

LUCINDA B. JOHNSON

Natural Resources Research Institute
University of Minnesota Duluth
5013 Miller Trunk Highway
Duluth, MN 55811-1442
218.720.4251
ljohnson@d.umn.edu

Education

Doctor of Philosophy, Department of Zoology, Michigan State University, 1999. "Ecological implications of coarse woody debris in low gradient Midwestern streams."
Master of Science, Department of Entomology, State University of New York, College of Environmental Science and Forestry, 1984. "An evaluation of biological assessment of water quality using stream macroinvertebrates."
Bachelor of Arts, Duke University, 1976. Botany.

Professional Experience

Director and Senior Research Associate, Center for Water and the Environment, Natural Resources Research Institute, University of Minnesota Duluth, 1/2010.
Interim Director and Senior Research Associate, Center for Water and the Environment, Natural Resources Research Institute, 1/2009-12/2009.
Founding Fellow, Institute on the Environment, University of Minnesota, January 2007.
Associate Director and Sr. Research Associate, Center for Water and the Environment, Natural Resources Research Institute, 2003-present.
Acting Director, Center for Water and the Environment, Natural Resources Research Institute, 2002-2003.
Assistant Director, Center for Water and the Environment, Natural Resources Research Institute, 1990 to 2002.
Graduate Faculty, Department of Biology, University of Minnesota Duluth, 1999-present.
Graduate Faculty, Water Resources Science Program, University of Minnesota, 2000-present.
Graduate Faculty, Stream Restoration Certificate Program, University of Minnesota, 2006 to present.
Research Assistant, Department of Fisheries and Wildlife, Department of Entomology, Michigan State University, East Lansing, MI, September 1994-1995.
Geographical Information System Manager, Natural Resources Research Institute, Duluth, MN. 1987-1991.
Assistant Research Biologist, Illinois Natural History Survey, Champaign, IL. 1985 – 1987.
Research Assistant, Project Coordinator, Department of Biology, Colgate University, Hamilton, NY. 1982-1985. Studies on the effects of environmental parameters on growth and reproduction on biological systems.
Instructor, Colgate University January Term, 1985. "Human Ecology of the Southwest" at Ghost Ranch Conference Center, Abiquiu, NM. Concurrently served as *Dean of Students* and *Ecologist* at Ghost Ranch.
Laboratory Coordinator, Department of Biology, Colgate University, Hamilton, NY. 1980-1982.

Grants and Contracts (Total \$20.8 million)

- GLEI-II Indicator Testing and Refinement.* Environmental Protection Agency, Great Lakes National Program Office (GLRI-GLIC). Principal Investigator (PI) with Co-PIs: G. Niemi, E. Reavie, V. Brady, R. Axler, G. Host; subawards to J. Ciborowski, University of Windsor and N. Danz, University of Wisconsin-Superior. \$ 1,625,769. 8/1/2010 to 7/31/2013.
- Ecological Design for the St Louis River Area of Concern.* U.S. Fish and Wildlife Service. PI with Co-PIs: V. Brady, G. Host, G. Niemi, T. Brown. \$143,980. 8/1/2010 to 9/30/2011.
- Landscape Metrics for Coastal Wetland Integrity Indices.* PI. U.S. Geological Survey. \$64,330. 8/1/2009 to 9/30/2011.
- Managing the Nations Fish Habitat at Multiple Spatial Scales in a Rapidly Changing Climate,* Kansas Cooperative Research Unit (U.S. Geological Survey, prime.) \$2.25M total (\$268,928 to LBJ). PI: Craig Paukert, Co-PIs: L. Johnson and 11 others.
- Minnesota's Water Resources: Impacts of Climate Change-Phase II.* Legislative and Citizen's Commission on Minnesota's Resources. \$300,000. PI, with R. Axler, R. Newman, H. Stefan, R. Skaggs, V. Card. 7/2007–6/2010.
- Predicting impacts of development on Lake Superior North Shore streams using high resolution GIS spatial data.* Minnesota Sea Grant, PI with R. Axler, T. Hollenhorst, D. Breneman, \$79,000. 2/2007 – 2/2009.
- Impacts of Water Resources from Climate Change.* Legislative and Citizen's Commission on Minnesota's Resources. \$250,000. PI, with R. Axler, R. Newman, H. Stefan, R. Skaggs, V. Card. 6/2006-6/2009.
- Restoring Instream and Riparian Habitat in Lake Superior's Lester-Amity Watershed.* National Fish and Wildlife Federation (Great Lakes National Program Office, Environmental Protection Agency is prime). \$35,000. 1/2006-12/2008.
- Assessing the Condition of Great Rivers using Benthic and Planktonic Algal Indicators,* Co-PI with E. Reavie. Environmental Protection Agency. 10/2005 to 09/2010. \$840,000.
- An Integrated Habitat Classification and Map of the Lake Erie Basin.* National Fish and Wildlife Federation (Great Lakes National Program Office, Environmental Protection Agency (prime). PI with Jan Ciborowski, Scudder Mackey, Ric Lawson. 10/2004 – 9/2007. \$128,278.
- Assessing the condition of Lake Superior's rocky coastlines.* Co-PI, with Valerie Brady. Minnesota Sea Grant. 4/2005 – 6/2008. \$80,000 plus 2 yr RA.
- Evaluation of DNR Aquatic Vegetation Surveys: Data Summaries and Comparative Analysis.* MN Department of Natural Resources. PI, with George Host. 5/25/04 – 12/15/05. \$60,000.
- Development of a Risk Assessment Plan for Acadia National Park.* PI. U.S. Geological Survey 8/01/2004 – 7/30/2008. \$65,000.
- Effects of multiple stressors on aquatic communities.* Environmental Protection Agency, STAR Program 2003-2006. Co-PI with P. Schoff, G. Guntenspergen. \$746,433.
- Testing Indicators of Coastal Ecosystem Integrity Using Fish and Macroinvertebrates,* Environmental Protection Agency, 2001-2005. PI with C. Richards, J. Schuldt, J. Ciborowski. \$893,628. Subproject of: Development of Environmental Indicators of Condition, Integrity, and Sustainability in the Great Lakes Basin, G. Niemi, PI \$6,000,000.
- Protocols for Selecting Classification Systems and Reference Conditions: A Comparison of Methods.* Environmental Protection Agency. 2001-2004. Co-PI with J. Schuldt, J. Ciborowski, G. Host, C. Richards. \$747,404 (plus \$250,000 cash university match).
- Identifying the Sources of Coliform Bacteria in Coastal Ecosystems and Their Relationship to Land Use.* Minnesota Sea Grant, 2001-2003. Co-PI with R. Hicks, M. Sadowsky. \$95,460.
- Critical Elements of Brook Trout Habitat in Lake Superior.* Minnesota Sea Grant, 2001-2003. Co-PI with J. Schuldt. \$60,000, plus 2 yrs RA.

Effects of Forest Fragmentation on Community Structure and Metapopulation Dynamics of Amphibians. Environmental Protection Agency, 1999-2002. PI with C. Johnson. \$769,623.

Environmental factors that influence amphibian community structure and health as indicators of ecosystem integrity. University of Illinois (Environmental Protection Agency prime). 1997-2000. PI. \$520,281 (Total grant \$1,299,991).

