James N. McNair

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Last updated: 25 August 2023

Current Position

Associate Professor, Robert B. Annis Water Resources Institute, Grand Valley State University.

Education

1979: Ph.D. Biology (Ecology and Theoretical Biology), University of Pennsylvania.

1974: B.S. Biology, Davidson College.

Educational Honors and Fellowships

1978–1979: N.I.H. Trainee in Theoretical Biology, University of Pennsylvania

1976–1978: University Fellow, University of Pennsylvania

1974: Graduated *cum laude* and Phi Beta Kappa from Davidson College.

Professional Experience, last 20 years

2009 to present: Associate Professor, Annis Water Resources Institute, Grand Valley State University.

2000–2009: Adjunct Professor of Biology, Department of Biology, University of Pennsylvania.

1991–2009: Senior Scientist and Head, Ecological Modeling Section, Patrick Center for Environmental Research, Academy of Natural Sciences of Philadelphia.

Current Professional Service

Academic Editor, *PLOS ONE*

Research Areas

My main research interests at the present time are developing and analyzing stochastic models of disturbance effects on patch dynamics and succession in ecological communities, mechanistic models of stream metabolism, statistical methods for estimating components of stream metabolism based on free-water dissolved-oxygen dynamics, statistical methods for environmental studies involving quantitative PCR data (qPCR, ddPCR), stochastic models and statistical methods in stream fisheries management, modern statistical methods for environmental studies involving censored time-to-event data or censored concentration data, and empirical and nonparametric statistical methods for studies of invasive plants.

Peer-Reviewed Publications (*: graduate student, **: undergraduate student)

Hart*, J.J., Jamison*, M.N., Porter, A.M., McNair, J.N., Szlag, D.C., Rediske, R.R. 2023. Fecal impairment framework, a new conceptual framework for assessing fecal contamination in recreational waters. *Environmental Management* (in press).

Hart*, J.J., Jamison*, M.N., McNair, J.N., Szlag, D.C. 2023. Frequency and degradation of SARS-CoV-2 markers N1, N2, and E in sewage. *Journal of Water and Health* 21(4): 514–524. DOI: 10.2166/wh.2023.314.

Hart*, J.J., Jamison*, M.N., McNair, J.N., Woznicki, S.A., Jordan, B., Rediske, R.R. 2023. Using watershed characteristics to enhance fecal source identification. *Journal of Environmental Management* 336: 117642. https://doi.org/10.1016/j.jenvman.2023.117642.

McNair, J.N., Lane, M.J., Hart*, J.J., Porter, A.M., Briggs, S., Southwell, B., Sivy, T., Szlag, D.C., Scull, B.T., Pike, S., Dreeling, E., Vernier, C., Carter, B., Sharp, J., Nowlin, P., Rediske, R.R. 2022. Validity assessment of Michigan's proposed qPCR threshold value for rapid water-quality monitoring of *E. coli* contamination. *Water Research* 226: 119235. https://doi.org/10.1016/j.watres.2022.119235

DeNicola, D., McNair, J. N., and Suh, J. 2021. A stochastic model of epilithic algal succession and patch dynamics in streams. *Ecosphere* 12(7):e03566.10.1002/ecs2.3566

Myers*, D.T., Rediske, R.R., McNair, J.N., Parker, A.D., and Ogilvie, E.W. 2021. Relating environmental variables with aquatic community structure in an agricultural/urban coldwater stream. *Ecological Processes* 10:37. https://doi.org/10.1186/s13717-021-00312-6

Mock*, A. J., Ruetz, C. R., McNair, J. N., Mays, D., and Martell, A. 2020. Evaluating remote site incubators in Michigan streams: implications for Arctic Grayling reintroduction. *North American Journal of Fisheries Management.* https://doi.org/10.1002/nafm.10534

Lane*, M. J., Rediske, R. R., McNair, J. N., Briggs, S., Rhodes, G., Dreelin, E., Sivy, T., Flood, M., Scull, B., Szlag, D., Southwell, B., Isaacs, N. M., and Pike, S. 2020. A comparison of *E. coli* concentration estimates quantified by the U.S. EPA and a Michigan laboratory network using U.S. EPA Draft Method C. *Journal of Microbiological Methods*. https://doi.org/10.1016/j.mimet.2020.106086

Myers*, D. T., Rediske, R. R., McNair, J. N., and Allen, M. E. 2020. Watershed and streambank erosion modeling in a coldwater stream using the GWLF-E model: application and evaluation. *Modeling Earth Systems and Environment.* https://doi.org/10.1007/s40808-020-00882-y

Rice*, E. K., Leimbach-Maus*, H., Partridge, C., and McNair, J. N. 2020. Assessment of invasive *Gypsophila paniculata* control methods in the northwest Michigan dunes. *Invasive Plant Science and Management* 13: 94–101. https://doi.org/10.1017/inp.2020.10

Lane*, M. J., McNair, J. N., Rediske, R. R., Briggs, S., Sivaganesan, M., and Haugland, R. 2020. Simplified analysis of measurement data from a rapid *E. coli* qPCR method (EPA Draft Method C) using a standardized Excel workbook. *Water* 2020, 12, 775; https://doi.org/10.3390/w12030775

Rice*, E. K., Martínez-Oquendo**, P., and McNair, J. N. 2019. Phenology of seed maturation in *Gypsophila paniculata* in northwest Michigan, USA, and its relation to glyphosate efficacy. *Invasive Plant Science and Management* 12: 194–201. https://doi.org/10.1017/inp.2019.21

