

HENRY A. VANDERPLOEG

Positions:

Ecologist, Affiliate Scientist (retired volunteer), NOAA Great Lakes Environmental Research Laboratory

Adjunct Professor [School for Environment & Sustainability](#), University of Michigan

Affiliation and Contact Information:

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Education

Ph.D., 1968-1973, Oregon State University, Corvallis, Oregon (Oceanography).

M.S., 1966-1968, University of Wisconsin, Madison, Wisconsin (Zoology).

B.S., 1962-1966, Michigan Technological University, Houghton, Michigan (Biological Sciences).

Current Research Interests

Research interests are food web interactions, particularly feeding mechanisms and life cycle strategies of zooplankton, benthos, and fish; harmful cyanobacteria; and spatial distribution and interactions of all food web components.

Current research projects include:

- Dreissenid mussel and zooplankton feeding behavior, nutrient cycling, and ecosystem effects
- Long-term trends in zooplankton populations
- Impacts of predatory cercopagids (*Bythotrephes* and *Cercopagis*) on Great Lakes food webs
- Spatial structure and function of Great Lakes food webs as driven by stressors such as hypoxia, invasive species, changing light climate (visible and UV), and interannual variability in weather (as surrogate for climate).
- Harmful cyanobacteria ecology and interactions with grazers, particularly dreissenid mussels and zooplankton.

Professional Experience

September 2022-Present:

Ecologist, Affiliate Scientist

Duties: Continue to collaborate with GLERL, CIGLR and SEAS staff, students and partners with emphasis on analysis and publication of research already completed or underway as well experimental design of ongoing research.

April 2011-August 2022:

Chief, Ecosystems Dynamics Branch and Research Ecologist

Duties: Manage Branch staff and develop research programs for understanding ecology of the Great Lakes.

July 1974-March 2011:

Research Ecologist (Series GS-408-15), NOAA/GLERL, Ann Arbor, MI

Duties: Develop research programs for understanding ecology of the Great Lakes.

January 1972-July 1974:

Aquatic Ecologist, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

Duties: Develop models to describe movement of radionuclides in aquatic systems, evaluate environmental impacts of nuclear power plants on aquatic systems, and develop research program to describe radionuclide cycling in on-site aquatic ecosystems.

Awards

Career

- International Association of Great Lakes Research Lifetime Achievement Award (2021)
- NOAA Distinguished Career Award, Scientific Achievement (2020) *for research contributions and leadership leading to a greater understanding of Great Lakes ecology*

Publication awards

- International Association of Great Lakes Research Chandler-Misner Award Outstanding Article Award Journal of Great Lakes Research, 2010: “Kerfoot, W.C., F. Yousef, S.A. Green, J.W. Budd, D.J. SCHWAB, and H.A. VANDERPLOEG. Approaching storm: Disappearing winter bloom in Lake Michigan. Journal of Great Lakes Research 36:30-41 (2010).”
- Oceanic and Atmospheric Administration 2008 Outstanding Scientific Paper Award for “VANDERPLOEG, H.A., T.H. JOHENGGEN, P.J. Lavrentyev, C. Chen, G.A. LANG, M.A. Agy, M.H. Bundy, J.F. CAVALETTO, B.J. EADIE, J.R. LIEBIG, G.S. MILLER, S.A. RUBERG, and M.J. McCORMICK. Anatomy of the recurrent coastal sediment plume in Lake Michigan and its impacts on light climate, nutrients, and plankton. Journal of Geophysical Research 112(C03S90, doi:10.1029/2004JC002379):23 pp. (2007).”
- Office of Oceanic and Atmospheric Administration, National Oceanic and Atmospheric Administration, United States Department of Commerce Outstanding Scientific Paper

Award, 2005 for “VANDERPLOEG, H. A., T. F. NALEPA, D. J. Jude, E. L. MILLS, K. T. HOLECK, J. R. LIEBIG, I. A. Grigorovich, and H. Ojaveer. Dispersal and emerging ecological impacts of Ponto-Caspian species in the Laurentian Great Lakes. Canadian Journal of Fisheries and Aquatic Sciences 59:1209-1228 (2002).”

