

Brian D. Fath

Ecosystem Ecologist

Department of Biological Sciences, Towson University, 8000 York Road, Towson, Maryland, 21252
410-704-2535 (ph), 410-704-2405 (fax), bfath@towson.edu, <http://pages.towson.edu/bfath>

Positions

Professor, Department of Biological Sciences, Towson University. 2001–present (promoted to Professor in 2011).
Research Scholar, Advanced Systems Analysis Program, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria. 2002–present.
Editor-in-Chief, International Journal of Ecological Modelling. 2009–present.
Co-scientific coordinator, Young Scientist Summer Program, IIASA, Laxenburg, Austria. 2011–present.
Fulbright Distinguished Chair in Environmental Sciences, Parthenope University, Naples, Italy. Jan-May 2012.
Deputy Director, Low Carbon Research Center, Beijing Development Area, Beijing, China. 2010–present.
Visiting faculty, University of Coimbra, Coimbra, Portugal, 1997–present.
Visiting faculty, Beijing Normal University, Beijing, China. 2009–present.

Education

University of Georgia, Athens, Georgia. Ph.D. *Ecology*. 1998. Summa Cum Laude.
Ohio State University, Columbus, Ohio. M.S. *Environmental Science*. 1993. Magna Cum Laude.
Miami University, Oxford, Ohio. B.S. *Physics*. B.S. *Aeronautics*. 1990. Magna Cum Laude.

Teaching

Towson University, Towson, Maryland. 2001–present.

BIOL 105: **Environmental Biology** F01, S02, F02, S03, F03, S04, F04, S05, F05, S07, F08, S09, S10, F10, S11, FA11.
BIOL 204: **Education and Career Planning for the Biologist** S11.
BIOL 306: **Human Ecology and Sustainability** S04, S05, S06, S07. S09, S10, SP11.
BIOL 486: **Senior Biology Seminar** S03, S06.
BIOL 491: **Independent Study in Biology** S10, S11.
BIOL 797: **Graduate Seminar** S03.
ENVS 471: **Independent Study in Environmental Science** S03, S04, S06, S09.
ENVS 482: **Environmental Research** S04, S06, FA11.
ENVS 491: **Environmental Science Senior Seminar** F06.
ENVS 604: **Ecosystem Ecology** F02, F03, F04, F05, F06, F07, F08. F09, F10, FA11.
ENVS 798: **Environmental Practicum** S04.
ENVS 897/898: **Environmental Thesis** F05, S06, F07, S07, S08, F08, F09, S10.
HONR 497: **Honors Independent Investigation** S11.
IDNM 315: **Networks: Science of Connections** S06, F07.

Invited International Courses

China, Beijing Normal University – two-day post graduate course

Ecological Network Analysis. January 2009.

Croatia, University of Zagreb – one-week masters course

Environmental Biology. January 2005.

Denmark, Danish University of Pharmaceutical Sciences – one-week graduate course

Ecosystem Theory. May 2005.

- Denmark, University of Copenhagen – one-week Ph.D. course
Ecosystem Modelling. June 2005.
Ecological Networks. June 2006.
- Germany, University of Kiel – two-week masters course
Ecosystem Theory and Ecological Indicators. June 2009. (European Masters in Applied Ecology -EMAE)
Environmental Development and Dynamics. January 2010. (European Masters in Applied Ecology -EMAE)
Environmental Development and Dynamics. January 2011. (European Masters in Applied Ecology -EMAE)
- France, French Research Institute for Exploitation of the Sea, Sete – 3 day advanced course
Economic vs ecological networks: integrating economy and ecology in scenario building for marine ecosystems. November 2009.
- Portugal, University of Coimbra – two-week masters course
Environmental Management and Modeling. October 1997.
Environmental Management and Modeling. October 1999.
Environmental Management and Modeling. May 2002.
Environmental Management and Modeling. May 2004.
Environmental Management of Ecosystems. May 2006.
Environmental Management of Ecosystems. May 2008.
Environmental Quality Assessment and Management. May 2010.
- Russia, Moscow State University – one week graduate course
Economic Growth: Modelling Dimensions, February 2011.

Publications

Books:

3. Jørgensen SE, **Fath BD**. 2011. *Fundamentals of Ecological Modelling: Applications in environmental management and research*, 4th edition. Elsevier.
2. Jørgensen SE, **Fath BD** (editors). 2008. *Encyclopedia of Ecology*. Elsevier, London. 5 Volumes. 4122 pp.
1. Jørgensen SE, **Fath BD**, Bastianoni S, Marques JC, Müller F, Nielsen SN, Patten BC, Tiezzi E, Ulanowicz RE. 2007. *Systems Ecology: A new perspective*. Elsevier, Amsterdam. 275 pp.

Journal Articles:

46. Cutlip L, **Fath BD**. Relationship between carbon emissions and economic development: case study of six countries. *Environment Development and Sustainability*. In press.
45. Seppelt R, **Fath BD**, Burkhard B, Fisher J, Grêt-Regamey A, Lautenbach S, Pert P, Hotes S, Spangenberg J, Verburg P, Van Oudenhoven, A. Form follows function? Proposing a blueprint for ecosystem service assessment studies based on reviews and case studies. *Ecological Indicators*. In press.
44. Zhang Y, Li S, **Fath BD**, Yang Z, Yang N. Analysis of an urban energy metabolic system: comparison of results produced using simple and complex models. *Ecological Modelling*. In press.
43. Veríssimo H, Neto J, Teixeira H, **Fath BD**, Marques JC, Patrício J. Benthic indices performance in capturing ecological changes in estuaries following management measures to improve system ecological condition. *Ecological Indicators*. In press.
42. Burkhard B, **Fath BD**, Müller F. 2011. Adapting the adaptive cycle: Hypotheses on the development of ecosystem properties and services. *Ecological Modelling*. 222, 2878-2890.
41. Carpio OV, **Fath BD**. 2011. Assessing the Environmental Impacts of Urban Growth Using Land Use/Land Cover, Water Quality and Health Indicators: A Case Study of Arequipa, Peru. *American Journal of Environmental Sciences* 7(2), 90-101.
40. Chen S, Fath BD, Chen B. 2011. Information-based Network Environ Analysis: A system perspective for ecological risk assessment. *Ecological Indicators*. 11, 1664–1672.

