

DOUGLAS B. McLAUGHLIN, PH.D.

Current Position:

Senior Scientist/Director of Environmental Engineering

Kieser & Associates, LLC

AREAS OF EXPERTISE:

Water Resources Management, Nutrient Management, Water Quality Criteria Development, TMDL Development, NPDES Permitting, Forest Product Industry Water and Wastewater Management, Ecological Risk Assessment, Freshwater Wetlands Ecology, Water Quality Monitoring Strategies, Modeling Stressor-Response Relationships, Statistical Methods, Uncertainty Analysis, Sources and Fate of Polychlorinated Biphenyls (PCBs), Contaminated Sediment Management.

EDUCATION:

Ph.D., Land Resources (Research Program: Water Chemistry), Institute for Environmental Studies, University of Wisconsin – Madison (1994) Thesis Title: “Natural and Induced Transformations of Polychlorinated Biphenyls in Sediments.”

M.S., Aquatic Biology, University of Wisconsin - Green Bay (1985) Thesis Title: “Aquatic Insect Emergence Patterns of Two Marshes on Green Bay, Lake Michigan.”

B.S., Biology. University of Wisconsin - Green Bay (1983).

SELECTED PROFESSIONAL APPOINTMENTS, SCIENCE ADVISORY ROLES, AWARDS:

Member, Illinois Nutrient Science Advisory Committee, appointed by Illinois Environmental Protection Agency and Illinois Department of Agriculture to guide the development of numeric nutrient water quality standards to protect aquatic life in Illinois waters. 2015-2018.

Member of U.S. Environmental Protection Agency Science Advisory Board Lake Erie Phosphorus Objectives Review Panel. 2016-2017.

Invited presenter at Invited Expert Meeting on Revising USEPA’s Guidelines for Deriving Aquatic Life Criteria, September 14-16, 2015, Arlington, VA. Presentation title: “Improving Uncertainty Characterization in USEPA’s Guidelines for Deriving Aquatic Life Criteria Using Decision Contexts.”

U.S. Environmental Protection Agency Science Advisory Board peer review panel for EPA draft “Effects of Mountaintop Mines and Valley Fills on Aquatic Ecosystems of the Central Appalachian Coalfields” and draft “Aquatic Life Benchmark for Conductivity in Central Appalachian Streams.” 2010-2011.

Consulting expert augmenting the U.S. Environmental Protection Agency Science Advisory Board Ecological Processes and Effects Committee to conduct a peer review of EPA’s draft guidance document, “Empirical Approaches for Nutrient Criteria Derivation.” 2009-2010.

Member, Federal Advisory Committee on Water Information (ACWI, 2003 - 2018).

Member, ACWI/ USGS Monitoring Challenges Workgroup (2012 – 2014).

Member, National Water Quality Monitoring Council (NWQMC, 2009- 2018).

Co-chair, Water Quality Statistics and Assessments Workgroup of NWQMC (2009 - 2018).

Member, NWQMC National Network of Reference Watersheds Committee (2013 - 2018).

Wisconsin Department of Natural Resources Phosphorus Criteria Advisory Committee, technical support. 2008.

Florida Department of Environmental Protection scientific peer review panel to assist in revision of dissolved oxygen criteria for freshwaters. 2011.

University of Wisconsin – Green Bay Environmental Management and Business Institute 2018 Earth Caretaker Award Recipient

SELECTED RECENT EXPERIENCE:

Development of an Approach to Establish the Scientific Basis for a Stream Restoration Crediting Protocol Using Field Data to Assess Stressor-Response Relationships and Build Ecosystem Response Models: DuPage River Salt Creek Workgroup, Naperville, IL with TetraTech, Inc. 2018-present.

Development of a Clearinghouse Framework for Phosphorus Reduction Programs in Wisconsin including WQT, Adaptive Management and Multiple Discharger Variance: Newtrient, LLC with funding from USDA, 2018.