- Environmental Research Laboratories, National Oceanic and Atmospheric Administration, United States Department of Commerce Outstanding Scientific Paper Award, 1996 for “VANDERPLOEG, H.A. Zooplankton particle selection and feeding mechanisms. In The Biology of Particles in Aquatic Systems, R.S. Wotton (ed.). Lewis Publishers, Ann Arbor, MI, 205-234 (1994).”

Service to External Partners (NOAA-centric)

- NOAA Harmful Algal Blooms (HABs), Corals and other 'Omics subcommittee
- NOAA Focus Area 3 (Nearshore Health) Lead for NOAA proposal submissions to EPA Great Lakes Research Initiative (GLRI) (2018-present)
- Member International Joint Commission (US-Canada) Working Group on Great Lakes Offshore Productivity (2017-2020)
- Member Great Lakes Fish Commission “Lake Michigan Lower Food Web Taskforce” (2015-2020)
- Guest Editor of Journal of Great Lakes Research Special Issue “*Complex Interactions in Lake Michigan’s Rapidly Changing Ecosystem*” published December 2015

Recent Service to CIGLR

- Co-mentor with Reagan and Errera and James Hood of CIGLR 2022 Summer Fellow Emilia Lepe “Pigment-specific identification of phytoplankton in Lake Erie” (used external funds to cover)
- Co-mentor with Reagan Errera and Cody Sheik of CIGLR 2022 Summer Fellow Maya Casey project “Exploring the buoyancy potential of Microcystis using metagenomic data” (used external funds to cover fellowship)
- Council of Fellows
- GLERL Technical Contact on several CIGLR proposals providing funding (several \$M) for CIGLR PIs, research assistants and CIGLR Partners—from programs I developed (EPA, NOAA) (see proposal funding for details)
- Co-mentor with Timothy James and Rao Chaganti of Katelyn McKindles’ 2022 CIGLR Post-doctoral Fellowship “Flow of Cyanotoxins Through the Food Web Mediated by Chytrid Fungi Infections”
- Faculty co-Advisor (2020-21) for SEAS Master’s Thesis Project (Sierra Rae Green, Carol W. Rosenbaum, Kathy Sun, Xinjie Wu, Emily Dusicska), “Assessing nutrient management strategies to control harmful algal blooms in Lake Erie.”
- 2019 CIGLR Graduate Research Fellowship Proposal co-mentor with James Hood (OSU) of Lyndsie Collis project “Evaluating the role of zooplankton in internal nutrient cycling dynamics in western Lake Erie.”

- Co-organizer of Winter Limnology on the Great Lakes – Prospects and Research Needs May 13-15, 2019
- Faculty co-advisor to SNRE Master’s Project (Devin Gill, Tonghui Ming, & Wanqi Ouyang), “Improving the Lake Erie HAB Tracker: A Forecasting & Decision Support Tool for Harmful Algal Blooms (2017).”

Recent Proposal Funding as Lead PI (all relevant to CIGLR-UM)

