Robert N. Stewart, Ph.D.
Curriculum Vitae
March 2024

Overview

My interests lie primarily in the geospatial dimensions of risk and decision making under uncertainty. Areas of application vary widely including population dynamics, environmental risk, maritime safety, transport risk, climate impacts, and change detection. Preferred methods vary but are usually probabilistic in nature and grounded in artificial intelligence, spatio-temporal modeling, spatial statistics, probabilistic graph models, Bayesian reasoning models, and so forth. Recent interests have increasingly focused on methods for eliciting expert knowledge as Bayesian priors in applications with sparse data.

Professional Highlights

30+ years of experience at the nexus of geospatial data, algorithms, and decision support

Developed and deployed significant decision support tools/capabilities across the U.S. Government

75+ peer reviewed publications in journals, conference, book chapters, and technical reports.

24+ years professional service through chair, program committee, panelist, and editorial positions

12+ years serving graduate committees as Joint/Adjunct Faculty at multiple universities.

Significant mentoring experience in guiding staff, post docs, and students at various career stages

Over 27 million in R&D funds from US federal agencies

Education

Ph.D. Geography, University of Tennessee, 2011
M.S. Mathematics, University of Tennessee, 1995
B.S. Mathematics and Statistics, University of Tennessee, 1992

Experience

Oak Ridge National Laboratory
Distinguished Scientist in Spatial Statistics Group (10/2020 – present)
Leading multiple projects in a wide array of R&D including machine learning, spatio-temporal analytics, data mining, big data workflows, simulation, visualization, ontology, semantics, and tool development. Work engages a wide range of use cases emerging from population dynamics, maritime safety, geomatics, urban dynamics, security, energy-water nexus, health, environmental risk, and many others.

Geographic Data Sciences Group/Team Lead (10/2015 – 9/30/2020)
Oversaw a diverse and talented group of staff, post-docs, interns and students engaged in data science R&D. Research spans a wide spectrum of expertise,

including imagery analytics, data mining, modeling and simulation, visualization, machine learning, and other big data challenges applied to a wide range of research domains.

Geographic Data Scientist (11/2009 – 9/2015)
Focused on statistical and computational methods in the areas of spatial and spatiotemporal modeling, with an emphasis on automation, machine learning, uncertainty quantification, data mining, probability modeling, risk, visualization, and decision support. Areas of application include population dynamics, sociocultural/economic analytics, social media analytics, geosciences, and environmental risk.

University of Tennessee Senior Research Associate (1994-2009)
Served as principal investigator, technical lead, and in most cases point of contact with sponsoring agencies such as the Environmental Protection Agency, the Nuclear Regulatory Commission, the Department of Energy, and the Oak Ridge National Laboratory. My effort centered largely on management and development of novel geospatial approaches to environmental risk assessment, decision support, uncertainty quantification, and regulatory compliance. A key outcome of this work was the Spatial Analysis and Decision Assistance (SADA) software program, which presently has over 18,000 registered users in the environmental restoration space. New capabilities from this research laid the framework for future regulatory guidance with spatial analysis as a core factor. SADA is now jointly managed by ORNL and UT, and I continue to serve in a leadership capacity

Societies

IEEE Senior Member (+CIS, +Computer, +GRSS)
International Society of Bayesian Analysis (+Computational)
Association of American Geographers (+GISS, +SAM)
American for Computing Machinery (+SIGKDD, +SIGSPATIAL)
American Association for the Advancement of Science

Service

IEEE CIS/GAC Government Actions Committee Chair (2024 - present)

NSF Ad-Hod Reviewer (2023 – present)

Federal Advisory Panel for FEMA Natural Hazard Mitigation Needs Assessment report to congress (2023 - presemt)

DoD Civilian Harm Mitigation and Response Action Plan Working Groups - Objectives 4 and 6 (2023)

IEEE CIS/IGA Governmental Task Force Leader (2023)

Member of International Working Party on Technical, Environmental and Safety Aspects of Decommissioning and Legacy Management for the Organisation for Economic Co-Development (OECD) Nuclear Energy Agency (NEA), Paris (2023 – present)

Editorial board member of International Journal of Geographical Information Science (2023- present)

Editorial board member of the Transactions in GIS (2/20/2022 – 12/31/2025)

Bredesen Center Data Science Professor, (6/1/2022 – 5/31/2027)

ACM SIGKDD Program Committee Member (2022-present)

ACM Deep Spatial Workshop Co-Chair (2021-present)

Joint Faculty Professor, Geography Department, University of Tennessee (since 2012)

Courses Taught: UTK 599 Geographic Thought, 501 Independent Studies

Consortium Partner of TennesseeView, chapter of AmericaView (since 2022)

Chair, American Association of Geographers GISS Specialty Group (2018-2019)

