

Curriculum Vitae of Craig E. Williamson

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EDUCATION:

Ph.D. in Biology, June 1981, Dartmouth College, Hanover, New Hampshire. Dissertation: The feeding ecology of the freshwater copepod *Mesocyclops edax*.

M.A. in Biology, June 1977, Mount Holyoke College, South Hadley, MA.

Thesis: Algal symbiosis in the freshwater sponge *Spongilla lacustris* (Porifera: Spongillidae).

B.A in Biology, June 1975, Dartmouth College, Hanover, NH

PROFESSIONAL APPOINTMENTS:

2005- Professor, Ohio Eminent Scholar of Ecosystem Ecology, Miami University
2008-2013 External Graduate Faculty, Climate Change Institute University of Maine, Orono
1993-2005 Professor of Earth & Environmental Sciences, Lehigh University
1994-1995 Visiting Research Scientist, Institute of Ecosystem Studies, Millbrook, N.Y.
1991-1993 Associate Professor of Earth & Environmental Sciences, Lehigh University
1989- 1996 Director, Pocono Comparative Lakes Program, Lehigh University
1987-1991 Associate Professor of Biology, Lehigh University
1981-1987 Assistant Professor of Biology, Lehigh University
1980 Instructor of Biology, Dept. of Biological Sciences, Dartmouth College
1977-1981 Research Fellow, Dept. of Biological Sciences, Dartmouth College
1976-1977 Teaching Fellow, Dept. of Biological Sciences, Mt. Holyoke College
1974 Intern (8 months) at the Museum of Science, Boston, MA

RESEARCH INTERESTS: As a global change limnologist I view lakes as sentinels, integrators, and regulators of environmental change. My interests focus on the role of transparency in the structure and function of lake ecosystems, with an emphasis on the causes of changes in ultraviolet (UV) transparency and their consequences for higher trophic levels (zooplankton and larval fish). Research in my lab combines field and laboratory experiments with broader comparative lakes work. Recent students have done research on topics ranging from mesocosm experiments with zooplankton and fish in lakes in glacial basins on the forested plateau of northeastern Pennsylvania, to experimental and comparative studies of the role of changes in UV transparency on warm-water fish invasions in Lake Tahoe, to the effects of climate change and UV transparency on zooplankton populations in alpine lakes of the western Rocky Mountains in the USA and Canada, and in the Andes of South America.

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

American Association for the Advancement of Science (AAAS)
Association for the Sciences of Limnology and Oceanography (ASLO)
Ecological Society of America (ESA), Life Member
Global Lake Ecological Observatory Network (GLEON, <http://www.gleon.org/>)
International Society of Limnology (SIL)
Northeastern Research Cooperative (NERC, www.nercscience.org)

TEACHING ACTIVITIES:

COURSES TAUGHT: Advanced Topics in Ecology, Aquatic Ecosystems, Ecology of UV Radiation, Ecosystem and Global Ecology, Ecology, Ecological Field Methods, Field Zoology, Global Change Ecology, Grand Challenges in Global Ecology (senior capstone course), Limnology, Population Declines on Planet Earth (freshman seminar), Salamander Response to Climate Change.

GRADUATE ADVISEES (27 total, degree, date): Sandra Smith (MS 1984), Lorraine Forcina (MS 1986), Mark Stoeckel (MS 1987), Jane Schoeneck (MS 1987), Eugina Novak (MS 1989), Kevin Wolbach (MS 1991), Scott Carpenter (MS 1992), Paul Stutzman (PhD 1996), Carla Gutierrez (MS 1997), Gabriella Grad Dee (PhD 1998), Susanne Metzgar (MS 1999), David Huff (MS 2000), Timothy Vail (PhD 2000), Dina Leech (PhD 2001), Emily MacFadyen (MS 2002), Laura Shirey (MS 2004), Shawna Gilroy (MS 2004), Aaron Clauser (PhD 2004), Jeremy Mack (MS 2006); Sandra Cooke (PhD 2006), Timothy Guida (MS 2007), Sandra Connelly (PhD 2007); Andrew Tucker (PhD 2011), Kevin Rose (PhD 2011), Taylor Leach (PhD 2016), Jennifer Brentrup (PhD 2017), Rachel Pilla (MS 2015, PhD in progress), Lauren Adkins (PhD in progress), Nicole Berry (MS in progress), Keiko Wilkins (MS in progress).

POSTDOCTORAL ASSOCIATES (7 total, dates): Robert Moeller (1989-92), Peter Schulze (1990-93); Horacio Zagarese (1990-93), Gabriella Dee (1998-2000), Marieke DeLange (1999-2000), Kirsten Kessler (2004-2005), Carrie Kissman (2007-2009), Macarena Valiñas (2017 Fulbright Fellowship).

OTHER PROFESSIONAL ACTIVITIES:

EDITORIAL ACTIVITY: Guest Editor for Proceedings of the National Academy of Sciences (April 2014, June 2014), Editorial Board of Journal of Water and Climate Change (2009-2013), Editorial Board of Journal of Plankton Research (1994 - 2003), Editorial Board of Nature Publishing Group (NPG) Scientific Reports (2016-2018).

OUTSIDE REVIEWER FOR RESEARCH PROPOSALS: (21 different national and international foundations and institutions and 19 different NSF programs) AAAS Women's International Science Collaboration Program; Australian Antarctic Science Program; Austrian Science Fund; Austrian Academy of Sciences, Environmental Protection Agency Water and Watersheds Program; Helsinki University Environmental Research Centre (HERC); Illinois-Indiana Sea Grant Program; InterAmerican Institute for Global Change Research; International Foundation for Science; Maryland Sea Grant Program; National Geographic Society; National Sciences and Engineering Research Council of Canada; Netherlands Organization for Scientific

Research Earth & Life Sciences Program; Norwegian Research Council (panel chair); Oklahoma State University Environmental Institute; United States Geological Survey (USGS) National Climate Change and Wildlife Center; USGS Biological Resources Discipline Global Change Research Program; United States Civilian Research & Development Foundation (U.S. CRDF); USA NOAA National Undersea Research Center; University of Hawaii Sea Grant Program, Wisconsin Sea Grant Institute.

USA National Science Foundation Programs in Biological Oceanography, Cell Biology, Ecological and Evolutionary Physiology, Ecology, Ecosystems, Fellowship Program in Biotic Systems and Resources, Field Station and Marine Laboratories, Frontiers in Integrative Biological Research, Geomorphology and Land-use Dynamics, Graduate Research Fellowships, Integrative Organismal Systems, Integrated Research Challenges in Environmental Biology, Integrative Graduate Education and Research Traineeship Program, Long-Term Research in Environmental Biology, Organism-Environment Interactions Advisory Panel, Polar Programs, Population Biology and Physiological Ecology, U.S.-Japan Cooperative Science Program.

OUTSIDE REVIEWER FOR MANUSCRIPTS: (100 different journals, recipient of the 2013 Outstanding Reviewer Citation Association for the Sciences of Limnology and Oceanography). *Acta Physiologiae Plantarum*, *Action Bioscience*, *African Journal of Agricultural Research*, *Ambio*, *American Midland Naturalist*, *Animal Biology*, *Annales de Limnologie - International Journal of Limnology*, *Aquatic Biology*, *Aquatic Ecology*, *Aquatic Microbial Ecology*, *Aquatic Sciences*, *Archiv für Hydrobiologie*, *Arctic Monitoring and Assessment Programme*, *Biologia*, *Biology and Environment: Proceedings of the Royal Irish Academy*, *Biology Letters*, *BioScience*, *Bulletin of Marine Science*, *Canadian Journal of Fisheries and Aquatic Sciences*, *Canadian Journal of Zoology*, *Chemosphere*, *Climatic Change*, *CLEAN-Soil-Air-Water*, *Comparative Biochemistry and Physiology*, *Continental Shelf Research*, *Developments in Hydrobiology*, *Earth's Future*, *Ecological Applications*, *Ecological Research*, *Ecology*, *Ecology Letters*, *Ecoscience*, *Ecosystems*, *Ecotoxicology and Environmental Safety*, *Environmental Biology of Fishes*, *Environmental Management*, *Environmental Modeling and Software*, *Environmental Microbiology*, *Environmental Modelling and Software*, *Environmental Pollution*, *Environmental Reviews*, *Environmental Science and Technology*, *Estuaries*, *Ethology Ecology and Evolution*, *Freshwater Biology*, *Frontiers in Ecology and the Environment*, *Functional Ecology*, *Fundamental and Applied Limnology*, *Global Biogeochemical Cycles*, *Global Change Biology*, *Gulf Research Reports*, *Hydrobiologia*, *Hydrological Processes*, *ICES Journal of Marine Science*, *International Journal of Radiation Biology*, *International Review of Hydrobiology*, *Journal of Comparative Physiology*, *Journal of Ecosystems*, *Journal of Environmental Monitoring and Assessment*, *Journal of Experimental Marine Biology and Ecology*, *Journal of Geophysical Research-Atmospheres*, *Journal of Geophysical Research-Biogeosciences*, *Journal of Great Lakes Research*, *Journal of Hydrometeorology*, *Journal of Insect Behavior*, *Journal of Mountain Science*, *Journal of Photochemistry and Photobiology B: Biology*, *Journal of Plankton Research*, *Knowledge and Management of Aquatic Ecosystems*, *Limnologica*, *Limnology and Oceanography*, *Limnology and Oceanography: e-Lectures*, *Limnology and Oceanography: Methods*, *Marine Biology*, *Marine Ecology Progress Series*, *Marine and Freshwater Research*, *Marine Microbial Food Webs*, *Mutation Research-Genetic Toxicology and Environmental Mutagenesis*, *Nature*, *National Science Review*, *New Zealand Journal of Marine and Freshwater Research*, *Oecologia*, *Ohio State Bulletin*, *Oikos*, *Philippine Scientist*, *Photochemical and Photobiological Sciences*, *Polar Research*, *Polish Journal of Environmental Studies*, *PLoS ONE*,

Proceedings of the Louisiana Academy of Sciences, Proceedings of the National Academy of Sciences, Proceedings of the Pennsylvania Academy of Science, Proceedings of the Royal Society B, Science, Sustainability, Transactions of the American Fisheries Society, Transactions of the Nebraska Academy of Sciences and Affiliated Societies, United States Geological Survey – NBS, Water, Water Resources Research.

OUTSIDE REVIEWER FOR OTHER ORGANIZATIONS AND PUBLISHERS:

Organizations: Arctic Monitoring and Assessment Programme, National Oceanic and Atmospheric Association (NOAA) and National Park Service (NPS) educational materials for distribution to the public, North Sea Region Climate Change Assessment (NOSCCA), United Nations Environment Programme Environmental Effects Assessment Panel (UNEP EEAP), United States Geological Survey (USGS).

Publishers: Blackwell Science, Gordon & Breach, McGraw-Hill, Prentice Hall.

SERVICE ON REVIEW and ASSESSMENT PANELS:

Current:

1) United Nations Environment Programme Environmental Effects Assessment Panel member (UNEP EEAP, 2010-, Lead Author of Aquatic Ecosystems Group 2015-).

2) Member of the Science Advisory Committee (SAC) for the Inter-American Institute for Global Change Research (IAI) project “Sensing the Americas’ Freshwater Ecosystem Risk (SAFER) from Climate Change”. This is a scientific network formed by investigators from Argentina, Canada, Chile, Colombia, United States and Uruguay where the main objectives are to employ freshwater ecosystems as “sentinels” or “sensors” of climate variability and watershed processes and investigate their interaction with other multiple stressors to assess risks to ecosystem services in the Americas, and to determine management and mitigation strategies which are both technically and economically feasible as well as culturally acceptable.

3) Expert on the Freshwater Ecosystems Indicators Technical Team to prepare material for the National Climate Assessment (NCA) conducted under the auspices of the U.S. Global Change Research Program (USGCRP), pursuant to the Global Change Research Act of 1990, Section 106, which requires a report to the United States Congress every 4 years.

