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Current Position

Associate Professor, 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

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

9 February 2009 to 5 August 2009: Associate Research Scientist, 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, Quantitative Population Biology Section, Patrick Center for Environmental Research, Academy of Natural Sciences of Philadelphia.

1986–1991: Research Associate, Environmental Research Division, Academy of Natural Sciences of Philadelphia.

1980–1986: Assistant Professor of Biology, Purdue University.

Research Areas

Mechanistic models and statistical methods for estimating components of lake metabolism based on free-water dissolved-oxygen dynamics; stochastic models of particle transport in streams (including microorganisms, invertebrates, and fine particulate organic matter); physiologically based models of microbial, algal, and invertebrate food-web components; physiologically based models of microbial uptake and loss of xenobiotics; evolutionary responses of invasive aquatic plants to herbicides; non-

parametric, semi-parametric, and fully parametric methods of statistical time-to-event analysis as applied to data from seed germination experiments; effects of novel trace contaminants on cyanobacteria, algae, rotifers, cladocerans, and nematodes; spatially explicit watershed models linking landuse/landcover-derived stressors to ecological conditions in streams; applications of artificial neural networks to problems in watershed hydrology and watershed-scale assessment of ecological risk; density-dependent dynamics of physiologically-structured population models; variation in seed germinability within and among populations of invasive Japanese knotweed; management strategies for controlling invasive plants.

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

- Ruetz, C. R. III, Harris**, B. S., McNair, J. N., and Homola*, J. J. 2014. Removal and mark-recapture methods for estimating abundance: empirical and simulation results for Mottled Sculpin in streams. *North American Journal of Fisheries Management* (in press).
- McNair, J.N., Sesselmann*, M.R., Gereaux*, L.C., Weinke**, A.D., Kendall, S.T., and Biddanda, B.A. 2014. Alternative approaches for estimating components of lake metabolism using the free-water dissolved-oxygen (FWDO) method. *Fundamental and Applied Limnology* (in press).
- 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.
- Sieg*, A.E., O'Connor, M.P., McNair, J.N., Grant, B.W., Agosta*, S.J., and Dunham, A.E. 2009. Mammalian metabolic allometry: do intraspecific variation, phylogeny, and regression models matter? *American Naturalist* **174**: 720–733.
- McNair, J.N. 2009. Two new methods for predicting effects of landcover-related stressors on stream biotic integrity at the catchment scale. *Proceedings of the Academy of Natural Sciences of Philadelphia* **158**: 61–88.
- Araújo, A. and McNair, J.N. 2007. Individual- and population-level effects of antimicrobials on the rotifers, *Brachionus calyciflorus* and *B. plicatilis*. *Hydrobiologia* **593**: 185–199.
- Johnson, T.E., McNair, J.N., Srivastava, P., and Hart, D.D. 2007. Stream ecosystem responses to spatially variable landcover: a model for developing riparian restoration strategies. *Freshwater Biology* **52**: 680–695.

- O'Connor, M.P., Agosta*, S.J., Hansen, F., Kemp*, S.J., Sieg*, A.E., McNair, J.N., and Dunham, A.E. 2007. Phylogeny, regression, and the allometry of physiological traits. *American Naturalist* **170**: 431–442.
- O'Connor, M.P., Agosta*, S.J., Hansen, F., Kemp*, S.J., Sieg*, A.E., Wallace*, B.P., McNair, J.N., and Dunham, A.E. 2007. Size, selection, and physiology: Reconsidering the mechanistic basis of the metabolic theory of ecology. *Oikos* **116**: 1058–1072.
- McNair, J.N. 2006. Probabilistic settling in the Local Exchange Model of turbulent particle transport. *Journal of Theoretical Biology* **241**: 420–437.
- Srivastava, P., McNair, J.N., and Johnson, T.E. 2006. Comparison of process-based and artificial neural network approaches for streamflow modeling in an agricultural watershed. *Journal of the American Water Resources Association* **42**: 545–563.
- Fingerut, J.T., Hart, D.D., and McNair, J.N. 2006. Silk use enhances benthic invertebrate settlement. *Oecologia* **150**: 202–212.
- Bram, M.R. and McNair, J.N. 2004. Seed germinability and its seasonal onset in three populations of Japanese knotweed. *Weed Science* **52**: 759–767.
- McNair, J.N. and Newbold, J.D. 2001. Turbulent transport of suspended particles and dispersing benthic organisms: the hitting-distance problem for the Local Exchange Model. *Journal of Theoretical Biology* **209**: 351–369.
- McNair, J.N. 2000. Turbulent transport of suspended particles and dispersing benthic larvae: the hitting-time distribution of the Local Exchange Model. *Journal of Theoretical Biology* **202**: 231–246.
- Goulden, C.E., Moeller, R.E., McNair, J.N., and Place, A.R. 1999. Lipid dietary dependencies in zooplankton. Pages 91–108 in: Arts, M.T. and Wainman, B.C. (Eds.) *Lipids in Freshwater Ecosystems*. New York: Springer-Verlag.
- 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.