Vice-Chair, American Association of Geographers GISS Specialty Group (2016-2017)

JASON Advisory Group, https://en.wikipedia.org/wiki/JASON_(advisory_group) (2015)

World Health Organization Chemical Risk Network ORNL Liaison (2014-2015)

Graduate Committees

Doctoral Committees
Evan Ezell, UT/ORNL Bredesen Center, Data Science (Active)
Jesse Piburn, UT/Bredesen Center, Data Science (Active)
Daniel Adams, Env. Sciences, Tennessee Tech. University, (Active)
Dr. Janna Caspersen, UTK Geography, (2018)

Master committees:
Karessa Manning, UTK Geography (2021)
Samantha Duchscherer, UTK Mathematics (2018)
Matthew Miller, UTK Geography (2017)
Jessica Moehl, UTK Geography (2014) (Chair)
April Morton, CalPoly Mathematics (2012)
Apostolis Sambanis, UIC Public Health (2012)

Awards/Honors

UT-Battelle Distinguished Researcher Award, 2023

ORNL National Security Sciences Directorate Distinguished Innovation Team Award, 2023.

ORNL National Security Sciences Directorate Level Distinguished Researcher Award, 2022.

Ecological Society of America Sustainability Science Award for US cities can manage national hydrology and biodiversity using local infrastructure policy, 2021.

DOE Appreciation Letter from Director of the Office of Science for COVID pandemic modeling under the National Virtual Biotechnology Laboratory (NVBL), 2021

Elevation to IEEE Senior Member, 2021

DoD Appreciation Letter from the Pentagon for life saving work in population modeling, 2019.

Oak Ridge National Laboratory Significant Event Award for Spatio-temporal R&D, 2019.

Oak Ridge National Laboratory Significant Event Award for Spatio-temporal R&D, 2014.

EPA Scientific and Technological Achievement Award for Providing Efficient Methods to Remediate and Protect Ecosystems from Chemical Exposures, 2010

Peer Reviewed Publications

Adams, D., J Gonzales, V Lebakula, D Hughes, and **R.N. Stewart** (in review), Survey of Change Detection Analysis in the Natural and Built Environment, Submitted to Nature Geoscience.

Stipek, C., T Hauser, D Adams, J Epting, J Moehl, P Dias, C Breslford, J Piburn, and **R.N. Stewart** (in review), Inferring Buildnig Height from Footprint Morphology Data, Submitted to Nature Communications Earth and Environment.

Stewart, R.N., B Carpenter, J Piburn, M Morris, P Sankhe, and A Myers (accepted), Bayesian Inferencing of Building Level Attributes on a Global Scale (poster). International Society for Bayesian Analysis, Venice, July 2024.

J Kaufman, R Stewart, D Maguire, A Sorokine. (accepted) "Evaluation of Digital Nautical Chart data for confirmation and expansion of GeoNames data." Cartography and Geographic Information Science, AutoCarto Special Issue.

Krapu, C., **R.N. Stewart**, K Kurte, N Hayes, A Rose, A Sorokine, and M Urban (2023) A Bayesian Model for multivariate discrete data using spatial and expert information with application to inferring building attributes, Spatial Statistics, Volume 55. https://doi.org/10.1016/j.spasta.2023.100745

Urban, M, **R.N. Stewart**, S Basford, Z Palmer, and J Kaufman (2023), Estimating Building Occupancy: A machine learning system for day, night, and episodic events, Natural Hazards, Vol 116, pp 2417-2436, https://doi.org/10.1007/s11069-022-05772-3.

Tuccillo J., **R.N. Stewart**, A Rose, N Trombley, J Moehl, N Nagle, and B Bhaduri (2022) UrbanPop: A spatial microsimulation framework for exploring demographic influences on human dynamics, Applied Geography, Volume 151. https://doi.org/10.1016/j.apgeog.2022.102844

Maguire, D., J Kaufman, A Sorokine, and **R.N. Stewart** (2022) Enhancing and validating GeoNames data with Digital Nautical Charts data: A case study in the mapping of freeform Map Labels, AutoCarto 2022 Extended Abstract, Redlands, CA, Nov 2-4.

Stewart, R.N., S Erwin, J Piburn, N Nagle, J Kaufman, A Peluso, J Blair Christian, J Grant, A Sorokine, and B Bhaduri (2022), Near Real-Time Monitoring and Forecasting of COVID-19 Situational Awareness, Applied Geography, Vol 146, pp 102759. https://doi.org/10.1016/j.apgeog.2022.102759

Krapu, C, **R.N. Stewart**, A Rose (2022) "A Review of Bayesian Networks for Spatial Data", Online March 30th, 2022, ACM Transactions on Spatial Algorithms and Systems, https://doi.org/10.1145/3516523.