39. Zhang Y, Yang Z, **Fath BD**. 2010. Ecological network analysis of an urban water metabolic system: model development, and a case study of Beijing. *Science of the Total Environment* 408, 4702–4711.
38. Zhang Y, Yang Z, **Fath BD**, Li S. 2010. Ecological network analysis of an urban energy metabolic system: model development, and a case study of four Chinese cities. *Ecological Modelling* 221, 1865–1879.
37. Su M, **Fath, BD**, Yang Z. 2010. Urban ecosystem health assessment: A review. *Science of the Total Environment* 408, 2425–2434.
36. Scharler UM, **Fath BD**. 2009. Comparing network analysis methodologies for consumer–resource relations at species and ecosystems scales. *Ecological Modelling* 220, 3210–3218.
35. Baird D, **Fath BD**, Ulanowicz RE, Asmus H, Asmus R. 2009. On the consequences of aggregation and balancing of networks on system properties derived from ecological network analysis. *Ecological Modelling* 220, 3465–3471.
34. Lobanova G, **Fath BD**, Rovenskaya E. 2009. Exploring Simple Structural Configurations for Optimal Network Mutualism. *Communications in Nonlinear and Numerical Simulations* 14, 1461–1485.
33. Pinto R, Patrício J, Baeta A, **Fath BD**, Neto JM, Marques JC. 2009. Review and Evaluation of Estuarine Biotic Indices to Assess Benthic Condition. *Ecological Indicators* 9, 1–25.
32. Swanack T, Grant WE, **Fath BD**. 2008. On the Use of Multi-Species NK Models to Explore Ecosystem Development. *Ecological Modelling* 218, 367–374.
31. **Fath BD**. 2007. Structural regimes in Ecological Networks. *Ecological Modelling* 208, 391–394.
30. **Fath BD**, Scharler U, Ulanowicz RE, Hannon B. 2007. Ecological Network Analysis: Network Construction. *Ecological Modelling* 208, 49–55.
29. **Fath BD**, Hanes G. 2007. Cyclic Energy Pathways in Ecological Food Webs. *Ecological Modelling* 208, 17–24.
28. **Fath BD**. 2007. Network Mutualism: Positive community level relations in ecosystems. *Ecological Modelling* 208, 56–67.
27. Hanes G, **Fath BD**, Liljenström H. 2007. The modified niche model: Including a detritus compartment in simple structural food web models. *Ecological Modelling* 208, 9–16.
26. **Fath BD**, Killian M. 2007. The relevance of ecological pyramids in community assemblages. *Ecological Modelling* 208, 286–294.
25. Schramski JR, Gattie DK, Patten BC, Borrett SR, **Fath BD**, Whipple SJ. 2007. Indirect effects and distributed control in ecosystems: Distributed control in the environ networks of a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA—Time series analysis. *Ecological Modelling* 206, 18–30.
24. Borrett SR, **Fath BD**, Patten BC. 2007. Functional integration of ecological networks through pathway proliferation. *Journal of Theoretical Biology* 245, 98–111.
23. **Fath BD**, Grant WE. 2007. Ecosystems as evolutionary complex systems: Network analysis of fitness models. *Environmental Modelling and Software* 22, 693–700.
22. Ulanowicz RE, Jørgensen SE, **Fath BD**. 2006. Exergy, Information and Aggradation: An Ecosystems Reconciliation. *Ecological Modelling* 198, 520–524.
21. Jørgensen SE, **Fath BD**. 2006. Examination of Ecological Networks. *Ecological Modelling*. 196, 283–288.
20. **Fath BD**, Borrett SR. 2006. A Matlab® Function for Network Environ Analysis. *Environmental Modelling and Software* 21, 375–405.
19. Schramski JR, Gattie DK, Patten BC, Borrett SR, **Fath BD**, Thomas CR, Whipple SJ. 2006. Indirect effects and distributed control in ecosystems: Distributed control in the environ networks of a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA—Steady-state analysis. *Ecological Modelling* 194, 189–201.
18. **Fath BD**. 2006. A non-thermodynamic constraint to trophic transfer efficiency based on network utility analysis. *International Journal of Ecodynamics* 1, 28–43.
17. **Fath BD**, Beck MB. 2005. Elucidating public perceptions of environmental behavior: A case study of Lake Lanier. *Environmental Modelling and Software* 20(4), 485–498.

16. Pawlowski CW, **Fath BD**, Mayer A, Cabezas H. 2005. Towards a sustainability measure using information theory. *Energy* 30(8), 1221–1231.
15. Jørgensen SE, **Fath BD**. 2004. Application of Thermodynamic principles in ecology. *Ecological Complexity* 1(4), 267–280.
14. **Fath BD**, Jørgensen SE, Patten BC, Straškraba M. 2004. Ecosystem growth and development. *Biosystems* 77, 213–228.
13. **Fath BD**. 2004. Distributed control in ecological networks. *Ecological Modelling* 179, 235–246.
12. Jørgensen SE, **Fath BD**. 2004. Modelling the selective adaptation of Darwin's Finches. *Ecological Modelling* 176, 409–418.
11. **Fath BD**, Cabezas H. 2004. Exergy and Fisher Information as ecological indices. *Ecological Modelling* 174, 25–35.
10. **Fath BD**. 2004. Network analysis in perspective: Comments on “WAND: an ecological network analysis user friendly tool.” *Environmental Modelling and Software* 19, 341–343.
9. **Fath BD**. 2004. Network analysis applied to large-scale cyber-ecosystems. *Ecological Modelling* 171, 329–337.
8. **Fath BD**, Cabezas H, Pawlowski CW. 2003. Regime Changes in Ecological Systems: An Information Theory Approach. *J. of Theoretical Biology* 222(4), 517–530.
7. Beck MB, **Fath BD**, Parker AK, Osidele OO, Cowie GM, Rasmussen TC, Patten BC, Norton BG, Steinemann A, Borrett SR, Cox D, Mayhew MC, Zeng W, Zeng XQ. 2002. Developing a concept of adaptive community learning: case study of a rapidly urbanizing watershed. *Integrated Assessment* 3, 299–307.
6. Cabezas H, **Fath BD**. 2002. Towards a theory of sustainable systems. *Fluid Phase Equilibria* 194–197, 3–14.
5. **Fath BD**, Patten BC, Choi JS. 2001. Complementarity of ecological goal functions. *J. Theoretical Biology* 208(4), 493–506.
4. **Fath BD**, Patten BC. 2001. Application of ecological network utility analysis to an economic input-output model. *Indian Journal of Applied Economics* 8(3), 205–221.
3. **Fath BD**, Patten BC. 1999. Quantification of resource homogenization using network flow analysis. *Ecological Modelling* 123, 193–205.
2. **Fath BD**, Patten BC. 1999. Review of the foundations of network environ analysis. *Ecosystems* 2, 167–179.
1. **Fath BD**, Patten BC. 1998. Network synergism: Emergence of positive relations in ecological systems. *Ecological Modelling* 107, 127–143.