Myers*, D. T., Rediske, R. R., and McNair, J. N. 2019. Measuring streambank erosion: a comparison of erosion pins, total station, and terrestrial laser scanner. *Water* 11(9). https://doi.org/10.3390/w11091846

McNair, J. N., Ruetz III, C. R., Carlson*, A., and Suh, J. 2018. Reducing effects of dispersal on the bias of 2-sample mark-recapture estimators of stream fish abundance. *PLOS ONE* 13(8): e0200733. https://doi.org/10.1371/journal.pone.0200733

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Taylor*, L. L., McNair, J. N., Guastello*, P., Pashnick*, J., and Thum, R. A. 2017. Heritable variation for vegetative growth rate in ten distinct genotypes of hybrid watermilfoil. *Journal of Aquatic Plant Management* **55**: 51–57.

Thum, R. A., Parks*, S. R., McNair, J. N., Tyning, P., Hausler, P., Chadderton, L., Tucker, A., and Monfils, A. 2017. Survival and vegetative regrowth of Eurasian and hybrid watermilfoil following operational treatment with auxinic herbicides in Gun Lake, Michigan, USA. *Journal of Aquatic Plant Management* **55**: 103-107.

Parks*, S. R., McNair, J. N., Hausler, P., Tyning, P., and Thum, R. A. 2016. Divergent responses of cryptic invasive watermilfoil to treatment with auxinic herbicides in a large Michigan lake. *Lake and Reservoir Management* **32**: 366–372.

McNair, J.N., Sesselmann*, M.R., Gereaux*, L.C., Weinke**, A.D., Kendall, S.T., and Biddanda, B.A. 2015. Alternative approaches for estimating components of lake metabolism using the free-water dissolved-oxygen (FWDO) method. *Fundamental and Applied Limnology* **186**: 21–44.

Ruetz III, C. R., Harris**, B. S., McNair, J. N., and Homola*, J. J. 2015. Removal and mark-recapture methods for estimating abundance: empirical and simulation results for Mottled Sculpin in streams. *North American Journal of Fisheries Management* **35**: 62–74.

McNair, J.N., Gereaux*, L.C., Weinke**, A.D., Sesselmann*, M.R., Kendall, S.T., and Biddanda, B.A. 2013. New methods for estimating components of lake metabolism based on free-water dissolved-oxygen dynamics. *Ecological Modelling* **263**: 251–263.

Sisson*, A.J., Wampler, P.J., Rediske, R.R., McNair, J.N., and Frobish, D. 2013. Long-term field performance of the Biosand Filter in the Artibonite Valley, Haiti. *American Journal of Tropical Medicine and Hygiene* **88**: 862–867.

Homola*, J.J., Scribner, K.T., Elliott, R.F., Donofrio, M.C., Kanefsky, J., Smith, K.M., and McNair, J.N. 2012. Genetically-derived estimates of contemporary natural straying rates and historical gene flow among Lake Michigan lake sturgeon populations. *Transactions of the American Fisheries Society* **141**: 1374–1388. (Winner of the 2013 Stevan Phelps Memorial Award from the Genetics Section of the American Fisheries Society as the best genetics paper of the year.)

McNair, J.N. and Newbold, J.D. 2012. Turbulent particle transport in streams: Can exponential settling be reconciled with fluid mechanics? *Journal of Theoretical Biology* **300**: 62–80.

McNair, J.N., Sunkara*, A., and Frobish, D. 2012. How to analyze seed germination data using statistical time-to-event analysis: nonparametric and semiparametric methods. *Seed Science Research* **22**: 77–95.

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McNair, J.N., Boraas, M.E., and Seale, D.B. 1998. Size-structure dynamics of the rotifer chemostat: a simple physiologically structured model. *Hydrobiologia* **387/388**:469–476.

Boraas, M.E., Seale, D.B., Boxhorn*, J.E., and McNair, J.N. 1998. Rotifer size distribution changes during transient phases in open cultures. *Hydrobiologia* **387/388**:477–482.

McNair, J.N., Newbold, J.D., and Hart, D.D. 1997. Turbulent transport of suspended particles and dispersing benthic organisms: how long to hit bottom? *Journal of Theoretical Biology* **188**:29–52.

McNair, J.N. 1995. Ontogenetic patterns of density-dependent mortality: contrasting stability effects in populations with adult dominance. *Journal of Theoretical Biology* **175**:207–230.

McNair, J.N., Goulden, C.E., and Ziegenfuss, M.C. 1995. Is there a place for ecotoxicology? *Setac News* **15**:18–21.

McNair, J.N. and Goulden, C.E. 1991. The dynamics of age-structured populations with a gestation period: density-independent growth and egg ratio methods for estimating the birth rate. *Theoretical Population Biology* **39**:1–29.

McNair, J.N. 1989. Stability effects of a juvenile period in age-structured populations. *Journal of Theoretical Biology* **137**:397–422.

McNair, J.N. 1987. Stability effects of prey refuges with entry-exit dynamics. *Journal of Theoretical Biology* **125**:449–464.

McNair, J.N. 1987. The effect of variability on the optimal size of a feeding territory. *American Zoologist* **27**:249–258.

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McNair, J.N. 1983. A class of patch-use strategies. *American Zoologist* **23**:303–313.

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Technical Reports

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McNair, J.N. and Thompson, K. 2009. WAM model evaluation/future development. Prepared for the South Florida Water Management District. Annis Water Resources Institute, Grand Valley State University. 24 pages.