Coauthor on “Comparison of NTT to Region 5/DRP Calculator Results for 2018 Erie P Market Agricultural Pilot Crediting Sites”, a Kieser & Associates technical memorandum provided to the Great Lakes Commission to Evaluate Uncertainty in Quantification Tools in Order to Identify and Prioritize Model Improvements. 2018.

Previous to Kieser & Associates

Provided Science Support to the Pulp and Paper Industry for Water Quality Criteria Development and Evaluation, Including the Assessment of Methods for Criteria Derivation and Uncertainty Characterization. 2003-2018.

Analyzed Long Term Water Quality and Macroinvertebrate Data Sets to Assess Impacts of Pulp and Paper Mill Effluents on Receiving Streams. 2013-2018.

Developed Quantitative Approaches for the Analysis of Field Data to Derive Numeric Nutrient Criteria and Estimate the Probability of Adverse Biological Community Impacts. 2010-2018.

Designed and Conducted Field and Data Analyses To Assess Status and Trends of PCB Contamination in Water, Sediment, and Fish to Support the Evaluation of Alternatives for Sediment Remediation in the Fox River, Wisconsin on Behalf of the Fox River Group of Companies. 1997 – 2003.

Provided Ecosystem Modeling Support to Ohio Environmental Protection Agency in Development of Quantitative Tools for Managing Water Quality and Macroinvertebrate Community Health in Headwater Streams. 2017-2018.

PREVIOUS POSITIONS HELD:

Principal Research Scientist, National Council for Air and Stream Improvement, Inc., Kalamazoo, Michigan (2002-2018).

Senior Scientist, Blasland, Bouck, and Lee, Inc., Syracuse, New York and DePere, Wisconsin. 1997-2002.

Environmental Research Manager and Analytical Services Laboratory Supervisor. Fort Howard Corporation, Green Bay, Wisconsin. 1993-1997.

Environmental Specialist, Research and Development, Fort Howard Corporation, Green Bay, Wisconsin. 1985-1990.

Lecturer, Western Michigan University. Water and Residuals Management Topics in the Forest Products Industry, (PAPR 3531, Fall semester, 2004, 2006, 2009, 2010, 2012, 2013)

Adjunct Professor, University of Wisconsin - Green Bay. Hazardous and Toxic Materials Spring semester, 2001.

SELECTED PUBLICATIONS AND PRESENTATIONS:

Journal Publications

Miltner, R. and D.B. McLaughlin. 2019. Management of headwaters based on macroinvertebrate assemblages and environmental attributes. *Science of the Total Environment* 650: 438–451.

McLaughlin, D.B., K.H. Reckhow. 2017. A Bayesian Network Assessment of Macroinvertebrate Responses to Nutrients and Other Factors in Streams of the Eastern Corn Belt Plains, Ohio, USA. *Ecological Modelling*. 345: 21-29. DOI: 10.1016/j.ecolmodel.2016.12.004.

McLaughlin, D.B., C.A. Flinders. 2016. Quantifying variability in four US streams using a long-term dataset: patterns in water quality endpoints. *Environmental Management*. 57(2):368-388. DOI 10.1007/s00267-015-0609-7.

Flinders, C.A., D.B. McLaughlin, and R.L. Ragsdale. 2015. Quantifying variability in four U.S. streams using a long-term dataset: patterns in biotic endpoints. *Environmental Management*. 56(2): 447-466. DOI 10.1007/s00267-015-0509-x

McLaughlin, D.B. 2015. Assessing the fit of biotic ligand model validation data in a risk management decision context. *Integrated Environmental Assessment and Management*, 11(4): 610-617. DOI: 10.1002/ieam.1634

McLaughlin, D.B. 2014. Maximizing the accuracy of field-derived numeric nutrient criteria in water quality regulations. *Integrated Environmental Assessment and Management* 10(1): 133-137.

McLaughlin, D.B. 2012a. Assessing the predictive performance of risk-based water quality criteria using decision error estimates from ROC analysis. *Integrated Environmental Assessment and Management*. 8(4): 674-684.

