

## STUART ALLEN LUDSIN

### PERSONAL INFORMATION

1314 Kinnear Rd., 222 Research Center  
Aquatic Ecology Laboratory  
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### EDUCATION

- Ph.D. The Ohio State University, Evolution, Ecology and Organismal Biology (EEOB), Columbus, 2000  
M.S. Auburn University, Fisheries and Allied Aquacultures, Auburn, AL, 1994  
B.S. Miami University, Zoology, Oxford, OH, 1992

### RESEARCH/WORK EXPERIENCE

- Professor, EEOB, OSU, Columbus, 2019-present.  
Associate Professor, EEOB, OSU, Columbus, 2013-2019.  
Assistant Professor, EEOB, OSU, Columbus, 2007-2013.  
Research Fishery Biologist, Department of Commerce, National Oceanic and Atmospheric Administration, Great Lakes Environmental Research Laboratory, Ann Arbor, MI, 2002-2007.  
Post-doctoral Fellow, Great Lakes Institute for Environmental Research (GLIER), Department of Biological Sciences, University of Windsor, Windsor, ON, Canada, 2001-2002.  
Graduate Research Associate, OSU, EEOB, Columbus, 1995-2000.  
Graduate Research Associate, Auburn University, Fisheries, Auburn, AL, 1992-1994.  
Undergraduate Research Assistant, OSU, Zoology, Columbus, May-July 1991.

### UNIVERSITY APPOINTMENTS

- Professor. OSU, Environmental Sciences Graduate Program, Columbus, 2019-present.  
Associate Professor. OSU, Environmental Sciences Graduate Program, Columbus, 2013-2019.  
Assistant Professor. OSU, Environmental Sciences Graduate Program, Columbus, 2009-2013.  
Adjunct Associate Professor. University of Michigan, School of Natural Resources and the Environment, Ann Arbor, 2007-present.  
Adjunct Assistant Professor. University of Toledo, Biology, Toledo, OH, 2006-present.  
Adjunct Assistant Professor. University of Windsor, Biological Sciences, Windsor, ON, 2003-present.  
Adjunct Faculty Member. Bowling Green State University, Biological Sciences, Bowling Green, OH, 2003-present.

### SELECTED RESEARCH GRANTS (TOTAL AWARD AMOUNT: > \$21,000,000; N = 32 TOTAL)

#### Ongoing

1. **NOAA, National Marine Fisheries Service**. "Great Lakes Fisheries Science Training (FiST) workshop for undergraduates." PI, 2020, \$139,802.
2. **Great Lakes Fishery Commission, Fisheries Research Program**. "A unified model of walleye recruitment" Co-PI, 2020-2022, \$187,728.

3. **Great Lakes Fishery Commission, Fisheries Research Program.** “Do summer cyanobacterial blooms negatively affect prey and commercial fish recruitment in the Great Lakes?” Co-PI, 2020-2023, \$364,350 (CAN).
4. **Ohio Lake Erie Commission, Lake Erie Protection Fund.** “HAB & hypoxia impacts on Lake Erie food webs and fisheries.” PI, 2019-2020, \$49,924.
5. **Great Lakes Fishery Commission, Fisheries Research Program.** “Moving toward ecosystem-based fisheries management: developing an integrated ecosystem assessment of Lake Erie as a case study”. Co-PI, 2019-2020, \$136,582.
6. **NOAA, Ohio Sea Grant College Program.** “Stock structure and contribution of west and east basin walleye to recreational and commercial fisheries in Lake Erie”. PI, 2018-2020, \$119,724.
7. **Ohio Department of Higher Education.** “Physiological, growth and survival response of age-0 yellow perch and walleye to toxic cyanobacteria”. PI, 2018-2020, \$152,886.
8. **Ohio Department of Natural Resources-Division of Wildlife,** Federal Aid in Sport Fish Restoration Project. “Fish Management in Ohio”. PI, 2010-2021, \$16,400,000 (\$1,500,000/year).
9. **National Science Foundation,** Division of Integrative Organismal Systems. “The influence of the prey physiological stress response on predator-prey interactions”. Co-PI, 2016-2020, \$652,556.
10. **Great Lakes Fishery Commission,** Fisheries Research Program. “Habitat quality as a driver of Lake Erie walleye population dynamics: past, present & future”. PI, 2016-2021, \$284,691.
11. **Great Lakes Fishery Commission,** Fisheries Research Program. “Do discrete spawning stocks contribute differentially to Lake Erie’s walleye fisheries?”. Co-PI, 2016-2021, \$273,000.
12. **Great Lakes Fishery Commission,** Fisheries Research Program. “Physical processes and fish recruitment in large lakes: Phase II.”. PI, 2016-2021, \$220,000.

