

## RICHARD ROSS SHAKER, Ph.D.

Assistant Professor of Landscape Modeling · Department of Sustainable Resources Management, SUNY College of Environmental Science and Forestry  
Former tenured Associate Professor of Environmental & Urban Sustainability, Toronto Metropolitan University  
Founder & President, GEOECO Inc. (USA/Canada) & GEOECO Global OÜ (Estonia)  
richard@geocoglobal.com · +1 929.266.7419 · [www.rsshaker.com](http://www.rsshaker.com) · [www.geocoglobal.com](http://www.geocoglobal.com) · Google Scholar, h-index [18](#)

### PROFILE

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Environmental geospatial scientist and Assistant Professor specializing in sustainable development assessment, Sustainable Development Goals (SDGs)-aligned indicator and benchmark systems, sustainability dashboards and geovisualization, and spatial / environmental planning. Developed the Mega-Index of Sustainable Development (MISD) and Megacity Sustainability Index frameworks. Over twenty years translating indicator science into strategic regional planning and decision support for national governments, United Nations-linked and international programs, including the United Nations Convention to Combat Desertification (UNCCD) and Fulbright, and non-governmental organizations across North America, Europe, Africa, and Latin America. Field-capable practice combining primary soil and water sampling with multivariate / spatial statistics and Esri-based modeling.

### AREAS OF EXPERTISE

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- **Sustainable development & SDG measurement** — national-to-local indicator frameworks; United Nations Indicators of Sustainable Development
- **Composite indices & benchmark systems** — index construction, weighting, validation; cross-national & megacity benchmarking
- **Sustainability dashboards & geovisualization** — indicator dashboards; 3D geovisualization; Wellbeing-Toronto-style tools
- **Spatial planning & land-use analysis** — suitability modeling, landscape metrics (FRAGSTATS), scenario analysis
- **Environmental planning** — waterfront revitalization, flood mitigation, strategic & feasibility studies
- **Statistics & geoinformatics** — OLS/GLM/GWR, ANN, kriging; ArcGIS Pro, GeoDa, R, SAM, SmartPLS

### EDUCATION

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- 2011 Ph.D.** University of Wisconsin–Milwaukee — Geography: Sustainability Modeling.  
*Dissertation: An Investigation of Sustainable Urbanization and Landscape Form: The Republic of Moldova Case Study.*
- 2007 M.Sc.** University of Wisconsin–Milwaukee — Geography: Aquatic / Landscape Ecology.  
*Thesis: Agricultural land fragmentation and biological integrity: Impacts of a rapidly changing landscape on streams in southeastern Wisconsin.*
- 2005 C.A.S.** University of Wisconsin–Milwaukee — Graduate Certificate, Geographic Information Science.
- 2004 B.Sc.** University of Wisconsin–La Crosse — Geography (Departmental Honors); minor Earth Science.

### ACADEMIC & PROFESSIONAL APPOINTMENTS

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- 2023–pres.** Assistant Professor of Landscape Modeling, Dept. of Sustainable Resources Management, SUNY-ESF; affiliated faculty, Graduate Program in Environmental Science (GPES).
- 2008–pres.** Founder & President, GEOECO Inc. (USA/Canada) & GEOECO Global OÜ (Estonia, R&D 72101) — environmental planning & design firm specializing in sustainable development, indicators, site assessment, and geospatial analytics.
- 2019–2023** Associate Professor of Environmental & Urban Sustainability, Toronto Metropolitan University (TMU); Graduate Program in Spatial Analysis.
- 2014–2019** Assistant Professor of Environmental & Urban Sustainability, TMU.
- 2011–2014** Visiting / Assistant Professor of Environmental Studies & Geography, Binghamton University, SUNY.

### SELECTED PEER-REVIEWED PUBLICATIONS — SDGs, INDICATORS & SUSTAINABLE DEVELOPMENT

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\* denotes student or postdoctoral advisee.

- Shaker, R.R., & Mackay\*, B.R. (2024). The hidden development patterns of Africa and their sustainability correlations. *Environmental and Sustainability Indicators*, 24, 100474.
- Mackay\*, B.R., & Shaker, R.R. (2024). A megacities review: comparing indicator-based evaluations of sustainable development and urban resilience. *Sustainability*, 16(18), 8076.
- Hossain\*, M.S., Volk, T.A., Therasme, O., & Shaker, R.R. (2024). Evaluation for establishing a monitoring system to reach sustainability in New York State's bioeconomy. *Sustainability*, 16(24), 11191.
- Shaker, R.R., & Mackay\*, B.R. (2021). Hidden patterns of sustainable development in Asia with underlying global change correlations. *Ecological Indicators*, 131, 108227.

