

Michael W. Murray, Ph.D.

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Education

Ph.D., Water Chemistry, 1996

Minor: Atmospheric and Oceanic Sciences. University of Wisconsin, Madison, WI

M.S., Water Chemistry, 1987

University of Wisconsin, Madison, WI

Graduate Program in Environmental Sciences

University of Virginia, Charlottesville, VA, 1983-1984

Diplôme, French Language and Civilization Program, 1983

Université de Paris-IV, Paris, France

B.S., Geological Engineering, 1982

Colorado School of Mines, Golden, CO

Experience

Assistant Professor, Department of Biological Sciences, Augusta University, Augusta, GA

August 2025 – present (non-tenure track); previously instructor, lecturer (August 2013 – June 2025)

- Teach environmental biology (with lab) for non-science majors (details below), including currently as Course Director; mentor students, serve on committees
- Currently developing new research program, including an emphasis on biogeochemical cycling and ecological exposures of per- and polyfluoroalkyl substances (PFAS)

Lecturer, Master of Public Health Program, Augusta University, Augusta, GA

January 2016 – May 2018; 2023

- Teach environmental health courses in online MPH program

Adjunct Associate Professor, University of Michigan School for Environment and Sustainability

February 2011 – present (non-salaried)

- Collaborate with faculty, advise students

Staff Scientist, National Wildlife Federation, Great Lakes Regional Center, Ann Arbor, MI

May 1997 – September 2021 (remotely from Georgia, 2013 – 2021)

- Served as principal NWF scientist addressing toxic chemicals at state, regional, national and international levels, with extensive involvement in other environmental issues
- Carried out and managed scientific and science-policy research and education work on multiple Great Lakes topics, including through supervision of over 50 interns, research assistants and volunteers, and collaborations with other Great Lakes researchers, including through International Joint Commission (IJC) work groups

Adjunct Lecturer, University of Michigan School of Public Health (SPH); **Intermittent Lecturer**,

University of Michigan School of Natural Resources and Environment

September 1998 – May 2013; January – May, 2011, 2013

- Taught/team taught four graduate-level courses (noted below)

Research Assistant/Student/Honorary Fellow, 1984 – 1997

Water Chemistry Program, University of Wisconsin-Madison.

- Extensive laboratory and field studies on polychlorinated biphenyls (PCBs), in particular involving physical-chemical properties and mass transfer in the environment

Teaching and Advising

Teaching

- Environmental Biology (Biol 1102, currently separate lecture and lab), Augusta University, Department of Biological Sciences (25 terms to date); draw on extensive work experience outside academia and multiple resources in these non-science major courses
- As Course Director, work with Biol 1102 colleagues in developing course plan/syllabi, planning field trips, developing and administering general education exam questions
- Augusta University Master of Public Health Program (online): Environmental Aquatic Sciences (MPHE 8904) (three terms, including significant redesign of course, 2016, 2017, 2018); Fundamentals of Air Pollution (MPHE 8900) (summer term, 2017); Introduction to Environmental Health (MPHC 8700) (summer term, 2023)
- Water Resource Policy (NRE 558), University of Michigan School of Natural Resources and Environment (winter terms 2011, 2013)
- Environmental Chemistry (EHS 574), University of Michigan School of Public Health, team taught/guest lectured with Dr. Jerome Nriagu (1998 – 2012)
- Water Quality Management (EHS 570), University of Michigan SPH, principal lecturer, including in significant redesign of course (2005 – 2006)
- Guest lecturer in EHS 570, EHS 574, and Great Lakes Water Quality and Human Health (EHS 615), NRE 558, and other courses (University of Michigan), including at Henry Ford Community College (1998 – 2012)
- Extensive experience with online teaching and platforms (including D2L and Echo360), and videoconferencing platforms, including MS Teams, Zoom, and Webex

Student Advising and Mentoring and Service

- Faculty advisor on Medical College of Georgia (MCG) student-led project, *The Impacts of Environmental Health Discussions on the Public Health Literacy of Medical Students* (Christopher Watson, PI)
- Faculty advisor on MCG student-led project leading to report *Planetary Health Report Card (Medicine) 2026; Medical College of Georgia at Augusta University*
- Committee member, Benjamin Dunlap, B.S. Honors Thesis, Augusta University (2025 – present)
- Faculty advisor to Friends of MSF at Augusta University (2019 – present)
- MPH Capstone program advisor of William Ealick (2017); have also advised several MPH students on capstone projects and career options
- Have advised and provided multiple recommendation letters for AU undergraduate and graduate students, including over 60 letters since 2022

- Advised University of Michigan Graham Scholars students Eden Blutstein, Christina Brietzke, Georgina Broyles, Madeline Peery, and Harrison Suchyta on research project for NWF examining chemicals of emerging concern in the Great Lakes, resulting in report released in summer 2021
- Co-advised six University of Michigan EHS OJ/OC students on M.S. theses: John Rafterowski (2002), April Wendling (2002), Andrew Webster (2003), Pamela Pugh (2005), Nancy Bobola (2006), and Mazen Boughanem (2006)
- Advised as client organization (with University of Michigan SNRE Faculty members Dr. Gloria Helfand and Dr. Michael Moore) Kathleen Cardamone, Stephanie Cuttler and Nikole Reaksecker on SNRE M.S. mercury emissions reduction project (2001-2002); advised several SNRE and Public Policy students on projects, coursework, and/or career issues
- Have spoken at several student career panels (including University of Michigan Graham Scholars virtual meeting in fall 2021), and advised numerous NWF interns and students from AU and UM on career options
- Service work has included formal committee work (indicated below) and review and advisory work on multiple issues, including on guidelines of Department of Biological Sciences and College of Science and Mathematics, faculty hiring, and faculty governance