Past: Chair of National Science Foundation Division of Biological Infrastructure (NSF DBI) Committee of Visitors; NSF/EPA/USDA Water and watersheds panel, VA; NSF Integrated Research Challenges in Environmental Biology (NSF IRCEB) program panel member; NSF Frontiers in Integrated Biological Research (NSF FIBR) program panel member. Norwegian Research Council (Outside Expert and Review Panel Chair); NSF Integrated Graduate Education and Research Training (NSF IGERT) program panel member.

MISC. OTHER AWARDS, HONORS, AND PROFESSIONAL ACTIVITIES:

- 1976 Summer fellowship for study at the Marine Biological Laboratory, Woods Hole, Massachusetts.

- 1978 Summer fellowship for study at the University of Washington Friday Harbor Laboratories, Friday Harbor, Washington.

- Invited participant, International Council for Science (ICSU), Scientific Committee on Problems of the Environment (SCOPE) workshop on effects of increased UV radiation on aquatic and terrestrial ecosystems. Sardinia, Italy, September 1992.
- 1993 University of Wisconsin Center for Limnology William V. Kaeser Visiting Scholar Award.
- Invited participant, USA Department of Energy (US DOE) "UV-B Critical issues workshop". Cocoa Beach, Florida, February, 1993.
- Invited participant, North Atlantic Treaty Organisation (NATO) "Advanced research workshop on stratospheric ozone depletion/UV-B radiation in the biosphere". Gainesville, Florida, June 1993.
- Participant, Gordon Research Conference on "Predictive Theories in Oceanography". August 1993.
- Invited participant, UV-Climate-DOC workshop, Palisades Center, Jasper, Alberta Canada. November 1994.
- Invited speaker, Gordon Research Conference on "Environmental Sciences: Water"; June 1996.
- American Society of Limnology and Oceanography
 - Lead convening editor of Special Issue of Limnology and Oceanography on "Lakes as sentinels, integrators, and regulators of climate change" published November 2009.
 - Organizing Committee for ASLO summer meeting in Victoria, B.C. (2006)
 - Chair of committee to form a national Council of Aquatic Sciences (1995- 97)
 - DIALOG Committee (develop symposia for recent Ph.D.'s, 1993-94)
 - Minority Mentor at annual meetings (1992-97)
 - Committee on Financial Resources. (1990)
- Invited speaker, International Society of Theoretical and Applied Limnology (SIL), Dublin Ireland, August 1998.
- Ecological Society of America Frost Award Committee for Excellence in Graduate Research (2002-2004).
- Invited Tutorial Speaker, American Society of Limnology and Oceanography Annual Meeting, Salt Lake City, Utah, February 2003.
- Co-Chair of Symposium "Tribute to John J. Gilbert: 40 Years of Contributions to Limnology". American Society of Limnology and Oceanography Annual Meeting, Salt Lake City, Utah, February 2003.
- Co-Chair of Organized Oral Session "Anthropogenic disturbances to western alpine lakes: Past, present, and future". Ecological Society of America, Portland, Oregon, August 2004.

- NEON: One of two lead co-authors on a response to the NEON RFI by the Global Lakes Ecological Observatory Network (GLEON). This is a national planning document that will be used by NEON Inc to design a National Ecological Observatory Network (NEON) in 2007. RFI submitted January 2007.

- Co-Chair of Organized Oral Session “UV Effects on Aquatic Ecosystems: Integration at Multiple Trophic Levels”. American Society of Limnology and Oceanography Annual Meeting, Orlando, Florida March 2008.

- PACRIM (Pacific Rim) Workshop: One of 15 international scholars invited to assess impacts of climate change on lakes throughout the northern and southern hemisphere countries that border on the Pacific Ocean. Held at Tahoe Environmental Research Center March 24-29, 2008.

- AGU-ASLO: Lead organizer of American Geophysical Union (AGU) Chapman Conference and Special Issue to be published in Limnology and Oceanography on “Lakes and Reservoirs as Sentinels, Integrators, and Regulators of Climate Change” Tahoe Environmental Research Center, Lake Tahoe, Incline Village, NV. September 8-10, 2008.

Proceedings of the National Academy of Sciences: Guest editor for submitted manuscripts December 2009-February 2010, April 2014, June 2014, and other.

Co-Chair of Special Session B13E: Warming waters: Role of Freshwaters in Regional and Global Carbon and Nutrient Cycling II at American Geophysical Union meeting in San Francisco with Charlotte Roehm, National Ecological Observatory Network (NEON), December 3, 2012.

Co-Chair of Special session “Session T2: Lakes as Sentinels for Climate Change: Monitoring and Sedimentary Records at the Junction of Paleo and Modern Limnology”; NE Geological Society of America meeting in Bretton Woods, New Hampshire, March 19, 2013 with Lisa Donner.

Co-chair of special session “Session: SS78: Assessing Vulnerability of U.S. Lakes and Reservoirs to Climate Change”; Annual Meeting of the Association for the Sciences of Limnology and Oceanography in New Orleans, LA, February 2013 with Daniel Nover, S. Geoffrey Schladow, and Christopher. Clark.

- July 17-22, 2016 Invited plenary speaker at Gordon Conference on Ocean Global Change Biology.

- August 2016 Lifetime Achievement Award from the Lacawac Sanctuary at their 50th anniversary celebration.

- November 2017 Sustaining Fellow, Association for the Sciences of Limnology and Oceanography (ASLO) “recognized as having sustained excellence in their contributions to ASLO and the aquatic sciences”

- March 8, 2018 Invited plenary talk at the Pennsylvania Lake Management Society (PALMS) annual meeting in State College, PA.
- May 23, 2018 Invited plenary talk at the Global Lake Ecological Observatory Network (GLEON) 19.5 international virtual meeting (online through Zoom).
- October 31, 2018 Invited plenary talk at the National Lake Management Society (NALMS) annual meeting in Cincinnati, OH.

CONVENER and EDITOR of INTERNATIONAL SYMPOSIA:

Sprules, W.G., P.C. Schulze, and C.E. Williamson (Editors). 1992. "Advanced techniques for in situ studies of zooplankton abundance, distribution, and behavior." *Archiv Für Hydrobiologie Advances in Limnology* Volume 36: 1-140.

Williamson, C.E. and Zagarese (Editors). 1994. "Impact of UV-B radiation on pelagic freshwater ecosystems". *Archiv Für Hydrobiologie Advances in Limnology* Volume 43: 1-226.

Williamson, C.E., and J.E. Saros (Convening Editors). 2009. "Lakes and reservoirs as sentinels, integrators, and regulators of climate change." *Limnology and Oceanography Special Issue* 54(6, part 2): 2273-2564. This special issue is a product of an AGU Chapman Conference: <http://www.agu.org/meetings/chapman/2008/dcall/>.

EXTERNAL GRANTS:

1983-85 National Science Foundation BSR-8219860. Williamson, C.E. "Predation on rotifer communities by freshwater suspension-feeding calanoid copepods". \$77,000.

1988 Bethlehem Mines Corporation. Williamson, C.E., C. Moses, and G. Lennon. "Limnological profiling". \$10,000.

1989-90 Geraldine R. Dodge Foundation. Williamson, C.E. "Comparative lakes internship program". \$16,000.

1989-91 A. W. Mellon Foundation. Williamson, C.E. "Pocono Comparative Lakes Program". \$300,000.

1990-91 Geraldine R. Dodge Foundation. Williamson, C.E. "Comparative lakes internship program". \$22,650.

1990-91 National Science Foundation BSR-9012746. Williamson, C.E., B.R. Hargreaves, and R.E. Moeller. "Assessing patchiness of aquatic organisms with remotely operated vehicles". \$24,000.

1990-92 National Science Foundation BSR-9014414. Goulden, C.E., R.E. Moeller, C.E. Williamson, and R. Sanders. "Dietary deficiencies of protein and lipid and the experimental resolution of food limitation in freshwater zooplankton." \$300,000.

1991-94 A. W. Mellon Foundation. Williamson, C.E. "Pocono Comparative Lakes Program". \$295,000.

1991-92 National Science Foundation DIR-9110434. Schulze, P.C., and C.E. Williamson. "Advanced instrumentation for in situ studies of zooplankton: A workshop. \$5,000.

1992 National Science Foundation REU Supplement to BSR-9014414. Moeller, R.E. and C.E. Williamson. "REU SUPPLEMENT: Nutrient deficiencies in the zooplankton-phytoplankton interaction. \$4,975.

1992-95 W. M. Keck Foundation. Kodama, K.P., B.C. Carson, C.E. Williamson, B.R. Hargreaves, A. Meltzer, and R.E. Moeller. "Integrated aquatic ecosystems and climate change program". \$300,000.

1993-95 National Science Foundation DEB-9306978. Williamson, C.E., Morris, D.P., Zagarese, H.E., and R.E. Moeller. "The response of freshwater plankton communities to natural levels of ultraviolet radiation". \$250,000.

1993-95 National Science Foundation OPP-9316534. Williamson, C.E., and H.E. Zagarese. "Impact of UV-B radiation on pelagic freshwater ecosystems: proposal for a workshop". \$30,000.

1993-95 National Science Foundation INT-9314421. Williamson, C.E. (PI/PD) with D.P. Morris. "UV-B radiation and zooplankton community structure across depth and elevation gradients in lakes in southern Argentina". \$29,825.

1995-99 National Science Foundation DEB-9509042. Williamson, C.E. (sole PI/PD) "The role of ultraviolet radiation in structuring freshwater zooplankton communities: Interactions with predation". \$233,000.

1996-1999 National Science Foundation DEB-9740356. Morris, D.P. (PI/PD), B.R. Hargreaves, R.E. Moeller and **C.E. Williamson**. "Causes and consequences of seasonal changes in the transparency of lakes to ultraviolet radiation". \$719,617.

1999-2002 National Science Foundation DEB-9973938. **Williamson, C.E.** (PI/PD), R.E. Moeller, and R.W. Sanders. "Collaborative proposal: The impact of UV radiation on trophic interactions in lakes: direct and indirect effects on zooplankton communities". \$446,151.

2002-2003 National Science Foundation REU-0217806. **Williamson, C.E.** (sole PI). REU Supplement to DEB-9973938. \$11,512.

2002-2005 Environmental Protection Agency STAR grant #R829642. Morris, D.P. (PI/PD), B.R. Hargreaves, **C.E. Williamson**, F.J. Pazzaglia, and R.N. Weisman. "Assessing the interactive effects of landscape, climate, and UV radiation on river ecosystems: modeling transparency to UVR and the response of biota". \$825,850.

2002-2009 National Science Foundation DEB-IRCEB-0210972. **Williamson, C.E.** (PI/PD) and others. "Interactive effects of UV radiation and temperature on pelagic foodwebs". \$2,750,000. *Transferred to Miami University* in June 2005 as NSF DEB-IRCEB-0552283; \$1,224,517.

2006-2008 National Science Foundation DEB-0645243 (Supplemental Award 0552283) **Williamson, C.E.** (PI/PD). "Interactive effects of UV radiation and temperature on pelagic foodwebs: Climate Effects on Lakes Conference Funding". \$49,857.

2008-2010. USDA Forest Service, Pacific Southwest Research Station, Southern Nevada Public Land Management Act #8-3D01. Chandra, S., **C. E. Williamson**, J.T. Oris, and G. Schladow. "NICHES: Nearshore Indicators for Clarity, Habitat and Ecological Sustainability". \$250,000, (\$124,654 to Miami).

2007-2011 National Science Foundation DEB-#0734277. Saros, J. L.J. Graumlich, J. Stone, and **C.E. Williamson**. "Climate-Induced Shifts in Alpine Diatom Communities: Linking Neocological and Paleoecological Approaches to Incorporate Responses to Trophic Forcing". \$534,154, (\$154,653 to Miami).