McNair, J.N. and Horwitz, R.J. 2009. PCB concentrations in fishes from the Housatonic River, Connecticut, 1984-2008, and benthic insects, 1978-2008. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 93 pages.

McNair, J.N. 2008. Development and use of an improved tool to maximize the environmental benefits of stream restoration and protection activities in the Schuylkill River watershed. Prepared for U.S. EPA Region 3. Academy of Natural Sciences of Philadelphia. 77 pages.

McNair, J.N. 2007. Development and use of an improved tool to maximize the environmental benefits of stream restoration and protection activities in the Schuylkill River watershed. Prepared for U.S. EPA Region 3. Academy of Natural Sciences of Philadelphia. 104 pages.

McNair, J.N. 2007. Development of a watershed management tool to predict and maximize the benefits of riparian restoration projects. Prepared for the Pennsylvania Department of Environmental Protection. Academy of Natural Sciences of Philadelphia. 84 pages.

McNair, J.N. and Horwitz, R.J. 2007. PCB concentrations in fishes from the Housatonic River, Connecticut, 1984-2006, and benthic insects, 1978-2006. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 86 pages.

Bouchard, R., Acker, R., Depew, M., Horwitz, R.J., McNair, J.N., and Velinsky, D. 2006. 2005 Sabine River studies for the Texas Eastman Division, Eastman Chemical Company. Prepared for the Texas Eastman Division, Eastman Chemical Company. Academy of Natural Sciences of Philadelphia. 151 pages.

McNair, J.N. 2005. Enhancing the effectiveness of vegetation restoration and maintenance activities in Philadelphia's Fairmount Park system. Prepared for the William Penn Foundation. Academy of Natural Sciences of Philadelphia. 56 pages.

McNair, J.N. 2005. An assessment of selected management practices for invasive Japanese knotweed and Norway maple in Philadelphia's Fairmount Park System. Prepared for the Fairmount Park Commission. Academy of Natural Sciences of Philadelphia. 50 pages.

McNair, J.N. 2005. A Review of the Normandeau Report on Potential Short-term Biological Impacts of a Fly Ash Spill at the PPL Martins Creek, LLC Power Plant. Prepared for PPL Martins Creek LLC. Academy of Natural Sciences of Philadelphia.

McNair, J.N. 2005. An overview of the 2003 biological studies of the Guadalupe River. Prepared for INVISTA S.a.r.l. Academy of Natural Sciences of Philadelphia. 22 pages.

McNair, J.N. and Horwitz, R.J. 2005. PCB concentrations in fishes from the Housatonic River, Connecticut, 1984-2004, and benthic insects, 1978-2005. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 89 pages.

Bouchard, R., Charles, D., Horwitz, R.J., Marshall, B., McNair, J.N. and Velinsky, D. 2005. Biological and Chemical Studies of the Guadalupe River, 2003. Prepared for INVISTA S.a.r.l. Academy of Natural Sciences of Philadelphia. 151 pages.

McNair, J.N., Johnson, T. and Srivastava, P. 2004. A watershed-level assessment to guide restoration planning and maximize the benefits of riparian restoration. Prepared for Pennsylvania Department of Environmental Protection. Academy of Natural Sciences of Philadelphia. 60 pages.

Brown, R., Hart, D.D. and McNair, J.N. 2004. A Risk Assessment Framework for Determining the Potential Ecological Effects of Dam Removal. Prepared for Pennsylvania Department of Environmental Protection. Academy of Natural Sciences of Philadelphia. 105 pages.

McNair, J.N. and Horwitz, R.J. 2003. PCB concentrations in fishes from the Housatonic River, Connecticut, 1984-2002, and benthic insects, 1978-2002. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 48 pages.

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McNair, J.N., Kiry, P., Jackson, J., Bouchard, R. and Horwitz, R.J. 1992. 1991 Studies on the White River: Interim report. Arkansas Eastman Division of the Eastman Chemical Company. Academy of Natural Sciences of Philadelphia. 12 pages.

McNair, J.N. 1992. Data report on results of 48-h *Daphnia magna* bioassay of methyl anthranilate toxicity, for Monell Chemical Senses Center. Academy of Natural Sciences of Philadelphia. 38 pages.

Bouchard, R., Acker, F., Grant, R., Hermanson, M., Horwitz, R.J., Isquith, M. and McNair, J.N. 1992. Preliminary report of Savannah River water quality surveys for Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 8 pages.

McNair, J.N. and Brennan, D. 1991. Metals studies on the Guadalupe River, 1989. Prepared for E.I. du Pont de Nemours & Company. Academy of Natural Sciences of Philadelphia. 50 pages.

McNair, J.N. 1991. Status and trends of toxic pollutants in the Delaware Estuary. Prepared for the Delaware Estuary Program and U.S. EPA. Academy of Natural Sciences of Philadelphia. 177 pages.

McNair, J.N. 1991. Results of the model search and selection process for the Niagara River and Lake Ontario. Prepared for BCM Engineers, Inc. and Occidental Chemical Co. Academy of Natural Sciences of Philadelphia. 7 pages.

Horwitz, R.J. and McNair, J.N. 1991. PCB concentrations in fishes from the Housatonic River, Connecticut in 1984-1990. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 132 pages.

McNair, J.N. and Goulden, C.E. 1990. Chronic bioassay tests of prechlorination effluent for the City of Philadelphia's Southeast water pollution control plant: Second monthly test. Prepared for the City of Philadelphia. Academy of Natural Sciences of Philadelphia. 9 pages.