Publications

Technical/Science-Policy Papers, Book Chapters (peer-reviewed)

- Koh, E., Kim, J., Aldihri, F., Huang, H., **Murray, M.**, Winston, N, Watson, C.M. 2025. Empowering learners through student-led integration of environmental health into small group discussions, *Medical Education Online*. 2025 Dec;30(1):2534054. doi: 10.1080/10872981.2025.2534054. Epub 2025 Jul 27. PMID: 40717422.
- Murray M.W.**, Livernois J., Bratton J.F., and Burrows M. Addressing Lake Erie eutrophication: An assessment of recent progress and recommendations. *Aquatic Ecosystem Health & Management*. 28(1), 112-124, (16 June 2025).
- Ludsin, S.A., Mohiuddin, M., Boegehold, A.G., Collingsworth, P.D., Hoffman, J.C. and **Murray, M.W.** 2025. Ecology of Lake Erie – Causes, consequences & management of eutrophication: A synthesis. *Aquatic Ecosystem Health & Management*. Aquatic Ecosystem Health & Management 28(1), 125-131, (16 June 2025).
- Collingsworth, P.D., Bunnell, D.B., **Murray, M.W.**, Kao, Y-C., Feiner, Z.S., Claramunt, R.M., Lofgren, B.M., Höök, T.O., Ludsin, S.A., 2017. Climate change as a long-term stressor for the fisheries of the Laurentian Great Lakes of North America, *Reviews in Fish Biology and Fisheries*, 27(2):363-391.
- Kalcic, M.M., Kirchhoff, C., Bosch, N., Muenich, R.L., **Murray, M.W.**, Gardner, J.G., Scavia, D., 2016. Engaging stakeholders to define feasible and desirable agricultural conservation in Western Lake Erie watersheds, *Environmental Science and Technology*, 50:8135-8145.

- Watson, S. B., Miller, C. J., Arhonditsis, G., Boyer, G.L., Carmichael, W., Charlton, M.N., Confessor, R., Depew, D.C., Höök, T.O., Ludsin, S.A., Matisoff, G., McElmurry, S. P., **Murray, M.W.**, Richards, R.P., Rao, Y.R., Steffen, M.M., Wilhelm, S.W., 2016. The re-eutrophication of Lake Erie: Harmful algal blooms and hypoxia, *Harmful Algae*, 56:44-66.
- Abbasi, G., Buser, A.M., Soehl, A., **Murray, M.W.**, Diamond, M.L., 2015. Stocks and flows of PBDEs in products from use to waste in the U.S. and Canada from 1970 to 2020, *Environmental Science and Technology*, 49:1521-1528.
- Mergler, D., Anderson, H.A., Chan, L.H.M., Mahaffey, K.R., **Murray, M.**, Sakamoto, M., Stern, A.H., 2007. Methylmercury exposure and health effects in humans: A worldwide concern, *Ambio*, 33(1):3-11.
- Scheuhammer, A., Meyer, M.W., Sandheinrich, M.B., **Murray, M.W.**, 2007. Effects of environmental methylmercury on the health of wild birds, mammals, and fish, *Ambio*, 33(1):12-18.
- Harris, R., Krabbenhoft, D.P., Mason, R.F., **Murray, M.W.**, Reash, R.J., Saltman, T., 2007. Introduction, In: Harris, R., Krabbenhoft, D.P., Mason, R.F., Murray, M.W., Reash, R.J., Saltman, T. (Eds.), *Ecosystem Responses to Mercury Contamination: Indicators of Change*. Society of Environmental Toxicology and Chemistry, Pensacola, FL, and Taylor & Francis, New York, NY, pp. 1-11.
- Wolfe, M.F., Atkeson, T., Bowerman, W., Burger, J., Evers, D.C., **Murray, M.W.**, Zillioux, E., 2007. Wildlife indicators, In: Harris, R., Krabbenhoft, D.P., Mason, R.F., Murray, M.W., Reash, R.J., Saltman, T. (Eds.), *Ecosystem Responses to Mercury Contamination: Indicators of Change*, Society of Environmental Toxicology and Chemistry, Pensacola, FL, and Taylor & Francis, New York, NY, pp. 123-189.
- Saltman, T., Harris, R., **Murray, M.W.**, Reash, R.J., 2007. An integrated framework for ecological mercury assessments, In: Harris, R., Krabbenhoft, D.P., Mason, R.F., Murray, M.W., Reash, R.J., Saltman, T. (Eds.), *Ecosystem Responses to Mercury Contamination: Indicators of Change*, Society of Environmental Toxicology and Chemistry, Pensacola, FL, and Taylor & Francis, New York, NY, pp. 191-207.
- Mason, R.F., Abbott, M.L., Bodaly, R.A., Bullock, O.R., Driscoll, C.T., Evers, D., Lindberg, S.E., **Murray, M.**, Swain, E.B., 2005. Monitoring the response to changing mercury deposition, *Environmental Science & Technology*, 39(1):16A-22A.
- Murray, M.** and Holmes, S.A., 2004. Assessment of mercury emissions inventories for the Great Lakes states, *Environmental Research*, 95:282-297.
- Boethling, B., Buccini, J., Cowan-Ellsberry, C., Graham, D., Hansen, B., **Murray, M.**, Rampy, L., Rodan, B., Wahlstrom, B., 2000. Framework and criteria for evaluating persistent and long-range transport, In: Evaluation of Persistence and Long-range Transport of Organic Chemicals in the Environment, Klecka, G., Boethling, B., Franklin, J., Grady, L., Graham, D., Howard, P.H., Kannan, K., Larson, R.J., Mackay, D., Muir, D., van de Meent, D. (Eds.), Society of Environmental Toxicology and Chemistry, Pensacola, FL, pp. 315-334.
- Murray, M. W.** and Andren, A.W., 1992. Evaluation of a precipitation collector for PCB analysis, *Atmospheric Environment*, 26A(6):1097-1101.

