

November 8, 2009
VITA

Name

Roger W. Bachmann

Education

B.S. University of Michigan, School of Natural Resources-Fisheries 1956

M.S. University of Idaho, College of Forestry-Fisheries 1958

Ph.D. University of Michigan, Graduate College- Zoology (limnology)1962

Iowa State University and University of Florida, Personnel Record

1963-1967, Assistant Professor, Iowa State University

1964, full membership in Graduate Faculty

1967-1971, Associate Professor, Iowa State University

1971-1993, Professor, Iowa State University

1975-1976, Acting Chairman, Department of Animal Ecology

1993-present, Research Professor, Dept. of Fisheries and Aquatic Sciences, University of Florida

Other Professional Experience

September 1961-September 1962, Postdoctoral Fellow, Woods Hole Oceanographic Institution, Woods Hole, Mass., research on zinc cycles in the ocean.

September 1962-August 1963, Postgraduate Research Zoologist, University of California, Davis, limnological research on northern California lakes.

January-August, 1984. On Sabbatical leave, Michigan State University, Kellogg Biological Station, limnological research on central Michigan lakes.

January-May, 1991, On Sabbatical leave, University of Florida, Department of Fisheries, studies of Florida Lakes and research on limnological methods

Awards, Honors and Recognition

B.S. with Distinction from University of Michigan (1956)

NSF Predoctoral Fellowship (1958-1961)

Fellow American Association for the Advancement of Science

Distinguished Iowa Scientist - named by Iowa Academy of Science (1981)

Saylor Award in Fisheries (U of Michigan)

Mid American States Universities Association Honor Lecturer (1985-86)

National Representative to International Association for Theoretical and Applied

Limnology elected for 1989-1992, reelected for 1992-1995

Phi Kappa Phi, Phi Sigma, Phi Eta Sigma, Society of Sigma Xi, Gamma Sigma Delta,

Xi Sigma Pi.

Professional Associations

American Society of Limnology and Oceanography, International Society for Theoretical and Applied Limnology, Ecological Society of America, American Fisheries Society, North American Lake Management Society, North American Benthological Society.

Research at ISU

I had a 34% research appointment at Iowa State University and with my graduate students (ave. 4-5/yr) conducted research on basic and applied aquatic ecology, including the influence of agriculture on water quality in Iowa lakes and streams. I supervised the completion of 10 PhD and 34 MS students. Most of this work has been supported by outside grants and contracts. I have a long-standing interest in eutrophication, factors controlling levels of phytoplankton in lakes and rivers, the modeling of phosphorus and nitrogen in lakes, and in lake restoration. In addition to these areas, my graduate students and I have done research on stream drift of invertebrates, epiphytes on zooplankton, nitrogen budgets in agricultural streams, and sediment resuspension in lakes. Research which I have conducted and/or supervised has resulted in the publication of over fifty reviewed publications and numerous reports and papers presented at state, national and international meetings. For example, in recent years I have presented papers at congresses of the International Association for Theoretical and Applied Limnology in Munich, Germany and Barcelona, Spain, and at the annual meetings of the North American Lake Management Society.

Research at the University of Florida

Since the fall of 1993 I have been conducting research on Florida lakes with Dr. Daniel Canfield, Jr. This research has been concerned with eutrophication in Florida waters and has included the testing of a new method for measuring nitrogen in lake waters, studying the relationships between fish populations and trophic states in Florida lakes, estimating the impact of wind resuspension on shallow Florida lakes, and critiquing the development of biocriteria for Florida lakes.

Service at National Level

Editor Lake and Reservoir Management (1991-1995) Editorial Board Ecology and Ecological Monographs (1976-1983) Review journal articles on occasional basis for Ecology, Limnology & Oceanography, Canadian Journal of Fisheries and Aquatic Sciences, and others. Review research proposals for National Science Foundation, Environmental Protection Agency, and other agencies. Served for 3 years on committee to select individuals for National Science Foundation Predoctoral Fellowships. International: Served two terms as a National Representative for the International Association for Theoretical and Applied Limnology.

Recent presentations

November 2004-North American Lake Management Society, Victoria, BC. Where nutrient control is not the answer: Lake Apopka and Lake Okeechobee, Florida.