#### Completed

1. **Ohio Department of Higher Education.** “Development of the MMPB method for quantifying total microcystins in edible fish tissues”. PI, 2016-2018, \$156,617.
2. **Ohio Department of Higher Education.** “Fish flesh and fresh produce as sources on microcystin exposure to humans”. PI, 2015-2017, \$162,598.
3. **United States Department of Agriculture, Natural Resources Conservation Service.** “Integrating the cropland and wildlife components of the conservation effects assessment project (CEAP) to assess and forecast benefits of agricultural BMPs to biological endpoints across the western Lake Erie basin watershed”. Co-PI, 2013-2016, \$271,416.
4. **NOAA, Ohio Sea Grant College Program.** “Impacts of climate change on public health in the Great Lakes through harmful algal blooms”. Co-PI, 2012-2016, \$189,506.
5. **National Science Foundation,** Coupled Natural and Human Systems Program. “Co-evolution of upstream human behavior and downstream ecosystem services in a changing climate”. Co-PI, 2011-2017, \$1,499,995.
6. **Great Lakes Fishery Commission,** Fisheries Research Program. “A coupled physical-biological model to forecast larval yellow perch distributions, growth rates, and potential recruitment in Lake Erie”. Co-PI, 2011-2014, \$199,699.
7. **Great Lakes Fishery Commission,** Fisheries Research Program. “Winter warming effects on yellow perch reproduction and recruitment”. PI, 2010-2013, \$112,725.
8. **Great Lakes Fishery Commission,** Fisheries Research Program. “River discharge as a predictor of Lake Erie yellow perch recruitment”. PI, 2006-2011, \$347,583.
9. **NOAA, ECOFORE Program.** “ECOFORE 2006: Forecasting the causes, consequences, and potential solutions for hypoxia in Lake Erie”. Co-PI, 2006-2014, \$2,200,000
10. **NOAA, CSCOR Program.** “NGOMEX 2006: Spatially-explicit, high-resolution mapping and modeling to quantify hypoxia effects on the living resources of the Northern Gulf of Mexico”. Co-PI (Project leader), 2006-2009, \$1,462,729