Murray, M. W. and Andren, A.W., 1992. Precipitation scavenging of polychlorinated biphenyl congeners in the Great Lakes Region, *Atmospheric Environment*, 26A(5):883-897.

Murray, M. W. and Andren, A.W., 1991. Preliminary evaluation of the potential of gas purging for investigating the air-water transfer of PCBs, *In Organic Substances and Sediments in Water*, Baker, R.A. (Ed.), Lewis Publishers, Inc., Chelsea, MI, pp. 3-13.

Committee/Workgroup/Other Reports

(Over 30 reports as lead author, co-author, or contributor; selected reports since 2006 listed here)

Ohio River Basin Alliance and National Wildlife Federation. Healthy waters, healthy communities, healthy economies – A collaborative plan to restore and protect the waters of the Ohio River Basin. (Contributor to Toxic Pollution section and reviewer) (draft report for public comment released June 2025)

International Joint Commission, Great Lakes Science Advisory Board Science Priority Committee and Great Lakes Water Quality Board, 2023. Nutrients in Lake Erie and Lake Ontario: Synthesis of International Joint Commission recommendations and assessment of domestic action plans. (**Murray, M.W.**, Livernois, J., and Wood, G., co-authors.)

Murray, M.W., Heath, J., 2023. Toxic Pollution Committee report (including appendix), background document for Ohio River Basin ecosystem restoration and protection plan.

Murray, M.W., Bratton, J.F., Elgin, A.K., Godwin, C.M., Riseng, C.M., 2021. Great Lakes indicators: Exploring alternative approaches through stakeholder input: A white paper. National Wildlife Federation, Great Lakes Regional Center, Ann Arbor, MI.

Murray, M.W., Bratton, J., Elgin, A., Godwin, C., Riseng, C., 2021. Great Lakes indicators: Background and overview for a HOW Coalition leadership meeting.

Murray, M.W., Bratton, J., Elgin, A., Godwin, C., Riseng, C., 2021. Great Lakes indicators: Exploring alternative approaches through stakeholder input, background document. (Prepared for Great Lakes Indicators: Exploring Alternative Approaches Through Stakeholder Input Virtual Summit, February 23-24, 2021.)

Murray, M.W. and Rau, E., 2020. Seizing the day for Ohio River restoration: A vision for science-based ecosystem restoration integrated with equity and justice. Background document for virtual session, Ohio River Basin Symposium & Summit 2020, October 2, 2020.

Murray, M.W. and Salim, O., 2019. The science and policy of PFASs in the Great Lakes Region: A roadmap for local, state and federal action, National Wildlife Federation, Great Lakes Regional Center, Ann Arbor, MI.

Murray, M.W., Steinman, A.D., Allan, J.D., Bratton, J.F., Johnson, L.B., Ciborowski, J.J.H., Stow, C.A., 2019. Conceptual frameworks and Great Lakes restoration and protection: A white paper. National Wildlife Federation, Great Lakes Regional Center, Ann Arbor, MI.

- International Joint Commission, Great Lakes Science Advisory Board. 2018. Potential ecological impacts of crude oil transport in the Great Lakes Basin. (**Murray, M.W.**, Allan, J.D. and M. Child, co-authors).
- International Joint Commission, 2018. Fertilizer application patterns and trends, and their implications for water quality in the western Lake Erie basin. Prepared by the Great Lakes Science Advisory Board for the International Joint Commission (Allan, J.D., **Murray, M.** and M. Child, co-authors).
- Murray, M.W.**, Kirchhoff, C., Kalcic, M.M., Steiner, A., Bosch, N., Lopez, F., Scavia, D., 2016. Guidance addressing Lake Erie eutrophication in a changing climate based on a case study with agricultural and coastal managers.
- International Joint Commission, Great Lakes Science Advisory Board, Science Priority Committee, Communication Indicator Workgroup, An assessment of the communicability of the International Joint Commission ecosystem indicators and metrics, June 2016 (contributor on PBTs in biota, and chemicals of mutual concern in water).
- Pebbles, V., Braun, H., Leduc-Lapierre, M., **Murray, M.**, Koslow, M., Hoffman, J., 2014. Best practices for climate change adaptation: Spotlight on Michigan coastal wetlands. Great Lakes Commission and National Wildlife Federation.
- Abbasi, G., Diamond, M., Soehl, A., **Murray, M.**, 2014. Great Lakes PBDE reduction project, Summary paper no. 1, PBDE product inventory.
- Murray, M.**, Soehl, A., Abbasi, G., Diamond, M., 2014. Great Lakes PBDE reduction project, Summary paper no. 2, PBDE alternatives assessment.
- Diamond, M., Abbasi, G., Soehl, A., **Murray, M.**, 2014. Great Lakes PBDE reduction project, Summary paper no. 3, PBDE reduction metrics.
- Koslow, M., Berrio, J., Glick, P., Hoffman, J., Inkley, D., Kane, A., **Murray, M.**, and Reeve, K., 2014. Restoring the Great Lakes' coastal future: Technical guidance for the design and implementation of climate-smart restoration projects with seven case studies. National Wildlife Federation, Reston, VA and National Oceanic and Atmospheric Administration, Silver Spring, MD.
- Work Group Report to the International Joint Commission, Technical Report on Ecosystem Indicators: Assessment of Progress Towards Restoring the Great Lakes, Great Lakes Water Quality Agreement, 2012 – 2015 Priority Cycle, July 2013.
- Murray, M., 2013. Lake Erie coastal wetlands and implications for nutrient loadings, draft report as part of International Joint Commission Lake Erie Ecosystem Priority Work Group.
- Murray, M., 2010. Identifying restoration and protection focus areas for the Healing Our Waters – Great Lakes Coalition: A report to the Healing Our Waters – Great Lakes Coalition Steering Committee, March 2010.
- U.S. Environmental Protection Agency (EPA) Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs, December 2007.
- U.S. EPA Science Advisory Board, EPI Suite Review Panel report, September 2007.