Ezell, E, S Lim, D Anderson, and **R.N. Stewart** (2021) "Community Fabric: Visualizing Communities and Structure in Dynamic Networks." Information Visualization 21, no. 2 (Febuary 2022): 130–42. https://doi.org/10.1177/14738716211056036.

Stewart, R.N., J Piburn, S Walters, J Kaufman E Ezell, D Anderson, D Axley, J Grant, B Eaton, A Sorokine, and G Simpson (2021), A Taxonomic Classification Approach for Global Spatio-temporal Data, Spatial Data Science Symposium 2021, University of California at Santa Barbara, https://doi.org/10.25436/E22S3H.

McManamay, R, KC Binita, M Allen-Dumas, S Kao, C Brelsford, B Ruddle, J Sanyal, **R.N. Stewart**, and B. Bhaduri, (2021), Reanalysis of water withdrawal for irrigation, electric power, and public supply sectors in the conterminous United States, 1950 to 2016, Water Resources Research, Vol. 57(2), https://doi.org/10.1029/2020WR027751

Lunga, D, J Arndt, J Gerrand and **R.N. Stewart** (2021), "ReSFlow: A Remote Sensing Imagery Data-Flow for Improved Model Generalization," in IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, vol. 14, pp. 10468-10483, 2021, https://doi.org/10.1109/JSTARS.2021.3119001

National Virtual Biotechnology Laboratory, (2021) Report on Rapid R&D Solutions to the COVID-19 Crisis, USDOE Office of Science, (**R.N. Stewart** led Near-Real-Time Situational Awareness effort), website (https://science.osti.gov/-/media/nvbl/pdf/NVBL_report_021822.pdf).

Erwin, S, **R.N. Stewart**, J Piburn, J Kaufman, A Peluso, B Christian, J Grant, B Bhaduri, N Nagle (2021) A 7-day Moving Window Ensemble for Real-Time Monitoring and Forecasting of COVID-19 Disease Progression, Presentation, SIAM Conference on Computational Sciences and Engineering, March 2021, Fort Worth, TX.

Lunga, D, J Gerrand, L Yang, C Layton, **R.N. Stewart**, (2019) Apache Spark Accelerated Deep Learning Inference for Large Scale Satellite Image Analytics, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing. https://doi.org/10.1109/JSTARS.2019.2959707

Sorokine, A, **R.N. Stewart** (2019) Replicability and Reproducibility in High-Performance and Cloud Geocomputations, Replicability and Reproducibility in Geospatial Research: A SPARC Workshop, February 2019, Tempe Arizona. https://doi.org/10.17605/OSF.IO/GVP3Q

Sparks, K, K Sims, T Gautam, M Urban, **R.N. Stewart** (2019) Modeling Building Use

and Population Distribution Opportunity Using Open Geosocial Data in Urban Areas. Geocomputation 2019, Queenstown, New Zealand, September 18-21.

Duchscherer, S, **R.N. Stewart**, M Urban (2018), revengc: An R package to Reverse Engineer Summarized Data, The R Journal Vol. 10/2, December 2018 ISSN 2073-4859.

Zaidi, S., V Chandola, M Allen, J Sanyal, **R.N. Stewart**, B. Bhaduri, and R McManamay, (2018), Machine Learning for energy-water nexus: challenges and opportunities, Big Earth Data, https://doi.org/10.1080/20964471.2018.1526057.

Allen, M., S Zaidi, V Chandola, A Morton, C Brelsford, R McManamay, B KC, J Sanyal, **R.N. Stewart**, and B Bhaduri (2018) A Survey of Analytical Methods for Energy-Water Nexus Knowledge Discovery, Big Earth Data, https://doi.org/10.1080/20964471.2018.1524344.

Aziz, H.M., B Park, A Morton, **R.N. Stewart,** M Hilliard, and M Maness (2018) A high resolution agent-based model to support walk-bicycle infrastructure investment decisions: A case study with New York City, Transportation, Vol 86, pp. 280-299. doi.org/10.1016/j.trc.2017.11.008.

Aziz, H.M., N Nagle, A Morton, M Hilliard, D White, **R.N. Stewart** (2018) Exploring the impact of walk-bike infrastructure, safety perception, and built-environment on active transportation mode choice: A random parameter model using New York City commuter data, Transportation, Vol 45, pp. 1207-1229. doi.org/10.1007/s11116-017-9760-8.

