

## RESUME

### PATRICK L. BREZONIK

#### Current Position and Contact Information

Professor of Environmental Engineering  
Department of Civil Engineering,  
500 Pillsbury Dr. SE  
University of Minnesota  
Minneapolis, MN 55455  
(612) 625-0866; [brezonik@umn.edu](mailto:brezonik@umn.edu)

#### PERSONAL RECORD

Date and place of Birth: July 17, 1941; Sheboygan, Wisconsin  
Marital Status: Married, wife's first name, Carol; two adult sons

#### EDUCATION

1963 Marquette University, Milwaukee, Wisconsin, B.S., Chemistry and Mathematics  
1965 University of Wisconsin, Madison, Wisconsin, M.S., Water Chemistry  
1968 University of Wisconsin, Madison, Wisconsin, Ph.D., Water Chemistry

#### EMPLOYMENT

1966-1970 Assistant Professor, Department of Environmental Engineering Sciences,  
University of Florida, Gainesville  
1970-1976 Associate Professor, Environmental Engineering Sciences, University of Florida  
1971-1972 NSF Faculty Fellow and Guest Professor, EAWAG-ETH, Zurich, Switzerland  
1976-1981 Professor, Environmental Engineering Sciences, University of Florida  
1980 Guest Professor, summer quarter, EAWAG-ETH, Zurich, Switzerland  
1981- Professor, Department of Civil Engineering, University of Minnesota  
1984- Member of graduate faculty in Ecology  
1985-2003 Director, Water Resources Center  
1991-1995 Director of Graduate Studies, Water Resources Science graduate minor  
1995-9; 2001-3 Founding Director of Graduate Studies, interdisciplinary Water Resources Science Graduate  
Program (M.S. and Ph.D.)  
2004-2007 Program Director, Environmental Engineering, National Science Foundation  
2005-2007 Program Manager, NSF Major Research Equipment and Facilities Program, WATERS  
Network Initiative

#### PROFESSIONAL SOCIETIES

American Chemical Society  
American Society of Limnology and Oceanography  
Association of Environmental Engineering Science Professors  
International Humic Substances Society  
North American Lake Management Society  
International Society of Limnology

#### PROFESSIONAL ACTIVITIES

American Chemical Society: *Environmental Science and Technology*, member of editorial board, 1973-1978;  
assoc. editor for special issue in honor of Werner Stumm, 1998.  
American Society of Civil Engineers: co-chair, second annual Environmental Engineering Division Confer-  
ence; Gainesville, Florida, July 1975.  
American Society of Limnology and Oceanography: *Limnology and Oceanography*, member of editorial  
board, 1975-1976; chair, organizing committee for 1985 annual meeting in Minneapolis.  
National Academy of Sciences-National Research Council:  
Chair of Panel on Nitrates in the Environment, 1975-1978  
Member of Committee on Restoration of Aquatic Systems, 1989-1991

Member of Committee to review EPA's EMAP program, 1991-1994  
Member of *Water Science and Technology Board*, 1993-96  
Chair of Committee on the Future of the Science of Inland Aquatic Ecosystems, 1994-96  
Member of Committee on Ecological Indicators for Terrestrial and Aquatic Environments, 1996-9  
Member of Committee on Restoration of the Greater Everglades Ecosystem (CROGEE), 1999-2004  
Member of Committee on Upper Mississippi River Navigation Study, 2003-5  
Chair, Committee to Review the St. Johns River Cumulative Impact Study, 2009-  
National Association of Water Institute Directors: member of Council of Representatives, 1986-1991;  
Chair, 1988-1990  
National Association of State Universities and Land-Grant Colleges: member Board of Directors of  
Environmental Division, 1989-91  
Universities Council on Water Resources: member of Board of Directors, 1988-1995; president, 1991-92  
Water Pollution Control Federation: Research Committee, 1973-1977; Standard Methods Committee,  
1974-1980; chair, Joint Task Groups on Nitrate and Nitrite, 1976-1980  
Water Environment Research Foundation: Research Council, 1992-97

### **GRADUATE STUDENTS SUPERVISED**

64 M.S. and 24 Ph.D. students at Universities of Florida and Minnesota.  
Ph.D. or post-Ph.D. advisees: Lawrence Baker, Naomi Detenbeck, Andrew Fang, Brian Huser, Abdul  
Khawaja, Steven Kloiber, Carl Mach, Bruce Monson, Lorin Hatch, Keith Pilgrim, Carolyn Sampson, Noel  
Urban, Thomas Belanger, Eldon C. Blancher, Ralph Brooks, Francis X. Browne, Neil Carriker, Forest E.  
Dierberg, Charles W. Hendry, Jay J. Messer, Carl Miles, R. Walter Ogburn, III, James W. Patterson,  
Curtis Pollman, Earl E. Shannon, John R. Tuschall.

### **AWARDS**

NSF Science Faculty Fellowship, 1971-72  
Universities Council on Water Resources, *Friend of UCOWR*, 1996  
University of Minnesota, *Fesler-Lampert Chair in Urban and Regional Affairs*, 2003-4  
Association of Environmental Engineering and Science Professors, *Distinguished Service Award*, 2004  
US Geological Survey, *Benchmark Award*, for distinguished service to WRRRI program, 2005  
Universities Council on Water Resources, *Warren Hall Medal*, 2007  
University of Minnesota, *Dave Ford Water Resources Award*, 2007

### **RECENT UNIVERSITY SERVICE ACTIVITIES**

Member, search committee for Dean of College of Continuing Education, 2000-1  
Member, department head search committee for Dept. of Soil, Water, and Climate, 2000-2  
Member, Dept. of Civil Engineering Planning Committee, 2001-2  
Member, College of Natural Resources Administrative Council, 1998-2003  
Member, Graduate School Constitution Committee, 2001-2  
Member, Graduate School Ethics Advocates Committee, 1999-2001  
Chair, Faculty Education Advisory Committee for Office of the Vice-President for Research, 2001-3  
Member Senate Judicial Committee, 2000-2004

