

GENEVIÈVE M. NESSLAGE

Chesapeake Biological Laboratory
University of Maryland Center for Environmental Science
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EDUCATION

Ph.D. 2005 – Michigan State University

Dual degree: Fisheries & Wildlife; Ecology, Evolutionary Biology & Behavior

M.S. 2000 – State University of New York College of Environmental Science and Forestry, Syracuse

Degree: Wildlife Biology and Management

B.S. 1997 – Cornell University

Degree: Biology

Hughes Undergraduate Research Fellow

EXPERIENCE

2016 – Present: **Assistant Research Professor**, Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, Solomons, MD.

- Conduct research in fisheries stock assessment, fish and wildlife population dynamics and modeling, invasive species, and quantitative ecology. Current projects address harvest policy analysis and development of ecosystem-based fisheries management tools for Atlantic menhaden, environmental drivers of golden tilefish dynamics, sampling and survey programs for Atlantic menhaden, and impacts of mycobacteriosis on Atlantic striped bass.

2015 – 2016: **Visiting Research Assistant Professor**, Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science, Solomons, MD.

- Conducted research on blue crab dynamics and invasive species population dynamics.

2007 – 2014: **Senior Stock Assessment Scientist**, Atlantic States Marine Fisheries Commission, Arlington, VA.

- Conducted and coordinated fisheries stock assessments for American lobster, Atlantic menhaden, American eel, and black sea bass. Served as lead assessment scientist for 2009 American lobster benchmark assessments for the Gulf of Maine and Southern New England stock units.
- Conducted and coordinated multispecies (menhaden, striped bass, bluefish, weakfish, and small coastal sharks) stock assessments to support ecosystem-based fisheries management.
- Taught stock assessment training short courses and coordinated professional development workshops on quantitative fisheries topics for state and federal biologists.
- Participated in and coordinated peer reviews of stock assessments, survey design and implementation, and collaborative research.

2005 – 2006: **Assistant Professor of Vertebrate Ecology**, Department of Biology, Clarion University, Clarion, PA.

- Developed and taught undergraduate and graduate courses in wildlife management and conservation, ecology, zoology, general biology, and biogeography.
- Curated the Clarion University Vertebrate Collections.

Summer 2006: **Instructor**, Michigan State University Study Abroad Program, East Lansing, MI.

- Co-instructed a study abroad undergraduate course on Tropical Ecology and Management in San Salvador, Bahamas.

Spring 2004 & Fall 2001: **Instructor**, Department of Fisheries and Wildlife, Michigan State University, East Lansing, MI.

- Developed and instructed lab section of a graduate course in Applied Multivariate Statistical Methods.
- Instructed an undergraduate non-majors course on Natural History and Conservation in Michigan.

