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### *EXPERIENCE*

#### *Current:*

##### ***PROFESSOR:***

The Graduate School of Geography  
International Development, Community and Environment (The  
Environmental Science and Policy Program)  
The George Perkins Marsh Research Institute  
(2008 – Present)

Research, advising and teaching in the development and use of analytical methods and mathematical models for: environmental assessment and policy; resource management; and risks and hazard assessment. Specific research areas include: spatial analysis and geographic information science, risk analysis and management, logistics, transportation, location-allocation, impact assessment and resource management.

##### ***CONSULTANT:***

Consultant to various organizations and agencies, including: U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, Los Alamos National Laboratories, (Technical Advisory Committee for the Central American Energy Resources Project), , The Cadmus Group, Industrial Economics, Inc., Abt Associates, Inc., Massachusetts Energy Facility Siting Council, U.S. Senate, New York State Energy Research and Development Authority.

#### **Previous:**

##### ***ASSOCIATE PROFESSOR:***

The Graduate School of Geography  
International Development, Community and Environment (The  
Environmental Science and Policy Program)  
The George Perkins Marsh Institute (1995 – 2007)

**DIRECTOR:** The George Perkins Marsh Institute (2000 to 2006)

**ACTING DIRECTOR:** The George Perkins Marsh Institute, Clark University, Worcester, MA 01610. (1994-1995)

**RESEARCH ASSOCIATE PROFESSOR:** The Graduate School of Geography  
The Environment Technology and Society Program  
(1987 - 1994).

**DIRECTOR:** Center for Technology, Environment, and Development; The George Perkins Marsh Institute, Clark University, Worcester, MA 01610. (1990-1994). Associate Director (1987-1989).

**FACULTY FELLOW:** Institute for Water Resources, U.S. Army Corps of Engineers. (1987-1991).

**ASSOCIATE PROFESSOR:** Department of Geography. Boston University, Boston, MA (1980-1987).

**ASSOCIATE DIRECTOR and DIRECTOR OF GRADUATE STUDIES:** Center for Energy and Environmental Studies, Boston University, Boston, MA (1980-1987).

Courses taught and ongoing research in the development and use of mathematical models for decision problems in environmental assessment and management, energy resources development, and location analysis.

Activities in the Center for Energy and Environmental Studies included the development and administration of the MA Program in Energy and Environmental Studies and the supervision of interdisciplinary research.

Duties as professor included research, teaching, advising undergraduate and graduate students, supervising graduate research and serving on academic committees.

**LEGISLATIVE ASSISTANT FOR ENVIRONMENT AND ENERGY, U.S. SENATE:** Office of The Honorable Daniel Patrick Moynihan, U.S. Senator from New York, Washington, DC (1978 - 1980).

Served as Legislative Assistant to Senator Moynihan on technical and scientific issues with specific focus on environmental and energy policy.

Legislative areas included air and water pollution, national water policy, national energy policy, hazardous waste control and disposal, regulation of nuclear power plants.

Drafting, modifying and monitoring legislation relevant to the Senator's position on the Senate Environmental and Public Works Committee. Preparing testimony for hearings, statements, speeches and press releases on public policy issues in the relevant subject areas.

Working with key individuals in private industry and all levels of the federal, state and local governments as well as other congressional staffs. Supervising the work of legislative research assistants.

**INSTRUCTOR:** The Johns Hopkins University, Baltimore, MD (1978).

Taught graduate course entitled "Mathematical Models for Public Decision Making." The course was a survey of computer implemented mathematical optimization models used for assessing public policy decisions with specific focus on resource and environmental problems. Techniques taught included: mathematical and integer programming, game theory, multiobjective analysis and dynamic programming.

**OPERATIONS RESEARCH ANALYST:** United States Environmental Protection Agency, Washington, D.C. Chemical Information Systems and Service Division, Office of Toxic Substances. (Permanent part-time while completing degree, March 1978 to September 1978).

Assisted in the development of a chemical information system used to regulate chemicals in commerce under the Toxic Substances Control Act (P.L 94-469).

**OPERATIONS RESEARCH ANALYST / ENVIRONMENTAL SCIENTIST:** U.S. Environmental Protection Agency, Office of Research and Development (1971 -1978).

Was responsible for the design, implementation, testing and application of a comprehensive, computer-based forecasting system, the Strategic Environmental Assessment System (SEAS).

Served as research director on studies used in the development of SEAS, topics included: determining the effects of pollution concentrations; developing regionalization methods for SEAS outputs; developing statistical city classification and analysis techniques; development of transportation models enabling the determination of the pollution loadings associated with freight and passenger transportation forecasts within SEAS.

Assisted in other design and implementation aspects of SEAS, these included: the preparation of the Cost of Clean Water reports for Congress, preparation of information for inclusion in the 1974 Council of Environmental Quality Annual Report (chapter on forecasts and trends in the environment), analysis of energy development impacts on the Ohio River Basin and on the Appalachian coal region.

Other duties included serving as technical director for the E.P.A. Summer Fellows Program and conducting research on computer-based models.

**TEACHER AND DEPARTMENT CHAIRMAN:** Monticello Central Schools, Monticello, NY (1967 - 1971).

Taught mathematics at Monticello High School, designed, developed and taught a curriculum for the application of mathematics in the physical sciences. The mathematics taught included Euclidean Geometry and an honor mathematics program encompassing Logic, Set Theory and Solid Geometry.