Book Chapters, Conference Proceedings, Editorials, other:

47. **Fath BD**, Zhang Y, Yang Z, Li S. Urban Energy Metabolism using Ecological Network Analysis: Case Study of Four Chinese Cities. Proceedings: Advances in Energy Studies Workshop. Barcelona, Spain, 19–21 October 2010.
46. **Fath BD**. Ecosystem Flow Analysis. In press. *Encyclopedia of Sustainable Science and Technology*. Springer.
45. **Fath BD**. 2010. Notes from the editor, mid-2010 update. *Ecological Modelling*. 221, 2509-2511.
44. **Fath BD**, Jørgensen SE, Scharler UM. In press. Ecosystem modeling: History and applications for Environmental Management. In: Baird D, Mehta A (eds.) *Treatise on Estuarine and Coastal Science - Volume 9*. Elsevier, Amsterdam.
43. Pastres R, **Fath BD**. 2011. Exergy use in Ecosystems: Background and Challenges. In: Bakshi B, Gutowski TG, Sekulic DP (eds.) *Thermodynamics and the Destruction of Resources*. Cambridge University Press, New York, pp. 453–476.
42. **Fath BD**, Müller F. 2010. Long-term ecosystem dynamics: Theoretical concepts of environmental change. In: Müller F, Baessler C, Schubert H, Klotz S (eds.) *Long-term ecological Research: between theory and application*. Springer, Berlin, pp 27-38.
41. Hong M, **Fath BD**. 2009. Measurement and Spatial Distribution of Urban Land Use Compactness in

- Chaoyang District of Beijing, China. *IR-09-048*. IIASA, Laxenburg, Austria.
40. Brady PA, **Fath BD**. 2009. Final Report, Baltimore County Government Greenhouse Gas Inventory 2002-2006, Projections for 2012.
 39. **Fath BD**. 2009. Editorial: Letter from the New Editor-in-Chief. *Ecological Modelling* 220, 1–3.
 38. **Fath BD**. 2008. Network Environ Analysis. In: SE Jørgensen, BD Fath (eds.), *Encyclopedia of Ecology*, Vol. 2 of 5, pp. 1083–1088 Oxford, Elsevier.
 37. **Fath BD**. 2008. Ecosystem Ecology. In: SE Jørgensen, BD Fath (eds.), *Encyclopedia of Ecology*, Vol. 2 of 5, pp. 1125–1131 Oxford, Elsevier.
 36. Casti JL, **Fath BD**. 2008. Ecological Complexity. In: SE Jørgensen, BD Fath (eds.), *Encyclopedia of Ecology*, Vol. 2 of 5, pp. 991–998 Oxford, Elsevier.
 35. **Fath BD**, Rovenskaya E, Lobanova G. 2008. Network analysis of energy transportation systems: a case study of Eurasian natural gas pipeline model. *Proceedings: Advances in Energy Studies Workshop*. Graz, Austria, June 30–July 2.
 34. Jørgensen SE, **Fath BD**, Grant WE, Legovic T, Nielsen SN. 2008. New initiative for thematic issues: An invitation. *Ecological Modelling* 215, 273–275.
 33. Jørgensen SE, Legović T, **Fath BD**. 2008. Recent progress in ecological modeling activity. *Ecological Modelling*, 212, 179.
 32. **Fath BD**, Kryazhimskiy AV, Liljenström H, Rovenskaya E. 2007. Introduction: Towards the Design of an Integrated Socio-Environmental Assessment Model for the Baltic Sea Region. In: Neittaanmäki P, Périaux J, Tuovinen T (eds.) *Evolutionary Methods for Design, Optimization and Control*. CIMNE, Barcelona, Spain, pp. 425-429.
 31. Rovenskaya E, **Fath BD**. 2007. Conceptualizing Integrated Socio-environmental Models. In: Neittaanmäki P, Périaux J, Tuovinen T (eds.) *Evolutionary Methods for Design, Optimization and Control*. CIMNE, Barcelona, Spain, pp. 425-429.
 30. Mayer AL, Pawlowski CW, **Fath BD**, Cabezas H. 2007. Applications of Fisher Information to Sustainable Environmental Management. In: Frieden BR, Gatenby RA (eds.) *Exploratory Data Analysis using Fisher Information*, Springer, London, pp. 217–244.
 29. Lobanova G. **Fath BD**. 2007. Exploring Simple Structural Configurations for Optimal Network Mutualism. *IR-07-021*. IIASA, Laxenburg, Austria.
 28. **Fath BD**. 2004. Editorial: Control of distributed systems and environmental applications. *Ecological Modelling* 179, 151–152.
 27. **Fath BD**. 2004. Complementarity of Ecological Collaborators: Reflections on exergetic moments with Sven. *Liber Amicorum* for Sven Erik Jørgensen's retirement. pp. 16-19.
 26. Patten BC, Gattie DK, Whipple SJ, Schramski JR, Borrett SR, Turk HJ, **Fath BD**. *Environ and Network Environ Analysis: Introduction and Overview*. 4th European Conference on Ecological Modelling September 29 – October 1, 2004, Bled, Slovenia.
 25. Schramski JR, Patten BC, Whipple SJ, Gattie DK, Turk HJ, Borrett SR, **Fath BD**. *Distributed Control in the Environ Networks of a Seven-Compartment Model of Nitrogen Flow in the Neuse River Estuary, USA: Static Analysis*. 4th European Conference on Ecological Modelling Sept. 29–Oct. 1, 2004, Bled, Slovenia.
 24. Patten BC, Schramski JR, Gattie DK, Turk HJ, Whipple SJ, Borrett SR, **Fath BD**. *Distributed Control in the Environ Networks of a Seven-Compartment Model of Nitrogen Flow in the Neuse River Estuary, USA: Time Series Analysis*. 4th European Conf. on Ecological Modelling Sept. 29–Oct. 1, 2004, Bled, Slovenia.
 23. **Fath BD**, Grant WE. 2004. Ecosystems as evolutionary complex systems: A synthesis of two system-theoretic approaches based on Boolean networks. In: Pahl-Wostl C, Schmidt S, Jakeman T (eds.) *iEMSs 2004 International Congress: Complexity and Integrated Resources Management*. International Environmental Modelling and Software Society, Osnabrück, Germany, June 2004.
 22. Jørgensen SE, **Fath BD**. 2003. Toward a consistent pattern of ecosystem theories. In: Ulgiati S, Brown MT, Giampietro M, Herendeen RA, Mayumi K (eds.) 3rd Int. Workshop on *Advances in Energy Studies: Reconsidering the Importance of Energy*. Porto Venere, Italy, 24–28 September 2002. pp. 269–276.
 21. Patten BC, **Fath BD**. 2003. A progressive definition of network storage aggradation. In: Ulgiati S, Brown