Agreement Review Committee, 2006. Report to the Great Lakes Binational Executive Committee Volume 2. (Contributor to Review Working Group B and Special Issues Working Group Final Reports). December 2006.

Axler, R., Bails, J. Elliott, K., Fahnenstiel, G., Gannon, J., Krantzberg, G., Mackey, S., **Murray, M.**, Morrison, L., Ruetz, C., Savino, J., Scavia, D., Taylor, J., Todd, T., 2006. Future of the Great Lakes: Prioritizing prevention, protection, and restoration activities, July 2006.

Bails, J., Beeton, A., Bulkley, J., DePhilip, M., Gannon, J., **Murray, M.**, Regier, H., and Scavia, D., 2006. Prescription for Great Lakes ecosystem protection and restoration. (Also edited, and co-coordinated endorsement by initial group of 62 Great Lakes scientists in late fall 2005, then expanded to over 200 endorsements in 2006.)

Dissertation/Thesis

Murray, M.W., 1996. Laboratory studies of physical-chemical properties and field measures of several parameters affecting the transport and fate of polychlorinated biphenyls in the environment, Ph.D. Dissertation (under mentorship of Dr. Anders Andren), Water Chemistry Program, University of Wisconsin, Madison, WI.

Murray, M.W., 1987. Precipitation scavenging of PCBs: Collector evaluation and event analysis, M.S. Thesis, Water Chemistry Program, University of Wisconsin, Madison, WI.

Policy Papers/Other Publications

Murray, M., 2010. Human health implications of the Gulf oil spill, *Therapeutics and Toxins News* (newsletter for the Therapeutic Drug Management and Toxicology Division of American Association for Clinical Chemistry), Summer 2010.

Stadler, F., **Murray, M.**, 2001. Mercury rising, *Forum for Applied Research and Public Policy*, 16(3): 43-51.

Murray, M.W., Lawther, J.H., DeFalco, T.S., Wolk, J.C., Cholewiak, D.M., Reyer, J.E., 1999. Technical and policy issues related to the development of a total maximum daily load plan for mercury in the St. Louis River, MN: Development of a case study, Air & Waste Management Association, Mercury in the Environment, Proceedings of A Specialty Conference, September 15-17, 1999, Minneapolis, MN, pp. 63-74.

Billups, S., Eder, T., Jackson, J., Muldoon, P., **Murray, M.**, 1998. Treading water: A review of government progress under the Great Lakes Water Quality Agreement, *The Toledo Journal of Great Lakes Law, Science & Policy*, Spring 1998, pp. 91-178.

Policy, Education, and Advocacy Reports/Fact Sheets

(Over 20 publications (not including blogs), with those since 2011 listed here. Project coordinator or co-lead on most reports)

Murray, M.W., 2017. Summary of recent studies on pollinators and neonicotinoids.

- Inkley, D., Losoff, T., Rowland, J., Ellenberger, D., Glick, P., Murphy, J., **Murray, M.**, Ritter, J., Szollosi, F., Yancey, M., 2015. Wildlife in hot water: America's waterways and climate change, National Wildlife Federation.
- Lazaroff, C., Weinmann, A., **Murray, M.**, Goldman-Carter, J., 2014. Harmful algal bloom state survey: Summary of results and recommendations, Resource Media and National Wildlife Federation.
- Whitney, P., Heller, G., **Murray, M.**, Goldman-Carter, J., Watkins, G., Whelan, A., 2013. Toxic algae: Coming soon to a lake near you? Resource Media and National Wildlife Federation.
- Murray, M.W.**, Ruszaj, A., O'Shea, C., Radcliffe, C., Guadagnino, A., 2011. From the Great Lakes Water Quality Agreement to the Binational Toxics Strategy: An assessment of NGO perspectives on chemicals policies in the Great Lakes, National Wildlife Federation.
- Mida Hinderer, J., **Murray, M.W.**, and Becker, T., 2011. Feast and famine in the Great Lakes: How nutrients and invasive species interact to overwhelm the coasts and starve offshore waters, National Wildlife Federation.