**SELECTED REFEREED PUBLICATIONS (OUT OF N = 98 IN PRESS OR PUBLISHED)**

1. Briland, R., J.P. Stone, M. Manubolu, J. Lee, and **S.A. Ludsin**. 2020. Cyanobacterial blooms modify food web structure and interactions in western Lake Erie. *Harmful Algae* 92:xxx-xxx. doi.org/10.1016/j.hal.2019.03.004.
2. Chen, K.Y., P.T. Euclide, **S.A. Ludsin**, W. Larson, M.G. Sovic, H.L. Gibbs, and E.A. Marschall. 2020. RAD-seq refines previous estimates of genetic structure in Lake Erie walleye (*Sander vitreus*). *Transactions of the American Fisheries Society* 149:159-173.
3. Chen, K.Y., **S.A. Ludsin**, B.J. Marcek, J.W. Olesik, and E.A. Marschall. 2020. Otolith microchemistry shows natal philopatry of walleye in western Lake Erie. *Journal of Great Lakes Research*. doi:10.1016/j.jglr.2020.06.006
4. Dillon, R.A., J.D. Conroy, L.G. Rudstam, P.F. Craigmile, D.M. Mason, and **S.A. Ludsin**. 2020. Towards more robust hydroacoustic estimates of fish abundance in the presence of pelagic macroinvertebrates. *Fisheries Research* 230:xxx-xxx. doi:10.1016/j.fishres.2020.105667
5. Dippold, D.A., N. Aloysius, S.C. Keitzer, H. Yen, J.G. Arnold, P. Daggupati, M.E. Fraker, J.F. Martin, D.M. Robertson, S.P. Sowa, M.V. Johnson, M.J. White, and **S.A. Ludsin**. 2020. Forecasting the combined effects of anticipated climate change and agricultural conservation practices on fish recruitment dynamics in Lake Erie. *Freshwater Biology* doi.org/10.1111/fwb.13515.
6. Fraker, M.E., S.C. Keitzer, J.S. Sinclair, N.R. Aloysius, D.A. Dippold, H. Yen, J.G. Arnold, P. Daggupati, J.F. Martin, D.M. Robertson, S.P. Sowa, M.V. Johnson, M.J. White, and **S.A. Ludsin**. 2020. Projecting the effects of agricultural conservation practices on stream fish communities in a changing climate. *Science of the Total Environment* 747:xxx-xxx. doi:10.1016/j.scitotenv.2020.141112
7. Marcek, B.J., E.A. Burbacher, K. Dabrowski, K.P. Winslow, and **S.A. Ludsin**. 2020. Interactive effects of hypoxia and temperature on consumption, growth, and condition of juvenile hybrid striped bass. *Transactions of the American Fisheries Society* 149:71-83.
8. May, C.J., **S.A. Ludsin**, D. Glover, and E.A. Marschall. 2020. The influence of larval growth rate on juvenile recruitment in Lake Erie walleye (*Sander vitreus*). *Canadian Journal of Fisheries and Aquatic Sciences* 2020:548-555.
9. Stone, J.P., K.L. Pangle, S.A. Pothoven, H.A. Vanderploeg, S.B. Brandt, T.O. Höök, T.H. Johengen, and **S.A. Ludsin**. 2020. Hypoxia's impact on pelagic fish populations in Lake Erie: a tale of two planktivores. *Canadian Journal of Fisheries and Aquatic Sciences* 77:1131-1148.
10. Bade, A.P., T.R. Binder, M.D. Faust, C.S. Vandergoot, T.J. Hartman, R.T. Kraus, C.C. Krueger, and **S.A. Ludsin**. 2019. Sex-based differences in spawning behavior account for male-biased harvest in Lake Erie walleye (*Sander vitreus*). *Canadian Journal of Fisheries and Aquatic Sciences* 76:2003-2012.
11. Chen, K.Y., E.A. Marschall, M.G. Sovic, A.C. Fries, H.L. Gibbs, and **S.A. Ludsin**. 2018. assignPOP: An R package for population assignment using genetic, non-genetic, or integrated data in a machine-learning framework. *Methods in Ecology and Evolution* 9:439-446.
12. Manubolu, M., J. Lee, K.M. Riedl, Z.X. Kua, L.P. Collart, and **S.A. Ludsin**. 2018. Optimization of extraction methods for quantification of microcystin-LR and microcystin-RR in fish, vegetable, and soil matrices using UPLC-MS/MS. *Harmful Algae* 76:47-57.
13. Collingsworth, P.D., D.B. Bunnell, M.W. Murray, Y.C. Kao, Z.S. Feiner, R.M. Claramunt, B.M. Lofgren, T.O. Höök, and **S.A. Ludsin**. 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*. 27:363-391.
14. Keitzer, S.C., **S.A. Ludsin**, S.P. Sowa, G. Annis, J.G. Arnold, P. Daggupati, A.M. Froehlich, M.E. Herbert, M.V. Johnson, A.M. Sasson, H. Yen, M.J. White, and C.A. Rewa. 2016. Thinking outside of the lake: Can controls on nutrient inputs into Lake Erie benefit stream conservation in its watershed? *Journal of Great Lakes Research* 42:1322-1331
15. DeVanna-Fussell, K.M., R.E.H. Smith, M.E. Fraker, L. Boegman, K.T. Frank, T.J. Miller, J.T. Tyson, K.K. Arend, D. Boisclair, S.J. Guildford, R.E. Hecky, T.O. Höök, O.P. Jensen, J.K. Llopiz, C.J. May, R.G. Najjar, L.G. Rudstam, C.T. Taggart, Y.R. Rao, and **S.A. Ludsin**. 2016. A perspective

