.J., Mertz, O., Gerstner, K., Heinimann, A., and Ellis, E.C. (2015). Synthesis in Land Change Science: Importance, Challenges and Opportunities. *Regional Environmental Change*, 15: 211-226. DOI: 10.1007/s10113-014-0626-8.
- Magliocca, N.R.**, McConnell, V., and Walls, M. (2015). Exploring sprawl: Results from an economic agent-based model of land and housing markets. *Ecological Economics*, 113: 114-125. DOI: 10.1016/j.ecolecon.2015.02.020
- Magliocca, N. R.**, Brown, D. G., McConnell, V. D., Nassauer, J. I., & Westbrook, S. E. (2014). Effects of alternative developer decision-making models on the production of ecological subdivision designs: experimental results from an agent-based model. *Environment and Planning B: Planning and Design*, 41(5), 907-927. DOI:10.1068/b130118p
- Magliocca, N.R.**, Shelley, M., Smorul, M. (2014). Agent-Based Virtual Laboratories for a Novel Experimental Approach to Socio-Environmental Synthesis. In: Ames, D.P., Quinn, N.W.T., Rizzoli, A.E. (Eds.), *Proceedings of the 7th International Congress on Environmental Modelling and Software*, June 15-19, San Diego, California, USA. ISBN: 978-88-9035-744-2
- Schmill, M.D, Gordon, L.M., **Magliocca, N.R.**, Ellis, E.C., Oates, T. (2014). GLOBE: Analytics for assessing global representativeness. *2014 Fifth International Conference on Computing for Geospatial Research and Application (COM.Geo)*, August 4-6, 2014, Washington, D.C. DOI: 10.1109/COM.Geo.2014.21
- Magliocca, N.R.**, Ellis, E.C., and Brown, D.G. (2014). Cross-site comparison of land-use decision-making and its consequences across land systems with a generalized agent-based model. *PLoS ONE* 9(1): e86179. doi:10.1371/journal.pone.0086179.
- Magliocca, N.R.**, Ellis, E.C., and Brown, D.G. (2013). Exploring agricultural livelihood transitions with an agent-based virtual laboratory: Global forces to local decision-making. *PLoS ONE* 8(9): e73241. DOI:10.1371/journal.pone.0073241

Rounsevell, M.D.A., Arneth, A., Alexander, P., Brown, D.G., de Noblet-Ducoudre, N., Ellis, E.C., Finnigan, J., Galvin, K., Grigg, N., Harman, I., Lennox, J., **Magliocca, N.R.**, Parker, D.C., O'Neil, B.C., Verburg, P.H., and Young, O. (2013). Toward decision-based global land use model for improved understanding of the Earth System. *Earth Systems Dynamics Discussions*, 4(2): 875-925.

Young, A.L., Lutters, W.G., **Magliocca, N.R.**, Ellis, E.C. (2013). Designing a system for land change science meta-study. CHI'13 Extended Abstracts on Human Factors in Computing Systems, ACM: 1473-1478.

**Magliocca, N.R.** and Ellis, E.C. (2013). Using pattern-oriented modeling to cope with uncertainty in multi-scale agent-based models of land change. *Transactions in GIS*. doi: 10.1111/tgis.12012.

**Magliocca, N.R.**, McConnell, V., Walls, M., and Safirova, E. (2012). Zoning on the Urban Fringe: Results from a New Approach to Modeling Land and Housing Markets. *Regional Science and Urban Economics*, 42: 198-210.

**Magliocca, N.R.** (2011) "Exploring Coupled Housing and Land Market Interactions Through an Economic Agent-Based Model (CHALMS)". In *Spatial Agent-based Models: Principles, Concepts and Applications*, Heppenstall, A.; Crooks, A.; Batty, M. (Eds.). Berlin: Springer-Verlag.

**Magliocca, N.R.**, Safirova, E., McConnell, V., and Walls, M. (2011). An economic agent-based model of coupled housing and land markets (CHALMS). *Computers, Environment, and Urban Systems*, 35(3): 183-191.

**Magliocca, N.R.**, McNamara, D., and Murray, A.B. (2011). Long-term, large-scale morphodynamic effects of artificial dune construction along a barrier island coastline. *Journal of Coastal Research*, 27(5): 918-930.

**Magliocca, N.R.**, Safirova, E., McConnell, V., and Walls, M. (2010). An agent-based model of coupled housing and land markets. In *Proceedings of the International Environmental Modelling and Software Society (iEMSS) 2010 International Congress on Environmental Modelling and Software, Modelling for Environment's Sake, Fifth Biennial Meeting, Ottawa, Canada*, Swayne, D., Yang, W., Voinov, A., Rizzoli, A. and Filatova, T. (eds). Available at <http://www.iemss.org/iemss2010/proceedings.html>.

**Magliocca, N.R.** (2008). Induced coupling: An approach to modeling and managing complex human-landscape interactions. *Systems Research and Behavioral Science*, 25(5): 655-651.

## SERVICE

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2011-2012

### **Development of a Graduate-Undergraduate Student Mentoring Program, UMBC, Baltimore, MD**

I have been the lead student representative in developing a mentoring program that pairs graduate students seeking teaching experience with undergraduates seeking research experience and/or mentoring to develop specific research skills. When implemented, the program will be the first of its kind for UMBC.

2004-2008

**Chair of the Special Integration Group for Students**, International Society for the Systems Sciences

Participated in conferences for the International Society for the Systems Sciences in Crete, Greece, Monterey, CA, Cancun, Mexico, and Tokyo, Japan. Facilitated guided group discussion and presentation of scholarly papers. Contributed to the organization of student activities within the South American systems society ALAS. Generated feedback on the operation of the society in the form of recommendations for student and public outreach, member support, and future conference activities.