Group Policy Letters

Served as coordinator and/or contributor on multiple organizational policy letters, including:

- Great Lakes Panel on Aquatic Nuisance Species: Letters/Statements to Aquatic Nuisance Species Task Force (ANSTF), including on ANSTF draft Strategic Plan and Position Statement on Governance Issues Involving the Great Lakes Water Quality Agreement
- Healing Our Waters – Great Lakes Coalition comments on a range of topics, including letters to U.S. EPA on the draft 2011 – 2015 Strategic Plan (2010) and an independent science structure to advise the agency on the Great Lakes Restoration Initiative (2012)
- National Wildlife Federation comment letters on multiple topics, including letters to U.S. EPA concerning proposed addition of certain PFAS to reporting program through Toxics Release Inventory, preliminary regulatory determinations for certain chemicals under the Fourth Drinking Water Contaminant Candidate List (2020), and a letter to the Great Lakes Observing System on the GLOS 5-Year IOSS Program, 2021 – 2026 (2020)
- Multiple letters with NGO colleagues concerning binational strategies for five chemicals/groups under the Great Lakes Water Quality Agreement, Annex 3, Chemicals of Mutual Concern (2017 – 2021)

Presentations – Conferences/Other Events

(Over 60 oral conference and other meeting presentations; presentations since 2011 listed here)

- Murray, M.W., 2025. Conversation on climate change: A brief overview. Presenter and panel moderator for ENGAGE AU: *A Conversation on Climate Change*, Augusta University, April 17, 2025.

- Murray, M.W., 2023. Occurrence and implications of PFAS in the Great Lakes Basin, presented at Lambton Water Summit 2023 (virtual meeting), organized by Lambton College (Ontario) and Ontario Water Consortium, October 3, 2023.
- International Joint Commission webinar, 2023. Progress toward nutrient management in Lake Erie and Lake Ontario. Joint webinar presentation (Stirratt, H., Winslow, C., Lee, D., Murray, M., and Livernois, J.), September 25, 2023.
- Murray, M.W., 2022. Climate change: Addressing inequities and the importance of youth voices, opening keynote address given at Augusta Junior Model United Nations meeting (for area middle school students), Augusta University, March 9, 2022.
- Murray, M., 2022. Environmental indicators: Thoughts on contributing to sustainability and equity in the Great Lakes and beyond, one of keynote addresses presented at International E-Conference on Mitigating Contemporary Environmental Issues by Sustainable Approaches (virtual conference), University of Delhi, India, February 24, 2022.
- Murray, M.W., 2021. Toxic chemicals and fish in the Great Lakes, as part of webinar organized by Toxics-Free Great Lakes Binational Network and Fish Health Network, October 14, 2021.
- Jackson, J. and Murray, M., 2021. The Canada-Ontario Agreement and the Great Lakes Water Quality Agreement – An ENGO perspective, webinar organized by Toxics-Free Great Lakes Binational Network and Fish Health Network, July 7, 2021.
- Murray, M.W., Bratton, J., Godwin, C., Riseng, C., and McNeil, L., 2021. Great Lakes indicators & alternative approaches: Input from Healing Our Waters Great Lakes Coalition leadership, Overview presentation for meeting as part of UM CIGLR-sponsored summit, June 16, 2021.
- Murray, M.W., Bratton, J., Elgin, A., Godwin, C., Riseng, C., 2021. Great Lakes indicators: Exploring alternative approaches through stakeholder input. Overview presentation for virtual summit sponsored by UM CIGLR, February 23, 2021.
- International Joint Commission webinar, 2020. An evaluation of stressor interactions in the Great Lakes. Joint presentation (Miller, C., Allan, J.D., Bratton, J., Kidd, K., and Murray, M.), September 20, 2020.
- Murray, M.W., 2020. PFASs and the Great Lakes: Brief overview of science and U.S. policies. presentation as part of PFAS "the Forever Chemicals" Contamination in the Great Lakes Basin webinar, organized by Toxic-Free Great Lakes Binational Network and Healthy Great Lakes Program, June 22, 2020.
- Salim, O., and Murray, M.W., 2019. PFAS, PFAS everywhere: Problems and solutions, River Rally 2019, Cleveland, OH, June 21-24, 2019.
- Murray, M.W., 2018. Revisiting the *Prescription*: Identifying a conceptual framework for approaches to restoring and protecting the Great Lakes, CIGLR All Partners Meeting, Ann Arbor, MI, September 21, 2018.
- Murray, M.W., 2017. PBDEs and other PBTs in the Great Lakes: Breaking the cycle, PBDEs in the Great Lakes Workshop, Windsor, ON, February 22, 2017.
- Murray, M.W., 2015. Harmful algal blooms in Lake Erie: A mini-review of recent science, 11th Annual Great Lakes Restoration Conference, Chicago, IL, September 29 – October 1, 2015.

- Murray, M.W., Kirchhoff, C., 2015. Enhancing manager and stakeholder awareness of and responses to changing climatic conditions and their impacts on Lake Erie, poster presented at National Adaptation Forum, St. Louis, MO, May 11-14, 2015.
- Murray, M., deBarros, C., Krantzberg, G., Ridal, J., Swackhamer, D., 2014. Re-evaluation of indicators of toxic chemicals in the Great Lakes, 57th Conference on Great Lakes Research, Hamilton, ON, May 26-30, 2014.
- Murray, M.W., Watson, S.B., Bejankiwar, R., 2013. Overview of binational approaches to address nutrients in Lake Erie, National Conference on Ecosystem Restoration, Schaumburg, IL, July 29 – August 2, 2013.
- Murray, M.W., Watson, S.B., Carpenter, D., Casselman, J., Miller, C., 2013. Lake Erie Ecosystem Priority: Taking Action on Lake Erie (TAcLE), 56th Conference on Great Lakes Research, West Lafayette, IN, June 2-6, 2013.
- Murray, M.W., Koslow, M., 2013. Guiding restoration in a changing Great Lakes climate: Steps and tools, 56th Conference on Great Lakes Research, West Lafayette, IN, June 2-6, 2013.
- Murray, M.W., 2013. Addressing climate, nutrients and interacting impacts in Lake Erie, Great Lakes, Great Challenges Conference, Rochester, MI, March 14, 2013.
- Murray, M.W., 2012. PBDEs in the Great Lakes: Filling in the picture, BIFMA Furniture Issues Summit, Ann Arbor, MI, October 16, 2012.
- Murray, M.W., 2012. Healing Our Waters – Great Lakes Coalition: Research, education and advocacy in support of restoration and protection, Society for Freshwater Sciences, 2012 Annual Meeting, Louisville, KY, May 21-24, 2012.
- Murray, M.W., 2011. Feast and famine in the Great Lakes: the interaction of nutrient pollution and invasive species, National Caucus of Environmental Legislators, Great Lakes/Midwest 10th Annual Meeting, Chicago, IL, December 8-10, 2011.
- Murray, M.W., 2011. Overview of offshore wind energy in the Great Lakes, 7th Annual Great Lakes Restoration Conference, Detroit, MI, October 12-14, 2011.
- Murray, M.W., 2011. Great Lakes wetland restoration and climate change: Vulnerability and adaptation considerations, Michigan Wetlands Association Annual Conference, Acme, MI, August 30 - September 2, 2011.