### **EDUCATION**

- Ph.D., 1979     **Geography and Environmental Engineering**, Program in Systems Analysis and Economics for Public Decision Making, The Johns Hopkins University, Baltimore, MD. Dissertation Title: *Multiobjective Programming Solutions to N-person Bargaining Games: With Application to Regional Wastewater Treatment Facilities*.
- B.A., 1966     **Mathematics**: State University of New York at Buffalo, NY.
- Non-Degree    **Mathematics, Biochemistry**; Columbia University, New York City, NY. (September 1966 - May 1967).
- Education, Physical Science**; State University of New York at New Paltz, NY. (Part-time May 1967 - May 1970).
- Physics, Astronomy**; National Science Foundation Program at Bucknell University, Lewisburg, PA (June 1971 - August 1971).
- Environmental Modeling**; George Washington University, Washington, DC, June 1972.

### **PUBLICATIONS**

**Edited Book:**

*Locational Decisions: Methodology and Applications. Volume 6. The Annals of Operations Research*, J. Osleeb and S. Ratick (eds.), 1986. Basel - Switzerland: J.C. Baltzer, AG.

**Online Book:**

Miori, G, Klimberg, R. and Ratick, S. *Business Analytics for the Public and Private Sector*, published online January 2015, Haub School of Business, St. Joseph's University, Philadelphia, PA.

**Article in revision:**

“A new method for pre-dating and post-dating land-cover maps with Landsat and ASTER imagery using a Kauth Thomas Change Index.” *GIScience and Remote Sensing* (Caiazzo, A.N., J. Rogan, Y. Ogneva-Himmelberger, C. Woodcock and S. Ratick).

**Book Chapters in Preparation:**

“How can we be sure that we are working on the right risks?” To appear in: *Risk Conundrums*, Roger Kasperson, ed., Earthscan. (Kasperson, R; Ram, B.; and Ratick, S.).

“How can we best deal with the unexpected?” To appear in: *Risk Conundrums*, Roger Kasperson, ed., Earthscan. (Goble, R; Kasperson, R; and Ratick, S.).

**Articles in Refereed Journals:**

- “A Multi-Criteria GIS Approach to Composite Vulnerability Index Construction for Flood Vulnerability in the Contiguous United States.” (2017), *Mitigation and Adaptation Strategies for Global Environmental Change*; DOI 10.1007/s11027-015-9674-8.( Runfola, D., Ratick, S., Blue, J., Machado, E., Hiremath, N., Giner, N., White, K., Arnold, J.).
- “Status of Aquifer Storage and Recovery in the United States - 2013.” (2015) *British Journal of Science*. Vol. 12 (2) pages 1603-1629. (Frederick Bloetscher, Ph.D., P.E.1, Chi Ho Sham, Ph.D., Joseph J. Danko III, Samuel Ratick, Ph.D.)
- "The Maximal Cover Location Model with Hedging: Siting Facilities under Uncertainty, a Lead Poisoning Screening Network for the Dominican Republic." *International Regional Science Review*, Special Issue: *40 Years of Maximal Cover*. (2015) Published online before print April 7, 2015, doi: 10.1177/0160017615576080. Pages 1-31. (Ratick, S., Osleeb, J. and Kangping, S.)
- “Modeling Metropolitan Land Use Change as an Institutional Process: The Case of Peri-urban Sprawl in the Greater Boston Region.” *Environment and Planning B: Planning and Design*. (2015), 42(2) pages 221 – 241 (McCauley, S., J. Rogan, J. Murphy, B.L. Turner, and S. Ratick)
- “Lessons Learned from Aquifer Storage and Recovery (ASR) Systems in the United States.” *Journal of Water Resource and Protection*, 6, pages 1603-1629. (2014) (Bloetscher, F., Sham, C.H., Danko III, J.J. and Ratick, S.). Published Online November 2014 in SciRes.  
<http://www.scirp.org/journal/jwarp>  
<http://dx.doi.org/10.4236/jwarp.2014.617146>
- “Using Fine Resolution Orthoimagery and Spatial Interpolation to Rapidly Map Turf Grass in Suburban Massachusetts,” *International Journal of Geospatial and Environmental Research*, (2014) Vol. 1, Issue 1, Article. 4 pages 1-17. (Runfola, D., Hamill, T., Pontius, R.G., Rogan, J., Giner, N., Decatur, A., Ratick, S.)
- “A spatial decision support system for conservation reserve design: Integrating geographical information systems (GIS) and multi-objective land allocation optimization.” *Transactions in GIS*. Volume 18, Issue 6, pages 936–949, December (2014) (WeiWei Dai and Samuel Ratick).
- “Creating spatially-explicit lawn maps without classifying remotely-sensed imagery: The case of suburban Boston, Massachusetts, USA.” *Cities and the Environment*. (2014) Vol. 7,1 pages 1-28. (Giner, N.M., Polsky, C., Pontius, Jr., R.G., Ratick, S.J., Runfola, D.M.).
- “The impact of tree cover loss on land surface temperature: A case study of central Massachusetts using Landsat Thematic Mapper thermal data,” *Applied Geography* 45 (2013) pages 49-57 (John Rogan, Martha Ziemer, Deborah Martin, Samuel Ratick, Nicholas Cuba, Verna DeLauer).
- "Measuring the vulnerability of populations susceptible to lead contamination in the Dominican Republic: evaluating composite vulnerability index construction methods," *GeoJournal* April (2013), Volume 78, Issue 2, pp 259-272: (Ratick, S.J. and Osleeb, J.P.). Published on-line 2011.