- MT, Giampietro M, Herendeen RA, Mayumi K (eds.) 3rd Int. Workshop on *Advances in Energy Studies: Reconsidering the Importance of Energy*. Porto Venere, Italy, 24–28 September 2002. pp. 289–298.
20. Patten BC, **Fath BD**, Choi JS. 2002. Complex adaptive hierarchical systems—background. In: Costanza R, Jørgensen SE (eds.). *Understanding and Solving Environmental Problems in the 21st Century*, Elsevier Science Ltd, London, England, pp. 41–94.
 19. Patten BC, **Fath BD**, Choi JS. 2002. Complex adaptive hierarchical systems—consensus. In: Costanza R, Jørgensen SE (eds.). *Understanding and Solving Environmental Problems in the 21st Century*, Elsevier Science Ltd, London, England, pp. 95–99.
 18. **Fath BD**. Exergy and Information Indices: A comparison for use in structurally dynamic models. International Environmental Modelling and Software Society Conference on Integrated Assessment and Decision Support, Lugano, Switzerland. 24–27 June 2002. Vol. 2, pp. 7–12.
 17. Pawlowski CW, **Fath BD**, Mayer A, Cabezas H. 2002. Towards a sustainability index using information theory. Sustainable Development of Energy, Water and Environment Systems Conference, Dubrovnik, Croatia, June 2–7 2002.
 16. **Fath BD**, Patten BC. 2001. A progressive definition of network aggradation. In: Ulgiati S, Brown MT, Giampietro M, Herendeen RA, Mayumi K (eds.). 2nd Int. Workshop on *Advances in Energy Studies: Exploring Supplies, Constraints and Strategies*. Porto Venere, Italy, 23–27 May 2000. pp. 551–562.
 15. **Fath BD**, Patten BC. 2000. Ecosystem theory: network environ analysis. In: Jørgensen SE, Müller F (eds.) *Handbook of Ecosystem Theories and Management*, CRC Publishers, New York, New York, pp. 345–360.
 14. Patten BC, **Fath BD**. 2000. The network variable in ecology: a partial account of Georgia systems ecology with research sketches from the Okefenokee. In: Barrett GW, Barrett TL, Smith MH (eds.). *Holistic Science: The Evolution of the Georgia Institute of Ecology (1940–2000)*. Gordon and Breach Science Publishers. pp. 168–222.
 13. Osidele OO, Beck MB, **Fath BD**. 2000. A case study in integrating stakeholder concerns with the water sciences. In: *Proceedings of the 7th National Hydrology Symposium of the British Hydrological Society*, University of Newcastle, Newcastle Upon Tyne, England.
 12. Beck MB, **Fath BD**, Rasmussen TC, Patten BC, Porter KG, Norton BG, Steinemann A. 2000. Community values and the long-term ecological integrity of rapidly urbanizing watersheds. Annual Report 2000, US EPA Grant # R825758.
 11. **Fath BD**, Beck MB, Coffin S, Norton BG, Steinemann A. 1999. Integrating community values into scientific models. In: Hatcher KJ (ed.) *Proceedings of the 1999 Georgia Water Resources Conference*, University of Georgia, Athens, Georgia, 30–31 March 1999, pp. 64–67.
 10. Coffin S, **Fath BD**, Beck MB, Norton BG, Steinemann A. 1999. Designing management strategies that integrate stakeholder beliefs and scientific models: a case study of Lake Lanier. In: Hatcher KJ (ed.) *Proceedings of the 1999 Georgia Water Resources Conference*, University of Georgia, Athens, Georgia, 30–31 March 1999, pp. 405–408.
 9. **Fath BD**, Patten BC. 1998. Network orientors: “Utility” as a goal function. In: Müller F, Leupelt M (eds.) *Eco Targets, Goal Functions, and Orientors*, Springer-Verlag, New York, pp. 161–176.
 8. Müller F, **Fath BD**. 1998. Introduction: the physical basis of ecological goal functions—fundamentals, problems, and questions. In: Müller F, Leupelt M (eds.) *Eco Targets, Goal Functions, and Orientors*, Springer-Verlag, New York, pp. 15–18.
 7. Müller F, **Fath BD**. 1998. Introduction: the physical basis of ecological goal functions—an integrative discussion. In: Müller F, Leupelt M (eds.) *Eco Targets, Goal Functions, and Orientors*, Springer-Verlag, New York, pp. 265–289.
 6. Patten BC, **Fath BD**. 1998. Environ theory and analysis: relations between aggradation, dissipation, and cycling in energy—matter flow networks at steady state. In: Ulgiati S, Brown MT, Giampietro M, Herendeen RA, Mayumi K (eds.) *Advances in Energy Studies: Energy Flows in Ecology and Economy*, MUSIS Publisher, Rome, Italy, pp. 483–497.
 5. **Fath BD**. 1998. Network analysis: foundations, extensions, and applications of a systems theory of the environment. *Ph.D. Thesis*. University of Georgia, Athens, Georgia, 176 pp.

4. **Fath BD**. 1998. Analysis of indirect effects in a hydrologic model for use in determining potential primary productivity. *IR-98-008*. IIASA, Laxenburg, Austria.
3. **Fath BD**. 1997. Network utility analysis: a non-thermodynamic constraint to trophic transfer efficiency. *IR-97-047*. IIASA, Laxenburg, Austria.
2. McDonald CA, **Fath BD**, Garrick R. 1994. Greenhouse Gas Emission Inventory for Ohio 1990. Ohio Department of Development, Office of Energy Efficiency, Columbus, Ohio. 153 pp.
1. **Fath BD**. 1993. Trends and projections of fuel energy resources in the republics of the former Soviet Union. *Masters Degree*. Ohio State University, Columbus, Ohio.

Professional Service

Current:

Editor-in-Chief, *Ecological Modelling Journal*. 2009–present.

President, North American Chapter of International Society for Ecological Modelling. 2006–present.

Baltimore County Commission on Environmental Quality (CEQ). 2005–present, Chair 2010–present.

Baltimore County Sustainability Network. 2008–present.

IIASA Day Committee, Worlds within reach from science to policy, 27 -29 June 2012.

Advisory Committee, 4th International EcoSummit: Restoring the planet's ecosystem services, Columbus, Ohio, 30 Sept – 5 Oct 2012.

Scientific Advisory Committee, International Environmental Modelling and Software Society, Leipzig, Germany 1-5 July 2012.

Editorial Board, *The Scientific World Journal*. 2001–present.

Editorial Board, *International Journal of Ecodynamics*. 2004–present.

Section Editor, *Global Change and Climate*, *Encyclopedia of Global Environmental Pollution*, Springer.

Board of Directors, International Environmental Modelling and Software Society. 2004–present.

IIASA, YSSP co-scientific coordinator 2011; DYN-representative, 2008–present.

Journal Reviewer for *Ecological Modelling*, *Ecological Indicators*, *Ecological Complexity*, *Journal of Theoretical Biology*, *Environmental Modelling and Software*, *Journal of Environmental Management*, *Int. J. of Design & Nature and Ecodynamics*, *Acta Biotheoretica*, *Acta Oecologica*, *Energy*, *Industrial & Engineering Chemistry Research*, *EcoHealth*, *Journal of Industrial Ecology*, *Energy Conservation and Management*, *Entropy*, *Nature Knowledge Project*, *Landscape and Urban Planning*, *Landscape Ecology*.

Proposal reviewer for U.S. EPA, U.S. National Science Foundation, European Science Foundation

Past:

Scientific Advisory Committee, ECEM 2011, Riva del Garda, Italy.

Scientific Advisory Committee, ISEM 2011, Beijing, China.

Organizing Committee, ECSA 47 Symposium, Integrative tools and methods in assessing ecological quality in estuarine and coastal systems worldwide, Figueira de Foz, Portugal, September 14-19, 2010.