PUBLICATIONS

Papers in refereed journals

- Nesslage, G., R. Leaf, M. Wilberg, R. Mroch III, and A. Schueller. 2020. A simulation-based evaluation of commercial port sampling programs for the Gulf and Atlantic Menhaden fisheries. *North American Journal of Fisheries Management* 40(4), 995-1006.
- Midway, S., A. Schueller, G. Nesslage, and R. Mroch III. 2020. Macroscale drivers of Atlantic and Gulf Menhaden growth. *Fisheries Oceanography* 29: 252– 264. <https://doi.org/10.1111/fog.12468>.
- Liang, D., G. Nesslage, and M. Wilberg, 2020. A spatial simulation approach to hydroacoustic survey design: A case study for Atlantic menhaden. *Fisheries Research* 222, 105402. <https://doi.org/10.1016/j.fishres.2019.105402>.
- Liang, D., G. Nesslage, M. Wilberg, and T. Miller. *In press*. Ranking ecosystem impacts on Chesapeake Bay blue crab (*Callinectes sapidus*) using empirical Gaussian Graphical Models. *Canadian Journal of Fisheries and Aquatic Sciences*
- Weber, M., L. Wainger, N. Harms, and G. Nesslage. *In press*. The Economic Value of Research in Managing Invasive Hydrilla in Florida Public Lakes. *Lake and Reservoir Management*
- Nesslage, G., and M. Wilberg. 2019. A performance evaluation of surplus production models with time-varying intrinsic growth in dynamic ecosystems. *Canadian Journal of Fisheries and Aquatic Sciences*. DOI: 10.1139/cjfas-2018-0292.
- Stratton, M. A., G. M. Nesslage, and R. L. Latour. 2019. Multi-decadal climate and fishing predictors of abundance for U.S. South Atlantic coastal fishes and invertebrates. *Fisheries Oceanography* 28: 487-504. DOI: 10.1111/fog.12426.
- Schueller, A. M., R. T. Leaf, R. M. Mroch III, and G. M. Nesslage. 2018. Response to Turner 2017 “Smaller size-at-age menhaden with coastal warming and fishing intensity”. *Geo: Geography and the Environment*. 2018;e00048. <https://doi.org/10.1002/geo2.48>.
- Wainger, L., N. Harms, C. Magen, D. Liang, G. Nesslage, A. McMurray, and A. Cofrancesco. 2018. Evidence-based economic analysis demonstrates that ecosystem service benefits of water hyacinth management greatly exceed research and control costs. *PeerJ* 6:e4824; DOI 10.7717/peerj.4824.
- Liang, D., G. Nesslage, M. Wilberg, and T. Miller. 2017. Bayesian calibration of blue crab (*Callinectes sapidus*) abundance indices based on probability surveys". *Journal of Agricultural, Biological, and Environmental Statistics*. DOI: 10.1007/s13253-017-0295-4.
- Simpson, C., H. Bi, D. Liang, M. J. Wilberg, A. Schueller, G. Nesslage, and H. J. Walsh. 2017. Spawning locations and larval dispersal of Atlantic menhaden during 1977-2013. *ICES Journal of Marine Science*. DOI:10.1093/icesjms/fsx030.
- Nesslage, G., L. Wainger, N. Harms, and A. Cofrancesco. 2016. Quantifying the population response of invasive water hyacinth, *Eichhornia crassipes*, to biological control and winter weather in Louisiana, USA. *Biological Invasions* 18(7): 2107-2115.

- Simpson, C., M. J. Wilberg, H. Bi, A. Schueller, G. Nessler, and H. J. Walsh. 2016. Trends in relative abundance and early life survival of Atlantic menhaden during 1977-2013 from long-term ichthyoplankton programs. *Transactions of the American Fisheries Society* 145:1139-1151.
- Nessler, G. M., and M. J. Wilberg. 2012. Performance of surplus production models with time-varying parameters for assessing multispecies assemblages. *North American Journal of Fisheries Management* 32:1137-1145.
- Nessler, G. M., B. A. Maurer, and S. H. Gage. 2007. Gypsy moth response to landscape structure differs from neutral model predictions: implications for invasion monitoring. *Biological Invasions* 9(5): 585-595.
- Nessler, G. M., M. J. Wilberg, and S. J. Riley. 2006. Rates and spatial patterns of decline in historical cougar and wolf populations in Montana. *Intermountain Journal of Sciences* 12(3-4): 63-76.
- Riley, S. J., G. M. Nessler, and B. A. Maurer. 2004. Dynamics of early wolf and cougar eradication efforts in Montana: implications for conservation. *Biological Conservation* 119(4): 575-579.
- Nessler, G. M., and W. F. Porter. 2001. A geostatistical analysis of deer harvest in the Adirondack Park, 1954-1997. *Wildlife Society Bulletin* 29(3): 787-794.

Book chapters

- Nessler, G. and D. Pauly. *Submitted*. Estuarine fisheries and aquaculture. In *Estuarine Ecology*, 3rd edition. (B. Crump, J. Testa, K. Dunton, Eds.). Wiley.