McNair, J.N. and Goulden, C.E. 1990. Chronic bioassay tests of prechlorination effluent for the City of Philadelphia's Southeast water pollution control plant: First monthly test. Prepared for the City of Philadelphia. Academy of Natural Sciences of Philadelphia. 9 pages.

McNair, J.N. and Goulden, C.E. 1989. Divinylbenzene bioassay conducted for the City of Philadelphia Water Department. Academy of Natural Sciences of Philadelphia. 15 pages.

Horwitz, R.J., McNair, J.N. and Ford, E. 1989. A literature review of methanol in aquatic ecosystems and a conceptual proposal for modeling studies. Prepared for the Sun Oil Company. Academy of Natural Sciences of Philadelphia. 22 pages.

Seminars and Presentations (*: graduate student, **: undergraduate student)

Hart*, J., Jamison*, M., Porter, A., McNair, J., Szlag, D., Rediske, R. 2023. Fecal impairment framework, a new screening tool for assessing fecal contamination in recreational waters. Oral presentation at the 62nd Annual MLSA Conference, May 2023, Thompsonville, MI. Presenter: Hart.

McNair, J.N. 2022. Validity assessment of Michigan's proposed qPCR threshold value for monitoring *E. coli* contamination. Oral presentation at the 2022 Great Lakes Beach Conference, 1 November 2022, Muskegon, Michigan. Presenter: McNair.

McNair, J.N. and Zuidema*, J.R. 2022. Estimating habitat-specific metabolic rates in streams with marked longitudinal habitat variation. Oral presentation at the 2022 Joint Aquatic Sciences Meeting, Grand Rapids, Michigan, 20 May 2022. Presenter: McNair.

McNair, J.N., Lane, M.J., and Rediske, R.R. 2021. A decision-theoretic framework for assessing the relationship between culture-based and qPCR-based recreational water-quality criteria for fecal indicator bacteria. Oral presentation at the 2021 Annual Meeting, American Water Resources Association, 6 November 2021, presented virtually via Zoom. Presenter: McNair.

McNair, J.N. and Thum, R.A. 2020. Some useful sampling and statistical methods for assessing potential abundance changes in aquatic plant surveys. Oral presentation (virtual) at the 2020 Annual Michigan Inland Lakes Convention, 18 September 2020. Presenter: McNair.

Neuman*, E., Woznicki, S.A., Karol, K.G., McNair, J.N., and Hamsher, S.E. 2020. Predictive modeling assessment of suitable habitats for Starry Stonewort (*Nitellopsis obtusa*). Poster presentation (virtual), 2020 Upper Midwest Invasive Species Conference, 6 November 2020. Presenter: Neuman.

Neuman*, E., Karol, K.G., Woznicki, S.A., McNair, J.N., Hamsher, S.E. 2020. Preliminary results − Star Wars: Phenology of the aquatic invasive species starry stonewort (*Nitellopsis obtusa*; Charaeae) in two Michigan drowned river-mouth lakes. Oral presentation (virtual) at the 2020 Michigan Space Grant Consortium Conference, 17 October 2020. Presenter: Neuman.

Yap**, C., Ruetz III, C., McNair, J.N. 2020. A new computer program to evaluate biases in the two-sample mark-recapture abundance estimator. Poster presentation (virtual) at the 2020 Annual Meeting, Michigan Chapter of the American Fisheries Society, Mt. Pleasant, Michigan, 12 March 2020. Presenter: Yap.

McNair, J.N. 2019. Estimating components of stream metabolism by the free-water dissolved-oxygen method: Where did the oxygen come from? Oral presentation at the 2019 Annual Meeting, American Water Resources Association, Salt Lake City, Utah, 6 November 2019. Presenter: McNair.

McNair, J.N. and Zuidema*, J.R. 2018. Comparison of alternative estimators of stream metabolism derived within a common modeling framework. Oral presentation at the 2018 Annual Meeting,

American Water Resources Association, Baltimore, Maryland, 8 November 2018. Presenter: McNair.

Rice*, E.K. and McNair, J.N. 2018. Assessment of baby's breath (*Gypsophila paniculata*) removal in the northwest Michigan dunes. Oral presentation at the 2018 Annual Meeting, Ecological Society of America, New Orleans, Louisiana, 9 August 2018. Presenter: Rice.

Rice*, E.K. and McNair, J.N. 2018. Assessment of baby's breath (*Gypsophila paniculata*) removal in the northwest Michigan dunes . Oral presentation at the Society for Ecological Restoration Midwest-Great Lakes Chapter Meeting, Stevens Point, Wisconsin, 20 April 2018. Presenter: Rice.

DeNicola, D., McNair, J.N., and Suh, J. 2018. A stochastic model of epilithic algal succession and patch dynamics in streams. Oral presentation at the 2018 Annual Meeting, Society for Freshwater Science, Detroit, Michigan, 23 May 2018. Presenter: DeNicola.

McNair, J.N. and Thompson, K.J. 2017. Using high-resolution terrestrial lidar to measure stream bank erosion/deposition. Oral presentation at the Annual Meeting, American Water Resources Association, Portland, Oregon, 9 November 2017. Presenter: McNair.

Rice*, E.K. and McNair, J.N. 2017. Phenology of seed maturation and the effect of glyphosate on Gypsophila paniculata (baby's breath) seed maturation. Poster presentation at the Society for Ecological Restoration Midwest-Great Lakes Chapter Meeting, Grand Rapids, Michigan, 24 March 2017. Presenter: Rice.