Organizing Committee, Solutions for Sustaining Natural Capital and Ecosystem Services: Designing Socio-Ecological Institutions, Salzau, Germany. June 8-11, 2010.

Co-Organizer, Viennese Talks on Resilience Research & Networks: New perspectives on growth, development and innovation. Vienna, Austria May 27, 2010.

Organizing Committee, International Society for Ecological Modelling Conference, Quebec City, October 2009.

Scientific and Technical Working Group member, Maryland Climate Change Commission 2007-2008.

Scientific Advisory Committee, 6th European Conf. on Ecological Modelling, Trieste, Italy, 27–30 November 2007.
 Scientific Advisory Committee, 6th Int. Conf. on Ecosystems and Sustainable Development, Coimbra, Portugal, 5–7 September 2007.
 Advisory Committee, Int. Conf. on Ecological Modelling, Yamaguchi, Japan 28 Aug. – 1 Sept. 2006.
 Scientific Advisory Committee, The Sustainable City Conference, Tallinn, Estonia 17–19 July 2006.
 Scientific Committee, Summit on Environmental Modelling and Software, International Environmental Modelling and Software Society, Vermont, USA 9–12 July 2006.
 Organizer, Workshop: Network on Environmental Application, Laxenburg, Austria 19–20 December 2005.
 Associate Editor, Ecological Modelling Journal. 2005–2008.
 Editorial Board, Ecological Modelling Journal. 2000–2005.

Presentations

- 1) *Ecological Network Analysis of Sylt-Rømø Bight Ecosystem*. International Society of Ecological Modelling Conference. Beijing, China, 23 September 2011.
- 2) *Transitions to a low carbon economy*. Beijing Development Area. Beijing, China. 22 September 2011.
- 3) *Publishing high quality papers*. Elsevier Editor's Workshop, Beijing, China. 20 September 2011.
- 4) *How ecological modelling contributes to global change science*. Keynote presentation. International Society of Ecological Modelling Conference. 20 September 2011.
- 5) *Agent based models*. Dream Valley Workshop, IIASA, Laxenburg, Vienna, 11 August, 2011.
- 6) *Ecosystem resilience and the adaptive cycle*. 2nd Viennese Talks on Resilience Research & Networks: New perspectives on growth, development and innovation. Vienna, Austria 26-27 May 2011.
- 7) *Energy as the basis for socio-ecological systems: where we are and where we are headed*. First Presbyterian Church of Towson, April 17, 2011
- 8) *Sustainable Development, ecosystems, and resilience*. Resilience and adaptation to Climate Change Workshop. Vienna, Austria, 21–22 February 2011.
- 9) *Systems Thinking and Simulation*. Teacher workshop for Baltimore Ecosystem Study. Towson University, Towson, Maryland, January 22, 2011.
- 10) *Urban Energy Metabolism using Ecological Network Analysis: Case Study of Four Chinese Cities*. Advances in Energy Studies Workshop. Barcelona, Spain, 19–21 October 2010.
- 11) *Climate crisis, well-being and urban network metabolism*. Beijing development Area, Low Carbon Research Center, Beijing, China. 2 August 2010.
- 12) *Publishing high quality papers*. Elsevier Editor's Workshop, Beijing Normal University, Beijing, China. 2 August 2010.
- 13) *Ecosystem goal functions for environmental management*. Beijing School of Forestry, Beijing, China. 1 August 2010.
- 14) *Socio-Ecological Systems: Flow analysis*. Institute for Social Ecology, University of Klagenfurt, Vienna, Austria. 29 June 2010.
- 15) *Ecological Networks: Complexity and mutualism*. Viennese Talks on Resilience Research & Networks: New perspectives on growth, development and innovation. Vienna, Austria 27 May 2010.
- 16) *Exploration of network evolution through bottom-up and top-down approaches*. International Society for Ecological Modelling Conference. Quebec City, Canada. 5–10 October 2009.
- 17) *Systems Analysis: Ecological Network Analysis*. IIASA seminar, Laxenburg, Austria. 2 July 2009.
- 18) *YSSP Workshop on Applied Systems Analysis*, IIASA, Laxenburg, Austria. 1 July 2009.
- 19) *Interfaces of Integrated Modelling: Improving Socio-Economic-Environmental Models to protect ecosystem services*. Core group lecture, conference on Modelling Ecosystem Services. Lecce, Italy. 26–29 May 2009.
- 20) *Exploring Ecological Complexity*. Invited Seminar on the occasion of Robert Ulanowicz' retirement. Chesapeake Biological Lab, Solomons, Maryland. 16 April 2009.
- 21) Invited Panelist, Towson Clean Energy Panel. Towson Energy Activists student group. 15 April 2009.

- 22) *Energy drives all systems: Where we are and where we are heading*. Invited Speaker, Towson University 1st Annual Environmental Conference, 7 April 2009.
- 23) *Greenhouse gas inventory: overview and workshop objectives*. Towson University Greenhouse Gas Inventory for Educational Institutions. 4 March, 2009.
- 24) *Ecosystem thermodynamics*. Beijing Normal University, Beijing, China. 12 January 2009.
- 25) *Ecosystem thermodynamics: goal functions for environmental management*. Sabbatical presentation, Towson University, Towson, Maryland. 18 November 2008.
- 26) *Comparison of Utility Analysis and Mixed Trophic Impacts*. Emergence of Novelty Workshop. Pacina, Italy 9–15 October 2008.
- 27) *Assessing Ecological Complexity: goal functions and network relations*. Chesapeake Biological Lab Invited seminar, Solomons, Maryland. 1 October 2008.
- 28) *Advances in Energy Network analysis of energy transportation systems: a case study of Eurasian natural gas pipeline model*. Advances in Energy Studies 6th Biennial Workshop: Towards an holistic approach based on science and humanity. Graz, Austria. 29 June – 2 July 2008.
- 29) *Long Term Ecosystem Dynamics: Can theoretical concepts of environmental change help manage ecosystem services?* Ecosystem Services Workshop: Solution for problems or a problem that needs solution? Salzau, Germany. 13–15 May 2008.
- 30) *Global macro-economic, energy and environmental scenarios*. Center for Energy, Environment, and Health Workshop. Roskilde, Denmark. 6–7 February 2008.
- 31) *Cyclic Energy Pathways in Ecological Food Webs*. European Conference on Ecological Modelling. Trieste, Italy. 27–30 November 2007.
- 32) *Marine Ecological Modelling and Assessment of the Baltic Sea Region*. Symposium for Socio-environmental modelling of Baltic Sea. Uppsala, Sweden. 10 November 2007.
- 33) *Complex Ecological Networks: Structural and Functional Regimes*. Center for Complexity Research, University of Vermont, Burlington, Vermont. 29 October 2007.
- 34) *Assessing Journal Quality using Bibliometrics: An editor's perspective*. Elsevier Editor's Conference. Miami, Florida. 20 October 2007.
- 35) *Ecological network analysis: Measuring cycling and indirect mutualism*. Invited Seminar, Environmental Science Department, University of Maryland, College Park, Maryland. 7 September 2007.
- 36) *Energy as the basis for socio-ecological systems: Where we are and where we are headed*. Broadmead Retirement Community, Cockeysville, Maryland. 5 September 2007.
- 37) *Network analysis of critical infrastructures: methodology and case study of natural gas pipeline*. IIASA seminar, Laxenburg, Austria. 27 July 2007.
- 38) *Ecological Network Analysis: Overview for application to BONUS*. EUROGEN: Evolutionary and deterministic methods for design, optimization and control with applications to industrial and societal problems. Jyväskylä, Finland. 13 June 2007.
- 39) *Ecosystem networks: Cyclic pathways and indirect mutualism*. Beijing Normal University, China. 28 May 2007.
- 40) *Identifying Ecological-Economic Relations Using Network Analysis*. 3rd International Eco-Summit, Beijing, China. 25 May 2007.
- 41) *A New Ecology: Systems Perspective*. Workshop on “What is Life?” Pacina, Italy. 12–18 March 2007.
- 42) *Building Sustainable Environmental Partnerships: Where are we and what can we learn from nature*. Trinity Episcopal Church, Towson, Maryland. 25 February 2007.
- 43) *Control and Qualitative System Analysis using Network Analysis*. Invited seminar, Moscow State University, Moscow, Russia, 26 December 2006.
- 44) *Sustainable Ecosystem Patterns*. Modelling Socio-Natural Systems, Stockholm, Sweden, 25 October 2006.
- 45) *Eco-Exergy: Reductionistic or Holistic Approaches*. Advances in Energy Studies: Perspectives on Energy Future, Porto Venere, Italy. 15 September 2006.
- 46) *Exergy in Ecology Background and challenges*. IIASA seminar, Laxenburg, Austria. 9 August 2006.
- 47) *Structural Food Web Regimes*. Ecosystem networks workshop, Copenhagen, Denmark. 7–10 June 2006.