Sims, K, G Thakur, K Sparks, M Urban, A Rose, and **R.N. Stewart** (2018) *Dynamically-Spaced Geo-GridSegmentation for Weighted Point Sampling on a Polygon Map Layer*, Leibniz International Proceedings in Informatics series, 10.4230/LIPIcs.GISCIENCE.2018.58, GIScience 2018, Melbourne, Australia

Byung Hoon Park, H M Abdul Aziz, A Morton, **R.N. Stewart** (2018) High performance Data Driven Agent-based Modeling Framework for Simulation of Commute Mode Choices in Metropolitan Area. 21st IEEE International Conference on Intelligent Transportation System, November 4-7, 2018, Hawaii, USA. doi.org/10.1109/ITSC.2018.8569232

Weber, E, V Seaman, **R.N. Stewart**, T Bird, A Tatem, J McKee, B Bhaduri, J Moehl, and A Reith (2018), *Census-independent population mapping in northern Nigeria*, Remote Sensing of Environment, In Press https://doi.org/10.1016/j.rse.2017.09.024)

Morton, A., J Piburn, R McManamay, N Nagle, **R.N. Stewart**, and V. Chandola (2017), Leveraging Advances in Population Modeling to Support Energy and Water Nexus Knowledge Discovery, American Geophysical Union Fall Meeting, 12/15 – 12/17, New Orleans (poster).

McManamay, R., M Allen, J Piburn, J Sanyal, **R.N. Stewart**, B Bhaduri (2017), Using Dynamic Time Warping and Data Forensics to Examine Tradeoffs among Land-Energy-Water Networks Across the Conterminous United States, American Geophysical Union Fall Meeting, 12/15 – 12/17, New Orleans (poster).

Morton, A., J Piburn, **R.N. Stewart**, R McManamay, N Nagle (2017) A High-Resolution Spatially-Explicit Statistical Framework for Estimating Residential Electricity

Consumption. Proceedings of the 2017 Grace Hopper Celebration of Women in Computing. Orlando, FL. October 4, 2017.

McManamay, R, S Nair, C DeRolph, B Ruddell, A Morton, **R.N. Stewart**, M Troia, L Tran, H Kim, and B Budhendra (2017) *US Cities can manage national hydrology and biodiversity using local infrastructure policy*, Proceedings of the National Academy of Sciences, Vol 114 (36) 9581-9586.

Sorokine, A and **R.N. Stewart** (2017) Spatio-temporal Data Model for Integrating Evolving Nation-level Datasets, ISPRS Annals of Photogrammetry, Remote Sensing & Spatial Information Sciences, Vol 4, pp. 69-76, DOI 10.5194/isprs-annals-IV-4-W2-47-2017.

Piburn, J, **R.N. Stewart**, A Myers, A Sorokine, D Axley, D Anderson, J Burdette, C Biddle, A Hohl, R Eberle, J Kaufman, and A Morton (2017), *The World Spatiotemporal Analytics and Mapping Project (WSTAMP): Further Progress in Discovering, Exploring, and Mapping Spatiotemporal Patterns Across the World's Largest Open Source Data Sets*, ISPRS Annals of Photogrammetry, Remote Sensing & Spatial Information Sciences, Vol 4, pp 199-205. https://doi.org/10.1073/pnas.1706201114

Piburn, J, **R.N. Stewart**, and A Morton (2017) *A Simple Spatially Weighted Measure of Temporal Stability for Data with Limited Temporal Observations,* ISPRS Annals of Photogrammetry, Remote Sensing & Spatial Information Sciences, Vol 4, pp 47-51. DOI: 10.5194/isprs-annals-IV-4-W2-47-2017

Morton, A, J Piburn, N Nagle, H M Aziz, S Duchscherer and **R.N. Stewart** (2017), *A Simulation Approach for Modeling High-Resolution Daytime Commuter Travel Flows and Distributions of Worker Subpopulations*, Geocomputation 2017 Shortpaper, Leeds UK, September 2017.

Sparks, K, G Thakur, M Urban, and **R.N. Stewart** (2017) *Temporal Signatures of Shops' and Restaurants' Opening and Closing Times at Global, Country, and City Scales*, Geocomputation 2017 Shortpaper, Leeds UK, September 2017. Accesible at http://www.geocomputation.org/2017/papers/51.pdf.

R.N. Stewart, M Urban, D Anderson, S Duchscherer, D Axley, and J Piburn (2017), *Towards a Virtual Reality Elicitation of Building Occupancy*, Geocomputation 2017 Shortpaper, Leeds UK, September 2017. Accessible at http://www.geocomputation.org/2017/papers/52.pdf.

Piburn, J, **R.N. Stewart** and A Morton, (2017) *An Approximate Entropy Based Approach for Quantifying Stability in Spatio-Temporal Data with Limited Temporal Observations*, Geocomputation 2017 Shortpaper, Leeds UK, September 2017. Accessible at http://www.geocomputation.org/2017/papers/55.pdf.

Stewart, R.N., J Piburn, E Weber, M Urban, A Morton, G Thakur, and B Bhaduri (2017). *Can Social Media Play a Role in the Development of Building Occupancy Curves?* Advances in Geocomputation: Geocomputation 2015--The 13th International Conference. D. A. Griffith, Y. Chun and D. J. Dean. Cham, Springer International Publishing: 59-66.