- “The spatial variability of heat-related mortality in Massachusetts.” Special Issue: The Health Impacts of Global Climate Change: A Geographic Perspective. *Applied Geography* 33 (2012) 45-52. (David Hattis, Yelena Ogneva-Himmelberger, Samuel Ratick).
- “Modeling Data Envelopment Analysis (DEA) Efficient Location/Allocation Decisions II,” in Lawrence, K., Klimberg, R., and V. Miori (eds). *The Supply Chain in Manufacturing, Distribution, and Transportation Modeling, Optimization, and Applications*, Auerbach Publishing, (2010) pp. 205-218. (Klimberg, Ratick, Tavva and Vuyyuru).
- “Development of an Interperiod Network Storage Location Allocation (INSLA) Model for the Distribution of Ethanol Biofuels with Application to the Burlington Northern Santa Fe Railroad.” *Journal of Transport Geography* 18 (2010) 729–737 (Jeffrey Osleeb and Samuel Ratick).
- “Creating an Index of Vulnerability to Severe Coastal Storms along the North Shore of Boston.” *Financial Modeling Applications and Data Envelopment Applications: Applications of Management Science*, (2009) Volume 13, 143–178 (Samuel Ratick, Holly Morehouse and Ronald Klimberg).
- “Application and Extension of the Moore and ReVelle Hierarchical Maximal Covering Model for Locating Systems of Medical Facilities,” *Socio-Economic Planning Sciences*, 43 No. 2, June (2009): 92 – 101. (Samuel Ratick, Jeffery Osleeb, and Dai Hozumi).
- “Locating Backup Facilities to Enhance Supply Chain Disaster Resilience,” *Growth and Change*, 39 Vol. 4, (2008): 642-666. (Samuel Ratick, Brian Meacham, and Yuko Aoyama).
- “Modeling Data Envelopment Analysis (DEA) Efficient Location/Allocation Decisions,” *Computers and Operations Research* 35 No.2 (2008): 457 - 474. (Ronald Klimberg and Samuel Ratick).
- “Introduction to the Special Issue on Location Modeling, Dedication to Charles S. ReVelle” *Computers and Operations Research* 35 No.2 (2008): 309 - 312. (H.A. Eiselt, Samuel Ratick).
- "Trust, Transactions, and Inter-firm Relations in the U.S. Logistics Industry." *Economic Geography* 83 No. 2 (2007): 159-180. (Yuko Aoyama and Samuel Ratick)
- “Organizational Dynamics of the U.S. Logistics Industry: From An Economic Geography Perspective,” (2006), *The Professional Geographer*, 58(3): 330–343 . (Yuko Aoyama, Samuel Ratick and Guido Schwarz).
- “Modeling the Impact of Business-to-Business Electronic Commerce on the Organization of the Logistics Industry,” (2005), *Geographical Analysis* 37. 84-106. (Yuko Aoyama. Samuel Ratick, Guido Schwarz).
- “Data Envelopment Analysis with Stochastic Variations in Data,” (2005): *Socio-economic Planning Sciences* 39. 147- 64. (Anand Desai, Samuel Ratick, and Arie Shinnar).
- “Decision making and uncertainty: Bayesian analysis of potential flood heights,” (2002): *Geographical Analysis* 34(2): 112-129. (Manson, S. M., S. J. Ratick and A. R. Solow).

- “Dynamic Facility Location When the Total Number of Facilities is Uncertain: A Decision Analysis Approach,” (1998): *The European Journal of Operational Research*. 110, 597-609. (John Current, Samuel Ratick and Charles ReVelle).
- "Assessing the Vulnerability of Coastal Communities to Extreme Storms: The Case of Revere, MA., USA," (1998): *Mitigation and Adaption Strategies for Global Change*. 3: 59-82. (George E. Clark, Susanne C. Moser, Samuel J. Ratick, Kirstin Dow, Willam B. Meyer, Srinivas Emani, Weigen Jin, Jeanne X. Kasperson, Roger E. Kasperson and Harry E. Schwarz.
- “An Interactive Decision Support System for Multiobjective Hazmat Location-Routing Problems,” (1997) *Transportation Research Record*. 1602, pages 101-109. (Joao Coutinho-Rodrigues, John Current, Joao Climaco, and Samuel Ratick).
- ”The Maximum Capture Problem with Uncertainty,” (1996): *Environment and Planning-B*. 26, 49 – 59. (Daniel Serra, Samuel Ratick and Charles ReVelle).
- “A Model to Assess Risk, Equity and Efficiency in Facility Location and Transportation of Hazardous Materials,” (1996): *Location Science*. Vol. 3, No. 3, pp 187-201. (John Current and Samuel Ratick).
- “Risk Based Spatial Decision Support System for Maintenance Dredging of Navigation Channels,” *Journal of Infrastructure Systems*, 1996: Vol. 2, No. 1. (Samuel Ratick and Holly Morehouse Garriga).
- "Toward a Pollution Abatement Monitoring Policy: Measurements, Model Mechanics, and Data Requirements," 1995: *The Environmental Professional*, 16, 292-303 (K.E. Haynes, S. Ratick, and J. Cummings-Saxton).
- "Conditional simulation and the value of information," In: *Geostatistics for the next Century*, 1994: R. Simitrakopoulos (ed.), Kluwer Academic Publishers, 209-217. (Solow, A.R. and Ratick, S.J.).
- "Environmental Decision Models: U.S. Experience and New Approaches to Pollution Management," *Environmental International*, 1993: Vol. 19, No. 3, pp 261-275. (K. Haynes, S. Ratick, W. Bowen, and J. Cummings-Saxton)
- "Introduction: Facility Location Modeling," *Papers in Regional Science: The Journal of the RSAI*, 1992: Vol. 71, No. 3, pp 193-197. (J. Current and S. Ratick).
- "Negotiated Compensation for Solid Waste Disposal Facility Siting: an Analysis of the Wisconsin Experience," *Risk Analysis*, 1992: Vol. 12, No. 4, pp 505-511. (Nieves, L.A., J. Himmelberger, S. Ratick, and A. White)
- "Development of a Reliability Based Dynamic Dredging Decision Model," *European Journal of Operational Research*, 1992: Vol. 58, No. 3, pp 318-334. (S. Ratick , W. Du and D. Moser).