- 48) *Ecosystem Theory to Guide Environmental Management*. International Workshop “The Ecosystem Approach to the Convention on Biological Diversity (CBD) – Between scientific concepts and practical demands” Salzau, Germany. 29–31 May 2006.
- 49) *Ecosystem networks: cyclic pathways and indirect mutualism*. Invited seminar Woods Hole Marine Biological Laboratory, Woods Hole, Massachusetts, 21 March 2006.
- 50) *Distributed Ecological Control*. IIASA DYN-NEA Biologizing Control Theory Workshop, Laxenburg, Austria. 19–20 December 2005.
- 51) *Ecology: the network perspective*. IIASA seminar, Laxenburg, Austria. 15 July 2005.
- 52) *Ecology: the network perspective*. Invited presentation University of New Mexico Biocomplexity seminar, Albuquerque, New Mexico. 15 April 2005.
- 53) *Examining Ecosystem Dynamics using Ecological Goal Functions*. U.S. EPA Workshop on Dynamic Regimes, Cincinnati, Ohio. 10–11 March. 2005.
- 54) *Community Level Relations and Network Mutualism*. Institute of Biological Engineering Annual International Meeting, Athens, Georgia. 4–6 March 2005.
- 55) *Ecosystem Patterns as a Guide for Sustainability*. AAAS Annual Meeting, Symposium on Science and Policy Transformations for Sustainability, Washington, DC. 19 February 2005.
- 56) *Energy Resources: Past, present and future*. Broadmead Continuing Care Retirement Community, Cockeysville, Maryland. 6 January 2005.
- 57) *Network mutualism: Positive community-level relations in ecosystems*. Department Ecology and Environmental Biology, Princeton University, Princeton, New Jersey. 1 December 2004.
- 58) *Ecosystem Growth and Development*. Jozef Stefan Institute seminar series, Ljubljana Slovenia. 4 August 2004.
- 59) *Ecosystems as evolutionary complex systems: A synthesis of two system-theoretic approaches based on Boolean networks*. IIASA seminar, Laxenburg, Austria. 3 August 2004.
- 60) *Ecosystems as evolutionary complex systems: A synthesis of two system-theoretic approaches based on Boolean networks*. International Environmental Modelling and Software Society, Osnabrück, Germany. 14–17 June 2004.
- 61) *Ecosystems as Complex Adaptive Hierarchical Systems: A case for ecological goal functions*. University of Maryland Center for Environmental Sciences, Appalachian Lab, Frostburg, Maryland. 18 September 2003.
- 62) *Ecosystem Growth and Development*. IIASA seminar, Laxenburg, Austria. 1 August 2003.
- 63) *Ecosystems as Complex Adaptive Hierarchical Systems: A Case for Ecological Goal Functions*. University of Venice, Venice, Italy. 16 June 2003.
- 64) *Distributed Control in Ecological Networks*. Workshop on Control of Distributed Systems and Environmental Applications. IIASA, Laxenburg, Austria. 26–27 May. 2003.
- 65) *Ecosystems as Complex Adaptive Hierarchical Systems: A Case for Ecological Goal Functions*. IIASA, Laxenburg, Austria. July 2002.
- 66) *Exergy and Information Indices: A Comparison for Use in Structurally Dynamic Models*. International Environmental Modelling and Software Society Conference on Integrated Assessment and Decision Support, Lugano, Switzerland. 24–27 June 2002.
- 67) *Short- and Long-Term Environmental Perceptions: A case study of Lake Lanier*. International workshop: Vulnerability of water quality in intensively developing urban watersheds. Athens, GA. March 2001.
- 68) *Ecosystems as Complex Adaptive Hierarchical Systems: A Case for Ecological Goal Functions*. U.S. EPA Sustainability Seminar Series. Cincinnati, Ohio. March 2001.
- 69) *Network analysis: foundations and applications of a systems theory of the environment*. Swiss Federal Institute for Environmental Science and Technology. Zurich, Switzerland. October 2000.
- 70) *Integrating models with stakeholder preferences of water quality indicators*. European Forum on Integrated Environmental Assessment Policy Workshop on Integrated Management of Water Resources. Paris, France. October 2000.