Piburn, J, A Morton, and **R.N. Stewart** (2017). Attribute Portfolio Distance: A Dynamic Time Warping based approach to comparing and detecting common spatiotemporal patterns among multi-attribute data portfolios. Advances in Geocomputation:

Geocomputation 2015--The 13th International Conference. D. A. Griffith, Y. Chun and D. J. Dean. Cham, Springer International Publishing: 197-205.

Morton, A, N Nagle, J Piburn, **R.N. Stewart**, R McManamay (2017). *Hybrid Dasymetric and Machine Learning Approach to High-Resolution Residential Electricity Consumption Modeling* In Advances Advances in Geocomputation: Geocomputation 2015--The 13th International Conference. D. A. Griffith, Y. Chun and D. J. Dean. Cham, Springer International Publishing: 47-58.

Stewart, R.N., A Myers, D Axley, A Sorokine, and J Piburn (2017) Minisymposterium: World SpatioTemporal Analytics and Mapping Project (WSTAMP): Cloud Implementation of Open Source Algorithms and Data Stores for Sustainable, Scalable Analysis of Space-Time Data. Society for Industrial and Applied Mathematics (SIAM) Conference on Computational Science and Engineering, February 27- March 3rd, 2017, Atlanta, GA.

Morton, A, J Piburn, R McManamay, N Nagle, **R.N. Stewart** (2016), *A Dasymmetric-Based Monte Carlo Simulation approach to the Probabilistic Analysis of Spatial Variables*. International Conference on GIScience Short Paper Proceedings, Montreal Canada. Volume 1 (1), pp. 208 – 211. http://escholarship.org/uc/item/9hf8b2wb

Thakur, G, K Sparks, **R.N. Stewart**, M Urban, and B Bhaduri, (2016), *Curating Transient Population in Urban Dynamics System*, International Conference on GIScience Short Paper Proceedings, Montreal Canada. Volume 1 (1), pp. 300 – 303. http://escholarship.org/uc/item/971896bp#page-1

Stewart, R.N., C Wilkerson, E Ragan, M Agreda, D White, S Duchscherer, and J Piburn (2016) *A 3D Virtual Environment for Spatio-Temporal Analysis: Theoretical Approach, Proof of Concept, and User Study*. International Conference on GIScience Short Paper Proceedings, Montreal Canada. Volume 1 (1), pp. 280 – 283. http://escholarship.org/uc/item/6mg271rn

Stewart, R.N., M Urban, S Duchscherer, J Kaufman, A Morton, G Thakur, J Piburn, J Moehl (2016) *A Bayesian Machine Learning Model for Estimating Building Occupancy from Open Source Data*, Natural Hazards 81 (3).

Stewart, R.N., J Piburn, A Sorokine, A Myers, and D White (2015) World Spatiotemporal Analytics and Mapping Project (WSTAMP): Discovering, Exploring, and Mapping Spatiotemporal Patterns across the World's Largest Open Source Geographic Data Sets, ISPRS Annals of Photogrammetry, Remote Sensing, and Spatial Information Sciences. Volume II-4W2.

Stewart, R.N., K Tucker, and F Dolislager (2015) *SADA: A Free Geospatial Human Health Risk Tool*, Society of Toxicology Annual Meeting, San Diego, CA.

Thakur, G., B Bhaduri, J Piburn, K Sims, **R.N. Stewart**, M Urban (2015). PlanetSense: A Real-time Streaming and Spatio-temporal Analytics Platform for Gathering Geo-spatial Intelligence from Open Source Data, ACM Sigspatial, Seattle, WA. (Among top 3 vision papers)

Stewart, R.N., M Urban, J Weaver, and D White. A Geographic Data Fusion Model for Estimating Quantitative Population Dynamics from Qualitative Survey Data. Journal of GEOINT Science. (2015)

Bhaduri, B., E Bright, A Rose, C Liu, M Urban, and **R.N. Stewart** (2014), Data Driven Approach for High Population Distribution and Dynamics Models, Winter Simulation Conference, Savannah, Georgia

Stewart, R.N. D White, M Urban, A Morton, C Webster, M Stoyanov, E Bright, and B Bhaduri (2013) *Uncertainty quantification techniques for population density estimates derived from sparse open source data.* Proceedings of the SPIE: Geospatial InfoFusion III (refereed) 8747: 874705-874705.

Stewart, R.N. (2012) *A Subsurface Decision Model for Supporting Environmental Compliance*, NUREG/CR-7021. Washington, D.C., United States Nuclear Regulatory Commission.