- EPA Coordinated Science and Monitoring Initiative Lake Michigan 2015 (\$250K)
- EPA Coordinated Science and Monitoring Initiative Lake Huron 2012 (\$323K)
Decision support tools to link P reductions to harmful algal blooms and source water protection 2017 version (EPA GLRI: \$1,427,000 with \$849,382 to CIGLR)
- Decision support tools... 2018 version (\$1,569,909 with \$1,123,711 to CIGLR)
- Decision support tools...2019 version (\$1,427,000 with \$875,994 to CIGLR)
- Decision support tools...2020 version (\$1,958,522 with \$1,200,000 to CIGLR)
- Decision support tools...2021 version (\$1,800,000 with \$1,017,048 to CIGLR)
- Decision support tools...2022 version (\$2,000,000 with ~\$1,100,000 to CIGLR)
- Enhancements to decision support tools to link nutrient reductions to harmful algal blooms and source water protection 2022 (\$1,950,113 with TBD to CIGLR)
- Decision support tools... is in GLRI proposed funding through at least 2024
- 2019-2021 Omics Umbrella Project with subprojects: Linking genes to microbial traits key to the rise and demise of cyanobacterial harmful algal blooms; Development of a surface plasmon resonance sensor chip for detection of toxic *Microcystis* blooms; and Targeted ‘Omics Research to Distinguish Toxin-Producing from Non-Toxin Producing Cyanobacterial Blooms (NOAA OAR Omics Program \$700,000 each year with \$600,000 to CIGLR each year)
- NOAA Support CSMI of Lake Erie 2019 with subprojects on: Priorities to Address the Changing Food Web; In-Lake Priorities to Address Eutrophication- HABs; and In-Lake Priorities to Address Eutrophication- Hypoxia (EPA CSMI: \$500,000 with \$230,00 to CIGLR).
- Role of Dreissenid mussels in Transforming Nutrient Loads into Harmful Algal Blooms 2017 (EPA GLRI: \$491,676 with \$227,000 to CIGLR)
- Spatial coupling of nutrients and food web—from phytoplankton to fish— in Saginaw Bay, Lake Huron, 2017 (EPA CSMI: \$267,300 with \$153,200 to CIGLR)
- 2018 Omics project with subprojects on eDNA, mussel-HAB interactions, and 3G AUV (NOAA OAR Omics Program: \$1,264,643 with \$1,033,643 to CIGLR)

Recent Proposal Funding as Co-PI (relevant to CIGLR)

- NOAA ‘Omics Great Lakes Projects for FY22-23 on *Microcystis* Strains and Traits project and eDNA food web project with Reagan Errera (GLERL) and Vincent Deneff (UM), Gregory Dick (UM), and Rao Chaganti (CIGLR) (\$296,000)

Postdoc/Visiting Scientist Mentoring

Nathaniel Marshall (CIGLR Postdoc 2019-2021), Marie H. Bundy, Miguel Dionisio Pires, Radka Ptáčnicková, Huijuan Tang, Mark D. Rowe

Master's Thesis Co-Chair SNRE

Megan A. Agy 2001. Changes in the nearshore and offshore zooplankton communities of southeastern Lake Michigan

Publications (**yellow-highlighted** indicate SEAS staff, students, or partners)

1. Dahal, N., Glyshaw, P., **Carter, G.**, Vanderploeg, H.A. and Denef, V.J. 2022. Impacts of an invasive filter-feeder on bacterial biodiversity are context dependent. *FEMS Microbiology Ecology* 99(1), 1-10.
2. **Green S.R., Rosenbaum, C.W., Hughes, S., Wu, X., Dusicska, E., Sun, K., Chaganti, S.R., Godwin, C., Fraker, M., Vanderploeg, H.A.** 2023. Nutrient management in Lake Erie: Evaluating stakeholder values, attitudes, and policy preferences. *J. Great Lks Res.* (in press).
3. **Marshall, N.T.**, Vanderploeg, H.A. and **Chaganti, S.R.** 2022. Improving Environmental DNA Sensitivity for Dreissenid Mussels by Targeting Tandem Repeat Regions of the Mitochondrial Genome. *Water* 14(13).
4. Pothoven, S.A. and Vanderploeg, H.A. 2022. Variable changes in zooplankton phenology associated with the disappearance of the spring phytoplankton bloom in Lake Michigan. *Freshw. Biol.* 67(2), 365-377.
5. Pothoven, S.A. and Vanderploeg, H.A. 2022. Factors affecting rotifer assemblages along a nearshore to offshore transect in southeastern Lake Michigan. *J. Great Lakes Res.* 48(5), 1230-1238.
6. **DEN UYL, P.A.**, S.B. Harrison, **C.M. GODWIN**, M.D. ROWE, J.R. Strickler, and **H.A. VANDERPLOEG**. Comparative analysis of Microcystis buoyancy in western Lake Erie and Saginaw Bay of Lake Huron. *Harmful Algae* 108(DOI:10.1016/j.hal.2021.102102) (2021).
7. Bunnell, D.B., Ludsin, S.A., Knight, R.L., Rudstam, L.G., Williamson, C.E., Hook, T.O., Collingsworth, P.D., Lesht, B.M., Barbiero, R.P., Scofield, A.E., Rutherford, E.S., Gaynor, L., **Vanderploeg, H.A.** and Koops, M.A. 2021. Consequences of changing water clarity on the fish and fisheries of the Laurentian Great Lakes. *Can. J. Fish. Aquat. Sci.* 78(10), 1524-1542.
8. **Dick, G.J.**, R.M. ERRERA, **C.M. GODWIN**, **H.A. VANDERPLOEG**, V.J Denef and et al. The genetic and ecophysiological diversity of Microcystis. *Environmental Microbiology* (DOI:10.1111/1462-2920.15615) (2021).
9. Ozersky, T., A.K. ELGIN, **H.A. VANDERPLOEG**, J. WANG, **A.F. MANOME**, M.D. ROWE, and e. al. The Changing Face of Winter: Lessons and Questions from the Laurentian Great Lakes. *Journal of Geophysical Research: Biogeosciences* 126(6)(DOI:10.1029/2021JG006247) (2021).
10. **Marshall, N.T.**, **H.A. Vanderploeg**, **S.R. Chaganti.** 2021. Environmental (e)RNA advances the reliability of eDNA by predicting its age. *Scientific Reports* 11: 2769. DOI10.1038/s41598-021-82205-4