Stock assessment reports (authored or co-authored and edited)

- Nessler, G. SouthEast Data, Assessment, and Review. 2016. Stock assessment of golden tilefish off the Southeastern United States – update assessment. SEDAR, North Charleston, SC.
- Atlantic States Marine Fisheries Commission. 2015. American lobster stock assessment report for peer review. Arlington, VA. 493pp.
- SouthEast Data, Assessment, and Review (SEDAR). 2015. SEDAR 40 – Atlantic Menhaden Stock Assessment Report. SEDAR, North Charleston SC. 643 pp.
- Atlantic States Marine Fisheries Commission. 2014. Multispecies Virtual Population Analysis Update Report. Arlington, VA. 68pp.
- Atlantic States Marine Fisheries Commission. 2012. Atlantic menhaden stock assessment update. Arlington, VA. 232 pp
- Atlantic States Marine Fisheries Commission. 2012. Update of the Multispecies Virtual Population Analysis. Arlington, VA. 39 pp.
- Atlantic States Marine Fisheries Commission. 2012. American eel stock assessment report for peer review. Stock Assessment Report No. 12-01. Arlington, VA. 259 pp.
- Atlantic States Marine Fisheries Commission. 2010. Atlantic menhaden stock assessment report for peer review. Stock Assessment Report No. 10-02. Washington, DC. 325 pp.
- Atlantic States Marine Fisheries Commission. 2009. American lobster stock assessment report for peer review. Stock Assessment Report No. 09-01. Washington, DC. 298pp.
- Atlantic States Marine Fisheries Commission. 2008. Update of the Multispecies Virtual Population Analysis. Washington, DC. 54 pp.
- SouthEast Data, Assessment, and Review (SEDAR). 2007. SEDAR 13 – Small coastal shark stock assessment report. North Charleston, SC. 395 pp.

CONTRACTS AND GRANTS

- Nessler, G., J. Gartland, R. Latour, D. Liang, C. Gurshin, M. Jech, R. Mroch, J. Brust, S. Axelsson, and W. Reichle. Enhancing sustainable development of the winter bait fishery for Atlantic menhaden through the use of industry acoustics. FY20 Saltonstall-Kennedy. 2020-2021. PI, \$297k.

- Nesslage, G., R. Leaf, A. Schueller. Evaluating the impact of plus group definition on the Atlantic and Gulf Menhaden stock assessments. National Science Foundation Science Center for Marine Fisheries I/UCRC. 2020-2021. PI, \$42k.
- Nesslage, G. M. Wilberg, K. Drew, A. Schueller. Evaluating consequences of alternative harvest policies for Atlantic menhaden and the impacts on their predator Atlantic striped bass. Maryland Sea Grant. 2020-2022. PI, \$129k.
- Nesslage, G. Effect of sample size on diagnosis of error in paired age comparisons. NOAA Southeast Fisheries Science Center. 2019-2020. PI, \$29k.
- Nesslage, G. and V. Lyubchich. Evaluating the effect of environmental factors on golden tilefish catch per unit effort and assessment accuracy. NOAA Fisheries And The Environment. 2018-2020. PI, \$90k.
- Nesslage, G. and R. Leaf. 2017. Evaluation of sampling adequacy for Atlantic menhaden fisheries. National Science Foundation Science Center for Marine Fisheries I/UCRC. PI, \$25k
- Nesslage, G. and D. Liang. 2017. Design of a cooperative winter pelagic survey for Atlantic menhaden in the Mid-Atlantic. National Science Foundation Science Center for Marine Fisheries I/UCRC. PI, \$37k
- Nesslage, G. 2016-2017. An evaluation of imperiled marine fish stocks and the stock assessment process in North Carolina. NC Sound Economy. PI, \$55k
- Nesslage, G., M. Wilberg. 2016-2017. An evaluation of commercial fishing operations within and adjacent to Assateague Island National Seashore. National Park Service. PI, \$25k
- Nesslage, G., M. Wilberg. 2016-2018. Development of a Bayesian approach for estimating ecosystem-based reference points for Atlantic menhaden. Maryland Sea Grant. PI, \$86k
- Nesslage, G., and T. Miller. 2015-2016. Support for updating stock assessments in the Southeastern US. NOAA Southeast Fisheries Science Center. PI, \$45k
- Bi, H., M. Wilberg, A. Schueller, G. Nesslage, H. Walsh. 2013. Estimating early mortality and implications for reference points for the Atlantic menhaden stock. NOAA Fisheries And The Environment. \$142k
- Caldwell, M. E. and G. Nesslage. 2008. Migration of the American Lobster stock assessment database interface from Business Objects to Oracle APEX. Atlantic Coastal Cooperative Statistics Program. PI, \$74k