August 2004-Shallow lakes symposium at American Fisheries Society, Madison, WI- invited paper Where nutrient control is not the answer

Publications

Ayres, J. C. and R. W. Bachmann. 1957. Simplified computations for the dynamic height method of current determination in lakes. *Limnol. Oceanogr.* 2:155-157.

Bachmann, R. W. and E. P. Odum. 1960. Uptake of Zn-65 and primary productivity in marine benthic algae. *Limnol. Oceanogr.* 5:349-355.

Saunders, G. W., F. B. Trama, and R. W. Bachmann. 1962. Evaluation of a modified C-14 technique for shipboard estimation of photosynthesis in large lakes. *Great Lakes Res. Div., IST, Univ. of Mich. Publ. No. 7*, 163 pp.

Bachmann, R. W. 1963. Zinc-65 in studies of the freshwater zinc cycle. In Schultz, V. and A. W. Klement, ed. *Radioecology; proceedings of the first national symposium on radioecology*. Reinhold Publ. Co., N.Y., pp 485-496.

Bachmann, R. W., and C. R. Goldman. 1964. The determination of microgram amounts of molybdenum in natural waters. *Limnol. Oceanogr.* 9:143-146.

Bachmann, R. W. 1964. Comments on reports: The plankton community. *Science* 144:556-557.

Bachmann, R. W. and C. R. Goldman. 1965. Hypolimnetic heating in Castle Lake, California. *Limnol. Oceanogr.* 10:233-239.

Bachmann, R. W. 1965. Some chemical characteristics of Iowa lakes and reservoirs. *Proc. Iowa Acad. Sci.* 72:238-243.

Bachmann, R. W., R. V. Bovbjerg, and J. D. Hall. 1966. The morphometry of Lake West Okoboji. *Proc. Acad. Sci.* 73:165-168.

Mrachek, R. J. and R. W. Bachmann. 1967. Quantitative studies of the benthic fauna of Clear Lake, Iowa. *Iowa State J. Sci.* 42:161-170.

Fee, E. J. and R. W. Bachmann. 1968. An empirical study of the Defant method of seiche analysis. *Limnol. Oceanogr.* 13:665-669.

- Konefes, J. L. and R. W. Bachmann. 1971. Growth of the fathead minnow (*Pimephales promelas*) in tertiary treatment ponds. Proc. Iowa Acad. Sci. 77:104-111.
- Bachmann, R. W. and C. L. Olson. 1973. Limnological aspects of the river and the proposed reservoir. Chapter 5 in Ames Reservoir Environmental Impact Study, Iowa State Water Resources Research Institute, 80 pp.
- Crum, G. H. and R. W. Bachmann. 1973. Submersed aquatic macrophytes of the Iowa Great Lakes region. Iowa State J. Res. 48:147-173.
- Jones, J. R., D. M. Coon, and R. W. Bachmann. 1974. Limnological and fisheries survey of the upper Skunk River, Iowa. Iowa State J. Res. 48:255-266.
- Jacobsen, T. V. and R. W. Bachmann. 1974. Calculation of water temperatures in Clear Lake, Iowa. Iowa State J. Res. 48:285-290.
- Bachmann, R. W. and J. R. Jones. 1974. Phosphorus inputs and algal blooms in lakes. Iowa State J. Res. 49:155-160.
- Bachmann, R. W. and T. V. Jacobsen. 1975. Thermal structure of Clear Lake, Iowa. Proc. Iowa Acad. Sci. 81:102-107.
- Jones, J. R. and R. W. Bachmann. 1975. Limnological features of some northwestern Iowa lakes. Proc. Iowa Acad. Sci. 81:158-163.
- Jones, J. R. and R. W. Bachmann. 1975. Algal response to nutrient inputs in some Iowa lakes. Verh. Int. Ver. Limnol. 19:904-910.
- Jones, J.R., B.P. Borofka, and R.W. Bachmann. 1976. Factors affecting nutrient loads in some Iowa streams. Water Research 10:117-122.
- Jones, J. R. and R. W. Bachmann. 1976. Prediction of phosphorus and chlorophyll levels in lakes. J. Water Pollut. Control Fed. 48:2176-2182.
- Swanson, C. D. and R. W. Bachmann. 1976. A model of algal exports in some Iowa streams. Ecology 57:1076-1080.
- Bachmann, R. W. and J. R. Jones. 1976. Nutrient removal and water quality. Water Wastes Eng. 13(2):14-16.
- Kilkus, S.P., J. D. LaPerriere, and R. W. Bachmann. 1975. Nutrients and algae in some central Iowa streams. J. Water Pollut. Control Fed. 47:1870-1879.
- Jones, J. R. and R. W. Bachmann. 1978. A survey of water transparency in Iowa lakes. Proc. Iowa Acad. Sci. 85:6-9.