2009-2011. National Science Foundation DBI-0829308. Fischer, J.M., M. Olson, B.R. Hargreaves, R.W. Sanders, and **C.E. Williamson**. "Planning Grant for Program and Facility Enhancement at Lacawac Sanctuary". \$24,788.

2009-2013. National Science Foundation DGE-0903560. Leff, L.G., D. Bade, G.E. Pacey, **C. E. Williamson**, and C.J. Woolverton. "IGERT: Environmental Aquatic Resource Sensing: Basic Science, Business Education, and Outreach". \$2,756,719 (\$1,012,048 to Miami University).

2013-2014. National Science Foundation DEB-1360066. **Williamson, C.E.**, and S.G. Schladow. "RAPID: Assessing Sentinel Responses of Lake Ecosystems to the Rim Wildfire". \$140,000.

2013-2015. National Science Foundation DBI-1318747. Knoll, L.B., J.M. Fischer, B.R. Hargreaves, R.W. Sanders, and **C.E. Williamson**. "A Regional Hub for the EON's at Lacawac Sanctuary". \$329,094.

2018-2023. National Science Foundation [DEB-1754276](#). **Williamson, C.E.**, T.J. Fisher, and J. Zhang. "Collaborative LTREB Proposal: Will increases in dissolved organic matter accelerate a shift in trophic status through anoxia-driven positive feedbacks in an oligotrophic lake?" \$434,332 total for the LTREB, \$126,391 to Miami University.

OTHER FUNDING:

2006-2009 Miami University Presidential Academic Enrichment Award. Tom Crist PI/PD along with others including **C.E. Williamson**. “The Ecology of Human-Dominated Ecosystems: Integrating Miami University into a National Network for Research and Education.” \$209,499.

2006-2008. Miami University Research Incentive Award. Vanni, M.J., W.H. Renwick, and **C.E. Williamson**. “Lakes in the landscape: Evaluating the importance of reservoirs for regional and global carbon cycles.” \$49,223.

2011-2014. Lacawac Sanctuary Foundation. “Lacawac Sanctuary Director of Research and Education”. \$150,000.

2015-2017. Lacawac Sanctuary Foundation. C.E. Williamson. “Lacawac Sanctuary Director of Research and Education”. \$147,000.

2017. Miami University Tech Fee Grant. **Williamson, C.E.**, A. Jones-Farmer, and J. Zhang. Combining Advanced Sensors and Big Data with Artificial Intelligence to Understand the Response of Lake Ecosystems to Climate Change. \$22,500 for advanced miniDOT sensors.

2017. Miami University Center for Analytics and Data Science (CADS) Summer Fellowship. **Williamson, C.E.** Combining Long-Term Empirical and High-Frequency Buoy Data to Model Ecosystem Responses and the Quality of Freshwater in Lakes. \$3,988 support for PhD student summer salary.

SCIENTIFIC PRESENTATIONS SINCE 1993:

1993 Invited lecture: Dept. of Zoology and Center for Limnology, University of Wisconsin, Madison, WI.

1993 Invited lecture: Dept. of Biological Sciences, University of California, Santa Barbara, CA.

1993 Invited lecture: "NATO advanced research workshop on stratospheric ozone depletion/UV-B radiation in the biosphere. Gainesville, Florida.

1993 University of Edmonton, Edmonton, Alberta, Am. Soc. Limnol. Oceanogr. Annual Meeting.

1993 Invited lecture: Department of Biological Sciences, University of Pennsylvania, Philadelphia, PA.

1994 Invited lecture: University of Miami, Miami Florida, Am. Soc. Limnol. Oceanogr. Annual Meeting.

1994 Poster: Regional assessment of freshwater ecosystems and climate change in North America, ASLO/NABS Symposium, Leesburg, VA.

1994 Invited lecture: UV-Climate-DOC workshop, Palisades Center, Jasper, Alberta Canada.

1994 Invited lecture: Sullivan County Community College, Loch Sheldrake, NY
1994 PCLP Annual Meeting @ Lacawac

1995 Invited lecture: Institute of Ecosystem Studies, Millbrook, NY

1995 Invited lecture: University of Nevada, Reno, Nevada, Am. Soc. Limnol. Oceanogr. Annual Meeting.

1995 Invited lecture: Millersville University, Millersville, PA

1995 Invited lecture, Laval University, Quebec City, Quebec, Canada

1995 Invited lecture: Lehigh University, Bethlehem, PA

1996 Invited lecture: Cornell University, Ithaca, NY

1996 University of Wisconsin, Milwaukee, Am. Soc. Limnol. Oceanogr. Annual Meeting.

1996 Invited lecture: Gordon Research Conference, New Hampton, NH

1997 Invited lecture: USGS Wellsboro, PA.

1997 Invited lecture: NSF REU @ Lacawac Sanctuary

1997 Invited lecture: Temple University, Department of Biology

1997 Invited Lecture: Biology Dept., Lehigh University

1997 Amer. Soc. Limnol. Oceanogr. Annual meeting in Santa Fe, NM.

1998 Invited Lecture: International Society of Theoretical & Applied Limnology, Dublin, Ireland

1998 Invited lecture: Villanova University, Department of Biology

1999 Amer. Soc. Limnol. Oceanogr. Annual meeting in Santa Fe, NM.

1999 Ecological Society of America Annual Meeting in Spokane, WA

Leech, D.M, and C.E. Williamson. 2000. *Daphnia* vertical migration in the presence and absence of UV radiation under full spectrum solar radiation: revisiting the damaging light hypothesis. Amer. Soc. Limnol. Oceanogr. Abstracts 2000: CS26-02.

De Lange, H.J, D. P. Morris, and C. E. Williamson. 2000. The interaction between ultraviolet radiation, DOC, and zooplankton in freshwater ecosystems. Amer. Soc. Limnol. Oceanogr. Abstracts 2000: CS26-04.

Hargreaves, B.R., D. P. Morris, R. E. Moeller, and C. E. Williamson. 2000. Seasonal variation of ultraviolet transparency in lakes. Amer. Soc. Limnol. Oceanogr. Abstracts 2000: CS17-05P.

Dee, G., C.E. Williamson, and D. Karapelou. 2000. Survival and reproduction in the presence of UV radiation: A matter of repair? Ecol. Soc. Amer. Abstracts 2000: 85.

Leech, D.M. and C.E. Williamson. 2000. *Daphnia* migrations in the presence and absence of UV radiation: Which way do they go? Ecol. Soc. Amer. Abstracts 2000: 141.

Williamson, C.E. and D.M. Leech. 2000. UV radiation and zooplankton distribution across vertical habitat gradients in three glacial lakes of differing transparency. Ecol. Soc. Amer. Abstracts 2000: 234.

Clauser, A. B., and C. E. Williamson. 2001. Temporal shifts in the DOC, UV penetration, and zooplankton populations in autumn temporary ponds. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting Conference Program 2001: 40.

Dee, G., C.E. Williamson, and D. M. Karapelou. 2001. Temperature dependence of ultraviolet radiation damage in zooplankton. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting Conference Program 2001: 39.

Padeletti, A. T., D. M. Leech, and C. E. Williamson. 2001. Light intensity as well as wavelength influences the vertical movements of *Daphnia in situ*. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting Conference Program 2001: 39.

Leech, D. M., A. T. Padeletti, and C. E. Williamson. 2001. Behavioral response to solar UV radiation varies across zooplankton taxa. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting Conference Program 2001: 39.

MacFadyen, E. J., and C. E. Williamson. 2001. Photoenzymatic repair in the waterflea, *Daphnia*. American Institute of Biological Sciences 52nd Meeting, Washington, D.C. Final Program p. 25.

Thorp, J. H., J. D. Wehr, D.P. Morris, C.E. Williamson, A.F. Casper, and A. A. Perrone. 2001. Patterns in ultraviolet radiation, DOC, and plankton in the upper St. Lawrence River. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting Conference Program 2001: 38.

Williamson, C.E., P.J. Neale, G. Grad, H.J. DeLange, and B.R. Hargreaves. 2001. Beneficial and detrimental effects of UV radiation on aquatic organisms. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting Conference Program 2001: 39.

Boeing, W.J., C.E. Williamson, and D.M. Leech. 2002. Sunburn or risk of predation – balancing conflicting evils in the water column. Amer. Soc. Limnol. Oceanogr. 2002 Summer Meeting Program 2002: 23. Victoria, British Columbia.

Clauser, A., and C.E. Williamson. 2002. Canopy cover and ephemeral pool ecosystems: optical

linkages and exposure to UV radiation. Amer. Soc. Limnol. Oceanogr. 2002 Summer Meeting Program 2002: 30. Victoria, British Columbia.

Clauser, A., and C.E. Williamson. 2002. UV radiation and ephemeral pool ecosystems: the dynamic role of canopy cover. Ecological Society of America Abstracts 2002: oral session #44. Tuscon, Arizona.

Leech, D.M., W.J. Boeing, and C.E. Williamson. 2002. Separating the effects of UV and fish on zooplankton vertical migration. Amer. Soc. Limnol. Oceanogr. 2002 Summer Meeting Program 2002: 23. Victoria, British Columbia.

MacFadyen, E.J., C.E. Williamson, and D.L. Mitchell. 2002. Temperature dependence of UV-induced damage and repair in *Daphnia*. Ecological Society of America Abstracts 2002: oral session #44. Tuscon, Arizona.

Moeller, R.E., S. Gilroy, G. Grad, and C.E. Williamson. 2002. Dietary acquisition of photoprotective compounds enhances UV-B tolerance in planktonic copepods. Amer. Soc. Limnol. Oceanogr. 2002 Summer Meeting Program 2002: 61. Victoria, British Columbia.

Invited Lecture: Williamson, C.E. 2002. Tom Frost – inspirations, interactions, and influences of his career on research in the ecology of UV radiation. Amer. Soc. Limnol. Oceanogr. 2002 Summer Meeting Program 2002: 26. Victoria, British Columbia.

Invited Lecture: Williamson, C.E., G. Grad, E.J. MacFadyen, H.J. De Lange, and D. Mitchell. 2002. Temperature dependent UV responses in zooplankton: implications of climate change. Amer. Soc. Photobiology 30th Annual Meeting Program and Abstracts 2002: 71. Quebec City, Quebec.

Invited Lecture: Williamson, C.E. 2002. Department of Biology, Dartmouth College, Hanover, N.H. USA. June 24

Invited Lecture: Williamson, C.E. 2002. Department of Biology, Miami University, Oxford, Ohio. October 24.

Cooke, S. L. and C. E. Williamson. 2003. Effects of UV radiation and chromophoric dissolved organic matter additions on zooplankton in a transparent lake. Amer. Soc. Limnol. Oceanogr. Annual Meeting Program 2003: 23. Salt Lake City, Utah.

Dee, G. G. Gerrish, M. D. Hesson, and C. E. Williamson. 2003. *Daphnia* life history stages vary in their tolerance to UV radiation. Amer. Soc. Limnol. Oceanogr. Annual Meeting Program 2003: 26. Salt Lake City, Utah.

Moeller, R.E., B.R. Hargreaves, D.P. Morris and C.E. Williamson. 2003. Seasonal, year-to-year and long term controls of UV attenuation in two mid-latitude lakes of contrasting wetland drainage and dissolved organic carbon content. Amer. Soc. Limnol. Oceanogr. Annual Meeting Program 2003: 23. Salt Lake City, Utah.

Invited Lecture: Williamson, C.E. 2003. Control of underwater UV and temperature environments in lakes and rivers: The importance of landscape linkages. Amer. Soc. Limnol. Oceanogr. Annual Meeting Program 2003: 23. Salt Lake City, Utah.

Williamson, C. E. and D. M. Leech. 2003. Rotifers and the solar bottleneck: Does UV tolerance provide small species with a refuge from predation? Amer. Soc. Limnol. Oceanogr. Annual Meeting Program 2003: 21. Salt Lake City, Utah.