McLaughlin, D.B. 2012b. Estimating the designated use attainment decision error rates of USEPA's proposed numeric total phosphorus criteria for Florida colored lakes. *Integrated Environmental Assessment and Management* 8(1):167-174.

McLaughlin, D.B. and V. Jain. 2011. Using Monte Carlo analysis to characterize the uncertainty in final acute values derived from aquatic toxicity data. *Integrated Environmental Assessment and Management* 7(2): 269-279.

McLaughlin, D.B. and H.J. Harris. 1990. Aquatic insect emergence in two Great Lakes marshes. *Wetlands Ecology and Management*. 1(2): 111-121.

Conference Proceedings

McLaughlin, D.B. 2009. Evaluating the Implications of End-of-Pipe Effluent Limits for Achieving Site-Specific Instream Water Quality Criteria: An Example From Wisconsin. *Water Environment Federation TMDL Conference Proceedings*, August. Minneapolis, Minnesota.

McLaughlin, D.B., Treasure, T., and Wiegand, P. 2008. Assessing variation in concentrations of dissolved iron in minimally disturbed streams to improve water quality criteria. *Proceedings of the WEFTEC Environmental Conference*, Chicago, Illinois.

Ice, G.G., J.P. Unwin, T.J. Hall, P. Wiegand, and D.B. McLaughlin. 2007. Addressing Infrequent, Brief, and Small Excursions of Water Quality. *Proceedings of the 4th American Society of Agricultural and Biological Engineers Conference on Watershed Management to Meet TMDLs*. San Antonio, Texas.

Beebe, J. and D.B. McLaughlin. 2005. Availability of Water Quality data for TMDL Development. *Conference Proceedings: TMDL 2005*. Water Environment Federation. Philadelphia, Pennsylvania.

McLaughlin, D.B. 1997. Congener specific PCB concentrations in fish from the Fox River, Wisconsin, USA. *Proceedings of the 1997 TAPPI Environmental Conference*, May 5-7, Minneapolis, Minnesota. p. 27-31.

McLaughlin, D.B., A. Andren, and D. Armstrong. 1992. Oxidation of PCB congeners adsorbed to particles. Proceedings of the 48th Annual Purdue Industrial Waste Conference, May 10-12, West Lafayette, Indiana.

NCASI Technical Bulletins and Special Reports

McLaughlin, D.B. and G. Ice. 2012. Considerations and Statistical Approaches for Effects-Based Site-Specific Numeric Nutrient Criteria. National Council for Air and Stream Improvement (NCASI). Technical Bulletin No. 1004. Research Triangle Park, North Carolina.

McLaughlin, D.B. 2012. PCBs in the Environment: A Summary of Their Distribution and Sources Relevant to Total Maximum Daily Load Studies. National Council for Air and Stream Improvement (NCASI) Technical Bulletin No. 1014. Research Triangle Park, North Carolina.

McLaughlin, D.B. and V. Jain. 2010. Using Monte Carlo Analysis to Characterize the Uncertainty in Final Acute Values Derived from Aquatic Toxicity Data. National Council for Air and Stream Improvement (NCASI). Technical Bulletin No. 972. Research Triangle Park, North Carolina.

McLaughlin, D.B., and P. Lagace. 2008. Investigation of the main sources of PCBs at a TMP/recycle pulp mill and a bleached kraft pulp mill. Special Report No. 08-04. Research Triangle Park, N.C.: National Council for Air and Stream Improvement, Inc.

McLaughlin, D.B. 2008. Evaluating trends in hydrophobic organic contaminants in biological tissues using linear regression. National Council for Air and Stream Improvement (NCASI). Technical Bulletin No. 950. Research Triangle Park, North Carolina.

Selected Presentations

McLaughlin, D.B. 2015. Improving Uncertainty Characterization in USEPA's Guidelines for Deriving Aquatic Life Criteria Using Decision Contexts. Presented at Invited Expert Meeting on Revising USEPA's Guidelines for Deriving Aquatic Life Criteria, September 14-16, 2015, Arlington, VA.