Rice*, E.K. and McNair, J.N. 2017. Phenology of seed maturation in invasive baby's breath (*Gypsophila paniculata*) and its importance for restoring coastal sand dune communities in Michigan. Poster presentation at the Annual Meeting, Ecological Society of America, Portland, Oregon, 7 August 2017. Presenter: Rice.

Feng, Y., Wijesinghe, R.U., and McNair, J.N. 2017. Survival of *Bacteroidales* in stream water and sediment. The third International Conference on Water Resource and Environment. 26–29 June 2017. Qingdao, China. Presenter: Feng.

McNair, J.N., Thum, R. A., and Parks, S. R. 2016. Modeling lake invasions by cryptic watermilfoil taxa and their eco-evolutionary responses to management. Oral presentation at the Annual Meeting, Society for Freshwater Science, Sacramento, California, 25 May 2016. Presenter: McNair.

McNair, J.N. 2016. REU-QUEST: An NSF-funded summer research experience for undergraduates at the Annis Water Resources Institute. Oral presentation to the Biology Department of the University of Missouri at St. Louis, 15 Mar 2016.

McNair, J.N. 2016. Reducing effects of dispersal on the bias of 2-sample mark-recapture abundance estimators. Oral presentation at the Midwest Fish & Wildlife Conference, Grand Rapids, Michigan, 27 Jan 2016.

Cahill, B.C., Monfils, A.K., Monfils, M.J., Chadderton, W.L., Tucker, A.J., Tyning, P., Hausler, P., Thum, R., and McNair, J.N. 2016. Carolina Fanwort (*Cabomba caroliniana*): Research efforts towards an integrated management plan. Presented September 2016 at the 2016 Upper Midwest Invasive Species Conference. Presenter: Cahill.

Parks, S., Thum, R.A., and McNair, J.N. 2016. Adaptive plant management strategies as a means to improve invasive plant control. Presented 8 March 2016 at the Midwest Aquatic Plant Management Society Conference, Grand Rapids, Michigan. Presenter: Parks.

Thum, R.A., S. Parks, J.N. McNair, P.J. Tyning, P.J. Hausler, Paul, A.K. Monfils, H.E. Dame, W.L. Chadderton and A.J. Tucker. 2016. Monitoring sources of regrowth of Eurasian watermilfoil following auxinic herbicide treatment in Gun Lake, Michigan. Presented 8 March 2016 at the Midwest Aquatic Plant Management Society Conference, Grand Rapids, Michigan. Presenter: Thum.

Parks, S., Thum, R.A., and McNair, J.N. 2016. How adopting an adaptive plant management framework can improve invasive plant management. Presented 11 March 2016 at the Indiana Lakes Management Society Conference, Plymouth, Indiana. Presenter: Parks.

Parks, S., R.A. Thum, and J.N. McNair. 2016. Response of pure versus hybrid Eurasian watermilfoil under operational management with auxinic herbicides and implications for adaptive management program planning. Presented 8 March 2016 at the 36th Annual Meeting of the Midwest Aquatic Plant Management Society, Grand Rapids, Michigan.

McNair, J.N. 2015. A general framework for deriving alternative estimators of GPP, R, and NP in streams by the free-water dissolved-oxygen method. Oral presentation at the Stroud Water Research Center, Avondale, Pennsylvania, 15 December 2015.

McNair, J.N. 2015. REU-QUEST: An NSF-funded summer research experience for undergraduates at the Annis Water Resources Institute. Oral presentation to the Biology Department of the University of Missouri at St. Louis, 29 Apr 2015.

McNair, J.N. 2015. Biostatistics applications at GVSU's Annis Water Resources Institute. Oral presentation to the Department of Statistics, Grand Valley State University, 26 Mar 201.

McNair, J.N., Thum, R.A., Parks*, S., and Schulte*, L. 2014. Modeling the spread of invasive Eurasian watermilfoil in northern lakes of the United States: Contemporary evolution, environment, and management. Oral presentation at the Joint Aquatic Sciences Meeting, Portland, Oregon, 23 May 2014. Presenter: McNair.

Thum, R.A., Grimm**, D., and McNair, J.N. 2014. Hybridization and rapid evolution of invasiveness in a heavily managed invasive aquatic plant species. Oral presentation at the Joint Aquatic Sciences Meeting, Portland, Oregon, 20 May 2014. Presenter: Thum.

McPherson*, M.R. and McNair, J.N. 2014. Estimating lake metabolism using the free water method and a 1-d hydrodynamic model. Oral presentation at the Joint Aquatic Sciences Meeting in Portland, Oregon, 22 May 2014. Presenter: McPherson.

Ruetz, C.R., Janetski, D.J., Woods**, J.L., Waller**, J.C., and McNair, J.N. 2014. Drift settling rates of benthic macroinertebrates: evaluating turbulent transport dynamics of particles in streams. Oral presentation at the Joint Aquatic Sciences Meeting, Portland, Oregon, 23 May 2014. Presenter: Ruetz.

McNair, J.N., Sesselmann*, M.R., Gereaux*, L.C., Weinke**, A.D., Kendall, S.T., and Biddanda, B.A. 2014. New approaches for estimating components of lake metabolism by the free-water dissolved-oxygen method. Oral presentation at the NOAA Muskegon Lake Summit, 28 April 2014. Presenter: McNair.

McNair, J. N., Biddanda, B., and Rediske, R. 2014. Stoichiometry and aquatic food web models. Oral presentation at the NOAA Muskegon Lake Summit, 28 April 2014. Presenter: McNair.