Presentation – Community

- Murray, M.W., 2024. Climate change and water resources. Presentation and discussion with Augusta Philomathic Club, May 8, 2024.

Grants Received (as Principal Investigator (PI) or Co-PI)

- Toxics-Free Great Lakes Binational Network* (2021). Awarded \$3,437 from the Canadian Environmental Law Association for coordination of binational NGO toxic chemicals work.

Great Lakes Indicators: Exploring Alternative Approaches Through Stakeholder Input (2020-2021). Awarded \$20,000 for expenses associated with organizing summit through University of Michigan Cooperative Institute for Great Lakes Research, virtual summit in February 2021.

Revisiting the Prescription: Assessing recent progress, understanding of stresses and responses, and needs concerning restoring and protecting the Great Lakes (2018-2019). Awarded \$20,000 for expenses associated with organizing summit through Cooperative Institute for Great Lakes Research, University of Michigan, June 2018.

Toxics Free Great Lakes Network (2017 – 2018). Awarded \$2,500, as part of larger grant from Freshwater Future to Canadian Environmental Law Association.

Enhancing manager and stakeholder awareness of and responses to changing climatic conditions and their impacts on Lake Erie (2013 – 2015) National Oceanic and Atmospheric Administration. Awarded \$296,709 to full project team, Co-PIs Dr. Christine Kirchhoff, Dr. Donald Scavia, Dr. Allison Steiner, Dr. Nate Bosch, Melinda Koslow, and Heather Elmer.

Use of Environmental Management Systems to Address Chemicals of Concern in the Great Lakes Region (2007 – 2009). Awarded \$35,000 from U.S. Environmental Protection Agency; supplemental funding (\$15,000, through 2010) awarded in May 2009.

Enhancing Reduction of Mercury and Other PBT Chemicals in the Great Lakes Region (2005 – 2006). Awarded \$35,000 from U.S. Environmental Protection Agency.

Addressing Mercury Reductions in the Great Lakes (2004 – 2005). Awarded \$35,000 from U.S. Environmental Protection Agency.

Also partner/collaborator on several other successfully funded proposals, including *A Self-Scaling Market Mechanism to Reduce Indirect Electricity Pollution* (WattTime *et al.*); *Real-Time Energy Impact Monitors for Residential, Industrial and Policy Use* (Dr. Carol Miller, Wayne State University, PI); *Forecasting Climate-Change Induced Effects on Recreational and Commercial Fish Populations in the Great Lakes* (Dr. David Bunnell, U.S. Geological Survey, PI); *Great Lakes PBDE Institutional Reduction project* (Anna Soehl, Great Lakes Commission, PI).

Also collaborated on numerous other successful NWF grant applications, including to the National Oceanic and Atmospheric Administration, U.S. EPA, the Wege Foundation, the Joyce Foundation, the Erb Family Foundation, the George Gund Foundation, the C.S. Mott Foundation, the Garfield Foundation, and the Great Lakes Fishery Trust.

Technical/Advisory/Review/Synthesis Committees

(Over 50 committees and work groups to date; Committees since 2006 listed here)

American Association of University Professors, Augusta University Chapter (2022 – present); currently vice president, active on issues concerning faculty governance, academic freedom, artificial intelligence

Augusta University, Green Team/sustainability committee (2015 – present). Currently leading efforts to reactivate and restructure the committee, including via charter development

International Joint Commission, Science Advisory Board/Science Priority Committee (2012 – 2023), with leadership and member roles in multiple work groups, including:

- Co-Chair of Nutrients Synthesis Work Group (2019 – 2023)
- Co-Chair of Fertilizer Application Work Group (2015 – 2019)
- Co-Chair of Energy Transport and Water Quality Work Group (2015 – 2018)
- Co-lead on PBTs in biota indicator (2014-2016), and lead role in added indicator on chemicals of mutual concern in water (2016), of Communication Indicators Work Group
- Co-lead, Climate Change Implications for Total Phosphorus, Dissolved Reactive Phosphorus Inputs/Outputs and Excessive Algal Blooms in Lake Erie subgroup of Taking Action on Lake Erie Work Group (2012 – 2013)
- Lead on Chemicals of Mutual Concern in Water subgroup of Environmental Indicators Work Group (2012 – 2013)
- Member of other work groups, including Toward Implementation of a Manure Management Framework Work Group; Community Science Work Group; Institutional Arrangement of Great Lakes Nutrient Adaptive Management Work Group; Stressor Interactions Work Group, Great Lakes Early Warning System Work Group, Harmonized Fish Consumption Advisory Framework Work Group, and other environmental indicators work groups