- "An Uncertainty Analysis for Parameters in the Log-Pearson Type III Probability Distribution," *The Journal of Hydrological Science and Technology*, 1991: Vol 66, (1-4) pp 7-15. (W. Du and S. Ratick).
- "Modeling U.S. Coal Export Planning Decisions," *The Annals of the Association of American Geographers*, 1991: Vol 81, 4, pp 627-649. (M. Kuby, S. Ratick, and J. Osleeb).
- "Compensation for Risks: Host Community Benefits in Siting Locally Unwanted Facilities," *Environmental Management*, 1991: Vol 15, 5, pp 647-658. (J. Himmelberger, S. Ratick, and A. White).
- "A Dynamic Location-Allocation Model for Evaluating the Spatial Impacts of Just-in-Time Planning," *Geographical Analysis*, 1990: Vol. 22, No. 1, pp 50-69. (J. Osleeb and S. Ratick).
- "Two Types of Global Environmental Change: Definitional and Spatial Scale Issues in their Human Dimensions," 1990: *Global Environmental Change: Human and Policy Dimensions*, Vol. 1, No. 1, pp 14-22. (B. Turner, R. Kasperson, W. Meyer, K. Dow, D. Golding, J. Kasperson, R. Mitchell, and S. Ratick).
- "Risk, Compensation, and Regional Equity in Locating Hazardous Facilities," 1989: *Papers of the Regional Science Association*, Vol. 67, pp 29-42. (A. White and S. Ratick).
- "The Coal Logistics System," *Transportation Research Record: Ports, Waterways, and Inland Transport*, 1989: Transportation Research Board, National Research Council, Vol. 1222, pp 6-13. (J. Osleeb, S. Ratick, M. Kuby, H. Olson, L. Antel, and A. Hawn).
- "Accidental Chemical Releases and Local Emergency Response: Analysis Using the Acute Hazardous Events Data Base," 1988: *Industrial Crises Quarterly*, Vol. 2, pp 139-170. (J. Cummings-Saxton, S. Ratick and F. W. Talcott).
- "The Social Amplification of Risk: A Conceptual Framework," 1988: *Risk Analysis*, Vol. 8, No. 2, pp 177-187. (R. Kasperson, O. Renn, P. Slovic, H. Brown, J. Emel, R. Goble, J. Kasperson, and S. Ratick).
- "A Risk Sharing Model for Locating Noxious Facilities," *Environment and Planning B*, 1988: Vol. 15, pp 165-179. (S. Ratick and A. White).
- "A Multiobjective Hierarchical Weighted Benefit Model for the Essential Air Services Program," 1988: *Transportation Science*, Vol. 22, No. 2, pp 139-147. (J. Flynn and S. Ratick).
- "A Note on Estimating a Long Run Average Cost Curve for Flue Gas Desulfurization," 1988: *Journal of Environmental Economics and Management*, Vol. 15, No. 1, pp 30-34. (K. Reinert and S. Ratick).
- "Technology Assessment of Regional Coal Utilization Technologies using Mathematical Programming," 1987: *Applications of Management Science*, Volume 5, pp. 155-195. (S. Ratick and M. Kuby).



"Increased Coal Utilization and the Conflict in National Objectives: Achieving Energy Security and Environmental Quality," 1986: *Man, Environment, Space and Time*, Vol. 4, No. 2, pp 12-26. (S. Ratick).

"Optimizing Freight Transshipments: An Evaluation of East Coast Coal Export Options," 1983: *Transportation Research - A*, Vol 17A, No. 6, pp 493-504. (S. Ratick and J. Osleeb).

"A Mixed Integer and Multiple Objective Programming Model to Analyze Coal Handling in New England," 1983: *European Journal of Operations Research*, Vol. 12, No. 3, pp 303-313. (J. Osleeb and S. Ratick).

"The Impacts of Coal Conversions on the Port of New England," 1983: *Economic Geography*, Vol. 59, No. 1, pp 35-51. (J. Osleeb and S. Ratick).

"Multiobjective Programming Solutions to N - Person Bargaining Games," 1981: in *Organizations: Multiple Agents with Multiple Criteria*, Proceedings, University of Delaware, Newark, 1980, Joel N. Morse (ed.), Springer-Verlag, New York, pp 296-319. (S. Ratick, J. Cohon and C. ReVelle).