McNair, J.N., Gereaux*, L.C., Weinke**, A.D., Sesselmann*, M.R., Kendall, S., and Biddanda, B.B. 2013. Alternative methods for estimating components of lake metabolism using process-based models of dissolved-oxygen dynamics. Oral presentation at the 2nd Bioinformatics and Computational Biology Symposium, GVSU, Allendale, Michigan, 12 September 2013. Presenter: McNair.

McNair, J.N., Gereaux*, L.C., Weinke**, A.D., Sesselmann*, M.R., Kendall, S.T., and Biddanda, B.A. 2013. Alternative methods for estimating components of lake metabolism using process-based models of dissolved-oxygen dynamics. Oral presentation at the Annual Meeting, Society for Freshwater Science, Jacksonville, Florida, 22 May 2013. Presenter: McNair.

Snyder, E., McNair, J., Morrison**, N., and Krause**, M. 2013. FPOM transport modeling: Surface and mid-depth injection using corn pollen as an analog. Poster presentation at the Annual Meeting, Society for Freshwater Science, Jacksonville, Florida, 22 May 2013.

Ruetz, C., Harris**, B., McNair, J., and Homola*, J. 2013. Mark-recapture and removal methods for estimating sculpin abundance in streams. Oral presentation at the Annual Meeting, Society for Freshwater Science, Jacksonville, Florida, 22 May 2013. Presenter: Ruetz

McNair, J.N., Gereaux*, L.C., Weinke**, A.D., Sesselmann*, M.R., Kendall, S.T., and Biddanda, B.A. 2013. Using quasi-mechanistic statistical models and high-frequency sensor data to estimate components of lake metabolism. Oral presentation at the Annual Meeting, Association for the Study of Oceanography and Limnology, New Orleans, Louisiana, 20 February 2013. Presenter: McNair.

McNair, J. N., Ruetz, C. R. III, and Harris**, B. S. 2012. How much bias does migration cause in 2-sample mark-recapture estimators of stream fish abundance? Seminar presented at the 2012 Annual Meeting of the American Water Resources Association, Jacksonville, Florida, 12 November 2011. Presenter: McNair.

McNair, J. N. 2012. Turbulent transport of ecologically important particles in streams. Seminar presented at the Bioinformatics and Computational Biology Symposium, held on the Allendale campus, 26 October 2012.

Harris**, B. S., Ruetz, C. R. III, Homola*, J. J., and McNair, J. N. 2012. Evaluating removal and mark-recapture methods for estimating abundance of a small, non-game fish. Oral presentation at the American Fisheries Society Meeting in St. Paul, Minnesota, August 2012. Presenter: Harrison.

Homola*, J. J., Scribner, K. T., Elliott, R. F., Donofrio, M. C., Kanefsky, J., Smith, K. M., and McNair, J. N. 2012. Genetically-derived estimates of contemporary natural straying rates and historical gene flow among Lake Michigan lake sturgeon populations. Oral presentation at the American Fisheries Society Meeting in St. Paul, Minnesota, August 2012. Presenter: Homola.

McNair, J. N. and Rediske, R. R. 2012. An overview of pharmaceuticals in the environment. Oral presentation to a physician continuing-education conference held at Mercy Health Partners' Hackley Campus, Muskegon, Michigan, 9 May 2012. Presenter: McNair.

McNair, J. N. 2012. Transport of biological particles in streams: do particles really settle exponentially, and why does it matter? Oral presentation at AWRI's Ecolunch internal seminar series, 3 Feb 2012.

McNair, J. N. 2011. Transport of biological particles in streams: do particles really settle exponentially, and should they? Seminar presented at the 2011 Annual Meeting of the American Water Resources Association, Albuquerque, New Mexico, 10 November 2011.

McNair, J. N. 2011. How should seed germination data be analyzed? An interdepartmental collaborative research project at GVSU. Seminar presented to the GVSU College of Liberal Arts and Sciences Faculty Research Colloquium, 17 Feb 2011.

McNair, J. N. 2010. Including reaction stoichiometry in aquatic food web and ecosystem models. Seminar presented at Stroud Water Research Center, Avondale, Pennsylvania, 5 November 2010.

McNair, J. N. 2010. A review of empirical studies of particle transport in streams: is fluid mechanics important, and shouldn't we be able to tell? Seminar presented to the GVSU College of Liberal Arts and Sciences Faculty Research Colloquium, 15 Oct 2010.

McNair, J. N. 2010. Applying the Local Exchange Model to stream seston and benthic macroinvertebrate data. Seminar presented at the 2010 Summer Meeting of the American Society of Limnology and Oceanography, Santa Fe, New Mexico, 12 Jun 2010.

McNair, J. N. 2010. The Local Exchange Model of turbulent particle transport in streams. Seminar presented to the GVSU College of Liberal Arts and Sciences Faculty Research Colloquium, 21 Jan 2010.

Horwitz, R. J., Mead, J., Raus, A., Babcock-Stiner, J., McNair, J. N., and Velinsky, D. 2009. Comprehensive watershed management planning in Chautauqua Lake (New York, USA). Oral presentation at the 13th World Lake Conference, Wuhan, China, 3 November 2009. Presenter: Horwitz.

McNair, J. N. 2009. Transport processes as a unifying conceptual framework in science and engineering. Seminar presented to faculty and students in GVSU's NSF Summer Mathematics REU (Research Experience for Undergraduates) Site Program.