Predicting Water and Forest Resources Health and Sustainability. Legislative Commission on Minnesota's Resources. 1999-2001 \$300,000 Co-PI, with J. Hanowski, C. Richards, G. Host.

Development and evaluation of multi-scale mechanistic indicators of regional landscapes. Environmental Protection Agency. 1997-2000. \$925,000. Co-PI, with C. Richards, G. Host.

*In situ characterization of ultraviolet and visible light in *Rana pipiens* (leopard frog) habitats*. Environmental Protection Agency. 1998-1999. \$200,000. PI, with R. Axler.

Lake Superior Basin Land Use Decision Support. Minnesota Department of Natural Resources (Environmental Protection Agency prime) 1997-2000. \$525,620. Co-PI, with G. Host, C. Richards.

Quantifying coaster brook trout habitat for evaluating potential watersheds for reintroduction. Minnesota Sea Grant. 1998-2000. \$96,350. Co-PI, with C. Richards.

Evaluating riparian area dynamics, management alternatives and impacts of harvest practices. Minnesota Forest Resources Council. 1996-2000. \$106,471. Co-PI, with J. Perry, others.

Development of ecological criteria in Midwestern watersheds. Environmental Protection Agency. 1993-1996. \$499,702. Co-PI, with C. Richards, G. Host.

Development of biocriteria for regional watersheds through integrated landscape and reach-scale analyses. Environmental Protection Agency. 1991-1993. \$248,000. Co-PI, with C. Richards, G. Host.

Analyzing the role of forested wetlands in mitigating effects of upland forest harvest on stream water quality. 1992-1993. North Central Forest Experiment Station. 1992-1993. \$22,808. PI, with C. Richards.

St. Louis River database development. Legislative Commission on Minnesota's Resources (subcontracted from Arrowhead Regional Development Corporation). 1992-1993. \$21,741. PI.

Temperance River watershed study-Phase I. Superior National Forest, 1991-1992. \$10,000. Co-PI, with G. Host.

Toimi Opportunity Area Assessment. Superior National Forest, 1991-1992. \$5,300. Co-PI, with G. Host.

Geographic Information Systems for Spatial Analysis and Landscape Design in Natural Resource Management: A Computer Demonstration Using Black Bear. Ottawa National Forest and North Central Forest Experiment Station, U.S. Forest Service. 1990-1991. \$3,500. Co-PI, with G. Host.

Refereed Publications

Schotthoefer, A.M., J.R. Rohr, R.A. Cole, A.V. Koehler, C.M. Johnson, **L.B. Johnson**, and V.R. Beasley. 2010. Effects of wetland and landscape variables on parasite communities of *Rana pipiens*: links to anthropogenic change. *Ecological Applications*, *in press*.

Johnson, L.B. and G.E. Host. Recent developments in landscape approaches for the study of aquatic ecosystems. *Journal of the North American Benthological Society* 25th Anniversary Issue 29(1): 41-66.

Merten, E.C., N.A. Hemstad, S.L. Eggert, **L.B. Johnson**, R.K. Kolka, R.M. Newman, and B. Vondracek. 2009. Relations between fish abundances, summer temperatures, and forest harvest in a northern Minnesota stream system from 1997 to 2007. *Ecology of Freshwater Fish*. *In press*.

Hutchens, J.J. Jr., J.A. Schuldt, C. Richards, **L.B. Johnson**, G.E. Host, and D.H. Breneman. 2009. Multi-scale mechanistic indicators of stream macroinvertebrates. *Ecological Indicators* 9:1138-1150.

Rohr, J.R., A.M. Schotthoefer, T.R. Raffel, H.J. Carrick, N. Halstead, J.T. Hoverman, C.M. Johnson, **L.B. Johnson**, C. Lieske, M.D. Piwoni, P.K. Schoff, V.R. Beasley. 2008. Agrochemicals increase trematode infections in a declining amphibian species. *Nature* 455(7217): 1235-1239.

- Hollenhorst, T., T. Brown, G.E. Host, **L.B. Johnson** and J.J.H. Ciborowski. 2007. A Multiscale Watershed Approach to Indicator Development for Coastal Ecosystems of the Great Lakes. *J. Great Lakes Res.* 33 (Special Issue 3):13-26.
- Bhagat, Y., Ciborowski, J.J.H., **Johnson, L.B.**, Brady, V., Breneman, D., Schuldt, J., Hrabik, T., Richards, C., Uzarski, D., and Burton, T. 2007. Testing a fish index of biotic integrity for Great Lakes coastal wetlands: stratification by plant zones. *J. Great Lakes Research* 33 (Special Issue 3): 224-235.
- Brady, V., J. Ciborowski, J. Holland, N. Danz, **L. Johnson**, D. Breneman, J. Gathman, T. Hrabik, J. Schuldt. 2007. Optimizing fishing time: One vs. two night fyke net sets in Great Lakes coastal systems. *J. Great Lakes Research* 33 (Special Issue 3):236-244.
- Kang, M., J.J.H. Ciborowski, **L.B. Johnson**, T. Hrabik, C. Richards, and J. Schuldt. 2007. The relationship between anthropogenic disturbance and the distribution of a nonindigenous species, *Echinogammarus ischnus* Stebbing, 1898 (Amphipoda: Gammaridae), at Great Lakes coastal margins. *J. Great Lakes Res.* 33 (Special Issue 3):198-210.
- Brazner, J.C., N.P. Danz, A.S. Trebitz, G.J. Niemi, R.R. Regal, T. Hollenhorst, G.E. Host, E.D. Reavie, T.N. Brown, J.M. Hanowski, C.A. Johnson, L.B. Johnson, R.W. Howe, J.J.H. Ciborowski. 2007. Responsiveness of Great Lakes Wetland Indicators to Human Disturbances at Multiple Spatial Scales: A Multi-Assemblage Assessment. *Journal of Great Lakes Research* 33 (Special Issue 3): 42-66.
- Brazner, J.C., N.P. Danz, G. J. Niemi, R. R. Regal, A. S. Trebitz, R. W. Howe, J. M. Hanowski, **L. B. Johnson**, J. J. H. Ciborowski, C. A. Johnston, E. D. Reavie, V. J. Brady, and G. V. Sgro. Evaluating geographic, geomorphic and human influences on Great Lakes wetland indicators: multi-assemblage variance partitioning. *Ecological Indicators* 7(2007):610-635.
- Boone, R.B., C.J. Johnson, and **L.B. Johnson**. 2006. Simulating vernal pool hydrology in central Minnesota, USA. *Wetlands* 26:581-592.
- Boone, R.B., C.M. Johnson and **L.B. Johnson**. 2006. Simulating wood frog movement in central Minnesota USA using a diffusion model. *Ecological Modeling* 198:255-262.
- Danz, N.P., G.J. Niemi, R.R. Regal, T. Hollenhorst, **L.B. Johnson**, J.M. Hanowski, R.P. Axler, J.J.H. Ciborowski, T. Hrabik, V.J. Brady, J.R. Kelly, J.C. Brazner, R.W. Howe, G.E. Host. Integrated Measures of Anthropogenic Stress in the U.S. Great Lakes Basin. *Environmental Management* 39:631-647.
- Johnson, L.B.**, G.E. Host, C. Richards, J. H. Olker. 2006. Landscape and local scale predictors of wood abundance in low gradient streams. Pages 151-174, In: Hughes, R.M., L. Wang, P.W. Seelbach, Editors. *Landscape Influences on stream habitats and biological assemblages*. American Fisheries Society Symposium 48, Bethesda, Maryland.
- Hollenhorst, T., G. Host, and **Johnson, L.B.** 2006. Scale Effects in Mapping Riparian Zones in Agricultural Landscapes. Chapter 15, in: *Scaling and Uncertainty Analysis in Ecology: Methods and Applications*. Springer, The Netherlands.
- Schomberg, J., Host, G.E. **Johnson, L.B.**, and Richards, C. 2005. Evaluating the influence of landform, surficial geology, and land use on streams using hydrologic simulation modeling. *Aquatic Sciences* 67(4):528-540.
- Host, G.E., J.A. Schuldt, J.J.H. Ciborowski, **L.B. Johnson**, T.P. Hollenhorst, and C. Richards. 2005. Use of GIS and remotely sensed data for *a priori* identification of reference areas for Great Lakes coastal ecosystems. *International Journal of Remote Sensing* (Special Issue on Estuarine Ecosystem Analysis) 26(23):5325-5342.
- Danz, N.P., R.R. Regal, G.J. Niemi, V.J. Brady, T. Hollenhorst, **L.B. Johnson**, G.E. Host, J.M. Hanowski, C.A. Johnston, T. Brown, J. Kingston, and J.R. Kelly. 2004. Environmentally stratified sampling design for the development of Great Lakes environmental indicators. *Environmental Monitoring and Assessment* 102:41-65.