- on needed research, modeling, and management approaches that can enhance Great Lakes fisheries management under changing ecosystem conditions. *Journal of Great Lakes Research* 42:743-752.
16. Farmer, T.M., E.A. Marschall, K. Dabrowski, and **S.A. Ludsin**. 2015. Short, warm winters threaten fish populations. *Nature Communications* 6:7724. doi:10.1038/ncomms8724.
  17. Bunnell, D.B., R.P. Barbiero, **S.A. Ludsin**, C.P. Madenjian, G. Warren, D. Dolan, T. Brenden, R. Briland, O.T. Gorman, J.X. He, T.H. Johengen, B.F. Lantry, T.F. Nalepa, S.C. Riley, C.M. Riseng, T.J. Treska, I. Tsehaye, D.M. Warner, M.G. Walsh, and B.C. Weidel. 2014. Changing ecosystem dynamics in the Laurentian Great Lakes: bottom-up and top-down regulation. *BioScience* 64:26-39. Cover photo of *BioScience* Issue.
  18. Carreon-Martinez, L.B., K.W. Wellband, T.B. Johnson, **S.A. Ludsin**, and D.D. Heath. 2014. Novel molecular approach demonstrates turbid river plumes reduce predation mortality on larval fish. *Molecular Ecology* 23:5366–5377.
  19. **Ludsin, S.A.**, K.M. DeVanna, and R.E.H. Smith. 2014. Physical-biological coupling and the challenge of understanding fish recruitment in large lakes. *Canadian Journal of Fisheries and Aquatic Sciences* 71:775-794.
  20. Scavia, D., J.D. Allan, K.K. Arend, S. Bartell, D. Beletsky, N.S. Bosch, S.B. Brandt, R.D. Briland, I. Daloğlu, J.V. DePinto, D.M. Dolan, M.A. Evans, T.M. Farmer, D. Goto, H. Han, T.O. Höök, R. Knight, **S.A. Ludsin**, D. Mason, A.M. Michalak, R.P. Richards, J.J. Roberts, D.K. Rucinski, E. Rutherford, D.J. Schwab, T. Sesterhenn, H. Zhang, and Y. Zhou. 2014. Assessing and addressing the re-eutrophication of Lake Erie: central basin hypoxia. *Journal of Great Lakes Research* 40: 226–246.
  21. Zhang, H., D.M. Mason, C.A. Stow, A.T. Adamack, S.B. Brandt, X. Zhang, D.G. Kimmel, M.R. Roman, and W.C. Boicourt, and **S.A. Ludsin**. 2014. Hypoxia, habitat quality, and the spatial distribution of pelagic fishes in the northern Gulf of Mexico. *Marine Ecology Progress Series* 505:209-226.
  22. Pangle, K.L., T.D. Malinich, D.R. DeVries, D.B. Bunnell, and **S.A. Ludsin**. 2012. Context-dependent planktivory: interacting effects of turbidity and predation risk on adaptive foraging. *Ecosphere* 3: article 114 (18 pp). <http://dx.doi.org/10.1890/ES12-00224.1>.
  23. Pangle, K.L., **S.A. Ludsin**, and B.J. Fryer. 2010. Otolith microchemistry as a stock identification tool for freshwater fishes: testing its limits in Lake Erie. *Canadian Journal of Fisheries and Aquatic Sciences* 67:1475–1489.
  24. Reichert, J.M., B.J. Fryer, K.L. Pangle, T.B. Johnson, J.T. Tyson, A.B. Drelich, and **S.A. Ludsin**. 2010. River-plume use during the pelagic larval stage benefits recruitment of a lentic fish. *Canadian Journal of Fisheries and Aquatic Sciences* 67:987-1004.
  25. **Ludsin, S.A.**, X. Zhang, S.B. Brandt, M.R. Roman, W.C. Boicourt, D.M. Mason, and M. Costantini. 2009. Hypoxia-avoidance by planktivorous fish in Chesapeake Bay: Implications for food web interactions and fish recruitment. *Journal of Experimental Marine Biology and Ecology* 381(Suppl. 1):S121-S131.
  26. Costantini, M., **S.A. Ludsin**, D.M. Mason, X. Zhang, W.C. Boicourt, and S.B. Brandt. 2008. Effect of hypoxia on habitat quality of striped bass (*Morone saxatilis*) in Chesapeake Bay. *Canadian Journal of Fisheries and Aquatic Sciences* 65:989-1002.
  27. **Ludsin, S.A.**, B.J. Fryer, and J.E. Gagnon. 2006. Comparison of solution-based versus laser-ablation ICPMS for analysis of larval fish otoliths. *Transactions of the American Fisheries Society* 135:218–231.
  28. Mora, C., P.M. Chittaro, P.F. Sale, J.P. Kritzer, and **S.A. Ludsin**. 2003. Patterns and processes in reef fish diversity. *Nature* 421:933-936.
  29. **Ludsin, S.A.**, and A.D. Wolfe. 2001. Biological invasion theory: Darwin’s contributions from The Origin of Species. *BioScience* 51:780-789.
  30. **Ludsin, S.A.**, M.W. Kershner, K.A. Blocksom, R.L. Knight, and R.A. Stein. 2001. Life after death in Lake Erie: nutrient controls drive fish species richness, rehabilitation. *Ecological Applications* 11:731-746.
  31. **Ludsin, S.A.**, and D.R. DeVries. 1997. First-year recruitment of largemouth bass: the interdependency of early life stages. *Ecological Applications* 7:1024-1038.