- Zimmer, D. W. and R. W. Bachmann. 1978. Channelization and invertebrate drift in some Iowa streams. *Water Resources Bulletin* 14(4):868-883.
- Jones, J. R. and R. W. Bachmann. 1978. Trophic status of Iowa lakes in relation to origin and glacial geology. *Hydrobiologia* 56:267-273.
- Canfield, D. E. and R. W. Bachmann. 1978. Detrital aggregates in some Iowa lakes and reservoirs. *Hydrobiologia* 57:275-279.
- Jones, J. R. and R. W. Bachmann. 1978. Phosphorus removal by sedimentation in some Iowa reservoirs. *Verh. Int. Ver. Limnol.* 20:1576-1580.
- Burkholder-Crecco, J. M. and R. W. Bachmann. 1979. Potential phytoplankton productivity of three Iowa streams. *Proc. Iowa Acad. Sci.* 86:22-25.
- Nesler, T. P. and R. W. Bachmann. 1979. Influence of coal mining on water quality in Marion and Mahaska counties, Iowa. *Proc. Iowa Acad. Sci.* 20:149-153.
- Bachmann, R. W. 1980. The role of agricultural sediments and chemicals in eutrophication. *Journal Water Pollution Control Federation.* 52:2425-2431,2600
- Canfield, D. E. Jr., and R. W. Bachmann. 1981. Prediction of total phosphorus concentrations, chlorophyll a, and Secchi depths in natural and artificial lakes. *Can. J. Fish. Aquat. Sci* 38:414-423.
- Bachmann, R. W. 1981. Prediction of total nitrogen in lakes and reservoirs. pp 320-324 In U. S. Environmental Protection Agency. Restoration of lakes and inland waters; International symposium on inland waters and lake restoration, September 8-10, 1980, Portland, Maine. U.S. EPA 440/5-81-010.
- Canfield, D. E. Jr., J.R. Jones, and R. W. Bachmann. 1982. Sedimentary losses of phosphorus in some natural and artificial Iowa lakes. *Hydrobiologia* 87:65-76.
- Bachmann, R. W. and P. J. Horick. 1982. Water. Chapter 3 in T. C. Cooper editor. Iowa's natural heritage. Iowa Natural Heritage Foundation and Iowa Academy of Science. Des Moines, Iowa.
- Canfield, D. E., Jr., R. W. Bachmann, and M. V. Hoyer. 1983. Freeze-out of salts in hard-water lakes. *Limnol. Oceanogr.* 28:970-977.
- Bachmann, R. W., G. Atchison. 1984. Fishery and limnological techniques. University Bookstore, ISU. 170 pp. (This is a laboratory manual that is revised each year).
- Bachmann, David W. and R. W. Bachmann. 1984. A beginner's guide to the ISU VAX computer. Kendall/Hunt, Dubuque.