PRESENTATIONS

Contributed papers

- Nesslage, G, V. Lyubchich, P. Nitschke, E. Williams, C. Grimes. 2019. Identifying Environmental Drivers of Golden Tilefish Dynamics in the Northwest Atlantic. AFS Annual Meeting, Reno, NV.
- Jesse, J. G. Nesslage, M. Matsche, H. Townsend, J. Jacobs. 2019. Drivers of Mycobacteriosis in Atlantic Striped bass (*Morone saxatilis*) in Maryland waters of the Chesapeake Bay. AFS Annual Meeting, Reno, NV.
- Nesslage, G. and M. Wilberg. 2017. Evaluating the performance of production models with time-varying parameters for assessing small pelagic fish in dynamic ecosystems. ICES/PICES International Symposium on Drivers of Small Pelagic Fish Resources. Victoria, BC, Canada.
- Nesslage, G. and M. Wilberg. 2016. Evaluating the performance of production models with time-varying parameters in changing ecosystems. World Fisheries Congress, Busan, Korea.
- Wainger, L., C. Magen, A. McMurray, G. Nesslage, D. Liang, N. Harms, A. Cofrancesco. 2016. Lessons learned from valuing ecosystem service benefits of invasive plant control. National Conference on Ecosystem Restoration. Coral Springs, FL.
- Simpson, C., M. Wilberg, H. Bi, A. Schueller, G. Nesslage, H. Walsh. 2015. Mysterious early lives of Atlantic menhaden. Tidewater AFS Annual Meeting, Pine Knoll Shores, NC.

- Lee, L., G. Nesslerage, J. Brust, B. Chase, J. Clark, J. Sweka, K. Whiteford. 2014. Stock assessment of Atlantic Coast American eel. AFS Annual Meeting, Québec City, QC.
- Simpson, C., M. Wilberg, G. Nesslerage, A. Schueller, H. Bi, and H. Walsh. 2014. Estimating Atlantic menhaden larval abundance along the Atlantic Coast of the United States. AFS Annual Meeting, Québec City, QC.
- Simpson, C., M. Wilberg, A. Schueller, G. Nesslerage, H. Walsh, H. Bi. 2014. Ichthyoplankton-based index of abundance for Atlantic menhaden (*Brevoortia tyrannus*). Tidewater AFS Annual Meeting, Newport News, VA.
- Nesslerage, G., J. Brust., L. Lee, J. Sweka. 2012. Trend analyses and depletion-based stock reduction analysis of American eel on the Atlantic Coast of the United States. World Fisheries Congress, Edinburgh, UK.
- Howell, P., K. McKown, and G. Nesslerage. 2012. All about M: the 2009 Southern New England lobster stock assessment story. The American Lobster in a Changing Ecosystem: A US-Canada Science Symposium, Portland, ME.
- Nesslerage, G. and M. Wilberg. 2011. Performance of surplus production models with time-varying parameters for multispecies complexes. AFS Annual Meeting, Seattle, WA.
- Nesslerage, G. and M. Wilberg, L. Jacobson, Y. Chen. 2010. Implications of maximum bin size selection in statistical length-structured stock assessment models. AFS Annual Meeting, Pittsburgh, PA.
- Nesslerage, G. and M. Wilberg. 2009. Implications of modeling multispecies complexes using single species assessment models. AFS Annual Meeting, Nashville, TN.
- Nesslerage, G. M. and M. Wilberg, C. R. Bronte, and M. J. Hansen. 2007. Estimation of early century lake trout abundance for developing restoration targets. AFS Annual Meeting, San Francisco, CA.
- Nesslerage, G., B. Maurer, S. Gage. 2006. Patterns of semivariance generated by simple and stratified dispersal models predict distinct invasion stages. Ecological Society of America Annual Meeting, Memphis, TN.
- Maurer, B., G. Nesslerage, S. Gage. 2006. Semivariance analysis of spatial patterns of abundance during range expansion: case studies of the house finch and gypsy moth invasions. Ecological Society of America Annual Meeting, Memphis, TN.
- Nesslerage, G., S. Riley, and B. Maurer. 2003. Patterns of range collapse in two large carnivores: response of cougars and wolves to historic overexploitation in Montana. The Wildlife Society 10th Annual Conference, Burlington, VT.
- Nesslerage, G., B. Maurer, M. Taper, J. Skillen, and K. Kahl. 2001. Modeling the population-level mechanics of species range stability. Ecological Society of America Annual Meeting, Madison, WI.