Hargreaves, B.R., C.W. Forstall, L.M. Nichols, D.P. Morris, F.J. Pazzaglia, C.E. Williamson, and R.N. Weisman. 2004. Lake model for ultraviolet attenuation adapted to streams. XXIX Congress of Societas Internationalis Limnologiae, Lahti, Finland. August 2004.

Palen, W.J., D.E. Schindler, A.A. Clauser, and C.E. Williamson. 2004. UV impacts on alpine amphibians: linking UV tolerance with field exposure. North American Benthological Society Annual Meeting 2004. Vancouver, British Columbia, Canada.

Shirey, L.J. and C.E. Williamson. 2004. How tolerant are benthic macroinvertebrates to UV radiation? North American Benthological Society Annual Meeting 2004. Vancouver, British Columbia, Canada.

Palen, W.J., D.E. Schindler, A.A. Clauser, and C.E. Williamson. 2004. UV impacts on alpine amphibians: linking UV tolerance with field exposure.

Williamson, C.E., J.E.G. Saros, R.S. Lockwood, and G. Dee. 2004. UV-climate interactions in alpine lakes from the molecular to the ecosystem level. Ecological Society of America Annual Meeting. Portland, Oregon.

Cooke, S. L., Williamson, C. E., Saros, J. E. 2005. UV radiation effects on calanoid reproduction are altered by temperature, dissolved organic carbon, and nutrients in alpine lakes. American Society of Limnology and Oceanography Aquatic Sciences Meeting, Salt Lake City, UT, USA.

Williamson, C. E. 2005. Ecological implications of variation in UV radiation tolerance and photorepair across taxa from bacteria to fish. American Society of Limnology and Oceanography Aquatic Sciences Meeting, Salt Lake City, UT, USA.

Kessler, K., C. E. Williamson, J. E. Saros. 2005. Mechanisms of UV defense in alpine phytoplankton and zooplankton. American Society of Limnology and Oceanography Aquatic Sciences Meeting, Salt Lake City, UT, USA.

Doyle, S.A., J.E. Saros, C.E. Williamson. 2005. Interactive effects of ultraviolet radiation, temperature, and nutrients on alpine phytoplankton communities. American Society of Limnology and Oceanography Aquatic Sciences Meeting, Salt Lake City, UT, USA.

Lockwood, R.S., C.E. Williamson, J.E. Saros, and K.I. Kessler. 2005. Zooplankton distribution and abundance across DOC gradients in alpine lakes of the Beartooth Mountains: Is there

evidence for avoidance of UV radiation? American Society of Limnology and Oceanography Aquatic Sciences Meeting, Salt Lake City, UT, USA.

Invited lecture: Williamson, C.E., and J.E. Saros. 2005. Plankton communities in alpine lakes as indicators of multiple stresses from UV radiation, temperature, and nitrogen deposition. American Society of Limnology and Oceanography Aquatic Sciences Meeting, Santiago de Compostela, Spain.

Cooke, S.L., C.E. Williamson and J.E. Saros. 2006. How do temperature, dissolved organic matter, and nutrients influence the response of *Leptodiptomus ashlandii* to UV radiation in a sub-alpine lake? Amer. Soc. Limnol. Oceanogr. Annual Meeting, Victoria, B.C. (Canada), June 2006.

Guida, T.A., J.A. Porter, C.E. Williamson, W.H. Jeffrey. 2006 Exposure of bacteria to UV-B radiation over chronic and acute time scales: Evidence for dose-rate dependence. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Victoria, B.C. (Canada), June 2006.

Moeller, R.E., B.R. Hargreaves, D.P. Morris and C.E. Williamson. 2006. Correlations of rainfall, DOC, and pH to decreasing trends of UV transparency in two slightly acidic lakes. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Victoria, B.C. (Canada), June 2006.

Neale, P.J., R. E. Moeller, G. Grad, C. E. Williamson, W. Jeffrey, R. Sanders, and M. Olson 2006. UV effects across multiple trophic levels in freshwater ecosystems: Comparative spectroscopy of biological weighting functions. 33rd Meeting, American Society of Photobiology, Rio Grande, PR.

Scott, C., Saros, J.E. and C.E. Williamson. 2006. Seasonal variation in the effects of nutrients and dissolved organic material on the response of phytoplankton community structure to ultraviolet radiation. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Victoria, B.C. (Canada), June 2006.

Invited Lecture: Williamson, C.E. 2006. Interactions of UV radiation with biotic and abiotic components in a changing environment: Overview for freshwater ecosystems. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Victoria, B.C. (Canada), June 2006.

Invited Lecture: Williamson, C.E. 2007. Ultraviolet Radiation: Seeing the Light in Lake Ecosystems. January 30, 2007, Miami University Microbiology Department.

Rose, K.C, C.E. Williamson, A.J. Tucker, J.T. Oris, and M. Winder. 2007. Seasonal and spatial variation in ultraviolet radiation transparency of Lake Tahoe, USA. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Santa Fe, NM, USA, February 2007.

Saros, J.E., and C.E. Williamson. 2007. Multiple effects of enhanced atmospheric nitrogen deposition on alpine lakes: evidence from paleolimnological records and comparative lake sampling. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Santa Fe, NM, USA, February 2007.

Tucker, A.J., C.E. Williamson, K.C. Rose, M. Winder, and J.T. Oris. 2007. Seasonal and spatial variation of ultraviolet radiation in Lake Tahoe, USA: implications for zooplankton and fish communities. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Santa Fe, NM, USA, February 2007. **Won first place student poster award.**

Williamson, C.E. 2007. The optical niche: UV transparency as a sensitive indicator of environmental change and biotic responses in lakes. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Santa Fe, NM, USA, February 2007.

Invited Plenary Lecture: Williamson, C.E., and K.C. Rose. 2007. Ultraviolet transparency as an indicator of lake metabolism in the Global Lake Ecological Observatory Network. Fourth Global Lake Ecological Observatory Network (GLEON) Workshop, March 3, 2007, Lammi Biological Station, Finland.

Connelly, S.J., E.A. Wolyniak, C.E. Williamson, and K.L. Jellison. 2007. Abiotic and biotic controls of human pathogens: Can solar UV radiation and zooplankton grazers alter the viability, excystation, and/or infectivity of *Cryptosporidium parvum* and *Giardia lamblia*? Midwest Ecology and Evolution Conference, March 2007, Kent State University, Kent, Ohio.

Invited Talk: K. C. Rose, and C. E. Williamson. 2007. Ultraviolet radiation (UVR) transparency of Lake Tahoe CA/NV: Using UVR as an indicator of lake dynamics. Fourth Global Lake Ecological Observatory Network (GLEON) Workshop, March 3, 2007, Lammi Biological Station, Finland.

Connelly, S.J, E.A. Wolyniak, K.L. Dieter, C.E. Williamson, K.L. Jellison. 2007. Effect of *Daphnia pulicaria* grazing on the persistence of infectious *Cryptosporidium parvum* and *Giardia lamblia*. II International *Giardia* and *Cryptosporidium* Conference, Centro Cultural Universitario, Universidad Michoacana de San Nicolás de Hidalgo, Morelia-Michoacán, México, May 13-18, 2007.

Invited Talk: Williamson, C.E. 2007. Ultraviolet radiation tolerance and photoenzymatic repair across aquatic taxa from bacteria to fish: implications for climate change. European Society for Photobiology 12th Congress, Bath, England, September 1-6, 2007.

*MacMillan, M., R. Otter, E. Overholt, L. Knoll, C.E. Williamson, J.T. Oris. 2007. UV radiation toxicity and fluoranthene photoinduced toxicity to *Daphnia magna* in Ohio Reservoirs. Society of Environmental Toxicology and Chemistry 28th Annual Meeting. Milwaukee, WI, November 11-15, 2007.

Invited Talk – Williamson, C.E. 2007. Ultraviolet transparency as an indicator of lakes in transition. NSF FSML “Lakes in Transition” Workshop. Colby Sawyer College, New London, NH, December 10-11, 2007.

**Rose, K., C.E. Williamson, J.E. Saros. 2008. Adding UV Transparency as an Optical Indicator of Allochthony in Low DOM Lakes. Global Lake Ecological Observatory Network (GLEON) Meeting VI, February 2008, Lake Placid, Florida.

**Connelly, S.J., C.E. Williamson, and K.L. Jellison. 2008. The potential for interactions between abiotic and biotic forcing on the control of the freshwater human pathogens *Cryptosporidium parvum* and *Giardia lamblia*. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Orlando, FL, March 2008.

Fischer, J.M., K. Kessler, R.W. Sanders, C.E. Williamson, W.H. Jeffrey, R.E. Moeller, D.P. Morris, J.A. Porter**, P.A. Neale, J.E. Saros, S.L. Cooke**, A.L. Macaluso**, E.P. Overholt, J.D. Pakulski, D. Schoener*, and C. Scott**. 2008. Effects of CDOM addition on crustacean zooplankton in an oligotrophic lake: carbon and nutrient subsidy or UV screen? American Society of Limnology and Oceanography. Orlando, FL., March 2008.

Mitchell, D. L., S.J. Connelly**, W.H. Jeffrey, A. Macaluso**, R.E. Moeller, M.H. Olson, J.A. Porter, R.W. Sanders, A.J. Tucker**, and C.E. Williamson. 2008. Photoprotection against UV-B radiation in freshwater plankton: a comparative approach across a broad trophic spectrum. American Society of Limnology and Oceanography Annual Meeting. Orlando, FL. March 2-7.

** Rose, K., C.E. Williamson, J.M. Fischer, M. Olson, S.J. Connelly**, A. Tucker**, Erin Overholt. 2008. The role of fish and ultraviolet radiation in stimulating zooplankton migration. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Orlando, FL, March 2008.

Tucker, A.J., C.E. Williamson, K.C. Rose, S.J. Connelly**, J.T. Oris, M.H. Olson, and D.L. Mitchell. 2008. Temperature and ultraviolet radiation interact to control invasive warmwater fishes. Amer. Soc. Limnol. Oceanogr. Annual Meeting, Orlando, FL, March 2008.

Williamson, C.E., G. Dee, L. Shirey**, J. Saros, R. Sanders, J. Porter, W. Palen**, M. Olson, P. Neale, A Macaluso**, K. Kessler, W. Jeffrey, T. Guida**, S. Gilroy*, M. DeLange, S. Connelly**, A. Clauser**, R. Moeller. Do ultraviolet (UV) tolerance and photoenzymatic repair vary across trophic levels from bacteria and phytoplankton to zooplankton and fish? Amer. Soc. Limnol. Oceanogr. Annual Meeting, Orlando, FL, March 2008.

Williamson, C.E., C.R. Salm**, J.E. Saros, and D.L. Mitchell. 2008. Climate impacts on zooplankton grazing in alpine lakes: UV and temperature. Amer. Soc. Limnol. Oceanogr. Annual Meeting, St. Johns, New Foundland, June 2008.

Winn, N., C.E. Williamson, R. Abbitt, M. Henry, K.C. Rose, and J.E. Saros. 2008. Dissolved organic carbon prediction in the lakes of the Absaroka-Beartooth Wilderness using a GIS and remote sensing. Assoc. Amer. Geogr. Annual Meeting, Boston, MA April 15-19, 2008

Cooke**, S.L., J.M. Fishcer, C.E. Williamson, and D.P. Morris. 2008. Effects of increased dissolved organic matter on zooplankton vertical distribution ina UV-transparent lake: Results from large-scale mesocosms. American Geophysical Union Chapman Conference on “Lakes and reservoirs as sentinels, integrators, and regulators of climate change”, Incline Village, NV. September 2008.

Olson, M.H., A.J. Tucker**, and C.E. Williamson. 2008. Implications of changing temperature and ultraviolet radiation regimes for reproductive success of temperate fishes. American Geophysical Union Chapman Conference on “Lakes and reservoirs as sentinels, integrators, and regulators of climate change”, Incline Village, NV. September 2008.