#### ***Encyclopedia Entries:***

"Monte Carlo Simulation," In: Kitchin R, Thrift N, *editors: International Encyclopedia of Human Geography*, Vol 1, *International Encyclopedia of Human Geography*, Rob Kitchin, Nigel Thrift. The Netherlands: Elsevier, 2009, pp. 184–11. (Samuel Ratick and Guido Schwarz).

"Resource Management: Decision Models," for *Encyclopedia of Geography*, Sage Publications. 2010.

#### ***Book Chapters:***

"Creating an Index of Vulnerability to Severe Coastal Storms along the North Shore of Boston." *Financial Modeling Applications and Data Envelopment Applications: Applications of Management Science*, (2009) Volume 13, 143–178 (Samuel Ratick, Holly Morehouse and Ronald Klimberg).

"Competition and Inter-firm Relations in the Age of Instant Access: Case of the U.S. Logistics Industry." 2007, Chapter in Miller, H. (ed.) *Societies and Cities in the Age of Instant Access*. Springer. (Yuko Aoyama and Samuel Ratick)

"Pollution Prevention Frontiers: A Data Simulation," Chapter 11 in *Environmental Program Evaluation: A Primer*, T.J. Kim and G. Knapp (eds), University of Illinois Press, Urbana, 1998. (K.E. Haynes, S. Ratick, and J. Cummings-Saxton)

"A Preliminary Working Paper on Critical Zones in Global Environmental Change," in *Defining and Mapping Critical Environmental Zones for Policy Formulation and Public Awareness*, T.C. Meredith, C. Marley, and W. Smith (eds), pp 37-62, 1991, Montreal: McGill University Department of Geography. (R.E. Kasperson, B. Turner, J.X. Kasperson, R.C. Mitchell, and S.J. Ratick).

- "Human Reliability and Risk Management in the Transportation of Spent Nuclear Fuel," *Reliability on the Move: Safety and Reliability in Transportation*, edited by G.B. Guy, London: Elsevier Applied Science, pp 169-194, 1989. (S. Tuler, R. Kasperson, and S. Ratick).
- "Interperiod Network Storage Location-Allocation (INSLA) Models," in *Spatial Analysis and Location Allocation Models*, Gerard Rushton and Avijit Ghosh (eds), New York: Van Nostrand Reinhold Company, pp 269-301, 1987. (S. Ratick, J. Osleeb, M. Kuby and K. Lee).
- "Evaluating Dredging and Offshore Loading Locations for U.S. Coal Exports Using the Coal Logistics System," in *Locational Decisions: Methodology and Applications: Volume 6. The Annals of Operations Research*, J. Osleeb and S. Ratick (eds.), pp 163-180, 1986. Basel - Switzerland: J.C. Baltzer, AG. (J. Osleeb and S. Ratick).
- "Assessing the Environmental Consequences of Large Scale Energy Projects," in *Large Scale Energy Projects: Assessment of Regional Consequences*, T.R. Lakshmanan and B. Johansson (eds.), Holland: Elsevier Science Publishers B.V., The International Institute of Applied Systems Analysis, Austria, pp 233-265, 1985. (Samuel J. Ratick).
- "Integrated Models for Economic - Energy - Environmental Impact Analysis," in *Economic-Environmental-Energy Interactions: Modeling and Policy Analysis*. T.R. Lakshmanan and Peter Nijkamp, (eds.), Boston and the Hague: Martinus- Nijhoff Co., pp 7-39, 1983. (T.R. Lakshmanan and S. Ratick).
- "An Overview of the Strategic Environmental Assessment System," in *Systems and Models For Energy and Environmental Analysis*, Peter Nijkamp and T.R. Lakshmanan, (eds.), London: Gower Press, pp 127-152, 1983. (S. Ratick and T.R. Lakshmanan).

***Selected Published Proceedings:***

- "An Analysis of the Structure of Chemical Accidents in the United States for Local Emergency Response Planning," in *Risk Analysis*, C. Zervos (ed). pp 619-625, 1991. (J. Cummings-Saxton, M. Benoff, A. Barad, S. Ratick, F.W. Talcott).
- "An Approach to Risk-Cost Aspects of Sea Level Rise and Climate Change in the Evaluation of Coastal Protection Projects," Proceedings of the NATO Advanced Studies Institute conference on *Risk and Reliability in Water Resources and Environmental Engineering*, 1991. (E. Stakhiv, S. Ratick, and W. Du).
- "Human Error in the Transportation of Spent Nuclear Fuel," *Proceedings of the Annual Meetings of the Society for Risk Analysis, 1989*. (S. Tuler, R. Kasperson, and S. Ratick).
- "The Coal Logistics System: Description, Applications and Extensions," in *Proceedings of the Coal Transportation Costing and Modeling Seminar*, Kansas City, MO. U.S. Department of Energy and the Electric Power Research Institute. October 1984. (S. Ratick and J. Osleeb).
- "Assessing the Implications of World Coal Demand on U.S. Port Strategic Planning Using the Computer Based Coal Logistics System (COLS)," *Pre-Conference, Proceedings of the National Coal*

*Association Seminar on Computer Assisted Planning of Transportation Systems for Coal and Bulk Freight*, Chicago, IL. National Coal Association, September 16-18, 1984. (S. Ratick and J. Osleeb).