- Schoff, P. K., C. M. Johnson, A. M. Schotthoefer, C. Leiske, **L. B. Johnson**, and V. R. Beasley. 2003. Current prevalence of malformed frogs: estimations based on collections from randomized sites. *Journal of Wildlife Diseases* 39:510-521.
- Elosegi, A. and **L.B. Johnson**. Wood in Rivers in Developed Landscapes. 2003. Pages 337-354, *In: S. V. Gregory, K. B. Staley and A. Gurnell, editors. The Ecology and Management of Wood in World Rivers*. American Fisheries Society. Symposium 37, Bethesda, Maryland.
- Johnson, L.B.**, D. Breneman, C. Richards. 2003. Macroinvertebrate community structure and function associated with large wood in low gradient agricultural streams. *River Research and Applications* 19(3):199-218.
- Peterson, G. S., **L. B. Johnson**, R. P. Axler, and S. A. Diamond. 2002. Assessment of the Risk of Solar Ultraviolet Radiation to Amphibians II: *In Situ* Characterization of Exposure in Amphibian Habitats. *Environmental Science and Technology* 36:2859-2865.
- Johnson, C.M., **L.B. Johnson**, C. Richards, V. Beasley. 2002. Predicting the occurrence of amphibians: an assessment of multiple-scale models. Chapter 12, *In: J.M. Scott, et al. Predicting Issues of Scale and Accuracy*, Island Press. 868 pp.
- Richards, C. and **L.B. Johnson**. 1998. Landscape perspectives on ecological risk assessment. *In: M.C. Newman and C. Strojjan (eds). Risk Assessment: Logic and Measurement*. Ann Arbor Press.
- Johnson, L.B.** and J.D. Allan (editors). 1997. Special Applied Issue Section: Advances in Catchment-Scale Analyses of Aquatic Ecosystems. *Freshwater Biology* 37(1).
- Johnson, L.B.** and S.H. Gage. 1997. Landscape approaches to the analysis of aquatic ecosystems. *Freshwater Biology* 37:113-132.
- Johnson, L.B.**, C. Richards, G.E. Host and J.W. Arthur. 1997. Landscape influences on water chemistry in Midwestern stream ecosystems. *Freshwater Biology* 37:193-208.
- Richards, C., R.J. Haro, **L.B. Johnson** and G.E. Host. 1997. Catchment and reach-scale properties as indicators of macroinvertebrate species traits. *Freshwater Biology* 37:219-230.
- Richards, C., **L.B. Johnson**, and G.E. Host. 1996. Landscape-scale influences on stream habitats and biota. *Can. J. Fish. Aq. Sci.* 53 (Suppl 1):295-311.
- Johnson, L.B.** 1990. Analyzing spatial and temporal phenomena using geographical information systems: A review of ecological applications. *Landscape Ecology*. 4:31-43.
- Hoffman, R.A., **L.B. Johnson**, M.K. Vaughn and R.J. Reiter. 1989. Interaction of Harderian glands, illumination and temperature on growth and thyroid hormones in golden hamsters. *J. Comp. Endocrinol.* 158:697-702.
- Hoffman, R.A., **L.B. Johnson** and R.J. Reiter. 1988. Regulation of melatonin in the Harderian gland of golden hamsters. *J. Pineal Res.* 6:63-71.
- Kokoska, S. and **L.B. Johnson**. 1987. A comparison of statistical techniques used to analyze growth curves. *Growth* 51:261-269.
- Hoffman, R.A., **L.B. Johnson**, M.K. Vaughn, and R.J. Reiter. 1987. Influence of diet on photoperiod-induced gonadal regression in female hamsters. *Growth* 51:385-396.
- Johnson, L.B.** and R.A. Hoffman. 1985. Interaction of diet and photoperiod on growth and reproduction in male golden hamsters. *Growth* 49:380-399.
- Hoffman, R.A. and **L.B. Johnson**. 1985. Effect of photic history and illuminance levels on male golden hamsters; Possible pineal involvement. *J. Pineal Res.* 2:209-215.
- Hoffman, R.A., **L.B. Johnson**, and G.M. Brown. 1985. Growth and development in the golden hamster: Influence of the pineal gland, melatonin, and photic input. Chapter 42, *In: The Pineal Gland: Endocrine Aspects*, G.M. Brown and S.C. Wainright (eds). Pergamon Press, NY.
- Hoffman, R.A., **L.B. Johnson**, and R. Corth. 1985. The effects of spectral power distribution and illuminance levels on key parameters in the male golden hamster and the rat. *J. Pineal Res.* 2:217-233.
- Hoffman, R.A., **L.B. Johnson** and R.J. Reiter. 1985. Harderian glands of golden hamsters: Temporal and sexual differences in immunoreactive melatonin. *J. Pineal Res.* 2:161-168.

Ghent, A.W., R. Singer, and **L. Johnson-Singer**. 1978. Depth distribution with SCUBA and associated studies of the freshwater unionid clams, *Elliptio complanata* and *Anodonta grandis* in Lake Bernard, Ontario. Can. J. Zool. 56:1654-1663.