### **RESEARCH INTERESTS**

Chemistry and quality of natural waters; eutrophication of lakes and rivers; nutrient cycling and chemistry;  
phosphorus dynamics in sediment-water systems; transport and retention processes for nitrogen in large  
river systems and impacts on hypoxia in coastal waters; sources and distribution of acid precipitation and  
its ecological effects on lakes; biogeochemical cycling of mercury and other metals; heavy metal reactivity  
and speciation; natural organic matter in water; aquatic photochemistry; kinetics of chemical processes in  
aquatic systems; application of GIS and satellite imagery to regional-scale modeling and analysis of lake  
and river water quality; scale issues in watershed science and management; development of indicators  
and sampling designs for ecological monitoring and assessment programs.

### **RESEARCH and WORKSHOP GRANTS**

Major grants during last ten years; PI or Co-PI on ~50 grants before 1996

1. U.S. EPA/NSF, Integrating Modeling and Management of Agriculturally-Impacted Watersheds:

- Issues of Spatial and Temporal Scale, 1996-2000; project manager and PI with three other co-PIs; \$800K
2. MN Pollution Control Agency, Effectiveness and impacts of chemical treatment of stormwater inputs to lakes for phosphorus control, 1997-2000; \$125K
  3. U.S. EPA/NOAA. Effects of nutrient source reductions in the Mississippi-Atchafalaya Basin on water quality conditions in these waters and on hypoxia in the Gulf of Mexico, 1997-99; one of two co-PIs; \$99K
  4. Metropolitan Council, Development of GIS and satellite imagery tools for regional water quality assessment, 1998-2000, \$100K; PI with two co-investigators
  5. Sea Grant. Role of nitrate-induced photolysis of natural organic matter and organic contaminants in Lake Superior, 1998-2001, \$160K
  6. U.S. Geological Survey, WRRRI Regional grant program. Role of NOM and humic substance in the chemical binding and photochemical reactivity of mercury and methylmercury, 1998-2000, co-PI; \$55K
  7. MN Pollution Control Agency. Bioavailability of phosphorus in soils of the Minnesota River Basin, 1998-99; one of two co-PIs; \$20K
  8. MN Pollution Control Agency. Effects of alum treatment on phosphorus availability to macrophyte communities in urban lakes, 1999-2002; co-PI; \$75K
  9. NASA. Regional center for application of satellite imagery to natural resources and environmental research, 1999-2002; co-investigator; \$900K
  10. NSF. Coupled biogeochemical cycles of carbon, nitrogen, phosphorus, water and salts in urban and agricultural systems; PI with four co-PIs, \$99K, 2001-2
  11. MN DNR. Advanced applications of satellite imagery for lake quality assessments., one of two co-PIs; \$99K, 2001-3
  12. NSF. CLEANER workshop planning grant; \$45K, 2002
  13. NSF. FAME Symposium; \$80K, 2003

## PUBLICATIONS

### BOOKS

- Brezonik, P.L. 1994. *Chemical Kinetics and Process Dynamics in Aquatic Systems*. Lewis Publ.-CRC Press, Boca Raton, FL, 754 p.
- Brezonik, P.L. (chair) 1996. *Protecting Freshwater Ecosystems: Revitalizing Education in Limnology*. National Academy Press, Washington, D.C., 450 p.

### MONOGRAPHS and JOURNAL ISSUES EDITED

- Brezonik, P.L. and J.L. Fox (Eds.), 1975. *Water Quality Management Through Biological Control*. Proc. Symp. co-sponsored by U.S. EPA and Univ. Florida, Publ. 07-75-01, Dept. Environ. Eng. Sci., Univ. of Florida, Gainesville, 164 p.
- Brezonik, P.L. (chair). 1978. *Nitrates in the Environment*. Panel Report for the National Research Council, Washington, D.C.
- Brezonik, P.L. and J.E. Perry (Eds.). 1989. Minnesota's Water Resources. A special issue devoted to the status of water research and water management concerns in Minnesota. *J. Minnesota Acad. of Sci.* **55**: (No. 1), 160 p.
- Brezonik, P.L. (Ed.) 1992. Issues of Human Diversity in Water Resources, *Water Resources Update*, Issue No. 89,
- Brezonik, P.L. and D.H. Moreau (Eds.) 1994. The Clean Water Act Revisited. *Water Resources Update*, Issue No. 94, 90 p.
- Brezonik, P.L. (Ed.) 1996. Prospects for Limnology in its Second Century. *Water Resources Update*, Issue No. 99, ~45 p.

### JOURNAL ARTICLES

- Brezonik, P.L. and G.F. Lee. 1966. Sources of elemental nitrogen in fermentation gases. *Internat. J. Air. Wat. Poll.* **10**: 145-160.
- Brezonik, P.L. and G.F. Lee. 1968. Denitrification as a nitrogen sink in Lake Mendota, Wis. *Environ. Sci. Technol.* **2**: 120-125.
- Brezonik, P.L., J. J. Delfino and G. F. Lee. 1969. Chemistry of N and Mn in Cox Hollow Lake, Wis., Following Destratification. *J. Sanit. Eng. Div. ASCE* **95**: No. SA5, October.