11. Stone, J.P., Kevin L. Pangle, Steven A. Pothoven, **Henry A. Vanderploeg**, Stephen B. Brandt, Tomas O. Höök, Thomas H. Johengen, and Stuart A. Ludsin. Hypoxia's impact on pelagic fish populations in Lake Erie: a tale of two planktivores. *Canadian Journal Fisheries and Aquatic Sciences* **77**: 1131-1148.
12. Pothoven, S.A. **Vanderploeg, H.A.** 2020. Seasonal patterns for Secchi depth, chlorophyll a, total phosphorus, and nutrient limitation differ between nearshore and offshore in Lake Michigan. *Journal of Great Lakes Research* **46**:519–527.
13. Marino, J. A., **H. A. Vanderploeg**, S. A. Pothoven, A. K. Elgin, and S. D. Peacor. 2020. Long-term survey data reveal large predator and temperature effects on population growth of multiple zooplankton species. *Limnology and Oceanography* **65**:694-706.
14. Marino, J.A., Jr., Peacor, S.D. Bunnell, D.B., **Vanderploeg, H.A.**, Pothoven, S.A., Elgin, A.K., Bence, J.R., Jiao, J., Ionides, E.L. 2019. Evaluating consumptive and nonconsumptive predator effects on prey density using field time-series data. *Ecology* **100** (3): e02583
15. Pothoven, S.A., **Vanderploeg, H.A.** 2019. Variable demographics and consumption requirements of *Bythotrephes longimanus* (Crustacea, Cercopagididae) along a nearshore to offshore gradient in Lake Michigan. *Hydrobiologia* **830**: 63-75.
16. Kharbush, J.J., D.J. Smith, M. Powers, **H.A. VANDERPLOEG**, D.L. FANSLAW, R.S. ROBINSON, G.J. Dick, and A. Pearson. Chlorophyll nitrogen isotope values track shifts between cyanobacteria and eukaryotic algae in a natural phytoplankton community in Lake Erie. *Organic Geochemistry* **128**:71-77 (DOI:10.1016/j.orggeochem.2018.12.006) (2019)
17. Goto, D., J.J. Roberts, S.A. POTHOVEN, S.A. Ludsin, **H.A. VANDERPLOEG**, S.B. Brandt, and T.O. Höök. Size-mediated control of perch–midge coupling in Lake Erie transient dead zones. *Environmental Biology of Fishes* (DOI:10.1007/s10641-017-0667-1) (2017)
18. Props, R., M.L. Schmidt, J. Heyse, **H.A. VANDERPLOEG**, N. Boon, and V.J. Deneff. Flow cytometric monitoring of bacterioplankton phenotypic diversity predicts high population-specific feeding rates by invasive dreissenid mussels. *Environmental Microbiology* (DOI:10.1111/1462-2920.13953) (2017)
19. **ROWE, M.D.**, E.J. ANDERSON, **H.A. VANDERPLOEG**, S.A. POTHOVEN, A.K. ELGIN, J. WANG, and F. Yousef. Influence of invasive quagga mussels, phosphorus loads, and climate on spatial and temporal patterns of productivity in Lake Michigan: A biophysical modeling study. *Limnology and Oceanography* **62**(6):2626-2649
20. **Deneff, V.J.**, H.J. Carrick, J.F. CAVALETTO, E. Chiang, **T.H. JOHENGEN**, and **H.A. VANDERPLOEG**. Lake Bacterial Assemblage Composition Is Sensitive to Biological Disturbance Caused by an Invasive Filter Feeder. *mSphere* **2**(3)(DOI:10.1128/mSphere.00189-17) (2017)
21. Luo, L., J. WANG, T.S. HUNTER, D. Wang, and **H.A. VANDERPLOEG**. Modeling spring-summer phytoplankton bloom in Lake Michigan with and without riverine nutrient loading. *Ocean Dynamics*:1-14 (DOI:10.1007/s1023) (2017)
22. Nowicki, C.J., D.B. Bunnell, P.M. Armenia, D.M. Warner, **H.A. VANDERPLOEG**, J.F. CAVALETTO, C.M. Mayer, and J.V. Adams. Biotic and abiotic factors influencing