McNair, J.N. 2009. Transport processes as a unifying conceptual framework in basic and applied ecology. Presented to the GVSU Biology Department, April, 2009.

McNair, J. N. 2008. Transport processes as a unifying conceptual framework in basic and applied ecology. Invited seminar presented to the Annis Water Resources Institute, Grand Valley State University, 6 October 2008.

McNair, J. N. 2007. Strategic land protection and restoration to maximize stream ecological integrity: development and implementation of a GIS-based decision-support tool. Invited seminar presented to the Department of Marine and Ecological Sciences, Florida Gulf Coast University, 12 June 2007.

McNair, J. N. 2007. Strategic land protection and restoration to maximize stream ecological integrity: development and implementation of a GIS-based decision-support tool. Invited seminar presented to U.S. EPA Region 3, 5 June 2007.

McNair, J. N. 2007. The Local Exchange Model of turbulent particle transport in streams. Invited seminar presented to the Department of Biology, University of Akron, 20 May 2007.

McNair, J. N. 2006. An overview of PPCPs (pharmaceuticals and personal care products) in the environment. Invited seminar presented to U.S. EPA Region 3, Philadelphia, PA, 27 October 2006.

McNair, J. N., Srivastava, P., Johnson, T. E., and Hart, D. D. 2004. A watershed approach to determining the benefits of riparian restoration. 2004 Wetlands Workshop, Atlantic City, NJ, 25 October 2004.

McNair, J. N. 2003. The ecology and control of invasive Japanese knotweed in urban parks of Philadelphia. Invited seminar presented at the 2003 Wetlands Workshop, Atlantic City, NJ, 28 October 2003.

McNair, J. N. 2003. On-going studies of Japanese knotweed in Philadelphia's urban parks. Invited seminar presented at the conference on "Aquatic Invaders of the Delaware Estuary", sponsored by NOAA, Pennsylvania Sea Grant, Delaware Estuary Program, Partnership for the Delaware Estuary, and Pennsylvania Department of Environmental Protection's Coastal Zone Management Program, held at Penn State Great Valley, 20 May 2003.

McNair, J. N. and Srivastava, P. 2003. Artificial neural networks as a tool in watershed hydrology. Invited seminar presented at the 2003 American Water Resources Association Mid-Atlantic Region Conference on "Technology Advances in Water Resources", Philadelphia, PA, 1 May 2003.

McNair, J. N. 2002. Stochastic and deterministic models of stream insect transport on different spatial scales. Invited seminar presented to the Department of Biology, University of Pennsylvania, 10 December 2002.

McNair, J. N. 2002. Adaptive management project update: results of project year 3. Seminar presented to the Natural Lands Restoration and Environmental Education Program, Fairmount Park Commission, January 2002.

McNair, J. N. 2001. Adaptive management of invasive exotic plants in Philadelphia's Fairmount Park system. Invited seminar presented to the Pennsylvania Deer Management Forum, Harrisburg, PA, 18 December 2001.

McNair, J.N. 2001. The local exchange model: a simple stochastic diffusion model of turbulent particle transport. Invited paper presented at the 2001 American Society of Limnology and Oceanography meeting, Albuquerque, NM.

McNair, J. N. 2001. Ongoing studies of two invasive species (Japanese knotweed and Norway maple) in woodlands of Philadelphia's Fairmount Park system. Lecture presented to the Department of Biology, University of Pennsylvania.

McNair, J.N. 2000. Particle transport by turbulent fluids: dispersal of seeds, pollen, fine particulate organic matter, and benthic invertebrate larvae. Invited lecture, Department of Biology, University of Pennsylvania.

McNair, J.N. 1998. Towards a theory of stressed populations, with applications to the rotifer chemostat. Invited lecture, Department of Biology, University of Pennsylvania.

McNair, J. N., Boraas, M.E., and Seale, D.B. 1997. Size-structure dynamics of the rotifer chemostat: a simple physiologically structured model. Paper presented at the VIII International Rotifer Symposium, held at St. John's University, Collegeville, Minnesota.

McNair, J. N. 1996. Population consequences of allocation in a physiologically structured model of the rotifer chemostat. Invited lecture, international symposium on "Resource Allocation Processes: the Connection Between Individual and Population Levels of Biological Organization", held at the University of Georgia's Savannah River Ecology Laboratory.

McNair, J.N. 1996. Classical versus physiologically structured models of the rotifer chemostat. Department of Biological Sciences, University of Wisconsin, Milwaukee.

McNair, J.N. 1995. A simple physiologically structured model of a rotifer chemostat. American Society of Zoologists Annual Meeting.

McNair, J.N. 1995. Classical versus physiologically structured models of rotifer population dynamics in a chemostat. Department of Biology, University of Pennsylvania.

McNair, J.N. 1994. Physiologically structured population models: techniques for theoretical and applied ecology. Invited lecture, Department of Ecology and Evolutionary Biology, University of California at Irvine.

McNair, J.N. 1994. Physiologically structured population models: bridging the gap between theoretical and applied ecology. Invited lecture, Biology Department, Davidson College.

McNair, J.N. 1993. Continuum population models. Department of Biology, University of Pennsylvania.

McNair, J.N. 1989. On the "principle of prey protection" in predator-prey interactions. Invited lecture, Department of Biology, Pennsylvania State University.

McNair, J.N. 1989. Causes of spontaneous oscillation in age- and density-dependent population growth. Invited lecture, Department of Biology, Pennsylvania State University.

McNair, J.N. 1987. Refuges and other sources of prey protection: their effects on predator-prey dynamics. Invited lecture, Department of Ecology and Evolutionary Biology, University of California, Irvine.