"The Port Expansion System: Applications and Extensions," *Proceedings of the Coal Transportation Modeling Workshop*, Dec. 1981, U.S. Department of Energy and the Electric Power Research Institute, Palo Alto, California, Report No. EA-2551 and U.S. Department of Energy Argonne National Laboratories, Report No. ANL/EES-TM-190, 208-222, July 1982. (S. Ratick and J. Osleeb).

"A Model to Analyze Coal Handling in New England Ports", *Proceedings of the Applied Geography Conference*, 122-132, Vol. 4, 1981. (J. Osleeb, S. Ratick and G.K. Lewis).

***Selected Technical Reports:***

*A Multi-Criteria GIS Approach to Composite Vulnerability Index Construction for Flood Vulnerability in the Contiguous United States*, (2013,2014) US Army Corps of Engineers, Institute for Water Resources. (Daniel Runfola, Samuel J. Ratick, and Julie Blue).

*Components of an Indicator-Based Climate Change Vulnerability Assessment*, (2013, 2014), US Army Corps of Engineers, Institute for Water Resources. (Julie Blue, Jeffrey Maxted, Samuel J. Ratick, and Nupur Hiremath).

*Determining the Vulnerability of Populations to Mercury*, The US Environmental Protection Agency, The Office of Air and Radiation, The Office of Policy Analysis and Review, (2000) Contract Officer: Ellen Brown, Contract Number: XA – 83067901-0. 2005. (Samuel Ratick (Project Director), Stella Capoccia, Alexandra Dichter, Robert Goble, Dominic Golding, Dale Hattis, Jasmine Tanguay)

*A Method for Incorporating Topographic Uncertainty in the Management of Flood Effects Associated with Changing Storm Climate*, Phase I report to: the U.S. Department of Commerce, Economics of Global Change Program, National Oceanographic and Atmospheric Administration, April, 1994. (S. Ratick, A. Solow, J. Eastman, W. Jin, H. Jiang).

*Pollution Prevention Frontiers (PPF) and Other Approaches to Pollution Prevention Assessment: Comparison Based on New Jersey Materials Accounting Data*, prepared for the Office of Policy Analysis, U.S. Environmental Protection Agency. March 1994. (J. Cummings-Saxton, S. Ratick, H. Garriga, and A. Desai).

*Pollution Prevention Frontiers: An Approach to Measuring Pollution Prevention Progress*, prepared for the Office of Policy Analysis, U.S. Environmental Protection Agency. 1994. (J. Cummings-Saxton, S. Ratick, A. Desai).

*Coastal Hazards and Global Environmental Change*, Report to the Institute for Water Resources, Water Resources Support Center, U.S. Army Corps of Engineers. 1992. (S. Ratick, M. Baughman, K. Dow, W. Du, S. Moran, A. Solow, J. Broadus).

- Development of a Reliability Based Dynamic Dredging Decision Model*, Draft Report to the Institute for Water Resources, Water Resources Support Center, U.S. Army Corps of Engineers. 1991. (S. Ratick and W. Du).
- Uncertainty Analysis for Sea Level Rise and Coastal Flood Damage Evaluation*, Report to the Institute for Water Resources, Water Resources Support Center, U.S. Army Corps of Engineers. 1991. (S. Ratick and W. Du).
- "Host Community Benefits," *Solid Waste and Power*, Vol. 4, No. 2, pp 52-58, 1990. (A. White, S. Ratick, and J. Himmelberger).
- An Integrated Sensitivity Analysis Procedure for Evaluating Risk and Uncertainty in Local Flood Damage Alleviation Projects*, Report to the U.S. Army Corps of Engineers, 1989. (S. Ratick, W. Du and G. Stakhiv).
- The Growth-tax Dilemma: Findings of the Sandwich Citizens Survey*, Cape Cod Model Towns Project, 1989, The Graduate School of Geography, Clark University. (R. Mitchell, S. Ratick, and C. Wilmsen).
- Assessing the State/Nation Distribution Equity Issues Associated with the Proposed Yucca Mountain Repository: A Conceptual Approach*, 1988, (R. Kasperson and S. Ratick).
- The Effects of Human Reliability on Risk in the Transport of Spent Nuclear Fuel*, 1988. (S. Tuler, R.E. Kasperson, and S. Ratick).
- A Framework for Analyzing and Responding to the Equity Problems in High Level Radioactive Waste Disposal*, 1988. (R.E. Kasperson, S. Ratick, and O. Renn).
- Risk Assessment and Risk Management for the Transportation of High-Level Radioactive Waste: A Literature Review*, 1988. (D. Golding, J.X. Kasperson, R.E. Kasperson, S. Ratick, O. Renn, and S. Tuler).
- Managing Uncertainty in Water Resources Planning: Project Definition Document*, Report to the Institute for Water Resources, U.S. Army Corps of Engineers, 1987 (S. Ratick).
- Development of Guidelines for Evaluating Local Flood Damage Protection Projects*, Report to the Institute for Water Resources, U.S. Army Corps of Engineers, 1987 (S. Ratick and Wei Du).
- "Locating Hazardous Facilities: Toward a Conceptual Framework for Evaluating Space-dependent Risk," *Research Papers: The Center for Energy and Environmental Studies*, Boston: Boston University, 1987. (A. White and S. Ratick).
- "A Description of the Acute Hazardous Events Data Base," *Bulletin of the Center for Energy and Environmental Studies*, Vol. III, No. 1, Boston, MA: Boston University, 1987. (J. Cummings-Saxton, S. Ratick, and F. Talcott).