- zooplankton vertical distribution in Lake Huron. *Journal of Great Lakes Research* 43(6):1044-1054 (DOI:10.1016/j.jglr.2017.08.004) (2017).
23. POTHOVEN, S.A., and H.A. VANDERPLOEG. Changes in Mysis diluviana abundance and life history patterns following a shift toward oligotrophy in Lake Michigan. *Fundamental and Applied Limnology* 190(3):199-212 (DOI:10.1127/fal/2017/1039) (2017)
24. Vanderploeg, H.A., O. Sarnelle, J.R. Liebig, N.R. Morehead, Sander D. Robinson, T. H. Johengen, G. P. Horst. Seston nutrient stoichiometry drives feeding, tissue nutrient stoichiometry, and excretion in zebra mussels. *Freshwater Biology* 62: 664-280. (2017)
25. Fujimoto, M., J.F. CAVALETTO, J.R. LIEBIG, A. McCarthy, H.A. VANDERPLOEG, and V.J. Deneff. Spatiotemporal distribution of bacterioplankton functional groups along a freshwater estuary to pelagic gradient in Lake Michigan. *Journal of Great Lakes Research* 42(5):1036-1048. (2016).
26. Deneff V.J., Mueller R.S., Chiang E., Liebig J.R. & Vanderploeg H.A. (2015) Chloroflexi CL500-11 Populations That Predominate Deep-Lake Hypolimnion Bacterioplankton Rely on Nitrogen-Rich Dissolved Organic Matter Metabolism and C1 Compound Oxidation. *Applied and Environmental Microbiology*, **82**, 1423-1432.
27. POTHOVEN, S.A., G.L. Fahnenstiel, H.A. VANDERPLOEG, and T.F. NALEPA. Changes in water quality variables at a mid-depth site after proliferation of dreissenid mussels in southeastern Lake Michigan. *Fundamental and Applied Limnology* 188(3):233-244 (DOI:10.1127/fal/2016/0883) (2016).
28. ROWE, M.D., E.J. ANDERSON, T.T. Wynne, R.P. Stumpf, D.L. FANSLAW, K. Kijanka, H.A. VANDERPLOEG, J.R. Strickler, and T.W. DAVIS. Vertical distribution of buoyant Microcystis blooms in a Lagrangian particle tracking model for short-term forecasts in Lake Erie. *Journal of Geophysical Research* 121(7):5296-5314 (DOI:10.1002/2016JC011720) (2016).
29. Carrick, H.J., E. Butts, D. Daniels, M. Fehringer, C. Frazier, G.L. Fahnenstiel, S.A. Pothoven, and H.A. Vanderploeg. Variation in the abundance of pico, nano, and microplankton in Lake Michigan: Historic and basin-wide comparisons. *Journal of Great Lakes Research* 41(Supplement 3):66-74. (DOI:10.1016/j.jglr.2015.09.009) (2015).
30. Madenjian, C.P., D.B. Bunnell, D.M. Warner, S.A. Pothoven, G.L. Fahnenstiel, T.F. Nalepa, H.A. Vanderploeg, I. Tsehaye, R.M. Claramunt, and R.D. Clark. Changes in the Lake Michigan food web following dreissenid mussel invasions: A synthesis. *Journal of Great Lakes Research* 41(Supplement 3):217-231. (DOI:10.1016/j.jglr.2015.08.009) (2015).
31. Ptáčniková, R., H.A. Vanderploeg, and J.F. Cavaletto. Big versus small: Does *Bythotrephes longimanus* predation regulate spatial distribution of another invasive predatory cladoceran, *Cercopagis pengoi*? *Journal of Great Lakes Research* 41(Supplement 3): 143-149. (DOI:10.1016/j.jglr.2015.10.006) (2015).
32. Vanderploeg, H.A., D.B. Bunnell, H.J. Carrick, and T.O. Hook. Complex interactions in Lake Michigan's rapidly changing ecosystem. *Journal of Great Lakes Research* 41 (Supplement 3): 1-6. (DOI:10.1016/j.jglr.2015.11.001) (2015).
33. Vanderploeg, H.A., S.A. Pothoven, D.M. Krueger, D.M. Mason, J.R. Liebig, J.F. Cavaletto, S.A. Ruberg, G.A. Lang, and R. Ptacnikova. Spatial and predatory