Invited seminars

- Nesslerage, G. 2017. Quantifying population dynamics in light of ecosystem change: case studies of Atlantic menhaden and water hyacinth. UMCES HPL, Cambridge, MD.
- Nesslerage, G. 2017. Quantifying Atlantic menhaden population dynamics in light of ecosystem change. Long-Term Marine Ecosystem Research International Symposium, Busan, South Korea.
- Nesslerage, G. 2017. Quantifying population dynamics in light of ecosystem change: case studies of Atlantic menhaden and water hyacinth. UMCES IMET, Baltimore, MD.
- Nesslerage, G., D. Liang, M. Wilberg, V. Lyubchich, T. Miller. 2015. Analysis of blue crab survey data and reproductive output to assess causes of population variability. Chesapeake Bay Stock Assessment Committee Meeting. Solomons, MD.
- Nesslerage, G. 2012. A comparison of regional lobster population dynamics from New Jersey to Maine. University of New Hampshire Department of Biological Sciences Seminar Series, Durham, NH.
- Nesslerage, G. 2008. Use of recreational fishing catch and effort estimates in stock assessment. National Marine Fisheries Service Constituent Data Review Workshop. Alexandria, VA.

Nesslage, G. 2006. Historic trends in cougar and wolf bounty harvests in Montana. Slippery Rock University Biology Department Seminar Series, Slippery Rock, PA.

PROFESSIONAL SERVICE

Federal

- Chair, South Atlantic Fishery Management Council Scientific and Statistical Committee, 2020-2022. Member, 2016 – present.
- Chair, Member of the NOAA Marine Mammal Atlantic Scientific Review Group, 2019-2021. Member, 2018 – present.

UMCES Chesapeake Biological Laboratory

- 2016-Present. Faculty Advisor for the Chesapeake Biological Laboratory Chapter of the American Association of University Women
- 2017 Fall Distinguished Seminar Series Co-coordinator
- 2017 Maryland Sea Grant REU selection committee
- 2017 Open House Planning Committee
- 2017 Science for Citizens presenter
- 2017-2018 Junior Faculty Retreat Planning Committee
- 2018 Maryland Sea Grant REU selection committee
- 2018 Participated in institutional diversity subcommittee for the UMCES Strategic Plan
- 2018-Present. Ad hoc committee on diversity enhancement at CBL
- 2018-Present. CBL Graduate Education Committee
- 2019-Present. CBL Science Infrastructure Committee
- 2019-2010. CBL Faculty Search Committee

Clarion University of Pennsylvania

- Chair, Institutional Animal Care and Use Committee (College of Arts and Sciences)
- University representative to the Regional Science Consortium at the Tom Ridge Environmental Center, Presque Isle State Park
- New Science Center Fundraising Committee (College of Arts and Sciences)
- Graduate Committee (Department of Biology)
- Convocation Planning Committee

Michigan State University College of Agriculture & Natural Resources

- College Curriculum Committee

TEACHING

University of Maryland Center for Environmental Science

- Fisheries Science and Management MEES 682 – graduate course (3 credits).
- Scaling Fisheries: an early history of fisheries science MEES 608T – graduate seminar (1 credit).