*The Acute Hazardous Events Data Base*, Final Report to the U.S. Environmental Protection Agency, October 1985. (J. Cummings-Saxton, S. Ratick, et al.).

*Interperiod Network Storage Location-Allocation Models (INSLA)*, Final Report to the National Science Foundation, May 3, 1985. (S. Ratick and J. Osleeb).

*Implications of World Coal Demands on U.S. Port Strategic Planning*, with J. Osleeb, U.S. Department of Transportation, Maritime Administration. Available through the National Technical Information Service, Springfield, VA, 1983. (J. Osleeb and S. Ratick).

*Implications of Power Plant Coal Conversions on the Ports of New England Vols. I and II*, U.S. Maritime Administration, U.S. Department of Commerce. Available through the National Technical Information Service (NTIS), Vol. I Report No. PB-82-136409, Vol. II Report No. PB-82-136417, Springfield, VA, December 1981. (J. Osleeb and S. Ratick).

*Assessing Regional Consequences of Large Scale Energy Projects: An International Comparison of Experiences with Models and Methods*, Project Definition, Working Paper, The Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria, June 1981. (B. Johannson, T.R. Lakshmanan and S. Ratick).

**Book Review:**

*Quantitative Methods for Market-Oriented Economic Analysis Over Space and Time*, Edited by: Walter C. Labys, Takashi Takayama, and Noel D. Uri. Reviewed for the *Journal of Regional Science*, 1991, (with R. Tobin).

**Edited Journals:**

*Papers in Regional Science: Journal of the Regional Science Association International, Special Issue on Location Modeling*, Vol 71, No. 3, 1992. (with John Current).

*Computers and Operations Research: Location Modeling, Dedicated to the Memory of Charles S. ReVelle*, Vo. 35, No. 2, February 2008.(with H.A. Eilst).

**GRANTS and CONTRACTS RECEIVED**

*Organizational Dynamics of the U.S. Logistics Industry: The Impacts of Inter-firm Relations, Technologies, and Globalization*, National Science Foundation, \$190,000, 2004 – 2008, Co-Principal Investigator.

*Testing Sampling Methodologies for Rapid Population Assessments in Emergency Settlements*, Harvard Design and Mapping Company (from Centers for Disease Control), \$40,000, 2005.

*Assessing the Vulnerability of Populations to Mercury Emissions*: US Environmental Protection Agency, \$50,000, 2004, Principal Investigator.

*Coping with Climate Change: Vulnerability and Response to Sea-Level Rise and Severe Storms*, U.S. Department of Commerce, Human Dimensions of Global Change Program Area, National Oceanographic and Atmospheric Administration, \$115,455. 1994 - 1996, Principal Investigator.

*Identifying Leaders and Laggards in Pollution Prevention*, U.S. Environmental Protection Agency, Office of Exploratory Research, \$247,000. 1992-1994, Principal Investigator.

*A Method for Incorporating Topographic Uncertainty in the Management of Flood Effects Associated with Changing Storm Climate*, U.S. Department of Commerce, Economics of Global Change Program, National Oceanographic and Atmospheric Administration, \$191,428. 1992- 1995, Principal Investigator.

*Development of a Reliability Based Dynamic Dredging Decision Model*, U.S. Army Corps of Engineers, \$115,000. 1991-1994, Principal Investigator.

*Assessing Vulnerability to Severe Storms and Sea Level Rise*, Northeast Regional Center for Global Environmental Change, National Institute for Global Environmental Change, U.S. Department of Energy, \$75,000. 1992-1994, Co-Principal Investigator.

*The Implications of Sea-level Rise for Agency Planning*, U.S. Army Corps of Engineers, \$50,000. 1990-1991, Principal Investigator.

*Risk Communication Systems for Low-Level Radioactive Waste*, New York State Energy Research and Development Authority, \$110,000. 1989-1992, Co-Principal Investigator.

*New York State Program Plan for Low-Level Radioactive Waste*, New York State Energy Research and Development Authority, \$65,000. 1989-1992, Co-Principal Investigator.

*Faculty Fellow, Institute for Water Resources, Risk and Uncertainty in Water Resources Planning*, \$180,000, salary support. 1987-1991.

*Collection and Analysis of Public Water Supply Use Data for Massachusetts*, U.S. Department of Interior, Geological Survey, 1984-1985, \$13,000. Principal Investigator.

*Development of an Interperiod Network Storage Location Allocation Model*, National Science Foundation, 1983-1984, \$40,000. Co-Principal Investigator.

*Organization and Operation of the Third Symposium on Location Decisions*, National Science Foundation, 1983-1984, \$12,000. Co-Principal Investigator.

*Implications of World Coal Demand on U.S. Port Strategic Planning*, U.S. Department of Transportation, Maritime Administration, 1982-1983, \$50,180. Co-Principal Investigator.

*Energy Transportation Conservation Seminar and Topic Papers*, U.S. Department of Energy, Office of Transportation Energy Conservation," 1980-1981, \$10,000. Co-Principal Investigator.

Travel and Per Diem, International Geographical Union (IGU), Working Group on Energy Resources and Development, Amsterdam, The Netherlands, (through the American Geographical Union, 1984), (Travel Grant).

Travel and Per Diem, The International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria (through IIASA June 1982 and February 1983), (Travel Grant).

Travel and Per Diem. The Second International Symposium on Locational Decisions, Copenhagen, Denmark (through the National Science Foundation, June 1981), (Travel Grant).