- Patterson, J.W. and P.L. Brezonik. 1969. Toxicity measurements in activated sludge-discussion. *J. Sanit. Eng. Div. Amer. Soc. Civil Eng.* **95**: 929-940.
- Patterson, J.W., P.L. Brezonik and H.D. Putnam. 1970. Measurement of ATP and its application in biological waste treatment. *Environ. Sci. Technol.* **4**: 569-575.
- Brooks, R.H., P.L. Brezonik, H.D. Putnam and M.A. Keirn. 1971. Nitrogen fixation in an estuarine environment: the Waccasassa on the Florida Gulf Coast. *Limnol. Oceanogr.* **16**: 701-710.
- Keirn, M.A. and Brezonik, P.L. 1971. Nitrogen fixation in Lake Mize, Florida, and in some lacustrine sediments. *Limnol. Oceanogr.* **16**: 721-731.
- Brezonik, P.L. and J.W. Patterson. 1971. Activated Sludge ATP: effects of environmental stress. *J. Sanit. Eng. Div. Amer. Soc. Civil Eng.* **97**: 813-824.
- Shannon, E.E. and P.L. Brezonik. 1972. Limnological characteristics of north and central Florida lakes. *Limnol. Oceanogr.* **17**: 97-110.
- Shannon, E.E. and P.L. Brezonik. 1972. Eutrophication analysis: a multi-variate approach. *J. Sanit. Eng. Div. Amer. Soc. Civil Eng.* **98**: 37-57.
- Brezonik, P.L. and J.L. Fox. 1974. The limnology of selected Guatemala lakes. *Hydrobiologia* **45**: 467-487.
- Brezonik, P.L. 1974. Continuous monitoring, automated analysis, and sampling procedures. (Ann. Rev.) *J. Water Poll. Contr. Fed.* **46**: 1100-1109.
- Brezonik, P.L., F.X. Browne and J.L. Fox. 1975. Application of ATP to plankton biomass and bioassay studies. *Water Res.* **9**: 155-162.
- Brezonik, P.L. 1975. Continuous monitoring, automated analysis, and sampling procedures. (Ann. Rev.) *J. Water Poll. Contr. Fed.* **47**: 1241-1249.
- Brezonik, P.L., P.A. Brauner and W. Stumm. 1972. Trace metal analysis by anodic stripping voltammetry: effect of sorption by natural and model organic compounds. *Water Res.* **10**: 605-612.
- Brezonik, P.L. and N.E. Carriker. 1976. Continuous monitoring, automated analysis, and sampling procedures. *J. Water Poll. Contr. Fed.* **48**: 1077-1086.
- Brezonik, P.L. 1977. Denitrification in natural waters. *Prog. Water Technol.* **8**: 373-392.
- Brezonik, P.L., C. Hendry, and H. Prentice. 1977. Continuous monitoring, automated analyses, and sampling procedures. (Ann. Rev.) *J. Water Poll. Contr. Fed.* **49**: 986-992.
- Hansen, W.G., G. Bitton, J.L. Fox and P.L. Brezonik. 1977. Hydrocarbon status in Florida real estate canals. *Mar. Poll. Bull.* **8**: 57-62.
- Brezonik, P.L. 1978. Effect of organic color and turbidity on Secchi disk transparency. *J. Fish. Res. Bd. Canada* **35**: 1410-1416.
- Carriker, N.E. and P.L. Brezonik. 1978. Sources and levels of boron in Florida waters. *J. Environ. Qual.* **7**: 516-522.
- Messer, J.J. and P.L. Brezonik. 1979. Denitrification in sediments of Lake Okeechobee, Florida. *Verh. Internat. Verein. Limnol.* **20**: 1410-1416.
- Fellows, C.R. and P.L. Brezonik. 1980. Seepage flow into Florida lakes. *Water Resources Bull.* **16**: 635-641.
- Brezonik, P.L., C.D. Hendry and E.S. Edgerton. 1980. Acid rainfall and sulfate deposition in Florida. *Science* **208**: 1027-1029.
- Tuschall, J.R. and P.L. Brezonik. 1980. Characterization of organic nitrogen in natural waters: its molecular size, protein content, and interactions with heavy metals. *Limnol. Oceanogr.* **25**: 495-504.
- Hendry, C.D. and P.L. Brezonik. 1980. Chemistry of precipitation at Gainesville, Florida. *Environ. Sci. Technol.* **14**: 843-849.
- Fellows, C.R. and P.L. Brezonik. 1981. Fertilizer flux into two Florida lakes via seepage. *J. Environ. Qual.* **10**: 174-177.
- Dierberg, F.E. and P.L. Brezonik. 1981. Nitrogen fixation (acetylene reduction) associated with decaying leaves of pond cypress (*Taxodium distichum* var. *nutans*) in a natural and a sewage-enriched cypress dome. *Appl. Environ. Microbiol.* **41**: 1413-1418.
- Kratzer, C.R. and P.L. Brezonik. 1981. A Carlson-type trophic state index for nitrogen in Florida lakes. *Water Resources Bull.* **17**: 713-715.
- Miles, C.J. and P.L. Brezonik. 1981. Oxygen consumption by a photochemical ferrous-ferric catalytic cycle. *Environ. Sci. Technol.* **15**: 1080-1095.
- Tuschall, J.R. and P.L. Brezonik. 1981. Evaluation of the copper-ASV-complexometric titration for complexing capacities and conditional stability constants. *Anal. Chem.* **53**: 1986-1989. Exchanges of comments, *Ibid.* **54**, 1000-1001; 2116-2117.