Other publications:

- Niemi, G.J., and L.B. Johnson Editorial – A Scientists’ Dream – a Conservation Easement for 187,277 Acres of Forest. St. Paul Pioneer Press, May 4, 2009.
- Ciborowski, J.J.H., G.J. Niemi, V.J. Brady, S.E. Doka, L.B. Johnson, J.R. Keough, S.D. Mackey, and D.G. Uzarski. 2009. Ecosystem responses to regulation-based water level changes in the Upper Great lakes. White paper for the International Joint Commission. Upper Great lakes Water Level Regulation Study.
- Niemi, G. J., Brady, Valerie J., Brown, Terry N., Ciborowski, Jan J. H., Danz, Nicholas P., Ghioca, Dana M., Hanowski, JoAnn M., Hollenhorst, Tom P., Howe, Robert W., Johnson, Lucinda B., Johnston, Carol A. and Reavie, Euan D. 2009. Development of ecological indicators for the U.S. Great Lakes coastal region -A summary of applications in Lake Huron. Aquatic Ecosystem Health and Management 12(1)77-89.
- Johnson, L.B., D. Breneman, R. Hell. 2008. Lake Superior’s Coastal Ecosystems: How “Pristine” Are They? Lake Superior Angler. 2008.
- Kling, G., Hayhoe, K. **L. Johnson**, J. Magnuson, S. Polasky, S. Robinson, B. Shuter, M. Wander D. Wubbles, D. Zak. 2003. Confronting Climate Change in the Great Lakes Region. Sustaining the Ecology and Well Being of Our North American Heartland. Union of Concerned Scientists and Ecological Society of America.
- Carlidge, T., Larson, Lawson, L., Wyatt, M., **Johnson, L.B.**, Host, G. and Trauger, A. A Land Planning Primer for Lake Superior Basin Communities. [CD to be distributed to citizens involved in land use planning in the Lake Superior Basin and is deliverable of the Lake Superior Decision Support Project.]
- Host, G. E., **L. B. Johnson**, C. Richards, and P. Collins. 2000. Geographic information and tools for informed decisions: The Lake Superior Decision Support Project. In: Environmental Problem Solving with Geographic Information Systems 1994 and 1999 Conference Proceedings. Environmental Protection Agency Document Number EPA/625/R-00/010. 11 p.
- Allan J.D. and **L.B. Johnson**. 1997. Catchment scale analysis of aquatic ecosystems. Freshwater Biology 37:107-112.
- Richards, C., **L. B. Johnson**, G. Host. 1995. Using GIS to identify linkages between landscapes and stream ecosystems. Pp 131-141, In: National Conference on Environmental Problem-Solving with Geographic Information Systems, September 21-23, 1994, Cincinnati, Ohio. EPA/625/R-95/004.
- Johnson, L.B.** and C. Richards. 1992. Investigating landscape influences on stream macroinvertebrate communities. Water Resources Update 87:41-48.
- Johnson, L.B.** 1993. Ecological analyses using geographical information systems. Pp. 26 -38, In: Special Publication of the Oklahoma Museum of Natural History. Norman, Oklahoma.
- Johnson, L.B.**, G.E. Host, J.K. Jordan, and L.L. Rogers. 1991. Use of GIS for landscape design in natural resource management: Habitat assessment and management for the female black bear. Pp. 507 -515, In: Proceedings of GIS/LIS '91, Atlanta, GA.
- Johnson, L.B.**, C.A. Johnston, and J. Pastor. 1988. Raster and vector data in ecological research applications. Pp. 386-394, In: Proceedings of GIS/LIS'88, San Antonio, TX, November 30-December 3, 1988.

Manuscripts in revision or review:

Baghat, Y., J.J.H. Ciborowski, L.B. Johnson and J.Olker. A multivariate approach to determining fish assemblages associated with reference condition and anthropogenically disturbed areas at great lakes coastal margins. For Ecological Applications.

- Breneman, D., **Johnson, L.B.**, A. Ly, and C.M. Johnson. Macroinvertebrate communities in vernal pools in northern Minnesota: effects of forest fragmentation. For Journal of the North American Benthological Society.
- Kang, M., J.J.H. Ciborowski, J.C. Brazner, R.W. Howe, L.B. Johnson, C.A. Johnston, G.J. Niemi, E.D. Reavie, and A.S. Trebitz. Native-nonindigenous species biodiversity relationships, dominance, and propagule pressure trends of taxa of Laurentian Great Lakes coastal margins-niche versus neutral processes. For Ecology.
- Moore, S. A., Richards, C. R., **Johnson, L.B.** Linking Lake Superior tributary fish assemblages and life history characteristics to their habitats and landscapes. For Transactions of the American Fisheries Society.
- Olker, J.H., **L.B. Johnson**, R.P. Axler, C.A. Johnson. Ultraviolet Radiation Dose to *Rana sylvatica* (Wood Frog) in Vernal Pools in Northern Minnesota: A case study. For Conservation Biology
- Rohweder, A.K., J. H. Olker, **L.B. Johnson**, G.R. Guntenspergen, T.P. Hollenhorst, and P.K. Schoff. Wetland atrazine concentrations and occurrence of testicular oocytes in *Rana pipiens* from randomly-selected sites in the prairie pothole region. For Environmental Health Perspectives
- Sandberg, J. J.G., J. A. Schuldt, **L.B. Johnson**. Nearshore Macrobenthic Communities of Nipigon Bay, in Relation to Depth, Substrate Type, and Habitat Utilization by Coaster Brook Trout. For Transactions of the North American Fisheries Society.

Manuscripts in preparation:

- Breneman, D., **L.B. Johnson**, J.A. Schuldt, V. Brady, J.J.H. Ciborowski, G.E. Host. Comparison of fish communities in reference and non-reference coastal Great Lakes wetlands. For Canadian Journal of Fisheries and Aquatic Sciences
- Ciborowski, J.J.H., J. Schuldt, **L.B. Johnson**, G. Host, C. Richards and T. Hollenhorst. Reference conditions, degraded areas, stressors, and impaired beneficial uses: conceptual integration of approaches to evaluating human-related environmental pressures. For Ecological Applications
- Guntenspergen, G., J. Olker and **L. Johnson**. Predicting the persistence of amphibians in the Prairie Pothole Region under a changing climate. For Global Change Biology.
- Johnson, C., **Johnson, L.B.**, and Richards, C. Indicators of agricultural impacts on Midwestern wetlands: local versus landscape perspectives. For Wetlands.
- Johnson, C.A., **L.B. Johnson**, and J.H. Olker. Recruitment, dispersal and movement patterns of wood frogs (*Rana pipiens*) in a fragmented landscape.
- Johnson, L.B.**, J. Olker, R. P. Axler, R. Newman, R. Skaggs, H. Stefan, V. Card, K. Schenider, K. Blumenfeld, F. Dadaser-Celik, E. Ruzycki, J. Henneck. Water chemistry and fish assemblages: trends in Minnesota (USA) lakes with changing climate. For: Special issue: Journal of the North American Society
- Johnson, L.B.**, Ciborowski, J.J.H., Host, G.E., Brady, V.B. Landscape indicators of condition in nearshore areas of the Great Lakes. For Freshwater Biology
- Schoff, P.K., J. Olker, L. B. Johnson, G. Guntenspergen and C. Johnson. Predicting the distribution of amphibian malformations from landscape and local environmental data.
- Schoff, P.K., J. Olker, L. B. Johnson, G. Guntenspergen, and C.A. Johnson. Predicting the location of malformation “hot spots” from landscape and local scale data.