***Sessions Organized and Chaired:***

Chaired, Session on Spatial Optimization and GIS II, Annual Meeting the Association of American Geographers, Seattle, Washington, 4/12-4/16, 2011

Organized, The Location Modeling Track (27 papers), The Annual North American Meetings of the Regional Science Association, Houston TX. November, 1993.

Organized, The Location Modeling Track (30 papers), The Annual North American Meetings of the Regional Science Association, Toronto, Canada. November, 1992.

Organized, The Location Modeling Track (33 papers), The Annual North American Meetings of the Regional Science Association, New Orleans, LA. November, 1991.

Organized, The Location Modeling Track (20 papers), The Annual North American Meetings of the Regional Science Association, Boston, MA. November, 1990.

Chair, Location-Allocation Session, the North American Regional Science Association Meetings, Baltimore, MD, November 1987.

Co-organizer, "Industrial Accidents and Emergency Planning," Double Session at the Society for Risk Analysis Annual Meeting, November 1988.

"Risk Analysis Since Bhopal and Chernobyl", Double Session, The Association of American Geographers, Portland, OR, April 1987. (Co-Organizer, Co-Chair with A. White).

"Spatial Models for Geographical Analysis," the Joint National Meetings TIMS/ORSA, Boston, MA, April 1985. (Co-Organizer, Co-Chair with J. Osleeb).

The Third International Symposium on Locational Decisions (ISOLDE III). June, 1986, (On the conference organizing committee).

"Regional Consequences of Energy Development," The Joint National Meetings, ORSA/TIMS, Dallas, TX, November 26-28, 1984. (Organized and Chaired).

"Siting and Logistics Models for Energy Supply Activities," at the North American Regional Science Association Meetings, Pittsburgh, PA, November 1982. (Organized and Chaired).

"Multicriteria Decision Models," at the Annual Meeting of the Association of American Geographers, San Antonio, TX, April 25-28, 1982. (Organized).

"Optimization Methods in Infrastructure Planning and Management," Double Session, at the Joint National Meeting TIMS/ORSA, Colorado Springs, CO, November, 1980. (Co-Organizer, Co-Chair with T. Friesz).

"Multiobjective Optimization in Transportation and Location," Double Session, at the Twenty Seventh North American Meetings of the Regional Science Association, Milwaukee, Wisconsin, November, 1980. (Co-Chair and Co-Organizer with T. Friesz).

"Integrated Models for Economic-Environmental-Energy Trade-Offs," at the 1980 International Conference on Cybernetics and Society, IEEE, Cambridge, MA, October, 1980. (Co-Chair with T. R. Lakshmanan).

### ***HONORS AND AWARDS***

The IBM Fellowship for graduate Study leading to a Ph.D. in Geography and Environmental Engineering at Johns Hopkins University, (Academic year 9/76-5/77).

Johns Hopkins University Graduate Fellowship. (Academic Years 9/75-5/76, 9/77- 5/78).  
National Science Foundation Fellowship for Summer Study at Bucknell University (1971).

New York State Regents Scholarship to S.U.N.Y. at Buffalo (4 year undergraduate study), (1962-1966).

Elected at Bisonhead, Senior Men's Honor Society, S.U.N.Y. at Buffalo (1965-1966).

Environmental Protection Agency Special Achievement Award (2/73).

### ***PROFESSIONAL ASSOCIATIONS***

(past and present)

American Association for the Advancement of Science

American Association of Geographers

American Geophysical Union

International Association for Impact Analysis

International Geographical Union

Institute for Management Science

Operations Research Society of America

Regional Science Association



Society for Risk Analysis

## ***COURSES TAUGHT***

### **Clark University**

#### ***New Course Listings Developed and Taught***

Graduate Seminar in: Advanced Topics in Spatial Analysis

Decision Methods for Environmental Management and Policy (upper division undergraduate and graduate level)

Locating Hazardous Facilities (upper division undergraduate and graduate level)

Spatial Analysis (upper division undergraduate and graduate level)

#### ***Courses Taught***

Intermediate Quantitative Methods in Geography (upper division undergraduate and graduate level)

Introduction to Quantitative Methods in Geography (undergraduate level)

Introductory Case Studies (Environment, Technology, and Society Program, undergraduate level).

Introduction to Geography (undergraduate level)

Quantitative and Computational Methods (upper division undergraduate and graduate level)

Science Uncertainty and Decisionmaking (undergraduate)

Technology Assessment (upper division undergraduate and graduate level)

Numerous Directed Studies (undergraduate and graduate)

### **Boston University**

#### ***New Course Listings Developed and Taught:***

Mathematical Models for Environmental and Resource Management (upper division undergraduate and graduate level)

Mathematical Models for Location and Transportation (graduate)

Energy and Environmental Studies Internship (graduate)

Student Research in Energy and Environmental Studies (graduate)

***Courses Taught:***

Alternative Energy and Environmental Futures (undergraduate)

Man and Energy Lecture Series: Energy and Regional Growth (upper division undergraduate and graduate level)

Environmental Principles and Policy (upper division undergraduate and graduate level)

Research Methods in Geography (graduate)

Seminar in Water Resources (graduate)

Energy and Environmental Studies Workshop (graduate)

**The Johns Hopkins University**

***Courses Taught:***

Mathematical Models for Public Decision-Making (upper division undergraduate and graduate level)