- Dierberg, F.E. and P.L. Brezonik. 1981. Acetylene reduction activity associated with tree roots in cypress wetlands. *Soil Biol. Biochem.* **13**: 555-557.
- Dierberg, F.E. and P.L. Brezonik. 1981. Nitrifying population densities and inhibition of ammonium oxidation in natural and sewage-enriched cypress swamps. *Water Res.* **16**: 125-126.
- Dierberg, F.E. and P.L. Brezonik. 1983. Tertiary treatment of municipal wastewater by cypress domes. *Water Resources Bull.* **17**: 1027-1040.
- Dierberg, F.E. and P.L. Brezonik. 1983. Nitrogen and phosphorus mass balances in natural and sewage-enriched cypress domes. *J. Appl. Ecol.* **20**: 323-337.
- Messer, J.J. and P.L. Brezonik. 1983. Agricultural nitrogen model: a tool for regional environmental management. *Environ. Manag.* **7**: 171-187.
- Messer, J.J. and P.L. Brezonik. 1983. Comparison of denitrification rate estimation techniques in a large, shallow lake. *Water Res.* **17**: 631-640.
- Messer, J.J. and P.L. Brezonik. 1983. Laboratory evaluation of kinetic parameters for lake sediment denitrification models. *Ecol. Modelling* **21**: 277-286.
- Miles, C.J. and P.L. Brezonik. 1983. High-performance size exclusion chromatography of aquatic humic substances. *J. Chromatogr.* **259**: 499-503.
- Miles, C.J., Jr., J.R. Tuschall, Jr., and P.L. Brezonik. 1983. Isolation of aquatic humus with diethylaminoethyl cellulose. *Anal. Chem.* **55**: 410-411.
- Tuschall, J.R., Jr. and P.L. Brezonik. 1983. Application of continuous-flow ultrafiltration and competing ligand/differential spectrophotometry for measurement of heavy metal complexation by dissolved organic matter. *Anal. Chim. Acta* **149**: 47-58.
- Brezonik, P.L., T.L. Crisman, and R.L. Schulze. 1984. Planktonic communities in Florida softwater lakes of varying pH. *Canad. J. Fish. Aquat. Sci.* **41**: 46-56.
- Hendry, C.D. and P.L. Brezonik. 1984. Chemical composition of softwater Florida lakes and their sensitivity to acid precipitation. *Water Resources Bull.* **20**: 75-86.
- Kratzer, C.R. and P.L. Brezonik. 1984. Application of nutrient loading models to the analysis of trophic conditions in Lake Okeechobee, Florida. *Environ. Manag.* **8**: 109-120.
- Dierberg, F.E. and P.L. Brezonik. 1985. Nitrogen and phosphorus removal by cypress swamp sediments. *Water Air Soil Poll.* **24**: 207-213.
- Baker, L.A., P.L. Brezonik, E.S. Edgerton, and R.W. Ogburn, III. 1985. Sediment acid neutralization in softwater lakes. *Water Air Soil Poll.* **25**: 215-230.
- Baker, L.A., P.L. Brezonik, and C.D. Pollman. 1986. Model of internal alkalinity generation: sulfate retention component. *Water Air Soil Poll.* **31**: 89-94.
- Ogburn, III, R.W. and P.L. Brezonik. 1986. Examination of the oligotrophication hypothesis: phosphorus cycling in an acidic Florida lake. *Water Air Soil Poll.* **30**: 1001-1006.
- Brezonik, P.L., L.A. Baker, J.R. Eaton, T.M. Frost, P. Garrison, T.K. Kratz, J.J. Magnuson, J.E. Perry, W.J. Rose, B.K. Shephard, W.A. Swenson, C.J. Watras, and K.E. Webster. 1986. Experimental acidification of little Rock Lake, Wisconsin. *Water Air Soil Poll.* **31**: 115-121.
- Rogalla, J.A., P.L. Brezonik, and G.E. Glass. 1986. Empirical models for lake acidification in the Upper Great Lakes Region. *Water Air Soil Poll.* **31**: 95-100.
- Baker, L.W., P.L. Brezonik, and E.S. Edgerton. 1986. Sources and sinks of ions in a soft water, acidic lake in Florida. *Water Resources Res.* **22**: 715-722.
- Ogburn, III, R.W., P.L. Brezonik and J.J. Delfino. 1987. Effect of pH on phosphorus release during macrophyte (*Eleocharis* sp.) decomposition. *Water Resour. Bull.* **23**: 829 – 831.
- Kratz, T.K., R.B. Cook, C.J. Bowser, and P.L. Brezonik. 1987. Winter and spring in northern Wisconsin lakes caused by increases in P<sub>CO<sub>2</sub></sub>. *Canad. J. Fish. Aquat. Sci.* **44**: 1082-1088.
- Baker, L.A. and P.L. Brezonik. 1988. Dynamic model of internal alkalinity generation: calibration and application to precipitation-dominated lakes. *Water Resources Res.* **24**: 65-74.
- Baker, L.A., J.E. Tacconi and P.L. Brezonik. 1988. Role of seston deposition in ion budgets of a softwater seepage lake. *Verh. Int. Verein. Limnol.* **23**: 346-350.
- Brezonik, P.L. 1989. WRRP program: 25 years of accomplishments. *Environ. Sci. Technol.* **23**: 1433 (editorial).
- Mach, C.E. and P.L. Brezonik. 1989. Trace metal research at Little Rock Lake, Wisconsin: background data, enclosure experiments, and the first three years of acidification. *Sci. Total Environ.* **87/88**: 269-285.
- Twaroski, C.J., D. Thorton, R.L. Strassman, and P.L. Brezonik. 1989. Susceptibility of northern Minnesota lakes to acid deposition impacts. *J. Minn. Acad. Sci.* **55**: 95-102.