Society of Environmental Toxicology and Chemistry (SETAC) Technical Committee/North America Science Committee (1998 – 2024); Vice-Chair (2020), Chair (2021), Past Chair (2022); Member of Peer-Review Subcommittee (on wildlife toxicity assessments) (2017 – 2018); involvement in other efforts concerning reviews of workshop proposals, editing/reviewing standard operating procedures, advancing annual meeting sessions

Toxic Pollution Committee (Co-Chair), Ohio River Restoration Planning effort (2022 – 2024)

University of Michigan Cooperative Institute for Great Lakes Research-funded projects (Workshop Lead), to examine potential for increased use of conceptual frameworks in Great Lakes restoration and protection efforts (2018 – 2019), and to consider alternative approaches to Great Lakes indicator development (2020 – 2021)

Great Lakes Water Quality Agreement, Annex 3 (Chemicals of Mutual Concern), Extended Subcommittee (2013 – present)

2022 Great Lakes Public Forum Planning Advisory Committee (2021 – 2022)

Cooperative Institute for Great Lakes Research, Council of Fellows (2018-2021); reviewed proposals for new organizational members, fellowship applications.

Ludington Pumped Storage Project, Technical Work Group (2017)

Healing Our Waters Great Lakes Coalition, Technical Advisory Committee, Co-chair (2008 – 2015)

Mercury Science in the Great Lakes Workshop, U.S. EPA and U.S. Geological Survey (2012 – 2013)

Asian Carp Technical and Policy Workgroup (2011 – 2013)

Great Lakes Wind Collaborative, Steering Committee (2008 – 2013, including founding member), and co-organizer of workshop on offshore wind energy (2012)

Lake Michigan Biodiversity Conservation Strategy, Steering Committee (The Nature Conservancy-led project) (2011 – 2012)

Lake Erie Biodiversity Conservation Strategy, Steering Committee (The Nature Conservancy-led project) (2011 – 2012)

Great Lakes Panel on Aquatic Nuisance Species Policy Coordination Committee (including Chair) (2008 – 2012), with activities including coordinating development of committee work plans and priorities document, and multiple panel recommendation letters

SETAC Gulf Oil Spill Focused Topic Meeting, Pensacola Beach, FL, Steering Committee (2010 – 2011)

Cooperative Institute for Limnology and Ecosystems Research, External Review Panel for NOAA Great Lakes Environmental Research Laboratory, Great Lakes Restoration Initiative Projects (2011)

Evaluating US Army Corps of Engineer Protocols to Quantifying Aquatic Ecosystem Significance at Regional and National Scales, Review Workshop (2010)

Canada-U.S. Binational Toxics Strategy (1997 – 2010), including active role in Mercury Work Group and Integration Work Group

International Joint Commission, Expert Consultation on Chemicals of Emerging Concern (2009)

Minnesota Pollution Control Agency, Minnesota Department of Agriculture, American Association of Pesticide Control Officials/State FIFRA Issues Research and Evaluation Group, and U.S. EPA Region V, Development of Community-Level Pesticide Aquatic Life and Plant Benchmarks Using Great Lakes Initiative Methodologies: A Pilot Project for AAPCO/SFIREG & EPA Region 5 (Phase 2 review group) (2009)

Canada – U.S. Binational Toxics Strategy, 10 Year Anniversary Workshop Planning Committee (2006 – 2007)

Ecological team for research in support of economic analysis for Austin J.C., Anderson, S., Courant, P.N., Litan, R.E., America's North Coast: A Benefit-Cost Analysis of a Program to Protect and Restore the Great Lakes, September 2007 (2006 – 2007)

Michigan Department of Environmental Quality, Michigan Mercury Rules Workgroup (2006 – 2007)

Great Lakes Water Quality Agreement review, Governance and Institutions Working Group (2006 – 2007)

Health Risks and Toxicological Effects of Methylmercury panel; findings presented at 2006 Conference on Mercury as a Global Pollutant in Madison, WI (2005 – 2007)

U.S. EPA, Federal Advisory Committee on Detection and Quantitation for Uses in Clean Water Act Programs (2005 – 2007)

SETAC/U.S. EPA Mercury Monitoring and Assessment Workshop, Pensacola, FL (with book development), Steering Committee (2003 – 2007)

Great Lakes Water Quality Agreement review, Review Working Group B (Toxic Chemicals) (2006)

Great Lakes Water Quality Agreement review, Special Issues Working Group (2006)

U.S. EPA, Science Advisory Board, EPI Suite Review Panel (2006)

Conference Session Organizer/Co-Organizer

SETAC North America 44th Annual Meeting, Toxic Effects of Per- and Poly-fluorinated Compounds: From the Molecular to Ecosystem levels, Louisville, KY, November 12-16, 2023

SETAC North America 43rd Annual Meeting, PFAS and Related Compounds in Terrestrial and Aquatic Wildlife: Exposure, Uptake, Tissue Distribution, and Toxic Effects, Pittsburgh, PA, November 13-17, 2022

Joint Aquatic Sciences Meeting (JASM), Spatial and Temporal Scales of Stressor Effects on Ecosystems; and Per- and Polyfluoroalkyl Substances (PFAS) Contamination in Aquatic Systems, Grand Rapids, MI, May 14-20, 2022. (Served as a moderator in both sessions)