- Bachmann, R. W. 1984. Calculation of phosphorus and nitrogen loadings to natural and artificial lakes. *Verh. Int. Ver. Limnol.* 22:239-243.
- Dombeck, M. P., R. W. Bachmann, and B. W. Menzel. 1984. A method for measuring dissolved oxygen in aquatic microzones. *Jour. Freshwater Ecology* 2:535-540.
- Soballe, D. M., and R. W. Bachmann. 1984. Removal of Des Moines River phytoplankton by reservoir transit. *Can. J. Fish. Aquat. Sci.* 41:1803-1813.
- Carper, G. L., and R. W. Bachmann. 1984. Wind resuspension of sediments in a prairie lake. *Can. J. Fish. Aquat. Sci.* 41:1763-1767.
- Atchison, G. J., R. W. Bachmann, J. G. Nickum, J. B. Barnum, and M. B. Sandheinrich. 1986. Aquatic biota associated with channel stabilization structures and abandoned channels in the Middle Missouri River. Technical Report E-86-6. U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Bachmann, R. W. 1986. Chemical processes in lakes. W. Stum (editor) *J. N. Amer. Benth. Soc.* 5:321-323 (Book review)
- Bachmann, R. W., K. J. Kortge, and T. E. Robertson. 1988. Primary production in a small agricultural stream. *Vehr. Int. Ver. Limnol.* 23:1179-1182.
- Barnum, J. B. and R. W. Bachmann. 1988. Benthic macroinvertebrate habitat associations of the channelized Middle Missouri River. *Jour. Iowa Acad. Sci.* 95:60-65.
- Bushong, S. J., and R. W. Bachmann. 1989. In situ measurements of nutrient limitation in some agricultural streams. *Hydrobiologia* 178:1-10.
- Bachmann, R.W. 1990. Ecology and our endangered life-support systems. E.P. Odum. *J. N. Amer. Benth. Soc.* 9:91 (Book review)
- Bachmann, R.W. 1990. Climatic influences on annual variations on water transparency in Lake West Okoboji. *Jour. Iowa Acad. Sci.* 97:142-145.
- Bachmann, R.W., W.G. Crumpton, and G.L. Hallberg. 1991. Nitrogen losses in an agricultural stream. *Vehr. Int. Ver. Limnol.* 24:1641-1643.
- Bachmann, R.W. 1991. Reservoir limnology:ecological perspectives. K.W. Thornton, B.L. Kimmel, and F.E. Payne. *J.N. Amer. Benth. Soc.* 10:85-86. (Book review)
- Gaiser, E. E., and R. W. Bachmann. 1993. The ecology and taxonomy of epizoic diatoms on Cladocera. *Limnology and Oceanography* 38:628-637.

- Gaiser, E. E., and R. W. Bachmann. 1994. Seasonality, substrate preference and attachment sites of epizoic diatoms on Cladocera. *Journal of Plankton Research* 16:53-68.
- Birmingham, M. W., R. W. Bachmann, and W. G. Crumpton. 1994. Nitrate uptake by stream sediments: The influence of sediment character. *Vehr. Int. Ver. Limnol* 25:1467-1470.
- Bachmann, R. W., and D. E. Canfield Jr. 1996. Use of an alternative method for monitoring total nitrogen concentrations in Florida lakes. *Hydrobiologia* 323:1-8.
- Bachmann, R. W., B. L. Jones, D. D. Fox, M Hoyer, L. A. Bull, and Daniel E. Canfield, Jr. 1996. Relations between trophic state indicators and fish in Florida (USA) lakes. *Can. J. Fish. Aquat. Sci.* 53:842-855
- Brown, C. D., D. E. Canfield, Jr., R. W. Bachmann, and M. V. Hoyer. 1998. Seasonal patterns of chlorophyll, nutrient concentration and Secchi disk transparency in Florida lakes. *Lake and Res. Manage.* 14:60-76
- Brown, C. D., D. E. Canfield, Jr., R. W. Bachmann, and M. V. Hoyer. 1999. Evaluation of surface sampling for estimates of chlorophyll, total phosphorus, and total nitrogen concentration in shallow Florida lakes. *Lake and Res. Manage.* 15:121-132.
- Bachmann, R. W., M. V. Hoyer, and D. E. Canfield, Jr. 1999. The restoration of Lake Apopka in relation to alternative stable states. *Hydrobiologia* 394:219-232.
- Bachmann, R. W. 1999. A guide to the restoration of nutrient-enriched shallow lakes. B. Moss, J. Madgwick, and G. Phillips. *Limnol. & Oceanogr.* 44:737 (Book review).
- Bachmann, R. W., M. V. Hoyer, and D. E. Canfield, Jr. 2000. Internal heterotrophy following the switch from macrophytes to algae in Lake Apopka, Florida. *Hydrobiologia* 418:217-227.
- Brown, C. D., M. V. Hoyer, R. W. Bachmann, and D. E. Canfield, Jr. 2000. Nutrient-chlorophyll relationships: an evaluation of empirical nutrient-chlorophyll models using Florida and north-temperate lake data. *Can J. Fish. Aquat. Sci.* 57:1574-1583.
- Canfield, D. E., Jr., R. W. Bachmann, & M. V. Hoyer, 2000. A management alternative for Lake Apopka. *Lake and Res. Manage.* 16:205-221.
- Bachmann, R. W., M. V. Hoyer, and D. E. Canfield, Jr. 2000. The potential for wave disturbance in shallow Florida lakes. *Lake and Res. Manage.* 16:281-291.
- Bachmann, R. W. 2001. The limiting factor concept What stops growth? *Lakeline* 21(1):26-28.