- Brezonik, P.L., C.E. Mach, G. Downing, N. Richardson, and M. Brigham. 1990. Effects of acidification on minor and trace metal chemistry in Little Rock Lake, Wisconsin. *Environ. Toxicol. Chem.* **9**: 871-885.
- Brezonik, P.L., K.E. Webster, and J.E. Perry. 1990. Effects of acidification on benthic community structure and benthic processes in Little Rock Lake, Wisconsin. *Verh. Internat. Verein. Limnol.* **24**:
- Webster, K.E., A. Newell, L.A. Baker, and P.L. Brezonik. 1990. Climatically induced rapid acidification of a softwater seepage lake. *Nature* **347**: 374-376.
- Detenbeck, N.E. and P.L. Brezonik. 1991. Phosphorus sorption by lake sediments. 1. Comparison of equilibrium models. *Environ. Sci. Technol.* **25**: 395-403.
- Detenbeck, N.E. and P.L. Brezonik. 1991. Phosphorus sorption by lake sediments. 2. Effects of pH and other solution variables. *Environ. Sci. Technol.* **25**: 403-409.
- Schindler, D.W., T.M. Frost, K.H. Mills, P.S.S. Chang, I.J. Davies, L. Findlay, D.F. Malley, J.A. Shearer, M.A. Turner, P.J. Garrison, C.J. Watras, K.E. Webster, J.M. Gunn, P.L. Brezonik, and W.A. Swenson. 1992. Comparisons between experimentally- and atmospherically-acidified lakes during stress and recovery. *Proc. Royal Soc. Edinburgh* **97B**: 193-226.
- King, S.O., C.E. Mach, and P.L. Brezonik. 1992. Changes in trace metal concentrations in lakewater and biota during experimental acidification of Little Rock Lake, Wisconsin, U.S.A. *Environ. Poll.* **78**: 9-18.
- Swain, E.B., D.R. Engstrom, M.E. Brigham, T.A. Henning, and P.L. Brezonik. 1992. Increasing rates of atmospheric mercury deposition in midcontinental North America. *Science* **257**: 784-787.
- Baker, L.A., D.R. Engstrom, and P.L. Brezonik. 1992. Recent sulfur enrichment in the sediments of Little Rock Lake, Wisconsin. *Limnol. Oceanogr.* **37**: 689-702.
- Brezonik, P.L., J.G. Eaton, T.M. Frost, P.J. Garrison, T.K. Kratz, C.E. Mach, J.H. McCormick, J.A. Perry, W.A. Rose, C.J. Sampson, B.C.L. Shelley, W.A. Swenson, and K.E. Webster. 1993. Experimental acidification of Little Rock Lake, Wisconsin: chemical and biological changes over the pH range 6.1 to 4.7. *Canad. J. Fish. Aquat. Sci.* **50**: 1101-1121.
- Urban, N. and P.L. Brezonik. 1993. Transformations of sulfur in sediment microcosms. *Canad. J. Fish. Aquat. Sci.* **50**: 1946-1960.
- Webster, K.E., P.L. Brezonik, and B.J. Holdhusen. 1994. Temporal trends in low-alkalinity lakes of the Upper Midwest (1983-1989). *Water, Air, Soil Pollut.* **67**: 397-414.
- Urban, N., P.L. Brezonik, L.A. Baker, and L.A. Sherman. 1994. Rates of sulfate reduction and diffusion in sediments of Little Rock Lake, Wisconsin. *Limnol. Oceanogr.* **39**: 797-815.
- Sherman, L.A., P.L. Brezonik, and L.A. Baker. 1994. Spatial and temporal variations in porewater chemistry in a small seepage lake: implications for estimating in-lake alkalinity generation. *Limnol. Oceanogr.* **39**: 1155-71.
- Erdmann, J. B., H. G. Stefan, and P. L. Brezonik. 1994. Analysis of wind- and ship-induced sediment resuspension in Duluth-Superior harbor. *Water Resources Bull.* **30**: 1043-1053.
- Sampson, C. J., P. L. Brezonik, T. M. Frost, K. E. Webster, and T. D. Simonson. 1996. Experimental acidification of Little Rock Lake, Wisconsin: the first four years of chemical and biological recovery, *Water, Air, Soil Pollut.* **72**: 1713-1719.
- Brezonik, P. L. and D. R. Engstrom. 1998. Modern and historic accumulation rates of phosphorus in Lake Okeechobee, Florida. *J. Paleolimnol.* **20**: 31-46.
- Brezonik, P. L. and J. Fulkerson-Brekken. 1998. Indirect photolysis of acetochlor: rate constant of a nitrate-mediated hydroxyl radical reaction. *Chemosphere* **36**: 2699-2704.
- Monson, B. A. and P. L. Brezonik. 1998. Seasonal patterns of mercury species in water and plankton from softwater lakes in northeastern Minnesota. *Biogeochem.* **40**: 147-162.
- Brezonik, P. L. and J. Fulkerson-Brekken. 1998. Nitrate-induced photolysis in natural waters: controls on concentrations of hydroxyl radical photo-intermediates by natural scavenging agents. *Environ. Sci. Technol.* **32**: 3004-3010.
- Monson, B. A. and P. L. Brezonik. 1999. Influence of food, aquatic humus and alkalinity on methylmercury uptake by *Daphnia magna*. *Environ. Toxicol. & Chem.* **18**: 560-566.
- Brezonik, P. L., K. W. Easter, L. Hatch, D. J. Mulla, and J. Perry. 1999. Management of diffuse pollution in agricultural watersheds: lessons from the Minnesota River. *Wat. Sci. Tech.* **39**: 323-340.
- Frost, T. M., P. K. Montz, T. K. Kratz, T. Badillo, P. L. Brezonik, M. J. Gonzalez, R. G. Rada, C. J. Watras, K. E. Webster, J. G. Wiener, C. E. Williamson, and D. P. Morris. 1999. Multiple stresses from a single agent: Diverse responses to the experimental acidification of Little Rock Lake, Wisconsin. *Limnol. Oceanogr.* **44**: 784-794.