Theses and Technical Reports

- Johnson-Singer, L.B.** 1984. An evaluation of biological assessment of water quality using stream macroinvertebrates. MS thesis, State University of New York, College of Environmental Science and Forestry, Syracuse, NY, 76 pp.
- Johnson, L.B.** 1987. General Aquatic Ecology. Pp. 63-68, In: D.W. Webb (ed), Current and Selected Bibliographies on Benthic Biology. North American Benthological Society Bulletin.

- Johnson, L.B.** 1988. General Aquatic Ecology. Pp. 59-65, In: D.W. Webb (ed), Current and Selected Bibliographies on Benthic Biology. North American Benthological Society Bulletin.
- Johnson, L.B.** 1989. General Aquatic Ecology. Pp. 65-73. In: D.W. Webb (ed.) Current and Selected Biographies on Benthic Biology. North American Benthological Society.
- Johnson, L.B.** 1990. General Aquatic Ecology. Pp. 68-74. In: D.W. Webb (ed.) Current and Selected Biographies on Benthic Biology. North American Benthological Society.
- Johnson, L.B.** and W.U. Brigham. 1987. Using a Geographical Information System to optimize site selection for the Superconducting Supercollider in Illinois. Interim Report. Department of Energy and Natural Resources, State Natural History Survey Division, 37 pp.
- Johnson, L.B.,** J.A. Westman, J. Keyport, C. Richards, and G. Host. 1994. Integrating landscape and stream community data using geographic information system. Verh. Internat. Verein. Limnol. (Abstract).
- Richards, C., F. Kutka, G. Host and **L. Johnson.** 1994. Stream habitat assessment across regional landscapes: A comparison of techniques. Verh. Internat. Verein. Limnol. (Abstract).
- Richards, C., **L. Johnson,** and G. Host. 1993. Landscape influences on habitat, water chemistry, and macroinvertebrate assemblages in Midwestern stream ecosystem. Report to the Environmental Protection Agency. August, 1993. NRRI Technical Report No. TR-93-109.
- Johnson, L.B.** G.E. Host, C. Richards and R. Haro. 1998. Subregional variation in the Index of Biological Integrity: Quantifying the effects of geology and land use. NRRI Technical Report # NRRI/TR-98/23.
- Johnson, L.B.** G. E. Host and C. Richards. 1998. Hierarchical influences of channel, riparian, and landscape features on coarse woody debris in low-gradient, Midwestern stream. NRRI Technical Report NRRI/TR-98/24.
- Perry, J., C. Blinn, M.K. Fox, B. Palik, J. Mattson, M. Thompson, S. Verry, **L. Johnson,** C. Richards, R. Newman, E. Merten, R. Dahlman, and P. Emerson. 1998. Evaluating riparian area dynamics, management alternatives, and impacts of harvest practices. Final Report to Minnesota Forest Resources Council.
- Johnson, L.B.** 1999. Ecological implications of coarse woody debris in low gradient, Midwestern streams. PhD Dissertation. Michigan State University, East Lansing, MI. 211 pp.
- Perry, J., R. C. Blinn, R. Newman, N. Hemstad, E. Merten, K. Fredrick, M.K. Fox, B. Palik, J. Mattson, M. Thompson, S. Verry, **L. Johnson,** C. Richards, K. Stroom, J. Schomberg, R. Dahlman, P. Emerson. 2001. Evaluating riparian area dynamics, management alternatives, and impacts of harvest practices. Final Report of Part II, to Minnesota Forest Resources Council.
- Johnson, C. M., **L.B. Johnson,** J. Murphy, and V. Beasley. 2001. Evaluation of the potential effects of methoprene and Bti on anuran malformations in Wright County, MN. Submitted to: Scientific Review Panel, Metropolitan Mosquito Control District. NRRI Technical Report # NRRI/TR-2001/01.
- Richards, C. Hutchens, J.J., **Johnson, L.B.,** Host, G., and Schuldt, J. 2002. Multi-scale mechanistic indicators of stream integrity using macroinvertebrates. NRRI Technical Report TR/2002/18.

Selected Presentations-Symposia and Invited Seminars

- Johnson, L.B. 1990. GIS for Water Quality Assessment. Understanding Your Water Quality Data Workshop. February 1990. Brainerd, MN and Duluth, MN.
- Johnson, L.B. 1991. GIS for natural resource management and planning. National Council for Geographic Education, October 1991.
- Johnson, L.B. 1991. Analyzing spatial and temporal phenomena using geographic information systems. American Society of Mammalogists, June 1991.
- Johnson, L.B. 1991. Introduction to GIS. Presentation to the International Joint Commission's Council of Great Lakes Research Managers, Racine, WI. July 1991.

- Johnson, L.B. 1992. GIS and remote sensing in aquatic research applications. Special Symposium speaker. North American Benthological Society, May 1992. (*Symposium organizer*)
- Johnson, L.B., C. Richards, G.E. Host. 1993. Relationship between landscape patterns and stream habitat structure in the Saginaw River Watershed. Lake Huron Basin Symposium, Windsor, Ontario.
- Johnson, L.B., J. A. Westman, C. Richards, G. Host, and T. Aunan. 1994. Geographic information systems as important tools for watershed assessment. Minnesota Water '94, Minneapolis, MN.
- Johnson, L.B., C. Richards, C. Hagley and F. Kutka. 1994. Influence of landscape factors in mitigating effects of upland harvest on stream water quality. Ecosystem Management Strategies for the Lake Superior Region. Duluth, MN.
- Johnson, L.B. 1995. A landscape perspective for analyzing aquatic ecosystems. Plenary Session Presentation, North American Benthological Society.
- Johnson, L.B., G. Host, R. Haro and C. Richards. Predicting in-stream characteristics in agricultural catchments from landscape factors. American Society of Limnology and Oceanography; Aquatic Sciences Meeting, February 1997.
- Johnson, L.B. The influence of landscape context on stream water quality, habitats and communities. Forest Landscape Ecology Seminar. University of Wisconsin, Madison. November 13, 1996.
- Johnson, L.B., G.E. Host, R.J. Haro and C. Richards. 1997. Influence of landscape factors on coarse woody debris dynamics in Midwestern streams. University of Windsor, Department of Biology. March 21, 1997.
- Johnson, L.B. C. Richards, G.E. Host and R.J. Haro. 1997. Hierarchical organization as a framework for examining coarse woody debris in low-gradient, Midwestern streams. North American Benthological Society, Special Symposium.
- Johnson, L.B. GIS for Environmental Management and Planning. TECHNOBOTHNIA Polytechnic Institute, Vaasa, Finland. September 8, 1999.
- Johnson, L.B. The Influence of Landscape Context on Stream Ecosystem Structure and Function. Nordic Benthological Meeting, September 9-12, 1999. Jyvaskyla, Finland. *Plenary Speaker*.
- Johnson, L.B. Amphibian Community Structure and Health: Does Landscape Context Matter? U.S.G.S. Biological Resources Division, Patuxent Wildlife Research Center, October 5, 1999.
- Johnson, L.B. Amphibian Community Structure and Health: Does Landscape Context Matter? University of Rhode Island, November 1999.
- Johnson, L.B., Predicting Coarse Woody Debris Abundances from Landscape and Local Factors. Midwest Fisheries and Wildlife Conference, December 7-9, 1999. Chicago, IL.
- Johnson, L., Beasley, V, Richards, C., Johnson, C., Murphy, J., Lieske, C., Schotthoefer, A., Cole, R., Cope, R., Mateus-Pinilla, N., Piwoni, M., and Schoff, P. Environmental Factors that Influence Amphibian Community Structure and Health as Indicators of Ecosystem Integrity. Ecosystem Indicators STAR Grants Progress Review Meeting. U.S. Environmental Protection Agency, Region 8 Conference Facility, Las Vegas, NV, May, 2000.
- Johnson, L.B. Woody Debris in Midwestern Stream: Structure and Function. Wood in World Rivers Conference, Corvallis, OR. October, 2000.
- Johnson, L.B. Terrestrial-Aquatic Linkages. Identifying indicators for Midwestern Streams. Department of Civil Engineering, University of Minnesota. October 2000.
- Johnson, L.B. Influence of landscape versus local scale factors on wood in low gradient streams. "Pattern and process in aquatic ecosystems: How patches and networks affect ecosystem function." International Association of Landscape Ecology, Tempe Arizona. March 2001.
- Johnson, L.B., N. Hempstad, J. Schomberg, K. Stroom and R. Newman. Effects of Two Forest Harvest Regimes on Fish Communities, Coarse Particulate Organic Matter and Large Woody Debris. Invited symposium: Second Annual Forest Ecology Workshop, Duluth, MN. June 23 -23, 2001.
- Johnson, L.B. Is wood a significant component of agricultural stream ecosystems? Department of Biology, Michigan Technological University, November 2, 2001.