## SELECTED RECENT AWARDS AND HONORS RECEIVED

Keynote Address. Ontario Commercial Fisheries' Association, 75<sup>th</sup> Annual Conference, Niagara Falls, Canada, 2020.

- **Ludsin, S.A.** 2020. Understanding fishery dynamics in a changing ecosystem: Lessons from Lake Erie yellow perch and walleye

Best student presentation. Indiana and Ohio Chapters of the American Fisheries Society, Muncie, IN, 2017.

- Dillon, R., J.D. Conroy, and **S.A. Ludsin**. 2017. Determining potential bias by *Chaoborus* during hydroacoustic surveys of prey fish biomass in Ohio reservoirs.

Chandler-Misener Award, International Association of Great Lakes Research, 2015.

- Most notable paper in the *Journal of Great Lakes Research* during 2014.

Invited speaker. Growth–Survival Paradigm in Early Life Stages of Fish: Controversy, Synthesis, and Multidisciplinary Approach Symposium. Yokohama, Japan, 2015.

Keynote Speaker. 38<sup>th</sup> Annual Larval Fish Conference, American Fisheries Society, Québec City, Canada, 2014.

Most outstanding poster. Natural and Mathematical Sciences Undergraduate Research Forum, Organismal Biology Division, OSU, 2014.

- Corey, M.M., K.Y. Chen, E.A. Marschall, J.W. Olesik, and **S.A. Ludsin**. Otolith microchemistry as a tool to discriminate between river-spawning populations of walleye in Lake Erie.

Best student presentation. American Fisheries Society – Ohio Chapter, Columbus, 2014.

- Farmer, T.M., E.A. Marschall, K. Dabrowski, and **S.A. Ludsin**. Climate change effects on Lake Erie yellow perch reproduction and recruitment.

Most outstanding poster. Natural and Mathematical Sciences Undergraduate Research Forum, Organismal Biology Division, OSU, 2012.

- Lang, K.J., K.L. Pangle, J.D. Conroy, S. Goonewardena, and **S.A. Ludsin**. Hypoxia as a mediator of food web interactions and energy flow in reservoir ecosystems.

Best Professional Presentation. American Fisheries Society – Ohio Chapter, Ashland, 2012.

- Filbrun, J.E., D.A. Culver, and **S.A. Ludsin**. Does artificial feed enhance age-0 channel catfish growth?

Faculty Recognition Award for Outstanding Research Mentorship, Undergraduate Research Opportunities Program (UROP), University of Michigan, 2007.

Director's Award for Outstanding Effort. NOAA-GLERL, 2006.