- interactions of visually preying nonindigenous zooplankton and fish in Lake Michigan during midsummer. *Journal of Great Lakes Research* 41(Supplement 3):125-142. (DOI:10.1016/j.jglr.2015.10.005) (2015).
34. Bai, X., J. Wang, J. Austin, D.J. Schwab, R.A. Assel, A.H. Clites, J.F. Bratton, M.C. Colton, J. Lenters, B.M. Lofgren, T. Wohlleben, S. Helfrich, **H.A. Vanderploeg**, L. Luo, and G.A. Leshkevich. A record-breaking low ice cover over the Great Lakes during winter 2011/2012: Combined effects of a strong positive NAO and La Nina. *Climate Dynamics* 44(5-6):1187-1213 (DOI:10.1007/s00382-014-2225-2) (2015).
35. Bootsma, H.A., **M.D. Rowe**, C.N. Brooks, and **H.A. Vanderploeg**. Commentary: The need for model development related to *Cladophora* and nutrient management in Lake Michigan. *Journal of Great Lakes Research* 41 (Supplement 3):7-15. (DOI:10.1016/j.jglr.2015.03.023) (2015).
36. **Rowe, M.D.**, E.J. Anderson, J. Wang, and **H.A. Vanderploeg**. Modeling the effect of invasive quagga mussels on the spring phytoplankton bloom in Lake Michigan. *Journal of Great Lakes Research* 41 (Supplement 3): 49-65 . (DOI:10.1016/j.jglr.2014.12.018) (2015).
37. **Rowe, M.D.**, D.R. Obenour, T.F. Nalepa, **H.A. Vanderploeg**, F. Yousef, and W.C. Kerfoot. Mapping the spatial distribution of the biomass and filter-feeding effect of invasive dreissenid mussels on the winter-spring phytoplankton bloom in Lake Michigan. *Freshwater Biology* 60: 2270-2285. (DOI:10.1111/fwb.12653) (2015).
38. **Bai, X.**, J. Wang, J. Austin, D.J. Schwab, R.A. Assel, A.H. Clites, J.F. Bratton, M.C. Colton, J. Lenters, B.M. Lofgren, T. Wohlleben, S. Helfrich, **H.A. Vanderploeg**, L. Luo, and G.A. Leshkevich. A record-breaking low ice cover over the Great Lakes during winter 2011/2012: Combined effects of a strong positive NAO and La Nina. *Climate Dynamics*: 27 pp. (DOI:10.1007/s00382-014-2225-2) (2014).
39. Lavrentyev, P.J., **H.A. Vanderploeg**, G. Franze, D.H. Chacin, J.R. Liebig, and **T.H. Johengen**. Microzooplankton distribution, dynamics, and trophic interactions relative to phytoplankton and quagga mussels in Saginaw Bay, Lake Huron. *Journal of Great Lakes Research* 40(Supplement 1):95-105 (DOI:10.1016/j.jglr.2013.11.012) (2014).
40. TANG, H., **H.A. VANDERPLOEG**, **T.H. JOHENG**, and J.R. LIEBIG. Quagga mussel (*Dreissena rostriformis bugensis*) selective feeding of phytoplankton in Saginaw Bay. *Journal of Great Lakes Research* 40 (Supplement 1):83-94 pp. (DOI:10.1016/j.jglr.2013.11.011) (2014).
41. **Alderstein, S.A.**, T.F. Nalepa, **H.A. Vanderploeg**, and G.L. Fahnenstiel. Trends in phytoplankton, zooplankton, and macroinvertebrates in Saginaw Bay relative to zebra mussel (*Dreissena polymorpha*) colonization: A generalized linear model approach. In *Quagga and Zebra Mussels: Biology, Impacts, and Control*, Second Edition. T.F. Nalepa, and D.W. Schlosser (Eds.). CRC Press, Boca Raton, FL, 525-543 pp. (2013).
42. **Johengen, T.H.**, **H.A. Vanderploeg**, and J.R. Liebig. Effects of algal composition, seston stoichiometry, and feeding rate on zebra mussel (*Dreissena polymorpha*) nutrient excretion in two Laurentian Great Lakes. In *Quagga and Zebra Mussels: Biology, Impacts, and Control*, Second Edition. T.F. Nalepa, and D.W. Schlosser (Eds.). CRC Press, Boca Raton, FL, 445-459 pp. (2013).
43. **VANDERPLOEG, H.A.**, and J.R. Strickler. Video Clip 6: Behavior of zebra mussels exposed to *Microcystis* colonies from natural seston and laboratory cultures.