Stewart, R.N. (2011). A Geospatial Based Decision Framework for Extending MARSSIM Regulatory Principles into the Subsurface. Doctoral Dissertation, Department of Geography at the University of Tennessee (https://trace.tennessee.edu/utk_graddiss/1130/)

Stewart, R.N. and S.T. Purucker (2011) An environmental decision support system for spatial assessment and selective remediation. Environmental Modelling & Software 26(6): 751-760

Mahmoud, M., Y Liu, H Hartmann, S Stewart, T Wagener, D Semmens, **R.N. Stewart**, H.V. Gupta, D Dominguez, F Dominguez, D Hulse, R Letcher, B Rashleigh, C Smith, R Street, J Ticehurst, M Twery, H van Delden, R Waldick, D White, L Winter. (2009). *A Formal Framework for Scenario Development to Support Environmental Decision Making*. Environmental Modelling & Software. 24(7): 798-808.

Norman, J., Purucker, S.T., **Stewart, R.N**., Back, P.-E., Englelke, F., 2008. Framework for optimizing the evaluation of data from contaminated soil in Sweden. Conference proceedings of ConSoil 2008, 10th International Conference on Soil-Water Systems; Milan, Italy

S.T. Purucker, C.J.E. Welsh, **R.N. Stewart**, P. Starzec, (2007) Use of habitat-contamination spatial correlation to determine when to perform a spatially explicit ecological risk assessment, Ecological Modelling, Volume 204, Issues 1–2, 2007, Pages 180-192, https://doi.org/10.1016/j.ecolmodel.2006.12.032.

Stewart, R.N.., Purucker, S.T., 2006. *SADA: A Freeware Decision Support Tool Integrating GIS, Sample design, Spatial Modeling, and Risk Assessment*. Proceedings of the Third Biennial Meeting of the International Environmental Modelling and Software Society, Burlington, Vermont.

Stewart, R.N., Purucker S.T. 2004.*Incorporating Secondary Information Into Environmental Sampling Designs*. Joint Proceedings of the Sixth International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences and the 15th Annual Conference of the International Environmetrics Society

Lyon, B.F., Purucker, S.T**.**, **Stewart, R.N.**, 1994. *The Value of Perfect Information: How Much is a Crystal Ball Worth?* Proceedings of the International Specialty Conference. Cost Effective Acquisition and Utilization of Data in the Management of Hazardous Waste Sites. Air & Waste Management Association. Pittsburgh, PA. CONF-940386-2:44-55.

Book Chapters

Thakur G, K Sims, H Mao, J Piburn, K Sparks, M Urban, **R.N. Stewart**, E Weber, B Bhaduri (2018) Utilizing Geo-Located Sensors and Social Media Insight for Research in Population Dynamics and Land Classification in Human Dynamics Research in Smart and Connected Communities, Springer. doi.org/10.1007/978-3-319-73247-3_2

Purucker, S.T., **R.N. Stewart**, and J Wulff (2015) A spatial decision support system for efficient environmental assessment and remediation. In Madden, M., Allen, E., (Eds.) Landscape Analysis Using Geospatial Tools (accepted), Springer-Verlag.

Purucker, S. T., **R. N. Stewart**, and C. J. Welsh (2009) *SADA: Ecological Risk Based Decision Support System for Selective Remediation*. Chapter 11, A. Marcomini, G.W. Suter, and A. Critto (ed.), Decision Support Systems for Risk Based Management of Contaminated Sites. Springer Science + Business Media, LLC, New York, NY, pgs. 239-256.

Liu, Y., M Mahmoud, H Hartmann, S Stewart, T Wagener, D Semmens, **R.N. Stewart**, H Gupta, D Dominguez, D Hulse, R Letcher, B Rashleigh, C Smith, R Street, J Ticehurst, M Twery, H van Delden, R Waldick, D White, and L Winter., (2008), *Formal scenario development for environmental impact assessment studies*, Developments in Integrated Environmental Assessment, edited by Jakeman, A., A. Voinov, A. E. Rizzoli, and S. Chen, Elsevier. Volume 3: 145-162

Voinov, A., R Hood, J Daues, H Assaf, and **Stewart, R.N.** (2008) *Building a Community Modelling and Information Sharing Culture* In Developments In Integrated Environmental Assessment, edited by Jakeman, A., A. Voinov, A. E. Rizzoli, and S. Chen, Elsevier. Volume 3: 345-366

Invited Speaker/Panelist, Short Courses, and Workshops

Speaker/Panelist, National Science Foundation International Workshop on Implications of Urban Scale Occupant Behavior for Resilient Building Design, Operation and Policy Making, 5/13/2024. SyracuseCoE, Syracuse, NY.

Session Chair, Detailed Guesstimates: The Art of Sampling, Simplifying, and Scaling a Feasible Distribution of Global Building Assets, Co-chairs Charles Huyck (ImageCat), Kishor Jaiswal (USGS) American Geophysical Union Fall Meeting, December, 2023.