McNair, J.N. 1987. Refuges and other sources of prey protection: their effects on predator-prey dynamics. Invited lecture, Department of Biology, University of California, Riverside.

McNair, J.N. 1986. Refuges and other sources of prey protection: their effects on predator-prey dynamics. Invited lecture, Zoologische Museum der Universität Zürich (Switzerland).

McNair, J.N. 1985. Predator-prey interactions with refuges: What do we really know? Invited lecture, Department of Biology, Indiana University.

McNair, J.N. 1984. The effects of variability on the optimal size of a feeding territory. Invited lecture, Symposium on Territoriality, American Society of Zoologists Annual Meeting.

McNair, J.N. 1983. Destabilizing effects of prey refuges on predator-prey interactions. American Society of Zoologists Annual Meeting.

McNair, J.N. 1982. A class of foraging models for optimal patch use. Invited lecture, Annual Midwest Population Biology Conference.

McNair, J.N. 1982. Dynamic prey refuges in predator-prey interactions. Invited lecture, Department of Ecology, Ethology, and Evolution, University of Illinois.

McNair, J.N. 1981. Some implications of predator training effects for foraging theory. Invited lecture, Symposium on Foraging Ecology, Ecological Society of America Annual Meeting.

McNair, J.N. 1981. Some consequences of predator training effects. Invited lecture, Kellogg Biological Station, Michigan State University.

McNair, J.N. 1981. A class of patch-use strategies. Invited lecture, Symposium on Optimization of Behavior, American Society of Zoologists Annual Meeting.

Current Teaching

Techniques for Modeling Biological Systems — A dual-level course that includes a review of elementary mathematics (basic algebra, common functions, etc.), matrix algebra from the basics through spectral theory, linear and nonlinear difference equations, basic calculus, basic linear and nonlinear ordinary differential equations, and local stability theory of nonlinear difference and differential equations, plus basic computational and computer-graphics methods for all these topics, and applications in disciplines such as theoretical ecology, natural resources management, population genetics, ecotoxicology, epidemiology, physiology, cell biology, and statistics.

Advanced Population Ecology — A dual-level course that surveys the main phenomena of population ecology and the main theories that have been proposed to explain them. Emphasis is placed on classic field and laboratory studies that stimulated development of modern theories of population dynamics, and on key population models that were developed to explain results of these studies.

Postdoctoral Fellows Trained

Adriana Araújo – PhD, Nagasaki University, Japan

Margot Bram – PhD, Rutgers University

Rob Witmer – PhD, Virginia Tech

Master's Students Mentored

Emma Rice – Master's student at Grand Valley State University

Jay Zuidema – Master's student at Grand Valley State University

Meagan Sesselmann/McPherson – Master's student at Grand Valley State University

Syndell Parks – Master's student at Grand Valley State University

Lindsey Schulte – Master's student at Grand Valley State University

Service on Graduate Student Committees in the Last 10 Years

John Hart – Master's committee, Grand Valley State University

Emily Neuman – Master's committee, Grand Valley State University

Meg Sanders – Master's committee, Grand Valley State University

Cassidy Gilmore – Master's committee, Grand Valley State University

Molly Lane – Master's committee, Grand Valley State University

Alan Mock – Master's committee, Grand Valley State University

Matt Allen – Master's committee, Grand Valley State University

Dan Myers – Master's committee, Grand Valley State University

Hailee Pavisich – Master's committee, Grand Valley State University

Nicole Horne – Master's committee, Grand Valley State University

Nick Gezon – Master's committee, Grand Valley State University

Susanna LaGory – Master's committee, Grand Valley State University

Tony Weinke – Master's committee, Grand Valley State University

Leon Gereaux – Master's committee, Grand Valley State University

Susan Munster – Master's committee, Grand Valley State University

Mike Angeletta – Doctoral committee, University of Pennsylvania

Steve Beaupre – Doctoral committee, University of Pennsylvania

Dina Fonseca – Doctoral committee, University of Pennsylvania

Stan Kemp – Doctoral committee, University of Pennsylvania

Helen Murphy – Doctoral committee, University of Pennsylvania

Mike Sears – Doctoral committee, University of Pennsylvania

Roland Wall – Master's committee, University of Delaware

Other Students Mentored at Grand Valley State University

Monica Van Til – Biostatistics undergraduate student intern, Summer 2019

Brady Nahkala – NSF REU student, Summer 2017

Krystle Saylon – NSF REU student, Summer 2016

Eli Jacobson – NSF REU student, Summer 2016

Pamela Martínez-Oquendo – NSF REU student, Summer 2016

Shelby Brewer – NSF REU student, Summer 2015

Ariana Carlson – Biostatistics graduate student intern, Fall 2014

Jonathon Minard – Computing and Information Systems undergrad intern, Winter 2014

Kathy Roberts – Biostatistics graduate student intern, Fall 2013

Janae Wilson – Biostatistics graduate student intern, Fall 2012

Alex Ebenstein – Geography and Natural Resources Management undergraduate intern, Summer 2012

Zachary Madaj – Mathematics and Statistics undergraduate intern, Summer 2011

Meagan Sesselmann – Purdue Chemical Engineering undergraduate intern, Summer 2010

Anusha Sunkara – Biostatistics graduate student; Summer 2009, 2010

Allison Flood – Mathematics and Biology undergraduate intern; Summer 2009

Carson Pritchard – Natural Resources Management undergraduate intern, Spring and Summer 2009