- Bachmann, R. W., M. V. Hoyer, and D. E. Canfield, Jr. 2001. Sediment removal by the Lake Apopka marsh flow-way. *Hydrobiologia* 448:7-10.
- Bachmann, R. W., M. V. Hoyer, and D. E. Canfield, Jr. 2001. Evaluation of recent limnological changes at Lake Apopka. *Hydrobiologia* 448:19-26.
- Canfield, Jr., D. E., C. D. Brown, R. W. Bachmann and M. V. Hoyer. 2002. Volunteer lake monitoring: Testing the reliability of data collected by the Florida Lakewatch Program. *Lake and Res. Manage.* 18 (1):1-9.
- Bachmann, R. W., C. A. Horsburgh, M. A. Hoyer, L. K. Mataraza, and D. E. Canfield, Jr. 2002. Relations between trophic state indicators and plant biomass in Florida lakes. *Hydrobiologia* 470:219-234.
- Bachmann, R. W., M. V. Hoyer, C. Fernandez, and D. E. Canfield, Jr. 2003. An alternative to proposed phosphorus TMDLs for the management of Lake Okeechobee. *Lake and Reserv. Manage.* 19:251-264.
- Bachmann, R. W., M. V. Hoyer, and D. E. Canfield, Jr. 2003. Predicting the frequencies of high chlorophyll levels in Florida lakes from average chlorophyll or nutrient data. *Lake and Reserv. Manage.* 19:229-241.
- Bachmann, R. W., M. V. Hoyer, and D. E. Canfield, Jr. 2004. Aquatic plants and nutrients in Florida lakes. *Aquatics* 26:4-11.
- Hoyer, M.V., C.A. Horsburgh, D.E. Canfield, Jr. and R.W. Bachmann. 2005. Lake level and trophic state variables among a population of shallow Florida lakes and within individual lakes. *Can. J. Fish. Aquat. Sci.* 62: :2760-2769.
- Bachmann, R. W., M. V. Hoyer, S. B. Vinzon, and D. E. Canfield, Jr. 2005. The origin of the fluid mud layer in Lake Apopka, Florida. *Limnol. & Oceanogr.* 50:629-635.
- Bachmann, R.W., M.V. Hoyer, S.B. Vinzon and D.E. Canfield, Jr. 2006. Another look at the origin of the fluid mud layer in Lake Apopka, Florida. *Limnol. Oceanogr.* 51:2480-2483.
- Bachmann, R.W., M.V. Hoyer, and D.E. Canfield, Jr. 2006. Net production and net heterotrophy in Lake Apopka: a comment on Schelske et al. (2003). *Archiv fur Hydrobiologie.* 166:557-564.
- Mark V. Hoyer, Roger W. Bachmann and Daniel E. Canfield, Jr. 2008. Lake management (muck removal) and hurricane impacts to the trophic state of Lake Tohopekaliga, Florida. *Lake and Reservoir Management* 24:57-68
- Lazzarino, K.L., R. W. Bachmann, M.V. Hoyer, and D. E. Canfield, Jr. 2009. Carbon dioxide supersaturation in Florida lakes. *Hydrobiologia* 627:169-180

- Kosten, S, A. Kamarainen, E. Jeppesen, E. H. Van Nes, E. T. H. M. Peeters, N Mazzeo, L. Sass, J. Hauxwell, N. Hansel-Welch, T. L. Lauridsen, M. Sondegaard, R. W. Bachmann, G. Lacerot, and M. Scheffer. 2009. Climate-related differences in the dominance of submerged macrophytes in shallow lakes. *Global Change Biology* <http://dx.doi.org/10.1111/j.1365-2486.2009.01969.x>
- E. E. Gaiser, N. D. Deyrup, R. W. Bachmann, L. E. Battoe, and H. M. Swain. 2009. Multidecadal climate oscillations detected in a transparency record from a subtropical Florida lake. *Limnol. Oceanogr.* 54:2228-2232.
- E. E. Gaiser, N. D. Deyrup, R. W. Bachmann, L. E. Battoe, and H. M. Swain. 2009. Effects of climate variability on transparency and thermal structure in subtropical, monomictic Lake Annie, Florida. *Fundamental and Applied Limnology.* 175(3):217-230