Speaker, Turing Events GeoAI for Rich Attribution and Mapping of the Built Environment, Alan Turing Institute, London, 9/11/2023.

Speaker: Overview of Global Building Intelligence, Human Planet Forum, Columbia University, NY, July 2023

Speaker: Overview of Global Building Intelligence, USGS National Earthquake Center, April 2023

Co-chair for AGU Annual Meeting 2022 Session U53: Mapping the Built Environment: New Data, Advances and Challenges in Creating Detailed Understanding of Building

Characteristics from Materials to Occupancy. Chicago, Il, December 11-16, 2022.

Speaker/Panelist: Nuclear Energy Association Workshop on Innovative Techniques and Technologies, talk titled "A Geospatial Based Decision Framework for Extending MARSSIM, Regulatory Principles into the Subsurface", Boulogne-Billancourt, France, November 2022

SpatioTemporal Computing Workshop: Setting the ST 5-10 Year Research Agenda. University of Washington, Seattle, Washington, August 18-19, 2022.

Program Committee Member ACM SIGKDD 2022, Washington D.C.

Co-Chair for ACM SIGKDD DeepSpatial Workshop 2022, Washington D.C.

Keynote Speaker, 6th IEEE Workshop on Big Spatial Data, talk titled "Uncertainty Revisited" part of IEEE Big Data 2021, December 15th, 2021.

Co-Chair for ACM SIGKDD DeepSpatial Workshop 2021.

AAG Annual Meeting Panel on Spatiotemporal Sciences April 9th, 2021

Speaker: Open-Source Software in Geography: Theories, Developments, and Pathways toward Openness II, Boston, AAG 2017 Annual Meeting.

Speaker: Spatial Data Mining and Big Data Analytics (chair: Diansheng Guo), Association of American Geographers Annual Meeting, San Francisco , CA.

Speaker: *What Can('t) SADA Do for You?*, University of Illinois at Chicago (invited speaker), 5/2013

Speaker: Application of SADA for 3D Subsurface Characterization and Suggested Approach for Volumetric Compliance with Decommissioning Dose Criteria, Waste Management Symposium, February 24th-28th, Phoenix (invited panelist, Panel Session 87: Characterization for Decommissioning and Waste Management), 2013.

Speaker: *Spatial Analysis and Decision Assistance Version 5 Overview*, Midwestern States Risk Assessment Symposium, Indianapolis, IN. 2009

Speaker: Spatial Analysis and Decision Assistance (SADA): An integration of spatial analysis, risk, sample design, and GIS, Interagency Steering Committee on Multimedia Environmental Models Public Workshop, Rockville, MD. 2009.

Lecturer: ITRC ARAMS/SADA Conference October, 2008. Kennebunkport, ME, SADA Short Course

Lecturer, USEPA, TRIAD Conference June 10th-12th, 2008 in Amherst, MA. SADA Short Course.

Lecturer, State of Illinois, Department of Natural Resources May 21-22nd, 2008. SADA Short Course

University of Tennessee SADA Training, Knoxville, TN, April 23rd-25th, 2008. SADA Short Course

Lecturer, University of Helsinki, Short Course, "Overview of Environmental Methods in SADA", Helsinki, May 2007.

Lecturer, Uranium Recovery Workshop, SADA Short Course, Denver CO, May 2007.

Lecturer, University of Tennessee, Short Course, "Environmental Assessment Methods Using SADA", Knoxville, TN, April 2007.

Speaker, *Human health and ecological risk assessment with Spatial Analysis and Decision Assistance (SADA) Freeware.* Office of Solid Waste and Emergency Response, Technology Innovation Program, CLU-IN Studio Internet Seminar (presentation), 2007

Speaker Uses of Spatial Analysis and Decision Assistance. Office of Solid Waste and Emergency Response, Technology Innovation Program, CLU-IN Studio Internet Seminar.

Speaker, Stewart, R.N., 2006. SADA: A Freeware Decision Support Tool Integrating GIS, Sample design, Spatial Modeling, and Risk Assessment, Graduate Seminar, Department of Geography, UTK, Knoxville, TN

Lecturer, University of Tennessee, "Environmental Assessment Methods Using SADA", Knoxville, TN, 25-27 October 2006.

Lecturer, Swedish Geotechnical Institute, Goteborg, Sweden, 10-12 May 2006. SADA Short Course

Lecturer, University of Tennessee, "Environmental Assessment Methods Using SADA", Knoxville, TN, 26-28 April 2006.

Lecturer, University of Tennessee, "Environmental Assessment Methods Using SADA", Knoxville, TN, 5-7 October 2005.

Lecturer, Swedish Geotechnical Institute, Goteborg, Sweden, 12-15 September 2005. SADA Short Course.