- Medland\*, S.J., Shaker, R.R., Forsythe, K.W., Mackay\*, B.R., & Rybarczyk, G. (2020). A multi-criteria wetland suitability index for restoration across Ontario's Mixedwood Plains. *Sustainability*, 12(23), 9953.
- Shaker, R.R., Aversa, J., Papp\*, V., Serre\*, B.M., & Mackay\*, B.R. (2020). Showcasing relationships between neighborhood design and Wellbeing Toronto indicators. *Sustainability*, 12(3), 997.
- Brown\*, C., Shaker, R.R., & Das, R. (2018). A review of approaches for measuring and evaluating urban resilience outcomes. *Environment, Development and Sustainability*, 20(1), 23–40.
- Shaker, R.R. (2018). A mega-index for the Americas and its underlying sustainable development correlations. *Ecological Indicators*, 89, 466–479.
- Shaker, R.R. (2018). Examining sustainable landscape function across the Republic of Moldova. *Habitat International*, 72, 77–91.
- Shaker, R.R., & Sirodoev, I. (2016). Assessing sustainable development across Moldova using household and property composition indicators. *Habitat International*, 55, 192–204.
- Shaker, R.R. (2015). The well-being of nations: an empirical assessment of sustainable urbanization for Europe. *Int. J. Sustainable Development & World Ecology*, 22(5), 375–387.
- Shaker, R.R. (2015). The spatial distribution of development in Europe and its underlying sustainability correlations. *Applied Geography*, 63, 304–314.
- Shaker, R.R., & Zubalsky\*, S.L. (2015). Examining patterns of sustainability across Europe: a multivariate and spatial assessment of 25 composite indices. *Int. J. Sustainable Development & World Ecology*, 22(1), 1–13.

### SELECTED PUBLICATIONS — SPATIAL ANALYSIS, GEOVISUALIZATION & ENVIRONMENT

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- Shaker, R.R., Altman\*, Y., Deng, C., Vaz, E., & Forsythe, K.W. (2019). Investigating urban heat island through spatial analysis of New York City streetscapes. *Journal of Cleaner Production*, 233, 972–992.
- Shaker, R.R., Rybarczyk, G., Brown, C., Papp\*, V., & Alkins\*, S. (2019). (Re)emphasizing urban infrastructure resilience via scoping review and content analysis. *Urban Science*, 3(2), 44.
- Forsythe, K.W., Ford, D.E., Marvin, C.H., Shaker, R.R., et al. (2021). Multivariable 3D geovisualization of historic and contemporary lead sediment contamination in Lake Erie. *Pollutants*, 1(1), 29–50.
- Shaker, R.R., Yakubov\*, A.D., Nick\*, S.M., Vennie-Vollrath, E., Ehlinger, T.J., & Forsythe, K.W. (2017). Predicting aquatic invasion in Adirondack lakes: a spatial analysis of lake and landscape characteristics. *Ecosphere*, 8(11).
- Complete record: 34 peer-reviewed articles, 2 book chapters, 7 conference papers, 9 technical reports (52 total works). h-index 18, Google Scholar, accessed June 2026.*

### UNITED NATIONS-LINKED & AGENCY TECHNICAL REPORTS

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- Daradur, M., ... Shaker, R., et al. (2019). *National Drought Plan of the Republic of Moldova*. United Nations Convention to Combat Desertification (UNCCD); Ministry of Agriculture, Rural Development & Environment; State Hydrometeorological Service. 116 pp.
- Daradur, M., ... Shaker, R., et al. (2018). *National Land Degradation Neutrality Targets (Republic of Moldova)*. UNCCD; State Hydrometeorological Service. 42 pp.
- Brown, C., Shaker, R.R., et al. (2016). *Urban Resilience in Canada: Research Priorities and Best Practices for Climate Resilience in Cities*. SSHRC of Canada. 39 pp.
- Ehlinger, T., ... Shaker, R.R., et al. (2008). *Ecological and Sustainable Redevelopment of Mining Zones in Gorj County, Romania*. U.S. Trade and Development Agency (USTDA). 145 pp.