Oris, J.T., E. Fleming*, L. Knoll**, M. MacMillan*, R. Otter**, E. Overholt, M. Vanni, and C. Williamson. 2008. Dissolved organic matter and ultraviolet radiation as sentinels of landscape-scale climate change. American Geophysical Union Chapman Conference on “Lakes and reservoirs as sentinels, integrators, and regulators of climate change”, Incline Village, NV. September 2008.

Overholt, E.P., C.E. Williamson, M.J. Vanni, W.H. Renwick, and L.B. Knoll**. 2008. Reservoirs as sentinels and integrators of climate change: Using optical tools. American Geophysical Union Chapman Conference on “Lakes and reservoirs as sentinels, integrators, and regulators of climate change”, Incline Village, NV. September 2008.

Rose**, K.C., C.E. Williamson, J.E. Saros. 2008. The development of an optical indicator of allochthony in low DOM lakes. American Geophysical Union Chapman Conference on “Lakes and reservoirs as sentinels, integrators, and regulators of climate change”, Incline Village, NV. September 2008.

Salm**, C.R., J.E. Saros, C.E. Williamson, and D.L. Mitchell. 2008. Alpine lakes as sentinels of climate change: Investigating the effects of ultraviolet radiation and temperature on plankton dynamics. American Geophysical Union Chapman Conference on “Lakes and reservoirs as sentinels, integrators, and regulators of climate change”, Incline Village, NV. September 2008.

Sanders, R.W., S.L. Cooke**, J.M. Fischer, A.W. Heinze**, W.H. Jeffrey, A.L. Macaluso**, R.E. Moeller, D.P. Morris, J.D. Pakulski, J.A. Porter**, D.M. Schoener**, C.E. Williamson. Dissolved organic carbon (DOC) forcing of plankton dynamics in a lake ecosystem. American Geophysical Union Chapman Conference on “Lakes and reservoirs as sentinels, integrators, and regulators of climate change”, Incline Village, NV. September 2008.

Tucker**, A., C. Williamson, K. Rose**, S. Connelly**, J. Oris, M. Olson, and D. Mitchell. 2008. Temperature and ultraviolet radiation interact to control invasive warm-water fishes. American Geophysical Union Chapman Conference on “Lakes and reservoirs as sentinels, integrators, and regulators of climate change”, Incline Village, NV. September 2008.

Rose**, K.C., C.E. Williamson, J.E. Saros. 2008. The development of an optical indicator of allochthony in low DOM lakes. Global Lake Ecological Observatory Network (GLEON) Meeting 7, September 29-October 2, 2008, Uppsala University, Norrtalje, Sweden.

Invited Talk: Kessler, K., R.S. Lockwood, C.E. Williamson, and J.E. Saros. 2008. Vertical distribution of zooplankton in subalpine and alpine lakes: Does ultraviolet radiation play a role? 28th International Symposium of the North American Lake Management Society, Lake Louise, Alberta, Canada, November 11-14, 2008.

Fischer, J.M, C.E. Williamson, M.H. Olson, and R.D. Vinebrooke. 2008. Ultraviolet radiation as a potential constraint on zooplankton community structure and vertical distribution in fishless alpine lakes. 28th International Symposium of the North American Lake Management Society, Lake Louise, Alberta, Canada, November 11-14, 2008.

Overholt, E.P., C.E. Williamson, M.J. Vanni, W.H. Renwick, and L.B. Knoll**. 2008. Reservoirs as sentinels and integrators of climate change: Using optical tools. 69th Midwest Fish & Wildlife Conference, Columbus, Ohio; December 15-17, 2008.

Saros, J., A. P. Wolfe, and C. E. Williamson. 2009. Response of alpine versus subalpine lakes to nitrogen deposition: Similar but asynchronous community and ecosystem-level changes. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting, Nice, France; January 25-30, 2009.

Tucker**, A. J., C. E. Williamson, J. T. Oris, and M. Olson. 2009. Ultraviolet radiation controls fish invasion in lakes. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting, Nice, France; January 25-30, 2009.

Williamson, C.E., K. Kessler, J. Saros, and R. S. Lockwood*. 2009. Vertical distribution of zooplankton in subalpine and alpine lakes: Ultraviolet radiation and the transparency-gradient hypothesis. Amer. Soc. Limnol. Oceanogr. Aquatic Sciences Meeting, Nice, France; January 25-30, 2009.

Rose**, K. C., C. E. Williamson, J. Saros. 2009. Transparency patterns of high elevation lakes in the Beartooth Mountains, MT/WY, USA. Global Lake Ecological Observatory Network Meeting February 2-6, 2009, Hamilton, New Zealand.

Cabrol, N.A., E.A. Grin, L. Bebout, G. Chong, C. Demergasso, E. Fleming, V. Gaete, J. Gibson, D-P. Häder, J. Mack, E. Minkley, E. Pinto, K. Rose, I. Ukstins Peate, C. Tambley, C.E. Williamson, and J.J. Wynne. 2009. High lakes project – Impact of climate variability and high UV flux on lake habitat: Implications for early Mars and present-day Earth. 40th Lunar and Planetary Science Conference. March 23-27, The Woodlands, TX, USA.

Invited Talk: Williamson, C.E. 2009. “Ultraviolet radiation: Climate forcing and biotic response”. Cornell University Biogeochemistry IGERT Program, March 6, 2009.

Invited Talk: Williamson, C.E. 2009. “Ultraviolet radiation: Climate forcing and biotic response”. Université du Québec à Trois-Rivières Research Group on Aquatic Ecosystems. April 2, 2009.

Invited Talk: Williamson, C.E. 2009. “Ultraviolet radiation: Climate forcing and biotic response”. University of Maine Climate Change Institute, April 24, 2009.

Invited Talk: Williamson, C.E. 2009. “Ultraviolet radiation: Climate forcing and biotic response”. University of Lund Limnology and Department of Ecology. May 8, 2009.

Invited talk: Williamson, C.E. 2009. "How do fish and zooplankton respond to UV radiation in lakes?" Shackelton Field Station, Cornell University, June 11, 2009.

Kissman, C.E.H., M. Winder, C.E. Williamson, and J.E. Saros. 2009. Deuterium stable isotopes: What do they reveal about food sources for *Diatomus* sp. and cladocerans in alpine and subalpine lakes? Ecological Society of America Annual Meeting, Albuquerque, New Mexico, August 2-7, 2009.

Gevertz, A.K., A.J. Tucker, C.E. Williamson, and J.T. Oris. 2009. Differential tolerances to UVR and fluoranthene exposure: Comparisons between native and invasive fish species of Lake Tahoe (CA/NV). SETAC 30th Annual Meeting, New Orleans, Louisiana, November 19-23, 2009.

Mack, J.S., C.E. Williamson, J.M. Fischer, and M.H. Olson. 2009. The importance of fine-scale monitoring in alpine lakes: An example of transparency from the Canadian Rockies, Lake Oesa, British Columbia, Canada. Global Lake Ecological Observatory Network Meeting, Boulder Junction, Wisconsin, USA. October 12-15, 2009.

Rose, K.C., C.E. Williamson, J.E. Saros, and C. Kissman. 2009. Indicators of allochthony in high mountain lakes. Global Lake Ecological Observatory Network Meeting, Boulder Junction, Wisconsin, USA. October 12-15, 2009.

Williamson, C.E. 2009. NSF EARS IGERT and GLEON. Global Lake Ecological Observatory Network Meeting, Boulder Junction, Wisconsin, USA. October 12-15, 2009.

Gevertz, A.K., A.J. Tucker, C.E. Williamson, and J.T. Oris. 2010. Differential Tolerances to UVR and Fluoranthene Exposure: Comparisons Between Native and Invasive Fish Species of Lake Tahoe (CA/NV). Tahoe Basin Conference, Incline Village, NV, March 15-16, 2010.

Tucker, A, C.E. Williamson, J.T. Oris, and M. Olson. 2010. Water Temperature and Ultraviolet Radiation Transparency Interact to Control Invasive Warm-water Fish Establishment in Nearshore Lake Tahoe. Tahoe Basin Conference, Incline Village, NV, March 15-16, 2010.

Invited Seminar: Williamson, C.E. 2010. "Seeing the unseen in lakes: Ultraviolet radiation, fish, and zooplankton." Ohio State University, April 8, 2010.

Rose, K.C., Williamson, C.E., Saros, J.E., and Kissman, C.E.H. 2010. What can dissolved absorbance tell us about lake ecology? Global Lake Ecological Observatory Network (GLEON) 10 Meeting, Torres, Brazil, May 10-15 2010.

Kissman, C.E.H., C.E. Williamson, J.E. Saros, and K.C. Rose. 2010. The role of climate induced trophic forcing in alpine lake ecosystems: Coupling plankton dynamics to sediment signals. American Society of Limnology and Oceanography Summer Meeting, Santa Fe, New Mexico, June 6-11, 2010.

Rose, K.C., C.E. Williamson, J.E. Saros, and C.E.H. Kissman. 2010. Indicators of allochthony in high mountain lakes. American Society of Limnology and Oceanography Summer Meeting, Santa Fe, New Mexico, June 6-11, 2010.

Saros, J.E., A.P. Wolfe, D.W. Clow, K.C. Rose, and C.E. Williamson. 2010. Melting alpine glaciers enrich lake ecosystems with reactive nitrogen and reduce biodiversity. American Society of Limnology and Oceanography Summer Meeting, Santa Fe, New Mexico, June 6-11, 2010.

Tucker, A., C.E. Williamson, J.T. Oris, A. Gevertz, and M. Olson. 2010. Water temperature and ultraviolet radiation transparency interact to control invasive warm-water fish establishment in nearshore Lake Tahoe. American Society of Limnology and Oceanography Summer Meeting, Santa Fe, New Mexico, June 6-11, 2010.

Williamson, C.E., J.M. Fischer, E.P. Overholt, S.M. Bollens, and J.K. Breckenridge. 2010. Shedding light on zooplankton diel vertical migration: Integration of abiotic and biotic drivers across transparency gradients. American Society of Limnology and Oceanography Summer Meeting, Santa Fe, New Mexico, June 6-11, 2010.

Williamson, C.E., J.E. Saros, C.E.H. Kissman, K.C. Rose, J.M. Fischer, and J. Everhart. 2010. Water transparency to UV radiation in mountain lakes: consequences of climate-driven changes in terrestrial inputs for regulation of trophic interactions. Global Change and the World's Mountains Conference; Perth, Scotland, September 26-30, 2010.

Fischer, J.M., M.H. Olson, J.C. Everhart, K.C. Rose, C.E. Williamson, and R.D. Vinebrooke. 2010. Factors influencing the distribution of *Daphnia middendorffiana* in alpine lakes of the Canadian Rockies. Global Change and the World's Mountains Conference; Perth, Scotland, September 26-30, 2010.

Invited Seminar: Williamson, C.E. 2010. Ultraviolet radiation: Beneficial and detrimental effects in lakes. Dartmouth College, October 8, 2010.

Williamson, C.E., K.C. Rose, J. Mack, J.E. Saros, J.M. Fischer, J. Everhart, and M. Winder. 2010. Water transparency to UV radiation as a sentinel of climate and land-use-driven changes in the terrestrial landscape: Potential consequences for zooplankton and invasive invertebrates. 10th Biennial Scientific Conference on the Greater Yellowstone Ecosystem, October 13, 2010.

Tucker, A., C.E. Williamson, J.T. Oris, A. Gevertz, and M. Olson. 2010. Water temperature and ultraviolet radiation transparency interact to control invasive warm-water fish establishment in a cold, clear, high-elevation lake. Poster presentation at the 10th Biennial Scientific Conference on the Greater Yellowstone Ecosystem, October 13, 2010.

Saros, J.E., A.P. Wolfe, K.C. Rose, and C.E. Williamson. 2010. Melting alpine glaciers in the Beartooth Mountains enrich lake ecosystems with reactive nitrogen and reduce biodiversity. 10th Biennial Scientific Conference on the Greater Yellowstone Ecosystem, October 13, 2010.