McLaughlin, D.B. 2014. How Well Do BLM Predictions Fit Model Validation Data? A WQC Attainment Decision Perspective. SETAC North America 35th Annual Meeting. November, 2014. Vancouver, BC.

McLaughlin, D.B. 2014. Using a Long Term Data Set to Evaluate the Role of Variability and Decision Error Tolerance in Making Water Quality Assessment Decisions. SETAC North America 35th Annual Meeting. November, 2014. Vancouver, BC.

McLaughlin, D.B. 2013. Numeric Nutrient Criteria Development and the U.S. Forest Products Industry. Mississippi Manufacturers Association Environmental & Safety Conference, Nutrient Criteria Panel, October 17-18, 2013

McLaughlin, D.B. 2013. Translating Prediction Uncertainty Into Decision Uncertainty: A Numeric Nutrient Criteria Example. North American Lake Management Society 33rd International Symposium, San Diego, CA. October 30 - November 1, 2013.

Flinders, C.A., and D.B. McLaughlin. 2013. Quantifying Spatial and Temporal Variation Using a Long-term Dataset: Implications for Management. Society for Freshwater Science Annual Conference. May 19-23, 2013. Jacksonville FL.

McLaughlin, D.B., D. Sullivan, L. McGeorge. 2012. Better Access to Water Quality Statistical and Assessment Methods: Developing a New Component of the National Environmental Methods Index (NEMI). Eighth National Monitoring Conference. April 30-May 5, 2012, Portland, OR.

McLaughlin, D.B. 2012. An update on the development of numeric nutrient criteria in the United States: a forest industry perspective. IWA Annual Conference, Concepcion, Chile. January, 2012. (presented by Paul Wiegand).

McLaughlin, D.B. 2012. An Introduction to NCASI and Prediction Uncertainty, Bright Lines, and the Search for

Useful Indicator Benchmarks for Ecosystem Management. Presented at NOAA GL Environmental Research Lab, Ann Arbor, MI, January 10, 2012.

McLaughlin, D.B., and H. Bohra. 2011. Uncertainty Estimates for USEPA's Freshwater Acute Ambient Aquatic Life Water Quality Criterion for Acrolein. AWRA 2011, Albuquerque, NM November 7, 2011.

McLaughlin, D.B. 2010. Considering Water Quality Impairment Decision Errors in Numeric Nutrient Criteria Development. SETAC North America 31st Annual Meeting, November 7-11, 2010, Portland, OR.

McLaughlin, D.B., L. McGeorge, and D. Sullivan. 2010. Increasing Awareness, Understanding, and Availability of Statistical Methods for Water Quality Monitoring and Assessment. Seventh National Monitoring Conference - Monitoring From the Summit to the Sea. April 25-29, 2010, Denver, CO

Ice, G., McLaughlin, D.B., Wiegand, P., Beebe, J., Schilling, E., Greathouse, E., Rhoades, C.C., Johnson, S, Sebestyen, S., and Sugden, B. 2010. Nutrient Criteria and Standards for Forested Headwater Streams: An Overview of Issues and Solutions. Seventh National Monitoring Conference - Monitoring From the Summit to the Sea. April 25-29, 2010, Denver, CO.

McLaughlin, D.B. 2009. A Review of Approaches Used to Establish Regional and Site-Specific Numeric Nutrient Criteria. American Water Resources Association 2009 Annual Water Resources Conference. Seattle, Washington.

McLaughlin, D.B. Evaluating the Implications of End-of-Pipe Effluent Limits for Achieving Site-Specific Instream Water Quality Criteria: An Example From Wisconsin. Water Environment Federation TMDL Conference, Minneapolis, Minnesota. August 2009.