### ENVIRONMENTAL PLANNING & GEOECO CONSULTING STUDIES (PRINCIPAL INVESTIGATOR)

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- Village of Afton, NY — Strategic Plan (2018) and Feasibility & Planning Study for Waterfront Revitalization (2018). Riverfront revitalization, flood mitigation, and economic-development planning. NY State Dept. of State; Empire State Development. 24 pp. + 183 pp.
- Beach Rd., Sherkston, ON — Forest-Patch Die-Off (2024). Preliminary Report of Environmental Assessments & Findings; site assessment and land-use / environmental planning analysis. PI, GEOECO Inc.; prepared for legal counsel (MNK & Associates), Ontario. Primary soil / water sampling, geospatial analysis, and geovisualization. 111 pp.
- Nineteenth St., Jordan Station (Town of Lincoln), ON — Septic-System Pollution (2024). Final, supplemental, and executive reports (164 + 22 + 15 pp.); environmental site assessment and remediation-planning support. PI, GEOECO Inc.; prepared for legal counsel, Ontario.
- Point Abino Lighthouse Atlas (2024) — bathymetric and shoreline geovisualization atlas for the Point Abino Lighthouse Preservation Society (charitable). 57 pp.

### SELECTED FUNDED RESEARCH & FELLOWSHIPS (PI UNLESS NOTED)

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- 2026–2028** Forecasting Aquatic Invasions across the Lake Champlain Basin: environmental DNA (eDNA) + spatial modeling. National Oceanic and Atmospheric Administration (NOAA) / Lake Champlain Sea Grant. \$292,237.
- 2026–2028** Lake Champlain Basin eDNA Surveillance & Geospatial Aquatic Invasive Species (AIS) Risk Infrastructure. Environmental Protection Agency (EPA) / Lake Champlain Basin Program. \$253,916.

<b>2025–2026</b>	Fulbright Specialist — Local Development Indicators for Sustainability Planning, University of Botswana. Co-development of a spatially explicit local sustainable-development indicator framework and decision-support dashboard / maps, adapting the framework first built for the Republic of Moldova; participatory workshops and technical training. U.S. Dept. of State, ECA. ~\$17,500.
<b>2024–2027</b>	Assessment of Coastal Ecosystems and their Services on the Northern Coast of Honduras (team member; PI N. Navarro, URJC Spain). Spanish Ministry of Science & Innovation. €120,000.
<b>2015–2018</b>	Village of Afton Strategic Plan for Flood Mitigation, Economic & Riverfront Revitalization. NY State Dept. of State; Empire State Development. \$36,910.
<b>2009–2010</b>	Sustainability, Landscapes & Human Behavior: The Republic of Moldova. J. William Fulbright Fellowship, U.S. Dept. of State. ~\$50,000.

## RESEARCH IMPACTS

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- Delivered the Republic of Moldova's first national sustainable development assessment (indicator framework built from 11,000+ household / property observations), strengthening capacity and strategic spatial planning for government officials.
- Adapting the same cross-country, indicator-based spatial assessment approach to Botswana (Fulbright Specialist), delivering a local indicator framework and decision-support dashboard for district-level sustainability planning.
- Developed the Mega-Index of Sustainable Development (MISD), establishing a reproducible reductionist paradigm for assessing sustainable development across space and time.
- Indicator and benchmarking research applied to megacities and to Wellbeing Toronto, informing urban sustainability and resilience evaluation.

## EDITORIAL BOARDS & PROFESSIONAL SERVICE

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Editorial Advisor, *Natural Resources Forum* (Wiley); Associate Editor, *Geology, Ecology & Landscapes* and *Int. J. Applied Geospatial Research*; Editorial boards: *Environment, Development and Sustainability* (Springer), *Sustainability, Data, and Sci* (MDPI). Guest editor, special issues on “Bioeconomy & the SDGs” and “Landscape Planning for Sustainability” (*Sustainability*). Fulbright Specialist Roster (2025–2028). Board of Directors, Canadian Regional Science Association.