Gevertz, A.K., A.J. Tucker, C.E. Williamson, and J.T. Oris. 2010. Differential tolerances to UVR and fluoranthene exposure: Comparisons between native and non-native fish species of Lake Tahoe (CA/NV). SETAC North America 31st Annual Meeting, Portland, OR, USA; November 7-11, 2010.

Oris, J.T., A.J. Tucker, A.K. Gevertz, C.E. Williamson. 2011. Water Temperature, Ultraviolet Radiation Transparency, and Motorized Watercraft Activity Interact to Control Invasive Warm-water Fish in a Montane Lake. Abstract of SETAC Europe meeting, 15-19 May, 2011 Milan, Italy.

Gevertz, A.K., A.J. Tucker, C.E. Williamson, and J.T. Oris. 2011. Skin Damage and Alteration in Larval Fish as a Result of Exposure to Ultraviolet Radiation and a Polycyclic Aromatic Hydrocarbon. 17th Annual meeting of the North Atlantic Chapter of the Society for Environmental Toxicology and Chemistry (SETAC), June 8-10, 2011; Freeport, ME.

Laura Leff, Darren Bade, Craig Williamson and Christopher Woolverton. 2011. Environmental Aquatic Resource Sensing (EARS): Basic Science, Business Education and Outreach. Abstract, UCOWR/NIWR Annual Meeting in Boulder Colorado, July 12-14, 2011.

Rose, K.C., C.E. Williamson, J.E. Saros, and C.E.H. Kissman. 2011. Indicators of Allochthony: New Tools and Techniques. 96th Annual meeting of the Ecological Society of America. August 7-12, 2011, Austin, Texas.

Invited Seminar: Williamson, C.E. 2011. Ultraviolet radiation in Lakes: Consequences of the invisible. Uppsala University Evolutionary Biology Center, September 21, 2011.

Williamson, C.E. and J.M. Fischer. 2011. Key Sentinel Responses of *Daphnia* to Climate Change: Establishing a Continental Scale Lake Observatory. IXth International Symposium on Cladocera, Verbania, Italy, October 2-8, 2011.

Invited Talk: Williamson, C.E. and J.E. Saros. 2011. Lakes as Sentinels of Climate Change: A new GLEON Initiative. 13th Meeting of the Global Lake Ecological Observatory Network, Lake Sunapee, NH. October 10-13, 2011.

Brentrup, J.A., K.C. Rose, T.H. Leach, C.E. Williamson, J.M. Fischer, J.E. Saros, B.R. Hargreaves, R.E. Moeller. 2011. Sentinel Responses to Extreme Precipitation Events in Lakes: Changes in UV Transparency. 13th Meeting of the Global Lake Ecological Observatory Network, Lake Sunapee, NH. October 10-13, 2011.

Leach, T.H., J.A. Brentrup, C.E. Williamson, K.C. Rose, J.M. Fischer, E.L. Rabinowitz and M.H. Olson. 2011. Biotic Consequences of Extreme Precipitation Events in Lakes: Zooplankton Vertical Distribution Responses. 13th Meeting of the Global Lake Ecological Observatory Network, Lake Sunapee, NH. October 10-13, 2011.

Rose, K.C. J. Read, C. McBride, C.E. Williamson, and D. Hamilton. 2011. Deep Chlorophyll Maxima: Where do they form and what implications do they have for ecosystem structure and

metabolism estimates? 13th Meeting of the Global Lake Ecological Observatory Network, Lake Sunapee, NH. October 10-13, 2011.

Hargreaves, B.R., J.A. Brentrup, K.C. Rose, K. Strock, L. Knoll, J.E. Saros, and C.E. Williamson. 2011. Lakes as sentinels of change: DOC signals from terrestrial watersheds. Joint NERC Environmental Sensor Network/SensorNIS Workshop, Hubbard Brook Experimental Forest, NH, USA; October 24-27, 2011.

Invited Seminar: Williamson, C.E. 2011. Ultraviolet radiation in lakes: Consequences of the invisible. Institute of Ecology, University of Innsbruck, Innsbruck, Austria. October 24, 2011.

Invited Seminar: Williamson, C.E. 2011. Lakes as sensors in the landscape: Consequences of the invisible. National Ecological Observatory Network (NEON), Boulder, Colorado. November 16, 2011.

Invited Lecture: Williamson, C.E. 2012. Consequences of the Invisible: Ultraviolet Radiation in Lakes. Department of Biological Sciences, Kent State University, Kent, OH; November 9, 2012.

Brentrup, J.A., Williamson, C.E., Hargreaves, B.R., Knoll, L.B. ARTHUR – Aquatic Resource Tool for High-Frequency Underwater Research. Poster Presentation. Miami University Graduate Research Symposium, Oxford, Ohio, November 2012.

Brentrup, J.A., Williamson, C.E., Hargreaves, B.R., Knoll, L.B. ARTHUR – Aquatic Resource Tool for High-Frequency Underwater Research. Poster Presentation. Global Lake Ecological Observatory Network Conference, Mulranny, Ireland, October 15-19, 2012.

Leach, T.H., J.D. Warren, C.E. Williamson. Acoustic detection of diel vertical migration of freshwater zooplankton: integrating automated acoustic technology with current buoy platforms. Global Lake Ecological Observatory Network Annual Meeting, Mulranny, Mayo, Ireland October 15-19, 2012.

Invited Lecture: Williamson, C. E. 2012. Lakes as Climate Sentinels: Establishing a Continental Scale Network of Lakes as Sensors in the Landscape; Department of Electrical and Computer Engineering, Miami University. October 5, 2012.

Williamson, C.E. 2012. Lakes as Climate Sentinels. Lacawac Ecology Conference, Lacawac Sanctuary and Field Station, September 29, 2012.

Invited Lecture: Williamson, C. E. 2012. Lakes as Climate Sentinels: Establishing a Continental Scale Network of Lakes as Sensors in the Landscape; Department of Mechanical and Manufacturing Engineering, Miami University. September 14, 2012.

Williamson, C.E. 2012. Lakes as Climate Sentinels. NSF IGERT Annual Workshop, Lacawac Sanctuary and Field Station, September 6-9, 2012.

Kissman, C.E.H., C.E. Williamson, K.C. Rose and J.E. Saros. 2012. Climate change-induced effects on food web structure in an alpine lake: Terrestrial DOM subsidies alter consumer:producer biomass ratios in unexpected ways. Poster Presentation at Ecological Society of America 97th Annual Meeting in Portland, OR August 5-10, 2012.

Saros, J.E., C.E. Williamson, C.E.H. Kissman, and K.C. Rose 2012. Dissolved organic material as a resource subsidy for phytoplankton in lake ecosystems. Oral Presentation at Ecological Society of America 97th Annual Meeting in Portland, OR August 5-10, 2012.

Williamson, C.E., and J.E. Saros. 2012. Lakes as climate sentinels: Developing a theoretical framework. Chair, Special Session at Ecological Society of America 97th Annual Meeting in Portland, OR, August 8, 2012.

Brentrup, J.A. Buoy Platforms: Stationary and Profiling Buoys. Oral Presentation. Lacawac Ecological Observatory Workshop, Lacawac Sanctuary, Pennsylvania, June 11-12, 2012.

Invited Talk: Williamson, C.E. 2012. Lakes as sentinels of climate change. Lacawac Ecological Observatory Workshop, Lake Ariel, PA June 11-12, 2012.

Invited Talk: Williamson, C.E., J. Mack, J. Brentrup, L. Knoll, E. Overholt, K. Rose. 2012. Climate change trends in natural organic matter. New York City Department of Environmental Protection Natural Organic Matter Workshop; May 10, 2012, Kingston, NY.

Hayes, N.M., Brentrup, J.A., Gaglione, M., Hopson, A., Johnson, D., Johnston, P., Widner, D., Williamson, C.E., Vanni, M.J., Bade, D. Sensing Climate Change: Using sensors to identify drivers of climate change in aquatic ecosystems. Video and Poster Presentation. IGERT Annual PI Meeting, Washington, D.C., May 2012.

Davidson, C., C.E. Williamson, K. Vincent, S.M. Simonich, K.S. Yip, J-M. Hero, and K.M. Kriger. 2013. Anuran population declines occur on an elevational gradient in the Western Hemisphere. Amphibian Pathogens Annual Meeting, November 9-10, 2013. Arizona State University

Brentrup, J., C.E. Williamson, J.M. Fischer, M. Olson, and K.C. Rose. Rapid increases in transparency in an alpine lake following ice-out. Annual meeting of the Association for the Sciences of Limnology and Oceanography (ASLO), February 17-22, 2013. New Orleans, LA,

Leach, T. H.; Williamson, C. E.; Fischer, J. M.: The zones of maximum daytime and nighttime depletion: Novel indices for assessing structural and dynamic drivers of diel migration of zooplankton. Annual meeting of the Association for the Sciences of Limnology and Oceanography (ASLO), February 17-22, 2013. New Orleans, LA.

Zepp, R.G., M. Molina, M. Cyterski, C. Fitzgerald, C.E. Williamson, and S.R. Corsi. 2013. Impacts of changing precipitation on natural organic matter and microorganisms in lakes and reservoirs. Annual meeting of the Association for the Sciences of Limnology and Oceanography (ASLO), February 17-22, 2013. New Orleans, LA,

Invited Plenary Lecture: Williamson, C.E. 2013. Managing Water Resources in a Changing Climate: Deciphering the Sentinel Responses of Lakes in a Warmer & Wetter World. Maine Water Conference, March 19, 2013; Augusta, Maine.

Brentrup, J.A., C.E. Williamson, B.R. Hargreaves, L.B. Knoll. 2013. **ARTHUR** – Aquatic Resource Tool for High-Frequency Underwater Research: Assessing sentinel responses of lakes to climate change. Northeast Geological Society of America Annual Meeting, March 18-20, Bretton Woods, NH.

Knoll, L.B., J.A. Brentrup, C.E. Williamson, and B.R. Hargreaves. 2013. Automated Profiling Buoy for Exploring Lakes as Sentinels of Change: ARTHUR at Lake Lacawac. Northeastern Ecosystem Research Cooperative Annual Meeting, Saratoga Springs, NY, March 19-20, 2013;

Knoll, L.B., J.A. Brentrup, C.E. Williamson, and B.R. Hargreaves. 2013. Automated Profiling Buoy for Exploring Lakes as Sentinels of Change: ARTHUR at Lake Lacawac. Pennsylvania Academy of Sciences Annual Meeting, April 5-7, 2013; University of Pittsburgh at Bradford, Bradford, PA

Hargreaves, B.R., J.A. Brentrup, C.E. Williamson, L.B. Knoll. 2013. Profiling buoy improvements yield new insights on climate change signals in a NE Pennsylvania (USA) lake. Global Lake Ecological Observatory Network meeting (GLEON 15), Bahia Blanca, Argentina, November 4-8, 2013.

Brentrup, J.A., C.E. Williamson, B.R. Hargreaves, L.B. Knoll. Tea or Coffee Anyone? 2013. Using high-frequency sensor data to understand differences in DOM optical quality. Global Lake Ecological Observatory Network meeting (GLEON 15), Bahia Blanca, Argentina, November 4-8, 2013.

Brentrup, J.A., T.H. Leach, and C.E. Williamson. 2014. Application of advanced optical and acoustic tools to assess climate-driven changes in DOC and consumer-producer biomass ratios. THAW 2014 - Thermokarst Aquatic ecosystems Workshop: Freshwater ecosystems in changing permafrost landscapes. March 12-15, 2014; Quebec City, Canada.

Saros, J.E., R. Northington, C.E. Williamson, and N. John Anderson. 2014. A whole-lake mixing experiment to assess the effects of changing thermal structure in Arctic Lakes. THAW 2014 - Thermokarst Aquatic ecosystems Workshop: Freshwater ecosystems in changing permafrost landscapes March 12-15, 2014; Quebec City, Canada.