Lecturer, US Naval Facilities Engineering Command (NAVFAC) SADA Workshop, Philadelphia, Pennsylvania, 2-3 August 2005.

Lecturer, University of Tennessee, "Environmental Assessment Methods Using SADA", Knoxville, TN, 23-25 February 2005
.
Lecturer, Petróleo Brasileiro SA (Petrobras), Rio de Janeiro, Brazil,16-20 Aug 2004 SADA Workshop.

Lecturer: FIELDS/SADA 2003 Training Conference in Chicago, 5-7 March 2003.

Keynote Speaker/Co-organizer, Spatial Analysis and Decision Assistance Overview Opening remarks at the annual EPA FIELDS/SADA Conference, Denver, Colorado, 2001

Speaker/Co-Organizer, Stewart, R.N., 2000. *Geostatistically Based Sampling Strategies*, FIELDS/SADA 2000 Annual EPA Conference, Chicago Illinois.

Lecturer: Geospatial Methods For Environmental Decision Making and Cost Benefit Analysis, Fifth Course on Mathematical Ecology at The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, 2000.

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Krapu, C., N Hayes, R.N. Stewart, A Rose, A Sorokine, and K Kurte, (2022) Distributed Inference for a Spatial Bayesian Network with Application to Natural Hazard Risk Assessment, Annual American Statistical Association's Joint Statistical Meeting 2022, Washington D.C., August 6th – 11th.

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Yang, Lunga, King, Arndt, **R.N. Stewart** (2021), Exploring Spatially Distributed Deep Learning Models for Global Gravitational Mapping, AGU Fall Meeting (2021), Abstracts 2021, New Orleans, LA, December 13-17. EP12C-05.

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Urban, M., **R.N. Stewart**, J Kaufman (2019) Reporting Populations at Risk Through Building Occupancy, AGU Meeting, December 2019, San Francisco, CA.

Bragg, L., J Piburn, M Urban and **R.N. Stewart** (2018) Cultural Factors that Drive Occupancy Numbers in Manufacturing, American Association of Geographers Annual Meeting, New Orleans.

Stewart, R.N., Wilkerson, C., Ragan, E. (2016) ST World: Spatiotemporal Analytics Within a Prototype Serious Gaming Environment Association of American Geographers Annual Meeting, San Francisco , CA.

Piburn, J, **R.N. Stewart** (2015) Using non-linear data mining algorithms for exploring global spatiotemporal trends, Conference on Complex Systems, Tempe, AZ

Stewart, R.N., J Piburn, A Sorokine, and A Myers, (2015) WSTAMP: Discovering, Exploring, and Mapping Patterns of Strategic Importance from SpatioTemporal Data

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Morton, A., Stewart, **R.N. Stewart**, S. Duchscherer, and M. Urban, (2015), *A Bayesian Model for Estimating Building Occupancy: Integrating Data, Knowledge, and Uncertainty in an Open Source Environment*, Association of American Geographers Annual Meeting, Chicago, IL.

Piburn, J., **R.N. Stewart**, 2015, Using Dynamic Time Warping for Finding and Assessing Spatiotemporal Trends in Large Global Datasets: applications and findings from the World STAMP Project, Association of American Geographers Annual Meeting, Chicago, IL

Moehl, J., **R.N. Stewart**, N. Nagle, 2015, *Comparing Demographic Household Modeling Techniques*, Association of American Geographers Annual Meeting, Chicago, IL

Urban, M., **R.N. Stewart**, A Myers, D Axley, E Bright, 2015, *Open Source Occupancy Modeling and Services*, Association of American Geographers Annual Meeting, Chicago, IL.

Stewart, R.N., A Rose, E Bright, 2014 Spatial Analysis and Decision Assistance: A Free Program Integrating LandScan High Resolution Population Datasets with Advanced Spatiotemporal Risk-Based Decision Support Models. Association of American Geographers Annual Meeting, Tampa, FL.

Sorokine, A, **R.N. Stewart**, 2014, *Multiperspective Database Architecture for Spatiotemporal Geodatasets*, Association of American Geographers Annual Meeting, Tampa, FL

Urban, M, **R.N. Stewart**, A Myers, D Axley, and E Bright, 2014, *Occupancy Modeling Framework Overview*, Association of American Geographers Annual Meeting, Tampa, FL.

Stewart, R.N., Bright, Eddie, Rose, Amy, McGinn, Wilson. *Enriching Risk Based Decision Support Models with Large Scale, High Resolution Population Data*, Society for Risk Analysis Annual Meeting, December 8th-11th, 2013. Baltimore, MD.

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Urban, M., Bright, E., **Stewart, R.N.**, Lee, R., and Sylvester, L., 2011 *Creating a Database for Demographic and Socio-cultural Characteristics*, Association of American Geographers Annual Meeting, Seattle, WA.

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