- In *Quagga and Zebra Mussels: Biology, Impacts, and Control*, Second Edition. T.F. Nalepa, and D.W. Schlosser (Eds.). CRC Press, Boca Raton, FL, 757-758 pp. (2013).
44. VANDERPLOEG, H.A., A.E. Wilson, T.H. JOHNGEN, J. DYBLE BESSIE, O. Sarnelle, J.R. LIEBIG, S.D. ROBINSON, and G.P. Horst. Role of selective grazing by dreissenid mussels in promoting toxic *Microcystis* blooms and other changes in phytoplankton composition in the Great Lakes. In *Quagga and Zebra Mussels: Biology, Impacts, and Control*, Second Edition. T.F. Nalepa, and D.W. Schlosser (Eds.). CRC Press, Boca Raton, FL, 509-523 pp. (2013).
 45. LUO, L., J. WANG, D.J. SCHWAB, H.A. VANDERPLOEG, G.A. LESHKEVICH, X. BAI, H. HU, and D. Wang. Simulating the 1998 spring bloom in Lake Michigan using a coupled physical-biological model. *Journal of Geophysical Research* 117(C10011):14 pp. (DOI:10.1029/2012JC008216) (2012).
 46. POTHOVEN, S.A., H.A. VANDERPLOEG, T.O. Hook, and S.A. Ludsin. Hypoxia modifies planktivore-zooplankton interactions in Lake Erie. *Canadian Journal of Fisheries and Aquatic Sciences* 69:2018-2028 (DOI:10.1139/cjfas-2012-0144) (2012).
 47. BELETSKY, D., N. HAWLEY, Y.R. Rao, H.A. VANDERPLOEG, R. BELETSKY, D.J. SCHWAB, and S.A. RUBERG. Summer thermal structure and anticyclonic circulation of Lake Erie. *Geophysical Research Letters* 39:L06605 (DOI:10.1029/2012GL051002) (2012).
 48. Goto, D., K. Lindelof, D.L. FANSLow, S.A. Ludsin, S.A. POTHOVEN, J.J. Roberts, H.A. VANDERPLOEG, A.E. Wilson, and T.O. Hook. Indirect consequence of hypolimnetic hypoxia on zooplankton growth in a large eutrophic lake. *Aquatic Biology* 16:217-227 (DOI:10.3354/ab00442) (2012).
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