- 71) *Stakeholder preferences of water quality parameters: A case study of Lake Lanier, Georgia.* 2nd International Eco-Summit: Integrating the Sciences. Halifax, Canada. 18–24 June 2000.
- 72) *Network thermodynamic analysis: formulation and unification of ecological goal functions.* Advances in Energy Studies: Exploring Supplies, Constraints, and Strategies. Porto Venere, Italy. 23–27 May 2000.
- 73) *Network synergism in economic input-output models: existence and limitations of the invisible hand.* Advances in Energy Studies: Exploring Supplies, Constraints, and Strategies. Porto Venere, Italy. 23–27 May 2000.
- 74) *Network thermodynamic analysis: formulation and unification of ecological goal functions.* School of environmental science, engineering & policy. Drexel University, Philadelphia. April 2000.
- 75) *Integrated environmental assessment: water resources case study and network analysis.* Great Lakes Environmental Research Laboratory. Ann Arbor, Michigan. October 1999.
- 76) *Reconciling uncertainty using short and long-term management strategies.* European Forum on Integrated Environmental Assessment: Workshop on Uncertainty. Baden, Austria. July 1999.
- 77) *Integration of stakeholder values and scientific models in management strategies.* National Conference on Environmental Decision Making. Knoxville, Tennessee. 3–6 May 1999.
- 78) *Integrating community values into scientific models.* Georgia Water Resources Conference. Athens, Georgia. 30–31 March 1999.
- 79) *Network analysis applied to large-scale ecosystems.* International Society for Ecological Modeling and Ecological Society of America Conference. Baltimore, Maryland. July 1998.
- 80) *Analysis of indirect effects in a hydrologic model for use in determining potential primary productivity.* International Institute of Applied Systems Analysis, Laxenburg, Austria. August 1997.
- 81) *Network synergism as an ecological goal function.* Goal Functions Workshop. Salzau, Germany. 30 August – 4 September 1996.
- 82) *Network synergism: why nature is more “green” than “red in tooth and claw.”* 1st International Eco-Summit. Copenhagen, Denmark. 19–23 August 1996.

Co-author* delivered presentations

- Scharler U*, Fath BD. *Network mutualism in ecological and trophic networks.* International Society for Ecological Modelling Conference. Quebec City, Canada. 5–10 October 2009.
- Brady PA*, Fath BD. *Greenhouse gas inventories for Baltimore County and County Government Operations.* USEPA 18th International Greenhouse Gas Inventory Conference, Baltimore, Maryland April 2009.
- Berkower C*, Fath B, Haines S, Boucher L, Mangurian L. *Improving science learning through a faculty partnership.* 7th Annual Lilly Conference on College and University Teaching-East, Towson, Maryland April 2, 2004 (supported by NSF grant #0227325).
- Masters B*, Fath B. *Inquiry-based science course for non-science majors.* 8th Annual Lilly Conference on College and University Teaching-East, Towson, MD April 1, 2005 (supported by NSF grant #0227325).
- Borrett SR*, Fath BD, Patten BC. *Determinants of Pathway Proliferation in Ecological Networks.* Ecological Society of America, Portland, Oregon, August 1–7 2004.
- Patten BC*, Fath BD. *Ecological network analysis: weak links and indirect effects in food webs.* Ecological Society of America Conference, Savannah, Georgia, August 4–7, 2003.
- Borrett SR*, Fath BD, Patten BC. *Investigating Pathway Proliferation in Ecological Networks.* Ecological Society of America, Tucson, Arizona, August 4–9, 2002.
- Pawlowski CW*, Fath BD, Mayer AL, Cabezas H. *Towards a sustainability index using information theory.* UNESCO conference, Sustainable development of energy, water and environment systems. Dubrovnik, Croatia, 2–7 June, 2002.

Grants/Funding

- International Institute for Applied Systems Analysis, Research Scholar. June – August 2011.
 International Institute for Applied Systems Analysis, Research Scholar. June – August 2010.

European Masters in Applied Ecology, September 2009 – July 2011.
Towson University, Travel Grant International Society for Ecological Modelling Conference. Quebec City, Canada. 5–10 October 2009. \$850 (partial funding – hotel and per diem paid for by ISEM).
 International Institute for Applied Systems Analysis, Research Scholar. June – August 2009.
 International Institute for Applied Systems Analysis, Research Scholar. January – August 2008.
Towson University. Travel Grant. Ecosystem Services Workshop, Salzau, Germany. 12–15 May 2008. \$461.
Towson University. Travel Grant. Symposium for Socio-environmental modelling of Baltic Sea. Uppsala, Sweden. 9–13 November 2007. \$1100.
 International Institute for Applied Systems Analysis, Research Scholar. June – August 2007.
Towson University. Travel Grant. 3rd International Eco-Summit. Beijing, China. 21–28 May 2007. \$1502 (partial funding – airfare paid by IIASA).
Towson University Travel Grant. Advances in Energy Strategies Workshop. Porto Venere, Italy. 11–17 September 2006. \$800 (partial funding – airfare paid by IIASA).
 International Institute for Applied Systems Analysis, Research Scholar. June – August 2006.
 International Institute for Applied Systems Analysis, Research Scholar. June – August 2005.
Towson University. Summer Research Stipend. 2005.
 International Institute for Applied Systems Analysis, Research Scholar. June – August 2004.
National Science Foundation. Vertically Integrated Partnerships. 2003–2007.
 International Institute for Applied Systems Analysis, Research Scholar. June – August 2003.
Towson University. Summer Research Stipend. 2003.
Towson University. Proposal Preparation Grant. 2002.
Oak Ridge Institute for Science and Education. Postgraduate Research Program. 2000.
United States Environmental Protection Agency. National Network for Environmental Management Studies Fellowship. 1995–1997.
National Science Foundation. International Institute for Applied Systems Analysis, YSSP program. 1997.
University of Georgia. Franklin College Doctoral Dissertation Fellowship. 1997–1998.
The Ohio State University. University Fellowship. 1990–1991.

Honors

Keynote Speaker at International Society of Ecological Modelling Conference. 20 September 2011.
Regents Award for Outstanding Scholarship. University System of Maryland. 2011.
Deputy Director 2010-2012, Beijing Development Center, Low Carbon Research Center, Beijing, China.
 State of Maryland Proclamation from Governor O'Malley for participation in Scientific and Technical Working Group of Maryland Commission on Climate Change. 30 September 2009.
Guest Professor 2009-2014, School of Environment, Beijing Normal University, Beijing, China.
Excellence in Scholarship Award, Fisher College of Science and Mathematics, Towson University. 2005.
Early Career Research Excellence Award (natural systems) from International Environmental Modelling and Software Society. 2004.
 Georgia Water Resources Conference. Co-author **best student paper**. 1999.
 Young Summer Scientist Program. **Peccei Award Finalist**. 1997. International Institute for Applied Systems Analysis.
 University of Georgia. **Best student paper**. 1996. Institute of Ecology. Graduate student symposium.
 University of Georgia. **Outstanding Graduate Teaching Assistant Award Finalist**. 1996. Institute of Ecology.
 Ohio State University. **Sigma Xi**. University Graduate Fellowship.
 Miami University. **Phi Beta Kappa**. University Honors. Departmental Honors in Physics and Aeronautics. Sigma Pi Simga. Alpha Lambda Delta/Phi Eta Sigma. Miami University Marching Band percussion section leader.