## REPORTS AND WORKING PAPERS

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Rounsevell, M.D.A. Arneth, A., Brown, D.G., de Noblet-Ducoudré, N., Ellis, E., Finnigan, J., Galvin, K., Grigg, N., Harman, I., Lennox, J., **Magliocca, N.**, Parker, D., O'Neil, B., Verburg, P.H. and Young, O. (2012). Incorporating human behaviour and decision making processes in land use and climate system models. GLP Report No. 7. GLP-IPO, São José dos Campos.

**Magliocca, N.R.**, Safirova, E., McConnell, V., and Walls, M. (2010a). "An Economic Agent-Based Model of Coupled Housing and Land Markets," Resources for the Future Discussion Paper, Washington, D.C (September).

**Magliocca, N.R.**, Safirova, E., McConnell, V., and Walls, M. (2010b). "An Urban Growth Model with Heterogeneous Agents and Land and Housing Markets," Resources for the Future Discussion Paper, Washington, D.C (October).

**Magliocca, N.R.** (2005). "Case Study: Systemic Evaluation of Compensatory Mitigation Sites Within the Carlsbad Hydrological Unit". Carlsbad Watershed Network and UCSD Natural Reserve System. Available at: <http://www.carlsbadwatershednetwork.org/projects.php>

## PRESENTATIONS

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"Model-based synthesis of locally contingent responses to global market forces". Invited presentation at Fall Meeting of the American Geophysical Union (AGU), December 14, 2015, San Francisco, CA, USA.

"Investigating spatial and temporal sensitivities in coastal development dynamics in response to coastal amenities, risk perceptions, and a changing storm climate". Presented at AAG Annual Meeting 2015, April 20, Chicago, IL, USA.

"Agent-based modeling of land use change in developed and developing world contexts". Invited talk in SESYNC Seminar Series, April 7, 2015, Annapolis, MD, USA.

"Data-Driven Synthesis for Investigating Food Systems Resilience to Climate Change". Presented at AGU Fall Meeting 2014, December 19, San Francisco, CA, USA.

"Investigating the effects of repeated storms and 'near misses' on adaptation responses to coastal hazards". Presented at AAG Annual Meeting 2014, April 8, 2014, Tampa, FL, USA.

- “Globally representative meta-analyses of land change”. Global Land Project Open Science Meeting, March 18, 2014, Berlin, Germany.
- "Comparing decision-making across land-livelihood systems". Presented at AAG Annual Meeting 2013, April 11, 2013, Los Angeles, CA, USA.
- "Using an agent-based virtual laboratory to explore smallholder land-use decisions and implications for 'induced intensification' theory". Presented at AAG Annual Meeting 2012, February 25, 2012, New York City, New York, USA.
- “The Use of Agent-Based Models (ABMs) as Virtual Laboratories for Exploring Human-Environmental Interactions in Land-Use Systems”. Center for Urban and Environmental Research and Education (CUERE), February 17, 2012, University of Maryland, Baltimore County, Baltimore, MD, USA.
- “An Agent-Based Virtual Laboratory for Exploring Human-Environmental Interactions Globally”. Presented at Resilience 2011, March 15, 2011, Arizona State University, Tempe AZ, USA.
- “Emergent Landscapes: An Agent-Based Model of Urban Growth” Presented at the 2011 AAAS Annual Meeting, February 20, 2011, Washington, D.C., USA.
- “Explaining Sprawl with an Agent-Based Model of Ex-Urban Land and Housing Markets”. Presented at 2010 North American Regional Science Council Annual Meeting, Denver, CO, November 11-14, 2010.
- “Designing Land Change Case Studies for Generalization”. Presented at the GLP Open Science Meeting 2010- Land Systems, Global Change, and Sustainability, October 17, 2010, Arizona State University, Tempe, AZ, USA.
- “Zoning on the Urban Fringe: Results from an Economic Agent-Based Model”. Presented at the GLP Open Science Meeting 2010- Land Systems, Global Change, and Sustainability, October 17, 2010, Arizona State University, Tempe, AZ, USA.
- “Towards a General Theory of Land-Use Systems”. Presented at the 54<sup>th</sup> Annual Meeting of the International Society for the Systems Sciences, July 21, 2010, Waterloo, ON, Canada.
- “An Agent-Based Model of Coupled Housing and Land Markets”. Presented at the 5<sup>th</sup> Biennial International Congress on Environmental Modeling and Software, International Environmental Modeling and Software Society, July 7, 2010, Ottawa, ON, Canada.
- “Introduction to Systems Thinking and Complexity”. Presented as part of the IGERT Student-led Workshop Series, April 30, 2010, University of Maryland, Baltimore County.

“Can Markets for Development Rights Improve Land Use and Environmental Outcomes?”. Presented at the Workshop on Market Mechanisms and Incentives: Applications to Environmental Policy, U.S. EPA, NCEE and NCER, April 29, 2009, Resources for the Future, Washington, DC.

“Induced Coupling: An Approach to Modeling and Managing Complex Human-Landscape Interactions”. Presented at the 51st Annual Meeting of the International Society for the Systems Sciences, July 14, 2008, Tokyo, Japan.

“Managing Overwhelming Complexity in Human-landscape Interactions”. Presented at the 50th Annual Conference of the International Society for the Systems Sciences, July 9, 2006. Sonoma State University, Sonoma, CA.