## GEOINFORMATICS & TECHNICAL SKILLS

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**Geographic Information Systems (GIS) / Remote Sensing (RS):** ArcGIS Pro & ArcGIS Online, QGIS, GRASS, Idrisi, ERDAS, ENVI, Google Earth Engine, InVEST, Marxan, LANDIS-II. **Statistics:** R, SPSS, JMP, SYSTAT, GeoDa/GeoDaSpace, SAM, GWR4, FRAGSTATS, SmartPLS (OLS, GLM, GWR, ANN, kriging, PLS-SEM). **Geovisualization & design:** Adobe Illustrator/InDesign/Photoshop, Inkscape, SketchUp. **Programming:** Python, R, ArcObjects, HTML. **Field:** Trimble GPS, Lowrance sonar/bathymetry; primary soil & water sampling. **Languages:** English (fluent); Romanian & Russian (working).

## SELECTED INVITED PRESENTATIONS & ADDRESSES

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| <b>2025</b> | Seeking Sustainability: An Indicator Tale about Hidden Development and the Future. Dept. of Environmental Science seminar, University of Botswana, Gaborone. |
| <b>2022</b> | Seeking Sustainability: Indicators, Landscapes & the Bioeconomy. Dept. of Sustainable Resources Management colloquium, SUNY-ESF, Syracuse, NY.               |
| <b>2020</b> | Seeking Sustainability: An Indicator Tale about Urban Resilience. Dept. of Geography colloquium, University at Buffalo, NY.                                  |
| <b>2019</b> | Patterns of Development in the USA with Quest-for-Sustainability Conclusions. Urban Ecology colloquium, University of Utah, Salt Lake City.                  |
| <b>2018</b> | Development Indices and the Quest for Sustainable Urbanization. Sustainable Urban Systems colloquium, SUNY-ESF, Syracuse, NY.                                |

## SELECTED CONFERENCE PRESENTATIONS — INDICATORS, BENCHMARKING & SDGs

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| <b>2026</b> | Benchmarking City-Regions for Governance: Introducing the Megacity Sustainability Index. Urban Affairs Association, Chicago, IL.   |
| <b>2025</b> | Seven Plus or Minus Two: A Rapid Sustainable Development Index for Small Island Developing States. Annual Meeting, American Association of Geographers (AAG), Detroit, MI. |
| <b>2025</b> | A Landscape Approach to Strengthening Biosphere Integrity Assessments. IALE-North America Annual Meeting, Raleigh, NC.   |
| <b>2024</b> | Mapping Hidden Development Patterns in Africa and their Sustainability Correlations. AAG Annual Meeting (Honolulu, HI).  |
| <b>2019</b> | Promoting Ecosystem Services for Sustainable Development Goals (session co-organizer). 10th IALE World Congress, Milan, Italy.   |
| <b>2018</b> | A Mega-Index Paradigm for Simplifying Sustainable Development Assessment. AAG Annual Meeting, New Orleans, LA.   |

- 2016** The Spatial Distribution of Development in Europe and its Underlying Sustainability Correlations. AAG Annual Meeting, San Francisco, CA.
- 2015** Examining Patterns of Sustainability across Europe: a Multivariate and Spatial Assessment of 25 Composite Indices. AAG Annual Meeting, Chicago, IL.

*Additional presentations (40+) span the Applied Geography Conference, Canadian Association of Geographers, IALE, and the Sustainability & Development Conference (University of Michigan).*

### TEACHING & GRADUATE ADVISING

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**SUNY-ESF (2023–present):** Geospatial Information Technologies (ESF 300); Natural Hazards (FOR 496/796); Landscape Modeling & Management (FOR 496/796). **TMU (2014–2023):** Measuring Sustainability (EUS 860); Ecological Restoration (EUS 870); Research & Statistics (EUS 402); Ecological Processes (EUS 501); GIS for Environmental Management (ES 8922); Land/Geographic Information Systems (SA 8923).

**Graduate advising:** 23 graduate advisees graduated and 1 postdoctoral scholar sponsored; ongoing service on graduate thesis / dissertation committees and graduate program admissions at SUNY-ESF (Graduate Program in Environmental Science, GPES; Sustainable Resources Management, SRM).

### HONORS & AWARDS (SELECTED)

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Fulbright Specialist Roster, U.S. Dept. of State (2025–2028) · Outstanding Alumni Award, UW-Platteville–Richland (2019) · J. William Fulbright Fellowship, U.S. Dept. of State (2009) · President’s Choice & Best in Category, Wisconsin Land Information Association GIS Competition (2006–2007) · Departmental Honors, UW-La Crosse (2004).