Williamson, C. E., J. A. Brentrup, J. Zhang, W. Renwick, B. Hargreaves, L. Knoll, E. Overholt, and K. Rose. 2014. Lakes as Sensors in the Landscape: Optical metrics as scalable sentinel responses to climate change. Joint Aquatic Sciences Meeting, Portland, Oregon; May 18-23, 2014.

Fischer, J. M., M. Olson, C. E. Williamson, K. C. Rose, J. A. Brentrup, and M. Hayashi. 2014. Variation in sensitivity of mountain lakes to meteorological drivers: Implications for the

“Lakes as sentinels” concept. Joint Aquatic Sciences Meeting, Portland, Oregon; May 18-23, 2014.

Olson, M. H., J. M. Fischer, N. Theodore, C. E. Williamson, K. C. Rose, and J.Hwang. 2014. Diel vertical migration of copepods in mountain lakes: Assessing the role of UV radiation. Joint Aquatic Sciences Meeting, Portland, Oregon; May 18-23, 2014.

Brentrup, J. A. and C. E. Williamson. 2014. Photolability and biolability of dissolved organic matter in three contrasting lakes. Joint Aquatic Sciences Meeting, Portland, Oregon; May 18-23, 2014.

Leff, L. G., D. Bade, D., J. Scaffidi, C. E. Williamson, C. Woolverton. 2014. Environmental aquatic resource sensing: Basic sciences, business education, and outreach. Joint Aquatic Sciences Meeting, Portland, Oregon; May 18-23, 2014.

Pilla, R. M., Williamson, C. E., Zhang, J., Renwick, W., Smyth, R.; Hargreaves, B. 2014. Lakes as temperature sentinels of climate change. Joint Aquatic Sciences Meeting, Portland, Oregon; May 18-23, 2014.

Brentrup, J.A., C. E. Williamson, W. Eckert, E. de Eyto, H-P. Grossart, L. B. Knoll, A. Laas, T. H. Leach, D. da Motta Marques, C. G. McBride, F. Pomati, J. S. Read, E. Ryder, P. A. Staeher, L. A. Winslow. 2014. Using profiling buoys to look below the lake surface: An analysis of vertical chlorophyll dynamics across space and time. Global Lake Ecological Observatory Network Meeting, Orford, Quebec, Canada; October 27-31, 2014.

Leach, T. H., J. D. Warren, J. A. Brentrup, and C. E. Williamson. 2014. High-resolution acoustic and environmental data provide insight into vertical distributions and diel migrations of zooplankton. Global Lake Ecological Observatory Network Meeting, Orford, Quebec, Canada; October 27-31, 2014.

Pilla, R. M., C. E. Williamson, J. Zhang, W. H. Renwick, J. A. Brentrup, R. Smyth, J. D. Lenters, B. Felzer, and L. B. Knoll. 2014. Lakes as temperature sentinels of climate change. Global Lake Ecological Observatory Network Meeting, Orford, Quebec, Canada; October 27-31, 2014.

Warner, T. M., R. M. Pilla, L. B. Knoll, J. A. Brentrup, T. H. Leahc, and C. E. Williamson. 2014. Changes in dissolved oxygen over time: Does response depend on lake transparency? Global Lake Ecological Observatory Network Meeting, Orford, Quebec, Canada; October 27-31, 2014.

Invited Talk: Williamson, C. E. 2014. Scalable climate forcing optical indices: how effective are they in alpine lakes? American Geophysical Union, San Francisco, CA Dec. 15-19, 2014.

Pilla, R. M., C. E. Williamson, J. Zhang, R. L. Smyth, J. D. Lenters, J. A. Brentrup, and L. B. Knoll. 2015. Lakes as Sentinels of Climate Change: Lake Responses to Precipitation and DOC. International Association for Great Lakes Research, Burlington, Vermont, May 25-29, 2015.

Williamson, C., E. P. Overholt, J. A. Brentrup, R. Pilla, T. H. Leach, G. Schladow, S. Sadro, S. Chandra, T. Caldwell, and S. Watanabe, 2015. Sentinel responses to drought, climate teleconnections, and wildfire: UV exposure and DOM quality in lakes. Association for the Sciences of Limnology and Oceanography Annual Meeting, Granada, Spain, February 23-27, 2015.

Knoll, L.B, C.E. Williamson, T. M. Warner, R. M. Pilla, T. H. Leach, and J. A. Brentrup. 2015. Long-term dissolved oxygen responses to increasing dissolved organic matter in small northeastern Pennsylvania lakes. Pennsylvania Lake Management Society (PALMS) Annual Meeting, State College, PA, March 18-19, 2015.

Knoll, L. B., C. E. Williamson, T. M. Warner, R. M. Pilla, T. H. Leach, and J. A. Brentrup. 2015. Long-term dissolved oxygen responses to increasing dissolved organic matter in small temperate lakes. Ecological Society of America 100th Annual Meeting, Baltimore, MD, August 9-14, 2015.

Zimmermann, T.K.; K.E. Strock, L, Knoll, and C.E. Williamson. 2015. Reconstructing the effects of multiple stressors on algal communities in lakes with differing concentrations of dissolved organic carbon. Association for the Sciences of Limnology and Oceanography Annual Meeting, Granada, Spain, February 23-27, 2015.

Invited Talk: Williamson, C.E. July 2016 "Global Change Limnology: Sentinel Responses of Lakes and Their Implications for Coastal Marine Ecosystems". Gordon Research Conference on Ocean Global Change Biology, Waterville Valley, NH, July 17-21.

Brentrup, J.A.*, C.E. Williamson, C.D. Dempsey, L.B. Knoll. 2016. Photodegradation exceeds biodegradation in processing dissolved organic matter in one sub-tropical and three temperate lakes. Midwest Ecology and Evolution Conference. Oxford, Ohio. March 2016.

Brentrup, J.A.*, E. Ryder, A. Scofield, W. Colom-Montero, W. Eckert, E. de Eyto, H-P. Grossart, Y. Huot, P. Isles, L.B. Knoll, T.H. Leach*, C.G. McBride, D. Pierson, F. Pomati, K.C. Rose, N.R. Samal, R. Smyth, P.A. Staehr, C.E. Williamson, L.A. Winslow. 2016. What controls the formation of metalimnetic oxygen peaks? Global Lake Ecological Observatory Network (GLEON) meeting, Lunz & Gaming, Austria, July 4-8, 2016.

Brentrup, J.A.*, C.E. Williamson, C. Dempsey, and L. Knoll. 2016. Photodegradation exceeds biodegradation in processing dissolved organic matter in one sub-tropical and three temperate lakes. Association for the Sciences of Limnology and Oceanography Annual Meeting, Santa Fe, New Mexico, June 5-10, 2016.

Chin, T., K. Strock, L. Knoll, and C.E. Williamson. 2016. Differing patterns in seasonal succession of phytoplankton in lakes with high and low concentrations of dissolved organic carbon: Implications for long-term community shifts. Association for the Sciences of Limnology and Oceanography Annual Meeting, Santa Fe, New Mexico, June 5-10, 2016.

Dempsey, C., J.A. Brentrup*, S. Magyan, L.B. Knoll, and C.E. Williamson. 2016. The fate of terrestrially derived dissolved organic carbon in one sub-tropical and three temperate lakes.

Lacawac Ecology Conference, Lake Ariel, PA September 23-24.

Dempsey, C., J.A. Brentrup*, S. Magyan^, L.B. Knoll and C.E. Williamson. 2016. The fate of terrestrially derived dissolved organic carbon in one sub-tropical and three temperate lakes. Regional Science Consortium. 12th Annual Research Symposium. Erie, PA. November 2016.

Leach, T.H.*, C.E. Williamson, and J.D. Warren. 2016. Are horizontal distributions of zooplankton the result of interactions between lake morphology and zooplankton response to vertical habitat gradients? Association for the Sciences of Limnology and Oceanography Annual Meeting, Santa Fe, New Mexico, June 5-10, 2016.

Melles, S.J., R. Pilla*, D. Richardson, A.L. Hetherington, L. Knoll, and C.E. Williamson. 2016. Collaborating to explore how lake thermal structure has changed in recent decades for North Eastern North American lakes. Association for the Sciences of Limnology and Oceanography Annual Meeting, Santa Fe, New Mexico, June 5-10, 2016.

Pilla R.M.* , Williamson C.E., and others. Long-term Patterns in Global Lake Thermal Structure. 2016. 18th All-Hands Global Lakes Ecological Observatory Network and Networking Lake Observatories in Europe Joint Meeting. Lunz am See & Gaming, Austria. July 4-8, 2016.

Williamson, C.E., E.P. Overholt, T.H. Leach*, J.A. Brentrup*, E. Mette, R. Pilla*, T. Fisher, and L. Knoll. 2016. Relationship between long-term responses of zooplankton and changes in physical habitat structure during lake browning in two temperate lakes. Association for the Sciences of Limnology and Oceanography Annual Meeting, Santa Fe, New Mexico, June 5-10, 2016.

Williamson, C.E., S. Madronich, A. Lal, R. Zepp, R. Lucas, E. Overholt, K.C. Rose, S.G. Schladow. 2017. Is browner sicker? Climate-change-induced reduction in the solar UV inactivation potential for water-borne parasites and pathogens. Association for the Sciences of Limnology and Oceanography (ASLO) Annual Meeting, Honolulu, Hawaii, February 26 – March 3, 2017.

Adkins, L., N. Berry, E.P. Overholt, and C.E. Williamson. 2017. Observed changes and potential consequences of DOM loading in Pennsylvania lakes (USA). Northeastern Global Lake Ecological Observatory Network (GLEON) meeting, Millbrook, New York, April 8-9, 2017.

Princiotta, S., J.A. Brentrup, R.W. Sanders, and C.E. Williamson. 2017. What lies beneath: Integrating automated sensor technologies and classic techniques in aquatic ecology to explore vertical plankton dynamics. Northeast Ecosystem Research Cooperative Conference, Saratoga Springs, New York, March 28-29, 2017.

Invited Lecture: Williamson, C.E. 2017. Promoting good lake stewardship. Pocono Lake Ecological Observatory Network (PLEON) annual workshop, Lacawac Sanctuary and Biological Field Station, Lake Ariel, PA. July 16, 2017.

Shaw, C., S. Hall, E. Overholt, C.E. Williamson, and M. Duffy. 2017. Ultraviolet radiation mediates competition among parasites of *Daphnia*. Ecological Society of America Annual Meeting, Portland, Oregon, August 6-11, 2017.

Williamson, C.E., G. Dee, M. Olson, W. Palen, A. Clauser, K. Kessler, R.W. Sanders, W. Jeffrey, E.P. Overholt, and S.J. Connelly 2017. Insights into the ecology of the invisible: Implications of differential tolerance and repair of UV damage in freshwater organisms, European Society of Photobiology Conference, Pisa, Italy, September 5, 2017.

Adkins, L., C.E. Williamson, A. McBee, and E.P. Overholt. 2017. Investigating the Potential for DOM-mediated Changes in Transparency of Inland Waters to Increase Pathogens. Global Lake Ecological Observatory Network (GLEON) 19 meeting, Mohonk, New York, November 27 - December 1, 2017.

Pilla, R., C.E. Williamson, and many others. Global trends in lake thermal structure. 2018. Global Lake Ecological Observatory Network (GLEON) 19 meeting, Mohonk, New York, November 27 - December 1, 2017.

Invited Lecture: Williamson, C.E. 2018. The Ecological Consequences of Browner Lakes: From Physics to Fish (A story of ultraviolet radiation). Department of Life Sciences, University of Oslo, Oslo, Norway, February 7, 2018.

Invited Plenary Talk: Williamson, C.E. 2018. Why are lakes turning browner and why does it matter? Pennsylvania Lake Management Society (PALMS), State College, PA, March 7-8, 2018.