- Johnson, L.B. Great Lakes Environmental Indicators Project: Fish and Invertebrate Indicators. Workshop on Bioassessment. Kellogg Biological Center, MI. November, 2001.
- Johnson, L.B. Great Lakes Environmental Indicators: Fish and Invertebrate Indicators. Great Lakes Fisheries Commission, Duluth, MN. Jan. 2002.
- Johnson, L.B. Great Lakes Environmental Indicators Project: an Overview. Lake Superior Binational Executive Committee, Duluth MN, Jan. 2002.
- Schoff, P.K., et al. The Prevalence of malformed frogs in the Upper Midwest. ASTM. Special Conference on Frog Malformations. Pittsburgh, PA. April 2002.
- Johnson, L.B. Great Lakes Environmental Indicators, Site Selection and Site Characterization Framework. Lake Erie Millennium Plan Conference, Windsor, Ontario. June 2002.
- Johnson, L.B. Great Lakes Environmental Indicators: Fish and Invertebrates as Indicators of Nearshore conditions. MN Department of Natural Resources, Fisheries Division Research Meeting. July 2002.
- Johnson, L.B., J. Schuldt, G. Host, C. Richards, J. Ciborowski. Protocols for selection of reference systems and reference conditions: A comparison of methods. EPA STAR Progress Review Meeting, Denver, CO. September 2002.
- Johnson, L.B., T.P. Hollenhorst, and G. Host. Scale effects in mapping riparian zones in agricultural landscapes. Workshop on Scaling and Uncertainty, Tempe Arizona, October 2002.
- Johnson, L.B., et al., Development of Environmental Indicators of Condition, Integrity, and Sustainability in the Great Lakes Basin (GLEI) Using Fish and Invertebrates. Great Lakes National Program Office. Chicago, IL, May 2004.
- Johnson, L.B., et al., Development of Environmental Indicators of Condition, Integrity, and Sustainability in the Great Lakes Basin (GLEI). Region 5 Environmental Protection Agency, Chicago, IL, July 2004.
- Johnson, L.B., et al. Developing effective and relevant indicators of condition for nearshore coastal waters of the Great Lakes. Invited seminar. Water Resources Program, University of Minnesota, Twin Cities campus. September, 2004.
- Johnson, L.B., et al. Developing indicators of condition of nearshore coastal waters of the Great Lakes. Invited seminar, Environmental Protection Agency, MidContinent Ecology Division, October 2004.
- Johnson, L.B. et. al., Developing Indicators of Aquatic Ecosystem Condition from Landscape and Biotic Data. Invited seminar, Department of Biology, UMD, November, 2004.
- Johnson, L.B., J.J.H. Ciborowski, N. Danz, G. Host, G. Niemi, R. Regal, T. Hollenhorst, T. Brown, V. Brady, J. Schuldt. Quantifying the Human Disturbance Gradient for the Coastal Great Lakes. Invited presentation, South East Water Pollution Biologists, November, 2004.
- Johnson, L.B., et al. Developing indicators of condition of nearshore coastal waters of the Great Lakes. Invited seminar, Environmental Protection Agency, Office of Water, December 2004.
- Johnson, L.B., G. J. Niemi, R. P. Axler, V. Brady, J. M. Hanowski, G. E. Host, R. W. Howe, C.A. Johnston, E. Reavie, R. R. Regal, C. Richards, J. Schuldt, D. L. Swackhamer. Identifying Reference Areas and Developing Indicators of Coastal Ecosystem Conditions in the Great Lakes. Invited presentation. Surface Water Information and Monitoring (SWIMS) Conference, Chicago, IL, February 2005.
- Johnson, L. B., D. Breneman, V. Brady, J. Ciborowski, Y. Baghat. Indicators of water quantity and quality. Invited Presentation, Sustainable Water Resources Roundtable, Ann Arbor, MI. April 5,6, 2005.
- Johnson, L. B., D. Breneman, V. Brady, G. E. Host, T. Hollenhorst, J. J. H. Ciborowski, J. Holland, J. Schuldt, C. Richards. Identifying Reference Conditions In Highly Disturbed Coastal Great Lakes Wetlands. Invited symposium, North American Benthological Society, May 2005.
- Johnson, L.B., V. Brady, Y. Bhagat, J. Ciborowski, D. Breneman, J. Schuldt, T. Hrabik. Developing Indicators Using Coastal Macroinvertebrate and Fish Assemblages in Lake Michigan and the Other Great Lakes. Invited Presentation. Lake Michigan State of the Lake Conference. December, 2005.