- Kloiber, S. M., T. Anderle, P. L. Brezonik, L. Olmanson, M. E. Bauer, and D. A. Brown. 2000. Satellite imagery: an efficient methods for trophic state assessment. *Arch. Hydrobiol. Adv. Limnol.* **55**: 137–151.
- Urban, N. R., C. J. Sampson, P. L. Brezonik, and L. A. Baker. 2001. Sulfur cycling in the water column of Little Rock Lake, Wisconsin. *Biogeochem.* **52**: 41-77.
- Hatch, L. K., A. Mallawatantri, D. Wheeler, A. Gleason, D. Mulla, J. Perry, K. W. Easter, R. Smith, L. Gerlach, and P.L. Brezonik. 2001. Land management at the major watershed– agroecoregion intersection. *J. Soil Water Conserv.* **56**: 44-51.
- Urban, N. R., C. J. Sampson, P. L. Brezonik, and L. A. Baker. 2001. Sulfur cycling in the water column of Little Rock Lake, Wisconsin. *Biogeochem.* **52**: 41-77.
- Stadelmann, T. H. and P. L. Brezonik. 2001. Seasonal patterns of chlorophyll a and Secchi disk transparency in lakes of east-central Minnesota: implications for design of ground- and satellite-based monitoring programs. *Lake Reserv. Manage.* **17**: 299-314.
- Fang, F., P. L. Brezonik, D. J. Mulla, and L. K. Hatch. 2002. Estimating runoff phosphorus loss in the Minnesota River Basin. *J. Env. Qual.* **31**: 1918-29.
- Stadelmann, T. H. and P. L. Brezonik. 2002. Analysis and predictive models of stormwater runoff volumes, loads, and pollutant concentrations from watersheds in the Twin Cities (Minnesota, USA) metropolitan area. *Water Research* **36**: 1743-57.
- Kloiber, S. M., P. L. Brezonik, L. G. Olmanson, and M. E. Bauer. 2002. A procedure for regional lake water clarity assessment using Landsat multispectral data. *Remote Sens. Environ.* **82**: 38-47.
- Kloiber, S. M., P. L. Brezonik, and M. E. Bauer. 2002. Application of Landsat imagery to regional-scale assessments of lake clarity. *Water Research* **36**: 4330-40.
- Sawaya, K., L. Olmanson, N. Heinert, P. L. Brezonik, and M. E. Bauer. 2003. Extending satellite remote sensing to local scales: Land and water resource monitoring using high-resolution imagery. *Remote Sens. Environ.* **88**: 144-156.
- Sampson C. J. and P. L. Brezonik. 2003. Responses of nutrients to experimental acidification and recovery in Little Rock Lake, USA. *Water Air Soil Poll.* **142**: 39-57.
- Sampson C. J. and P. L. Brezonik. 2003. Ion budgets and sediment-water interactions during the experimental acidification and recovery of Little Rock Lake, Wisconsin. *Environ. Sci. Technol.* **37**: 5625-5635.
- Brezonik, P. L., C. E. Mach, and C. J. Sampson. 2003. Geochemical controls for Al, Fe, Mn, Cd, Cu, Pb, and Zn during experimental acidification and recovery of Little Rock Lake, WI, USA. *Biogeochem.* **62**: 119-143.
- Hines, N. A. and P. L. Brezonik. 2004. Mercury dynamics in a small northern Minnesota lake: water to air exchange and photoreactions of mercury. *Mar. Chem.* **90**:137-149.
- Hines, N. A., P. L. Brezonik, and D. R. Engstrom. 2004. Sediment and porewater profiles and fluxes of mercury and methylmercury in a small seepage lake in northern Minnesota. *Environ. Sci. Technol.* **38**: 6610-6617.
- Pilgrim, K. M. and P. L. Brezonik. 2005. Treatment of lake inflows with alum for phosphorus removal. *Lake Reserv. Manage.* **21**: 1-11.
- Pilgrim, K. M. and P. L. Brezonik. 2005. Evaluation of the potential adverse effects of lake inflow treatment with alum. *Lake Reserv. Manage.* **21**: 78-88.
- Fang, F., K. W. Easter, and P. L. Brezonik. 2005. Point-nonpoint source water quality trading: a case study in the Minnesota River basin. *J. Am. Wat. Resources Assoc.* **41**: 645-58.
- Fang, F., P. L. Brezonik, D. J. Mulla, and L. K. Hatch. 2005. Characterization of soil algal bioavailable phosphorus in the Minnesota River Basin. *Soil Sci. Soc. Am. J.* **69**:1016–1025.
- Brezonik, P. L., K. Menken, and M. E. Bauer. 2005. Landsat-based remote sensing of lake water quality characteristics, including chlorophyll and colored dissolved organic matter (CDOM). *Lake Reserv. Manage.* **21**: 373-382.
- Menken, K., P. L. Brezonik, and M. E. Bauer. 2006. Influence of chlorophyll and humic color on reflectance spectra of lakes: implications for measurement of lake-water properties by remote sensing. *Lake Reserv. Manage.* **22**: 179-190.
- Khwaja, A. R., P. R. Bloom, and P. L. Brezonik. 2006. Binding constants of divalent mercury (Hg<sup>2+</sup>) in soil humic acids and soil organic matter. *Environ. Sci. Technol.* **40**: 844-49.
- Dadaser-Celik, F., H. G. Stefan, and P. L. Brezonik. 2006. Dynamic hydrologic model of the Örtülüakar marsh in Turkey. *Wetlands* **26**: 1089-1102.
- Rockne, K. J. and P. L. Brezonik. 2006. Nutrient removal in a cold-region wastewater stabilization pond: importance of ammonia volatilization. *J. Environ. Eng. (ASCE)* **132** (4): 451-459.