Dempsey, C., J.A. Brentrup, S. Magyan, L.B. Knoll, and C.E. Williamson. 2018. The fate of terrestrially derived dissolved organic carbon in one sub-tropical and three temperate lakes of varying trophic status. Society of Freshwater Science Annual Meeting, Detroit, Michigan, May 20-24, 2018.

Invited Plenary Talk: Williamson, C.E. 2018. TROLS in the lake: High Frequency Sensors to Explore Oxygen Phenology in Lakes. Global Lake Ecological Observatory Network (GLEON) 19.5 international virtual meeting (online through Zoom), May 23, 2018.

Invited Lecture: Williamson, C.E. 2018. Promoting good lake stewardship. Pocono Lake Ecological Observatory Network (PLEON) workshop, Lacawac Sanctuary and Biological Field Station, Lake Ariel, PA. July 8, 2018.

Invited Plenary Talk: Williamson, C.E. 2018. Beyond the Holy Grail: Adding Browning to the Lake Management Paradigm. North American Lake Management Society (NALMS), Cincinnati, OH; October 29 – November 1, 2018.

REFEREED PUBLICATIONS (excluding abstracts, *undergraduate, **graduate student):

Williamson**, C.E. 1977. Fluorescence identification of zoochlorellae: A rapid method for investigating alga-invertebrate symbioses. J. Exp. Zool. 202: 187-194.

- Gilbert, J.J., and C.E. Williamson**. 1978. Predator-prey behavior and its effect on rotifer survival in associations of *Mesocyclops edax*, *Asplanchna girodi*, *Polyarthra vulgaris*, and *Keratella cochlearis*. *Oecologia* 37: 13-22.
- Williamson**, C.E. 1979. Crayfish predation on freshwater sponges. *Am. Midl. Nat.* 101: 245-246.
- Williamson**, C.E. 1979. An ultrastructural investigation of algal symbiosis in white and green *Spongilla lacustris* (L.) Porifera: Spongillidae). *Trans. Amer. Micros. Soc.* 98: 59-77.
- Williamson**, C.E. and G.L. Williamson**. 1979. Life-cycles of lotic populations of *Spongilla lacustris* and *Eunapius fragilis* (Porifera: Spongillidae). *Freshwat. Biol.* 9: 543-553.
- Williamson**, C.E. 1980. Phased cell division in natural and laboratory populations of marine planktonic diatoms. *J. Exp. Mar. Biol. Ecol.* 43: 271-279.
- Frost, T.M., and C.E. Williamson**. 1980. In situ determination of the effect of symbiotic algae on the growth of the freshwater sponge *Spongilla lacustris*. *Ecology* 61: 1361-1370.
- Williamson**, C.E., and J.J. Gilbert. 1980. Variation among zooplankton predators: The potential of *Asplanchna*, *Mesocyclops*, and *Cyclops* to attack, capture and eat various rotifer prey. In: Kerfoot, W.C. (ed.). *Evolution and Ecology of Zooplankton Communities*. *Am. Soc. Limnol. Oceanogr. Spec. Symp.* 3: 509-517. Univ. Press New England.
- Williamson**, C.E. 1980. The predatory behavior of *Mesocyclops edax*: Predator preferences, prey defenses, and starvation-induced changes. *Limnol. Oceanogr.* 25: 903-909.
- Williamson**, C.E. 1981. The feeding ecology of the freshwater cyclopoid copepod *Mesocyclops edax*. Ph.D. Dissertation, Dartmouth College.
- Williamson**, C.E. 1981. Foraging behavior of a freshwater copepod: frequency changes in looping behavior at high and low prey densities. *Oecologia* 50: 332-336.
- Williamson**, C.E. and R.E. Magnien**. 1982. Diel vertical migration in *Mesocyclops edax*: Implications for predation rate estimates. *J. Plankton Res.* 4: 329-339.
- Gilbert, J.J. and C.E. Williamson. 1983. Sexual dimorphism in zooplankton (Copepoda, Cladocera, and Rotifera). *Ann. Rev. Ecol. Syst.* 14: 1-33.
- Williamson, C.E. 1983. Invertebrate predation on planktonic rotifers. *Hydrobiologia* 104: 385-396.
- Williamson**, C.E. 1983. Behavioral interactions between a cyclopoid copepod predator and its prey. *J. Plankton Res.* 5: 701-711.

- Williamson**, C.E. 1984. Laboratory and field experiments on the feeding ecology of the freshwater cyclopoid copepod, *Mesocyclops edax*. *Freshwat. Biol.* 14: 575-585.
- Williamson, C.E., N.M. Butler**, and L. Forcina*. 1985. Food limitation in naupliar and adult *Diaptomus pallidus*. *Limnol. Oceanogr.* 30: 1283-1290.
- Williamson, C.E. 1986. The swimming and feeding behavior of *Mesocyclops*. *Hydrobiologia* 134: 11-19.
- Williamson, C.E., and N.M. Butler**. 1986. Predation on rotifers by the suspension-feeding calanoid copepod *Diaptomus pallidus*. *Limnol. Oceanogr.* 31: 393-402.
- Williamson, C.E. 1987. Predator-prey interactions between omnivorous diaptomid copepods and rotifers: the role of prey morphology and behavior. *Limnol. Oceanogr.* 32: 167-177.
- Williamson, C.E., and N.M. Butler**. 1987. Temperature, food, and mate limitation of copepod reproductive rates: separating the effects of multiple hypotheses. *J. Plankton Res.* 9: 821-836.
- Williamson, C.E., and H.A. Vanderploeg. 1988. Predatory suspension-feeding in *Diaptomus*: Prey defenses and the avoidance of cannibalism. *Bull. Mar. Sci.* 43: 561-572.
- Williamson, C.E., M.E. Stoeckel**, and L.J. Schoeneck**. 1989. Predation risk and the structure of freshwater zooplankton communities. *Oecologia* 79: 76-82.
- Schoeneck**, L.J., C.E. Williamson, and M.E. Stoeckel**. 1990. Diel periodicity and selectivity in the feeding rate of the predatory copepod *Mesocyclops edax*. *J. Plankton Res.* 12: 29-40.
- Williamson, C.E., and M.E. Stoeckel**. 1990. Estimating predation risk in zooplankton communities: the importance of vertical overlap. *Hydrobiologia* 198: 125-131.
- Williamson, C.E. 1991. Copepoda. Chapter 21 in: Thorp, J.H., and A.P. Covich (eds.). *Ecology and Classification of North American Freshwater Invertebrates*; pp. 787-822. Academic Press Inc.
- Williamson, C.E., P.C. Schulze, and W.G. Sprules. 1992. Opening remarks: The need for advanced techniques for *in situ* studies of zooplankton. *Arch. Hydrobiol. Beih. Ergebn. Limnol.* 36: V-VII.
- Schulze, P.C., C.E. Williamson, and W.G. Sprules. 1992. Concluding remarks: a comparison of acoustic devices, towed particle counters, and video systems. *Arch. Hydrobiol. Beih. Ergebn. Limnol.* 36: 135-140.
- Sprules, W.G., P.C. Schulze, and C.E. Williamson, (eds.) 1992. Advanced techniques for in situ studies of zooplankton abundance, distribution, and behavior. *Arch. Hydrobiol. Beih. Ergebn. Limnol.* 36: 140 pp.

Smith, S.L., R.R. Pieper, M.V. Moore, L.G. Rudstam, C.H. Greene, J.E. Zamon, C.N. Flagg, and C.E. Williamson. 1992. Acoustic techniques for the *in situ* observation of zooplankton. Arch. Hydrobiol. Beih. Ergebn. Limnol. 36: 23-43.

Williamson, C.E.. 1993. Linking predation risk models with behavioral mechanisms: Identifying population bottlenecks. Ecology 74: 320-331.

Williamson, C.E., H.E. Zagarese, P.C. Schulze, B.R. Hargreaves, J. Seva*. 1994. Impact of short-term exposure to UV-B radiation on zooplankton communities in north temperate lakes. J. Plankton Res. 16: 205-218.

Williamson, C.E., and H.E. Zagarese (Eds.) 1994. Impact of UV-B radiation on pelagic freshwater ecosystems. Arch. Hydrobiol. Beih. Ergebn. Limnol. 43: 1-226.

Williamson, C.E. and H.E. Zagarese. 1994. Opening remarks: The impact of UV-B radiation on pelagic freshwater ecosystems. Archiv Hydrobiol. Ergebn. Limnol. 43: IX-XI.

Siebeck, O., T. Vail**, C. Williamson, R. Vetter, D. Hessen, H. Zagarese, E. Little, E. Balseiro, B. Modenutti, J. Seva*, and A. Shumate*. (1994). Impact of UV-B radiation on zooplankton and fish in pelagic freshwater ecosystems. Arch. Hydrobiol. Beih. Ergebn. Limnol. 43: 101-114.

Zagarese, H.E., C.E. Williamson, M. Mislivets*, and P. Orr*. 1994. The vulnerability of *Daphnia* to UV-B radiation in the Northeastern United States. Arch. Hydrobiol. Beih. Ergebn. Limnol. 43: 207-216.

Zagarese, H.E., and C.E. Williamson. 1994. Modeling the impacts of UV-B radiation on ecological interactions in freshwater and marine ecosystems. *In*: Biggs, R.H., and M.E.B. Joyner. "Stratospheric ozone depletion/UV-B radiation in the biosphere. NATO ASI Series 1: Global Environmental Change 18: 315-328. Springer-Verlag, New York.

Schulze, P.C., H.E. Zagarese, and C.E. Williamson. 1995. Competition between crustacean zooplankton in continuous cultures. Limnol. Oceanogr. 40: 33-45.

Williamson, C.E. 1995. What role does UV-B radiation play in freshwater ecosystems? Limnol. Oceanogr. 40: 386-392.

Schulze, P.C., C.E. Williamson, and B.R. Hargreaves. 1995. Evaluation of a remotely operated vehicle (ROV) as a tool for studying the distribution and abundance of zooplankton. J. Plankton Res. 17: 1233-1243.

Morris, D.P., Zagarese, H.E., Williamson, C.E., Balseiro, E.G., Hargreaves, B.R., Modenutti, B., Moeller, R., and Queimalinos, C. 1995. The attenuation of solar UV radiation in lakes and the role of dissolved organic carbon. Limnol. Oceanogr. 40: 1381-1391.

Sanders, R.W., C.E. Williamson, P.L. Stutzman**, R.E. Moeller, C.E. Goulden, and R.B. Aoki. 1996. Differential use of microbial food resources for reproduction by co-occurring zooplankton. Limnol. Oceanogr. 41:1295-1305.

Williamson, C.E., R.W. Sanders, R.E. Moeller, and P.L. Stutzman**. 1996. Utilization of sub-surface food resources by zooplankton: Implications for diel vertical migration theory. *Limnol. Oceanogr.* 41: 224-233.

Williamson, C.E., R.S. Stemberger, D.P. Morris, T.M. Frost, and S. Paulsen. 1996. Ultraviolet radiation in North American lakes: Attenuation estimates from DOC measurements and implications for plankton communities. *Limnol. Oceanogr.* 41:1024-1034.

Williamson, C.E. 1996. Effects of UV radiation on freshwater ecosystems. *Int. J. Env. Studies Section A.* 51: 245-256.

Zagarese, H.E., Feldman, M.**, and Williamson, C.E. 1997. UV-B-induced damage and photoreactivation in three species of *Boeckella* (Copepoda, Calanoida). *J. Plankton Research* 19:357-367.

Williamson, C.E., S.L. Metzgar, P.A. Lovera*, and R.E. Moeller. 1997. Solar ultraviolet radiation and the spawning habitat of yellow perch, *Perca flavescens*. *Ecol. Applic.* 7:1017-1023

Zagarese, H.E., C.E. Williamson, T.L. Vail**, O. Olson**, and C. Queimalinos**. 1997. Long-term exposure of *Boeckella gibbosa* (Copepoda, Calanoida) to "in situ" levels of solar UV-B radiation. *Freshwat. Biol.* 37:99-106

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