Michigan State University

- Natural History and Conservation in Michigan – undergrad non-majors course.
- Tropical Ecology and Management – undergrad study abroad course.
- Applied Multivariate Statistical Methods Lab –lab section of graduate course.

Clarion University

- Seminar in Biogeography – graduate course.
- Wildlife Ecology & Management – senior undergrad and graduate course.
- General Zoology – upper level undergraduate course for Biology majors.
- Principles of Ecology – undergraduate course for Biology majors.
- Principles of Biology Lab, General Coordinator of 8 sections and Instructor – undergraduate course for Biology majors.

Stock assessment workshops taught

- Co-instructed “Introduction to stock assessment for fisheries scientists”. 2012. ASMFC Stock Assessment Training Program taught as both an in-person and a distance-learning course produced using Camtasia and distributed on DVD.
- Co-instructed “Introduction to stock assessment for fisheries managers”. 2011. ASMFC Commissioner stock assessment training workshop.
- Instructed “Length-based stock assessment models”. 2009. ASMFC Commissioner stock assessment training workshop.
- Co-instructed “An introduction to stock assessment” for ASMFC and South Atlantic Fisheries Management Council staff. 2008.
- Instructed “An introduction to forward and backward projection stock assessment models”. 2007. ASMFC Commissioner stock assessment training workshop.

Guest lectures

- Chesapeake Bay Health (University of Maryland MEES 6981), 2016-2018
- Applications of GIS to Natural Resources Management, MSU, 2005
- Quantitative Methods in Ecology, MSU, 2004
- Ecology, MSU, 2004
- Biogeography, MSU, 2003
- Wildlife Habitats and Populations, SUNY-ESF, 1999

COURSE DEVELOPMENT AND MANAGEMENT SOFTWARE

- Moodle, Blackboard, and ANGEL Course Management Systems
- PBWorks Wiki Online Team Collaboration software
- Camtasia screen recording and editing software (for production of distance-learning courses)
- Audacity audio file recording and editing software
- Webinar-based instruction using GoToMeeting

REVIEWER ACTIVITIES

Peer review workshop panelist

- Northwest Fisheries Science Center Stock Assessment Program Review, June, 2014.
- Stock Assessment for Gulf of Mexico Blue Crab. Gulf Data, Assessment, and Review (GDAR) 01. June 2013. Gulf States Marine Fisheries Commission Report #215.

Stock assessment reviews

- Stock assessment of southern flounder in the North Carolina waters. Peer review report to NCDEQ Division of Marine Fisheries. November, 2014.
- Stock assessment of Atlantic striped bass stocks in the Neuse and Tar/Pamlico Rivers of North

Carolina. Peer review report to NCDEQ Division of Marine Fisheries. August, 2010.

Journals and book chapter reviews

Biological Invasions, British Ecological Society, Canadian Journal of Fisheries and Aquatic Sciences, Ecology Letters, Ecological Applications, Endangered Species Research, Evolutionary Ecology Research, Fisheries Research, Journal of Biogeography, Journal of Wildlife Management, North American Journal of Fisheries Management, Transactions of the American Fisheries Society

Research proposal reviews

- NASA Research Opportunities in Space and Earth Science (ROSES)
- National Marine Fisheries Service Marine Fisheries Initiative (MARFIN)
- NOAA Fisheries And The Environment (FATE) Research Grant Program
- NOAA Saltonstall-Kennedy Grant Program
- Maine Sea Grant Program
- North Carolina Sea Grant Program

PROFESSIONAL SOCIETY MEMBERSHIPS

- American Fisheries Society
- The Wildlife Society

PROFESSIONAL DEVELOPMENT

- Recruiting Citizens to Conduct Science & Monitoring. 2016. North Carolina Coastal Training Program workshop.
- Maximum likelihood estimation for natural resources and ecology. 2007. Michigan State University Quantitative Fisheries Center online course.
- Integrating technology in the classroom. 2006. Learning and Technology Center, Clarion University.
- Energizing the large classroom. 2006. Partners in Teaching, Learning, and Assessment, Clarion University.