- Johnson, L.B., V. Brady, Y. Bhagat, J. Ciborowski, D. Breneman, J. Schuldt, T. Hrabik. Identifying Reference Sites in Great Lakes Coastal Areas. Invited presentation, EMAP-Great Rivers Reference Condition Workshop, Cincinnati, OH. January 10-12, 2006.
- Johnson, L.B. Linking Water to the Land: What have we learned in 20 years? Department of Biology, University of Minnesota Duluth, Duluth, MN, February 2006.
- Johnson, L.B. Development of Environmental Indicators of Condition, Integrity, and Sustainability In the Great Lakes Basin. Invited seminar. University of Windsor Biology Department, Windsor, Johnson, L.B., J.J.H. Ciborowski, S. Mackey, T. Hollenhorst, N. Danz, G.E. Host. Quantifying Anthropogenic Stressors in the Lake Erie Basin. Invited Presentation. Fourth Biennial Conference of the Lake Erie Millennium Network. 28 February – 2 March, 2006, Windsor, Ontario. February 3, 2006.
- Johnson, L.B. Great Lakes in a Changing Climate. Minnesota DNR Wildlife School. October 9-10, 2006.
- Johnson, L.B. Great Lakes in a Changing Climate. Minnesota DNR Parks and Recreation Annual Meeting, March 9, 2007.
- Johnson, L.B., T. Hollenhorst, N. Danz, G. Host, J. Ciborowski, C. Richards, V. Brady, G.J. Niemi. Quantifying Stress-Response Relations in Aquatic Landscapes. Minnesota Pollution Control Agency, invited seminar. June, 14, 2007.
- Johnson, L.B., G.J. Niemi, et al. The Great Lakes Environmental Indicators Project. Invited briefing to Minnesota Pollution Control Agency Department Heads in Monitoring and Assessment Division. October 17, 2007.
- Johnson, L.B. Climate change impacts in Minnesota. Minnesota Water Conference Special event on Climate change sponsored by Will Steger. October 2007.
- Johnson, L.B., T. Hollenhorst, N. Danz, G. Host, J. Ciborowski. Quantifying Threats to Midwest Glacial Lakes, Rivers and Wetlands. Glacial Lakes Partnership Annual Project meeting, Midwest Fish and Wildlife Conference, Madison, WI, December 11, 2007
- Johnson, L.B., G.R. Guntenspergen, J.H. Olker, W. C. Johnson, P. Schoff. Predicting effects of climate change on amphibians from Prairie Pothole Wetlands. Symposium. Midwest Fish and Wildlife Conference, Madison, WI, December 10, 2007.
- Johnson, L.B. Climate Change: What does it mean for Wisconsin? Presentation to Douglas County Board, January 17, 2008.
- Johnson, L.B. and R.P. Axler. Measuring Effectiveness. Keynote talk at: Workshop on Impaired Waters Effectiveness Monitoring. St. Paul, MN. February 11-12, 2008.
- Johnson, L.B., J. Pastor, G.R. Guntenspergen, J.H. Olker, W. C. Johnson, P. Schoff. Impacts of Climate Change on Northern Ecosystems. Special Symposium. Air Water Waste 2008. Bloomington, MN. February 27, 2008.
- Johnson, L.B., T. Hollenhorst, G. Host, J. Ciborowski, G. Niemi, N. Danz. Multivariate summary of loadings and watershed weightings. International Joint Commission Workshop. Nonpoint Nutrient Loadings and Nearshore Ecosystem Behavior. March 17-19, 2008. Toledo, Ohio.
- Johnson, L.B. Climate change and Minnesota's Natural Resources. Invited Presentation to Minnesota Coastal Zone Management Board. May, 2008.
- Johnson, L.B. Effects of climate change and anthropogenic stressors on amphibians. Invited seminar. University of North Carolina Greensboro, April
- Johnson, L.B. Climate change and Minnesota's aquatic ecosystems. Science Museum of Minnesota, Thursday Evening Lecture Series. Exploring Water. April 9, 2009.
- Johnson, L.B. Effects of climate change and anthropogenic stressors on amphibians. Invited seminar. J.W. Jones Ecological Research Center, Newton, GA. April, 2009.
- Johnson, L.B. Climate change and Minnesota's Aquatic Resources. Symposium. Minnesota Waters, Rochester, MN May 2009.
- Johnson, L.B. G.R. Guntenspergen, J.H. Olker, W. C. Johnson, P. Schoff. Multiscale approaches for quantifying effects of multiple stressors in aquatic communities. Symposium, North American Benthological Society Annual Meeting, May 2009. Grand Rapids, MI.

- Johnson, L.B. Adapting to climate change in Minnesota. Invited presentation to Minnesota Pollution Control Agency-Committee to evaluate Adaption to climate change in Minnesota. September 1, 2009.
- Johnson, L.B. 2009. Are climate conditions changing? How can we tell? Invited presentation, Lake Superior Binational Forum. Duluth, MN
- Johnson, L.B. 2010. Land use and land use change impacts on aquatic ecosystems. Invited presentation. MN Headwaters Council, Minnesota's Water Sustainability Framework. Minneapolis, MN March 31, 2010.
- Johnson, LB. et al. 2010. Impacts on Minnesota's Water Resources from climate change. Symposium. North American Benthological Society, June, 2010. Santa Fe.

Teaching/mentoring:

- Post Doctoral Fellow: Catherine Johnson, 1999-2001.
Roger Haro (co-supervisor with Carl Richards)
John Hutchens (co-supervisor with Carl Richards)
- Graduate Students Advised: Jennifer Olker, University of Minnesota, PhD
Jennifer Milan, UMD Biology. MS spring 2003
John Sandberg, UMD Biology. MS winter 2005
Terri Jicha, UMD Biology. MS Spring 2008
Brian Black, Integrated Biological Systems, MS expected winter 2010
Jeremy Erickson, Water Resources Program, MS Expected, fall 2009

Graduate Student Committee:

- Wendy Heib, Water Resources Program. MS 2004
Yakuta Baghat, University of Windsor, Biology, MS 2005
Angela Rohweder, UMD Biology, MS, fall 2009
Eric Merten, PhD, completed, spring, 2009

- Classes Taught: Landscape Ecology (2 credits) co-taught with G. Host, spring 2000
Landscape Ecology (3 credits) co-taught with G. Host and T. Hollenhorst, fall 2004, 2006, 2008
Wetland Ecology (3 credits), co-taught with V. Brady, fall 2005, 2007
Stream Ecology, co-taught with D. Breneman, fall, 2010

Lectures:

- 2005, 2006, 2007 Scientific Writing
2002 Stream Ecology (Geomorphology, River Continuum)
2000, 2001 Conservation Biology (Amphibian Malformations)
2000, 2001, 2002, 2004 Northern Stream Ecosystems and the Angler (Stream Insects, I, II)
1999 Limnology (Introduction to Landscape Ecology)
1998 Stream Ecology (Organic Matter Processing)
EnviroVet (Introduction to Landscape Ecology)

Invited workshops/panels:

- 2009 Lessard Outdoor Heritage Council Strategic Plan, Grand Rapids, MN, August 2009.
- 2009 International Joint Commission Upper Great Lakes Water Level Study, Ecological Effects Peer Review Panel, Detroit, MN, July 22, 2009.
- 2009 Environmental Protection Agency. Planning for Lake Superior's Intensive Year Sampling, Duluth, MN, May 2009.