- Hines, N. A. and P. L. Brezonik. 2007. Input-output analysis of mercury forms for a small lake in northern Minnesota. *Biogeochem.* **84**: 265-84.
- Pilgrim, K. R., B. Huser, and P. L. Brezonik. 2007. A method for comparative evaluation of whole-lake and inflow alum treatment. *Water Research* **41**: 1215-24.
- Olmanson, L. G., M. E. Bauer, and P. L. Brezonik. 2008. A 20-year Landsat record of water clarity in Minnesota's 10,000 lakes. *Remote sensing of Environment* **112**: 4086-97.
- Dadaser-Celik, F., P. L. Brezonik, and H. G. Stefan. 2008. Agricultural and environmental changes after irrigation management transfer in the Develi Basin, Turkey. *Irrig. Drainage Syst.* **22**: 47-66.
- Dadaser-Celik, F., P. L. Brezonik, and H. G. Stefan. 2008. Hydrologic sustainability of the Sultan Marshes in Turkey. *Water Internat.* (in press).

#### **BOOK CHAPTERS and SYMPOSIA CONTRIBUTIONS**

- Brezonik, P.L. and H.D. Putnam. 1968. Eutrophication: small Florida lakes as models to study the process. Proc. 17th South. Water Poll. Contr. Conf., Chapel Hill, North Carolina, April, 1968, pp.315-333.
- Brezonik, P.L. 1968. Application of mathematical models to the eutrophication process. Proc. 11th Conf. Great Lakes Res. Milwaukee, April, 1968, pp. 16-30.
- Brezonik, P.L. 1972. Kinetics and dynamics in natural water systems, pp. 831-912 in *Water and Water Pollution Handbook*, Vol. 3, L.L. Ciaccio (Ed.), Marcel Dekker, New York.
- Brezonik, P.L. 1972. Nitrogen sources and transformations in natural waters, pp.1-50 in *Nutrients in Natural Waters*, H.E. Allen, Jr. and J.R. Kramer (Eds.), J. Wiley, New York.
- Brezonik, P.L. 1974. Analysis and speciation of trace metals in water supplies, pp. 167-191 in *Aqueous Environmental Chemistry of Metals*, A.J. Rubin (Ed.), Ann Arbor Science Publ., Ann Arbor, MI.
- Brezonik, P.L., J.L. Fox, G. Bourne, R. Klein, D. Price and W. Mitsch. 1975. Cypress swamps as natural tertiary treatment systems. Proc. Assoc. Environ. Eng. Professors, Workshop, Charleston, SC, Environmental impact and linkages.
- Brezonik, P.L. 1976. Nutrients and other biologically active substances in atmospheric precipitation. Proc. Symposium on Effects of atmospheric inputs to the chemistry and biology of lakes. Int. Assoc. Great Lakes. Research. Special Symp. 1: 166-186.
- Messer, J.J. and P.L. Brezonik. 1980. Regional nitrogen mass balance model for the Florida peninsula, pp.311-318. In Fourth Internat. Symp. Environ. Biogeochemistry, Canberra, Australia, Australian Academy of Science, Canberra.
- Hendry, C.D., P.L. Brezonik, and E.S. Edgerton. 1980. Acid precipitation in Florida (U.S.A.): results of a statewide monitoring network, pp.118-119. In Ecological impact of acid precipitation, D. Drablos and A. Tollan (Eds.). Proc. Int. Conf., Sandefjord, Norway. SNSF, Oslo-As, Norway.
- Crisman, T.L., R.L. Schulze, P.L. Brezonik, and S.A. Bloom. 1980. Acid precipitation: the biotic response in Florida lakes, pp.296-297. In Ecological impact of acid precipitation, D. Drablos and A. Tollan (Eds.). Proc. Int. Conf., Sandefjord, Norway. SNSF, Oslo-As, Norway.
- Hendry, C.D., E.S. Edgerton, and P.L. Brezonik. 1981. Atmospheric deposition of nitrogen and phosphorus in Florida, pp.199-206 in: *Atmospheric Pollutants in Natural Waters*, S.J. Eisenreich (Ed.), Ann Arbor Science Press, Ann Arbor, MI.
- Messer, J.J. and P.L. Brezonik. 1981. Importance of atmospheric fluxes to the nitrogen balance of peninsular Florida, pp. 217-236 in: *Atmospheric Pollutants in Natural Waters*, S.J. Eisenreich (Ed.), Ann Arbor Science Press, Ann Arbor, MI.
- Edgerton, E.S., C.D. Hendry, and P.L. Brezonik. 1981. Seasonal and spatial patterns of acid precipitation in Florida, pp. 237-259 in: *Atmospheric Pollutants in Natural Waters*, S.J. Eisenreich (Ed.), Ann Arbor Science Press, Ann Arbor, MI.
- Tuschall, J.R., Jr. and P.L. Brezonik. 1982. Complexation of heavy metals by aquatic humus: a comparative study of five analytical methods, pp. 275-294 in: *Aquatic and Terrestrial Humic Materials*, R.F. Christman and E. Gjessing (Eds.) Ann Arbor Science Publ., Ann Arbor, MI.
- Baker, L.A. and P.L. Brezonik. 1984. Fate of sulfate in a softwater acidic lake. Proc. 6th internat. symp. biogeochem., Santa Fe, NM, Oct., 1983.
- Tuschall, J.R., Jr. and P.L. Brezonik. 1984. Analytical methods for measurement and interpretation of metal binding by aquatic humus and model compounds. Proc. Internat. Conf. heavy metals in aquatic systems, Texel, Netherlands.
- Brezonik, P.L. 1984. Trophic state indices: rationale for multivariate approaches. Lake and Reservoir