Collaborators

Robert Ayres, INSEAD, Fontainebleau, France
 Bhavik Bakshi, Ohio State University, Columbus, Ohio
 Simone Bastianoni, University of Siena, Siena, Italy.
 Pat Brady, Maryland Department of Environment, Annapolis, Maryland.
 Stuart Borrett, Biology Department, UNC-Wilmington, North Carolina.
 Bruce Beck, School of Forest Resources, University of Georgia, Athens, Georgia.
 Mark Brown, Environmental Engineering Sciences, University of Florida, Gainesville, Florida.
 John Casti, International Institute for Applied Systems Analysis, Laxenburg, Austria.
 Heriberto Cabezas, Sustainable Environments Branch, U.S. Environmental Protection Agency, Cincinnati, Ohio.
 Bin Chen, School of the Environment, Beijing Normal University, Beijing, China.
 Jae Choi, Dalhousie University, Halifax, Nova Scotia, Canada.
 Marko Debeljak, Jozef Stefan Institute, Ljubljana Slovenia.
 Kevin de Laplante, Philosophy Dept, Iowa State University, Ames, Iowa.
 William Grant, Ecological Systems Laboratory, Texas A&M University, College Station, Texas.
 Geir Halmes, Dept. of Biometry and Engineering, SLU, Uppsala, Sweden.
 Jill Jäger, Sustainable Europe Research Institute, Vienna Austria.
 Sven Jørgensen, Royal Danish School of Pharmacy, Copenhagen, Denmark.
 Harald Katzmair, FAS.research, Vienna, Austria
 Arkady Kryazhinsky, Steklov Mathematical Institute, Russian Academy of Sciences, Moscow, Russia.
 Hans Liljenström, Dept. of Biometry and Engineering, SLU, Uppsala, Sweden.
 João Marques, Institute of Marine Resources, Coimbra University, Coimbra, Portugal.
 Christopher Miller, St. Leo University, San Antonio, Florida.
 Felix Müller, Ecology Center, University of Kiel, Kiel, Germany.
 Søren Nielsen, Pharmacy College, Copenhagen, Denmark.
 Bryan Norton, School of Public Policy, Georgia Institute of Technology, Atlanta, Georgia.
 Roberto Pastres, Physical Chemistry Department, University of Venice, Venice, Italy.
 Bernard Patten, Institute of Ecology, University of Georgia, Athens, Georgia.
 Rute Pinto, Institute of Marine Resources, Coimbra University, Coimbra, Portugal.
 Elena Rovenskaya, Mathematics Department, Moscow State University, Moscow, Russia.
 Ursula Scharler, Marine Biology, University of KwaZulu-Natal, Durban, South Africa.
 John Schramski, Engineering Dept, University of Georgia.
 Todd Swannack, Ecological Systems Laboratory, Texas A&M University, College Station, Texas.
 Meirong Su, School of the Environment, Beijing Normal University, Beijing, China.
 Robert Ulanowicz, Chesapeake Biological Laboratory, University of Maryland, Solomons, Maryland.
 Sergio Ulgiati, Parthenope University of Naples, Naples, Italy.

Student Research Advisees

Carly Dean (Towson University). Graduate Thesis Advisor, 2011–present
 Ashley Anthony (Towson University). Undergraduate Research Student, 2011.
 Jing Dai (China). Young Scientist Summer Program. IIASA, Summer 2011.
 Huayi Lin (Sweden). Young Scientist Summer Program. IIASA, Summer 2011.
 Olli Lehonten (Finland). Young Scientist Summer Program. IIASA, Summer 2010.
 Muhammad Amjad (Pakistan). Young Scientist Summer Program. IIASA, Summer 2010.
 Catilin White (Towson University). Undergraduate Honors Student, 2011.
 Lauren Cutlip. (Towson University). Undergraduate Research Student, 2010.
 Meirong Su (Beijing Normal University). Post-doc supervisor, Fall 2009.

Oswaldo Villena (Towson University). Graduate Thesis Advisor, 2008–2010.
 Min Hong (Chinese Academy of Sciences). Young Scientist Summer Program. IIASA, Summer 2009.
 Vasilis Dakos (Wageningen University). Young Scientist Summer Program. IIASA, Summer 2009.
 Christine Kujath (Towson University). Undergraduate Research Student. 2009.
 Helena Verissimo (University of Coimbra, Portugal). co-Ph.D. advisor, Spring 2010 TU.
 Pat Brady (Towson University). Graduate Thesis Advisor, 2007–2008.
 James McNerney (Boston University). Young Scientist Summer Program. IIASA, Summer 2008.
 Jung-Chen Huang (Ohio State University). Young Scientist Summer Program. IIASA, Summer 2008.
 Theresa Black (Towson University). Graduate Thesis Advisor, 2006–2007
 Bess Caplan (Towson University). Graduate Thesis Advisor, 2005–2006
 Mike Hansen (Towson University). Undergraduate Research Student. 2002–2004.
 Megan Killian (Towson University). Undergraduate Research Student, 2004–2006.
 Megan McCormick (Towson University). Undergraduate Research Student, 2006.
 Dan Fiscus (Center for Environmental Science, Appalachian Lab, Frostburg, MD). Ph.D. committee.
 Geir Halnes (Swedish Agricultural Institute, Uppsala). Young Scientist Summer Program. IIASA, Summer 2005.
 co-Ph.D. advisor.
 Rute Pinto (University of Coimbra, Portugal). Exchange student, Fall 2004. co-M.S. advisor.
 Islam Khater (Egypt). Young Scientist Summer Program. IIASA, Summer 2004.

Past Experience

Research

Assistant Professor, Department of Biological Sciences, Towson University. 2001–2006.
 Environmental Scientist. U.S. EPA. 2000–2001. Ecologist on interdisciplinary team in Sustainable Environments Branch, applying information theory, ecological goal functions, and biological indicators to **quantify environmental sustainability**.
 Post-doctoral Research Fellow. University of Georgia. 1998–2000. *Coordinator and modeler for the Lake Lanier EPA-NSF Water and Watersheds project*. **Responsible for integration of ecological, hydrological, and social sciences** using ecosystem modeling and survey data concerning community values to develop a more effective method of adaptive environmental assessment and management.
 Ph.D. University of Georgia. 1994–1998. *Network analysis: Foundations, extensions, and applications of a systems theory of the environment*. **Designed a framework to model large-scale ecological networks** and developed theorems for a qualitative analysis of component interactions.
 International Institute of Applied Systems Analysis (IIASA), Laxenburg, Austria. 1997. *Young Summer Scientist Program*. **Developed hydrological model of an agricultural ecosystem** and applied network analysis to quantify the indirect effects.
 Ohio Department of Development, Office of Energy Efficiency, Columbus, Ohio. 11/1992–6/1994. *Policy Development Specialist*. Promoted energy efficiency initiatives for the **Ohio Energy Strategy**, helped develop an Ohio Home Energy Rating System, and began **Ohio's greenhouse gas inventory**.
 Masters Degree. Ohio State University. 1990–1993. *Trends and projections of fuel energy resources in the republics of the former Soviet Union*. **Modeled energy production trends of fossil fuel resources** for the republics of the former Soviet Union.
 NASA Lewis Research Center, Cleveland, Ohio. 1990. *Intern*. **Created initial model to analyze three-dimensional electromagnetic field** around the International Space Station.