- 2009 Groundwater Sustainability, Part II. Freshwater Society and Water Resources Center, St. Paul, MN. May 12, 2009.
- 2009 The Nature Conservancy Modeling Climate Change Impacts in Forest Ecosystems. Natural Resources, Research Institute, Duluth, MN, April 21, 2009.
- 2009 International Joint Commission, Upper Great Lakes Modeling workshop, Detroit, MI, April 3, 2009.
- 2008 International Joint Commission, Nonpoint Nutrient Loadings and Nearshore Ecosystem Behavior. March 17-19, 2008. Toledo, Ohio.
- 2008 Groundwater Sustainability Workshop I. Freshwater Society and Water Resources Center, ST. Paul, MN November 11, 2008.
- 2007 Glacial Lakes Partnership. Madison, WI, December 11, 2007.
- 2005 National Science Foundation Review Panel, Field Station and Marine Lab Facilities.
- 2005 Human Disturbance Gradient, Tiered Aquatic Life, Washington, DC, March 14-15.
- 2004 Bayesian Beliefs Network-Domain Expert for Sediment Impacts on Stream Ecosystems, December 13-15, 2004, Washington D.C. Sponsored by National Center for Ecological Research, Environmental Protection Agency.
- 2004 Human Disturbance Gradient, Tiered Aquatic Life, Region 3 EPA, November 2-4.
- 2004 External review of the SOLEC Indicators. Detroit, MI, January 27-28, 2004.
- 2002 Workshop on Scaling and Uncertainty, Tempe Arizona, October 17-19.
Lake Erie Millennium Plan, Habitat Classification Workshop Planning. Windsor, Ontario. June 16-17.
- 2001 Workshop on Bioassessment. Kellogg Biological Center, MI. November.
- 1997 Evaluating the Increase of Amphibian Malformations. Rapporteur. U.S. Environmental Protection Agency, Shenandoah National Park, April 15-16.
- 1997 National Wildlife Health Center, Amphibian Deformities: Strategic Planning Workshop, Madison, WI. March 13, 14.
- 1996 U.S. Environmental Protection Agency Workshop on Central North American Amphibian Deformities, Duluth, MN. September 25-26.
- 1994 Workshop on Ecosystem Management Strategies for the Lake Superior Region, Duluth, MN. May.
- 1993 Technical Workshop on EMAP indicators for Great Lakes Coastal Wetlands, Duluth, MN. November.
- 1993 Development of Biological Criteria for Wetlands-EMAP Program. Environmental Protection Agency. Duluth, MN. December 10-12.

Workshops conducted:

- 1992 Use of GIS and Remote Sensing for Wildlife Habitat Assessment, co-organizer. MN GIS/LIS Conference.
- 1990 Co-instructor: Workshop on geographic information systems: basic concepts and applications. Fifty-second Midwest Fish and Wildlife Conference.
- 1990 Introduction to ARC/INFO, (one week class), UM Twin Cities, Department of Ecology, Evolution, and Behavior and UM Duluth. July, September.
- 1990 Introduction to ARC/INFO, December 17-19. Brainerd, MN.
- 1989 Introduction to ARC/INFO (one week class), UM, Twin Cities, Department of Department of Ecology, Evolution, and Behavior, October, December.

Professional Service/Appointments

President, North American Benthological Society

President, Association of Ecosystem Research Centers, 2008-2010.
NEON Domain Science and Education Coordinating Committee (Domain 5)
Healing our Waters Great Lakes Coalition Technical Advisory Committee
Editorial Board, Landscape Ecology, 2003-present.
Advisor to Minnesota Pollution Control Agency on climate change issues 2004 to present
International Joint Commission Upper Great Lakes Water Level Study, Environmental Effects, 2008 -
2009
Secretary, North American Benthological Society, 2002-2008.
Reviewer, EPA: Causal Analysis Diagnosis Information System, 2007.
Tiered Aquatic Life Uses (Disturbance Gradient) Technical Team, Environmental Protection Agency,
Office of Water, Biocriteria Division, 2005-present.
National Science Foundation Marine Lab and Field Station Panel, July 2005.
Riparian Science Technical Team, State of Minnesota, 2004 to present.
Ad Hoc Journal Reviewer:
American Fisheries Society
ASTM Special Publications
BioScience
Canadian Journal of Fisheries and Aquatic Sciences
Conservation Biology
Ecological Society of America
Environmental Management
Journal of Environmental Quality
North American Benthological Society
Transactions of the American Fisheries Society

Ad Hoc Proposal Reviewer:

Minnesota Water Resources Program
National Science Foundation
Natural Environment Research Council (United Kingdom)
US EPA STAR
USDA-National Research Initiative

Curriculum Committee, Water Resources Graduate Program, 2000 to 2004.
Admissions Committee, Water Resources Graduate Program, 2004 to present.

University Committees:

Provost's Committee "Evaluating the Institute of the Environment" 2006
College of Science and Engineering-Development of the Data Visualization Center-1998
Department of Biology, UMD-Ecologist 1998
Department of Biology, UMD-Insect ecologist 1999
Department of Biology, UMD-Plant morphologist 1997
Department of Biology, UMD-Post-doctoral associate, 2001
NRRI-Research associate (multiple)-2000
NRRI-Database coordinator-2000
NRRI-Remote sensing specialist-2000
NRRI-Principal administrative specialist-2002

Professional Affiliations

American Women in Science

Ecological Society of America
International Association of Landscape Ecologists
International Society of Limnology
North American Benthological Society-secretary 2002 to 2005.
Photogrammetric Engineering and Remote Sensing
Sigma Xi-Chapter vice president and president 1989-91
Society of Conservation Biology

Special Training

BMDP Advanced Data Analysis Workshop, May 1985.
Remote Sensing Workshop, CALMIT, University of Nebraska, Lincoln, May 1988.
ARC/INFO, April 1989.
Scan Data Capture, GIS/LIS, Orlando, 1989.
Geostatistics, June 24-29, 1994.

Other Professional Service/Activities

Program Committee, Society of Conservation Biology, Duluth, MN 2003.
Local Arrangements Committee, Society of Conservation Biology, Duluth, MN, 2003.
Local Arrangements Committee, North American Benthological Society, Duluth, MN 1999.
Plenary speaker, Nordic Benthological Meeting, September 9-12, 1999. Jyväskylä, Finland.
Facilitator-*Treasures Under Pressure-The Future of Northeastern Minnesota Lakes*, Grand Rapids, MN.
September 1998.
Co-editor with J.D. Allan, *Advances in Catchment-Scale Analyses of Aquatic Ecosystems*. Special Issue
Freshwater Biology 37(1). 1997.
Co-organizer, Plenary Session and Special Symposium, "Landscape Influences on Watersheds," North
American Benthological Society, May 1995.
Co-chair, International Association of Landscape Ecology conference, Minneapolis, MN, 1995.
Co-organizer Special Symposium "Use of GIS and Remote Sensing in Aquatic Research Application,"
North American Benthological Society, 1992.
Minnesota GIS/LIS Steering Committee 1988-1994.
Technical Advisory Committee, St. Louis River Board, 1992-1994.
Vice-president and president, Sigma Xi Chapter at the University of Minnesota, Duluth, 1990-1991.
Co-chair, 52nd Midwest Fish and Wildlife Conference, GIS Workshop, December 1990.
Planning Committee and Moderator, Minnesota GIS/LIS-Growth through Cooperation 1990 Conference.
North Shore Management Board Technical Advisory Committee, 1987-1989.
Co-Organizer Special Symposium "Spatial and Temporal Analysis Using Geographical Information
Systems," Ecological Society of America, 1988.
Member, Madison County Environmental Management Council and Environmental Advisory Committee,
1985.
Instructor, Colgate University Computer Center, 1984, 1985. Workshops on BMDP and RS-1 for research
applications.