State of Lake Erie Conference, Lake Erie Harmful and Nuisance Algal Blooms and Panel, Cleveland, OH, March 16-17, 2022

Organized/co-organized with other researchers five sessions (toxic chemicals policy, multiple stressors, restoration prioritization, Lake Erie nutrients/impacts) at conferences of the International Association for Great Lakes Research (1998, 2006, 2010, 2013, 2018)

Co-organized two restoration prioritization workshops for Great Lakes researchers (2006, 2009), and science/science-policy sessions at 2nd, 3rd, 5th, 6th, 7th, 10th and 11th Annual Healing Our Waters Great Lakes Coalition Restoration Conferences

Community Organization/Additional Committee Work

Multi-organization planning committee for Earth Day Augusta (2016 – 2023), and as site coordinator for litter collection events (2021 – 2023)

Great Lakes Ecoregion Network (coalition of nongovernmental organization (NGO) representatives and interested individuals), and Co-organizer and vice president (2022 – 2023); Co-Chair of Toxics-Free Great Lakes Binational Network (2017 – 2024)

Additional Editorial, Review Activities

Associate Editor, Ecology of Lake Erie (Part 3): Causes, consequences and management of eutrophication, Special Issue Series in *Aquatic Ecosystem Health & Management*, Vol. 28, No. 1. (January – March 2025)

Have served as peer reviewer for the following journals:

Aquatic Ecosystem Health and Management

Atmospheric Environment

Chemistry and Ecology

Environmental Engineering Science

Environmental Health Perspectives

Environmental Monitoring and Assessment

Environmental Pollution

Environmental Practice

Environmental Research

Environmental Science and Technology

Have served as technical peer reviewer on grant proposals to U.S. EPA, Great Lakes Fishery Trust, and Great Lakes Protection Fund

Carried out technical review of research proposals recommended for funding by the Legislative-Citizen Commission on Minnesota Resources (review process coordinated by Oak Ridge Associated Universities) (2023, 2025)

Served as NWF staff commentator on resolutions for NWF annual meetings, including concerning moratorium on neonicotinoid insecticides (2017) and alternatives to single-use plastics (2018)

Have provided technical reviews on multiple agency and NGO reports, including (since 2006) the following:

Knuffman, L., Erndt-Pitcher, K., May, E. 2020. Drifting toward disaster: How dicamba herbicides are harming cultivated and wild landscapes. Washington, D.C.: National Wildlife Federation; Champaign, IL: Prairie Rivers Network; Portland, OR: Xerces Society for Invertebrate Conservation

International Joint Commission, Atmospheric deposition of phosphorus to freshwater lakes (2012); Review of atmospheric deposition of mercury in the Great Lakes Basin (2015); and subsection of Triennial assessment of progress report (2017)

Great Lakes One Health, A Convening at the John G. Shedd Aquarium, May 20, 2011

Commission for Environmental Cooperation, Taking stock: North American pollutant releases and transfers, 2006; and Taking stock: North American pollutant releases and transfers, Feature analysis: Pollutant releases to surface waters, 2011

Great Lakes Regional Collaboration, 2010, Great Lakes mercury emission reduction strategy

Canadian Environmental Law Association and Lowell Center for Sustainable Production, 2009. The challenge of substances of emerging concern in the Great Lakes Basin: A review of chemicals policies and programs in Canada and the United States, A report prepared for the International Joint Commission Multi-Board Work Group on Chemicals of Emerging Concern in the Great Lakes Basin

Provided technical input (via comment letters) on numerous additional agency reports, rulemakings, and guidance, including to U.S. EPA, U.S. Coast Guard, IJC, and numerous state and provincial agencies, and served as expert witness (concerning mercury cycling and exposure and effects in fish and wildlife, for Environmental Law and Policy Center) before the Illinois Pollution Control Board on proposed rule addressing large combustion sources (mercury) (35 Ill. Adm. Code 225) (2006)

Michael W. Murray
Page 16

Provided reviews of over 50 additional reports and comment letters from NWF, Healing Our Waters – Great Lakes Coalition, and other nonprofit groups/coalitions, including letters from NWF and colleagues to U.S. EPA on dicamba registration review in 2020 and 2022

Awards/Honors/Professional Societies

Advisor of the Year nominee, Friends of MSF at Augusta University (2021 – 2022)

Society of Environmental Chemistry and Toxicology, Presidential Citation for Exemplary Service, SETAC 39th North America Annual Meeting, 4-8 November, 2018, Sacramento, CA

Scheuhammer et al., 2007 paper cited as New Hot Paper by Thomson Reuters ScienceWatch.com in 2008; Scheuhammer et al., 2007 and Mergler et al., 2007 each have over 1,000 citations (Google Scholar)

Runner-up for the **HydroLab Best Student Paper** award at the 33rd Conference on Great Lakes Research (1990)

Selected for membership in Sigma Xi (1993)

Society Memberships:

American Association of University Professors
American Chemical Society
Association for Environmental Studies and Sciences
American Geophysical Union
American Public Health Association
International Association for Great Lakes Research
Society of Environmental Toxicology and Chemistry

Languages, Other Activities

- Speaking/reading/writing proficiency (moderate) in Spanish, French
- Georgia Carolina Toastmasters Club, Competent Communicator, IP3 (2016 – 2024); President (2017 – 2018)
- Augusta Choral Society, singer and Chorus Council member (2017 – 2023; 2025 – 2026)
- Accomplished distance cyclist, including two-time finisher of Paris-Brest-Paris; other outdoor interests include running (5 km, 10 km), hiking, cross-country skiing, tennis, birding, gardening, stargazing, travel