- Management, Proc. 3rd Ann. Meeting, North Amer. Lake Manage. Soc., Knoxville, TN, 1983.
- Baker, L.A., P.L. Brezonik, and C. Kratzer. 1985. Nutrient loading models for Florida lakes, pp. 253-258. In *Lake and Reservoir Management: Practical Applications*, J. Taggart and L. Moore (Eds.), Proc. 4th Ann. Meeting, North Am. Lake Manag. Soc., 1984, McAfee, NJ.
- Baker, L.A., T.E. Perry, and P.L. Brezonik. 1985. Internal neutralization mechanisms for softwater lakes, pp. 356-360. In *Lake and Reservoir Management: Practical Applications*, J. Taggart and L. Moore (Eds.), Proc. 4th Ann. Meeting, North Am. Lake Manag. Soc., 1984, McAfee, NJ.
- Ogburn, R.W., III, P.L. Brezonik, and B.W. Breedlove. 1986. Simple trophic state models and their use in wasteload allocations in Florida, pp. 219-234. In *Proceedings of Stormwater and Water Quality Model Users Group Meeting*, T.D. Bainwell, Jr. and W.C. Huber (Eds.). EPA/600/9-86/023, U.S. EPA, Athens, GA.
- Perry, T.E., L.A. Baker, and P.L. Brezonik. 1986. Comparison of sulfate reduction rates in laboratory microcosms, field mesocosms, and in situ at Little Rock Lake, Wisconsin, pp. 303-312, in *Lake and Reservoir Management*, G. Redfield, J.F. Taggart, and L.M. Moore (Eds.). Proc. 5th Ann. Conf. Int. Symp. N. Am. Lake Manage. Soc., 1985, Merryfield, VA.
- Preston, S.D. and P.L. Brezonik. 1986. Water quality in the Oklawaha chain of lakes: a case study on problems and limitations in compiling long-term data bases, pp. 101-107. In *Lake and Reservoir Management*, G. Redfield, J. Taggart, and L.M. Moore (Eds.). Proc. 5th Ann. Conf. N. Am. Lake Manag. Soc., 1985, Merryfield, VA.
- Perry, T.E., C.D. Pollman, and P.L. Brezonik. 1986. Buffer capacity of softwater lake sediments in Florida, pp. 67-83. in: *Impact of Acid Rain and Deposition on Aquatic Biological Systems*, B.G. Isom, S.D. Dennis, and J.M. Bates, (Eds.), ASTM STP928, Am. Soc. Testing Matl., Philadelphia, PA.
- Brezonik, P.L., L.A. Baker, and T.E. Perry. 1987. Mechanisms of alkalinity generation in acid-sensitive softwater lakes, pp. 229-260 in: *Chemistry of Aquatic Pollutants*, R. Hites, and S.J. Eisenreich (Eds.), Adv. Chem. Ser. **216**, American Chemical Society, Washington, D.C.
- Baker, L.A., P.L. Brezonik, and N. Urban. 1989. The biogeochemistry of sulfur in a dilute, acidic seepage lake, pp. 79-100 in: *Biogenic Sulfur in the Environment*, E.S. Saltzman and W.J. Cooper (Eds.), ACS Symp. Ser. **393**, Am. Chem. Soc., Washington, D.C.
- Brezonik, P.L. 1990. Principles of linear free energy and structure-activity relationships and their applications to the fate of chemicals in aquatic systems, pp. 113-143 in: *Aquatic Chemical Kinetics*, W. Stumm (Ed.), Wiley-Interscience, New York.
- Brezonik, P.L., C.E. Mach, and S. King. 1991. The influence of water chemistry on metal bioaccumulation and toxicity, pp. 1-29 in: *Ecotoxicology of Metals: Current Concepts and Applications*, M. Newman and A. McIntosh (Eds.) Lewis Publ., Chelsea, MI.
- Brezonik, P.L. G.D. Cooke, S.R. Carpenter, and S.L. Schelske. Lakes, pp. 71-164 in: *Restoration of Aquatic Ecosystems*, Committee on Restoration of Aquatic Ecosystems, J. Cairns (Chair), Nat. Res. Council., Nat. Acad. Science. National Acad. Press, Washington, D.C. 552 p.
- Sampson, C.E., P.L. Brezonik, and E. Weir. 1994. Effects of acidification on chemical composition and chemical cycles in a seepage lake: inferences from a whole-lake experiment, pp. 121-159 in *Environmental Chemistry of Lakes and Reservoirs*, L.A. Baker (Ed.), Am. Chem. Soc., Washington, D.C.
- Engstrom, D.R., E.B. Swain, T.A. Henning, M.E. Brigham, and P.L. Brezonik. 1994. Atmospheric mercury deposition to lakes and watersheds: a quantitative reconstruction from multiple sediment cores, pp. 33-66 in *Environmental Chemistry of Lakes and Reservoirs*, L.A. Baker (Ed.), Am. Chem. Soc., Washington, D.C.
- Wilson, G.J. and P.L. Brezonik. 1998. Analysis of urban stormwater quality from the Minneapolis Chain of Lakes watershed. Spec. Sess. Proc., 16<sup>th</sup> Ann. North Amer. Lake Manage. Soc. Internat. Symp., pp. 40-54.
- Jensen, K.M. and P.L. Brezonik. 1998. Minneapolis Chain of Lakes current and historical water quality. Spec. Sess. Proc., 16<sup>th</sup> Ann. North Amer. Lake Manage. Soc. Internat. Symp., pp. 55-69.
- Brezonik, P.L. and C.D. Pollman. 1999. Phosphorus chemistry and cycling in Florida lakes: global issues and local perspectives, pp. 69-109 in: *Phosphorus Biogeochemistry in Subtropical Ecosystems*, K. Reddy et al. (Eds.), Lewis Publ., Boca Raton, FL.