McLaughlin, D.B., C. Thompson, and P. Bollerman. Quantifying Trends in Color Increases Across Aerated Stabilization Basins at a Pulp and Paper Mill in Florida, USA. 9th International Wastewater Association Symposium on Forest Industry Wastewaters, Fredricton, New Brunswick. June 2009.

McLaughlin, D.B. Some Water Program Activities of the National Council for Air and Stream Improvement (NCASI). Advisory Committee on Water Information Annual Meeting, Herndon, Virginia. February 11, 2009.

McLaughlin, D.B. and V. Jain. Characterizing the Uncertainty of Final Acute Values Used in Aquatic Life Water Quality Criteria. Presented at SETAC North America, 29th Annual Meeting, Tampa, Florida, November, 2008.

McLaughlin, D.B., T. Treasure, and P. Wiegand. Assessing variation in concentrations of dissolved iron in minimally disturbed streams to support improved water quality criteria. Presented at WEFTEC, Chicago, Illinois. October, 2008.

McLaughlin, D.B. 2008. More Than Doable: An Examination of Statistical Methods Used to Analyze Time Trends in Contaminant Data Containing Nondetects. Presented at the National Water Quality Monitoring Conference, Atlantic City, New Jersey.

McLaughlin, D.B., and J. Beebe. 2008. Using GIS to Characterize Multiple Watersheds of Interest to Forest Products Industry Stakeholders. Presented at the American Water Resources Association Spring Specialty Conference - GIS and Water Resources V, San Mateo, California.

McLaughlin, D.B. 2007. Addressing Eutrophication in Freshwater Ecosystems: Water Quality Regulations and NPDES Limits. Presented at the NCASI Effluent Nutrients Workshop. Green Bay, Wisconsin.

McLaughlin, D.B. 2007. Handling Nondetects in Contaminant Time Trend Analysis: An Example Using Some Contemporary Methods. Presented at the USEPA Annual Conference on Managing Environmental Quality Systems. Cleveland, Ohio.

McLaughlin, D.B. 2006. Interpreting Tissue Contaminant Trend Data Using Linear Regression. Presented at the NCASI West Coast Regional Center Water Toxics Workshop. Portland, Oregon.

Barden, M. and D.B. McLaughlin. 2004. Regulatory Background and Perspectives on the Current and Future Role Water Quality Modeling in TMDLs. Presented at the NCASI Surface Water Quality Modeling/TMDL Workshop. Portland, Maine.

McLaughlin, D.B., D.S. Pham, and V.L. Menting. 2001. PCB Releases During Environmental Dredging of Contaminated Sediments in the Fox River, Wisconsin. U.S. EPA Forum on Managing Contaminated Sediments at Hazardous Waste Sites, Washington, D.C.

McLaughlin, D.B., D.S. Pham, J. Wolfe and H. Holmberg. 2001. Assessing the Effectiveness of Remedial Alternatives for Contaminated Sediments in Large River Systems. International Association for Great Lakes Research Annual Conference. Green Bay, Wisconsin.

Dekker, T., D.B. McLaughlin, and J. Wolfe. 2001. Development of Guidelines for Fish PCB Trend Analysis. International Association for Great Lakes Research Annual Conference. Green Bay, Wisconsin.

McLaughlin, D.B. 2000. "The Role of Natural Attenuation/Recovery Processes in Managing Contaminated Sediments." 16th Annual International Conference on Contaminated Soils, Sediments, and Water. Amherst, Massachusetts.

McLaughlin, D.B., and K.M. Janus. 1997. "Multidimensional gas chromatography for the analysis of PCB congeners in fish from the Fox River, Wisconsin." Presented at the annual meeting of the Midwest Regional Chapter of the Society for Environmental Toxicology and Chemistry. Green Bay, Wisconsin.

McLaughlin, D.B., J. Steuer, D. Armstrong, A. Andren, D. Patterson, and C. Buelow. 1993. PCB homolog and congener patterns in Fox River sediments. Presented at the International Association on Water Quality, First International Specialized Conference on Contaminated Aquatic Sediments. Milwaukee, Wisconsin.