Employee of the Year. NOAA-GLERL, 2005.

## SELECTED PROFESSIONAL SERVICE & SYNERGISTIC ACTIVITIES

Steering Committee Member, Ohio Water Consortium, 2019-present.

Advisory Committee Member, Ohio Sea Grant College Program, 2010-present.

Advisory Committee Member, Stone Laboratory, 2010-present.

Board of Technical Experts (BOTE), Great Lakes Fishery Commission, 2007-present.

- Proposal review panel member for Fisheries Research Program
- Co-developer of the research theme “Physical Processes and Fish Recruitment in Large Lakes”.

Associate Editor

- *Journal of Great Lakes Research*, 2015-2019.
- *Transactions of the American Fisheries Society*, 2005-2008.

Expert Participant, Ohio Fish Consumption Advisory Committee annual meeting, Columbus, OH, 2019.

Panelist, NOAA CoastWatch Users Engagement Session, Ann Arbor, MI, 2019.

Plenary Session Co-organizer. Midwest Fish and Wildlife Conference, Cleveland, OH, 2018-2019.

Coordinator and moderator, OSU-Ohio DNR-Division of Wildlife Lake Erie-Inland Waters Annual Research Review Meeting, Columbus, OH, 2009-2019.

Workshop Developer. Demystifying Proposal Writing. Early Career Event, Larval Fish Conference, Victoria, BC, 2018.

Proposal Peer Review Panel, Great Lakes Fishery Trust, 2017-2018.

External Evaluator, Czech Academy of Sciences, Biological Sciences Division, 2015.

## ACADEMIC MENTORING

Post-doctoral Researcher Supervisor (2 current, 15 past)

M.S. and Ph.D. Graduate Student Advisor (4 current, 13 past)

Undergraduate Thesis Researcher Advisor (2 current, 10 past)

## SELECTED PROFESSIONAL ORGANIZATION MEMBERSHIP

### American Fisheries Society

- **Scientific Program Committee Member**, North Central Division Representative, 2019-2020
  - Symposia Chairperson, 2019-2020
- **Sally Leonard Richardson Best Student Paper Award Evaluations Panel**, member, 2017
- **Evaluator** of student posters/papers, 2000 and 2002
- **President**, Auburn University Chapter of AFS, Auburn, AL, 1993-1994
- **Treasurer**, Auburn University Chapter of AFS, 1992-1993

### Ecological Society of America (ESA)

- **Appointed ESA Scientific Planning Committee Representative**, EcoSummit 2012 International Conference, 2011-2012

### International Association for Great Lakes Research

- **Publications Committee member**, 2014-present
- **Board of Directors**, elected U.S. representative, 2012-2015
- **Nominations Committee Chair**, 2012-2015
- **Paul W. Rodger's Scholarship Evaluations Panel**, member, 2015
- **IAGLR Scholarship Evaluations Panel**, member, 2014
- **Norman S. Baldwin Scholarship Evaluations Panel**, member, 2002, 2008, and 2013
- **Evaluator** of student papers, 2014

## SELECTED PUBLIC OUTREACH ACTIVITIES

### Public Lecturer.

- Expedition Club. Columbus, OH, 2019. Title: The threat that human-driven changes to Lake Erie pose to its fisheries.
- Old North High Club. Columbus, OH, 2018. Title: Climate change: a primer.
- Rotary Club. Columbus, OH, 2018. Title: Climate change: a primer.
- Trout Unlimited. Wooster, OH, 2018. Title: The threat that human-driven changes to Lake Erie pose to its fisheries.
- Lakeside Chautauqua Environmental Stewardship Educational Seminar Series, Lakeside, OH, 2013. Title: Climate change impacts on fishes of the Great Lakes.

### Co-coordinator of high school student research internships, Columbus, OH.

- St. Charles Preparatory School, Columbus, OH, summer 2014-2018 (2-3 students per year)

### Co-coordinator of student visits, Aquatic Ecology Laboratory, OSU, Columbus, OH.

- Indianola K-8 (~30 students), Columbus, OH 2016
- Columbus Academy High School (~15 students), Columbus, OH 2016
- Women in Science Day (~60 students), 1997, 2010