- McNair, J.N. 1987. A reconciliation of simple and complex models of age-dependent predation. *Theoretical Population Biology* **32**: 383–392.
- McNair, J.N. 1986. The effects of prey refuges on predator-prey interactions: a reconsideration. *Theoretical Population Biology* **29**: 38–63.
- McNair, J.N. 1985. Optimal foraging for operant conditioners. *Behavior and Brain Science* **8**: 343–344.
- Minchella*, D.J., B.K. Leathers, K.M. Brown and J.N. McNair. 1985. Host and parasite counteradaptations: an example from a freshwater snail. *American Naturalist* **126**: 843–854.
- McNair, J.N. 1983. A class of patch-use strategies. *American Zoologist* **23**: 303–313.
- McNair, J.N. 1982. Optimal giving-up times and the marginal value theorem. *American Naturalist* **119**: 511–529.
- McNair, J.N. 1981. A stochastic foraging model with predator training effects: II. Optimal diets. *Theoretical Population Biology* **19**: 147–162.
- McNair, J.N. 1980. A stochastic foraging model with predator training effects: I. Functional response, switching, and run lengths. *Theoretical Population Biology* **17**: 141–166.
- McNair, J.N. 1979. A generalized model of optimal diets. *Theoretical Population Biology* **15**: 159–170.
- McNair, J.N. 1979. A model of tentacle function in certain suctorians. *Journal of Theoretical Biology* **78**: 593–610.
- McNair, J.N. 1979. *Moina rostrata*: a new species of Moinidae (Cladocera). *Notulae Naturae, Academy of Natural Sciences of Philadelphia* **457**: 1–6.
- McNair, J.N. 1976. Sexual forms and phylogenetic positions of *Moina reticulata* Daday and *Moina minuta* Hansen (Cladocera: Moinidae). *Proceedings of the Academy of Natural Sciences of Philadelphia* **128**: 41–48.

Technical Reports

- McNair, J.N. and Thompson, K. 2014. An overview of stream sediment source attribution based on $^{7}\text{Be}/^{210}\text{Pb}_{\text{ex}}$ ratios. Prepared for Project Clarity (Lake Macatawa, Michigan). Annis Water Resources Institute, Grand Valley State University. 6 pages.
- 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.
- Srivastava, P., Carr, Hart, D.D. and McNair, J.N. 2003. A compilation and evaluation of stream restoration projects: learning from past projects to improve future success. Prepared for the William Penn Foundation. Academy of Natural Sciences of Philadelphia. 73 pages.
- McNair, J.N. 2002. An overview of the 2001 biological studies of the Guadalupe River. Prepared for E.I. du Pont de Nemours & Company, Victoria, Texas. Academy of Natural Sciences of Philadelphia. 16 pages.
- McNair, J.N. and Horwitz, R.J. 2001. PCB concentrations in fishes from the Housatonic River, Connecticut, 1984-2000, and in benthic insects, 1978-2001. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 70 pages.
- McNair, J.N. 2001. An overview of the 2000 biological and chemical studies of the Guadalupe River. Prepared for E.I. du Pont de Nemours & Company, Victoria, Texas. Academy of Natural Sciences of Philadelphia. 19 pages.

- McNair, J.N., Acker, F., Charles, D., Horwitz, R.J. and Marshall, B. 2000. Biological studies on the upper Delaware River: Final Report. Prepared for Roche Vitamins, Inc. Academy of Natural Sciences of Philadelphia. 99 pages.
- Kreeger, D. and McNair, J.N. 2000. Algal bioconcentration of radionuclides: 2000 Special “BCF” study - Phase II: Bioconcentration of Cs-137 by the green algal *Ankistrodesmus falcatus* in exponential and stationary phase. Prepared for PPL Susquehanna, LLC. Academy of Natural Sciences of Philadelphia. 31 pages.
- Bouchard, R., Charles, D., Horwitz, R.J., Marshall, B., McNair, J.N. and Velinsky, D. 2000. Biological and chemical studies of the Guadalupe River, 1999. Prepared for E.I. du Pont de Nemours & Company, Victoria, Texas. Academy of Natural Sciences of Philadelphia.
- Bouchard, R., Acker, F., Grant, R., Hart, D.D., Horwitz, R.J., McNair, J.N. and Velinsky, D. 2000. 1999 Savannah River Biological Surveys for Westinghouse Savannah River Company. Prepared for Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 235 pages.
- McNair, J.N. 1999. Review of Nitrate and Nitrite on the Guadalupe River, 1998-1999. Prepared for E.I. du Pont de Nemours & Company, Victoria, Texas. Academy of Natural Sciences of Philadelphia. 10 pages.
- McNair, J.N. 1999. An Overview of Biological and Chemical Studies of the Guadalupe River, 1996-1997. Prepared for E.I. du Pont de Nemours & Company, Victoria, Texas. Academy of Natural Sciences of Philadelphia.
- Biggs, R.B., Horwitz, R.J., McNair, J.N. 1999. The Delaware Estuary Ecosystem. Prepared for Public Service Electric and Gas. Academy of Natural Sciences of Philadelphia. 412 pages.
- Horwitz, R.J. and McNair, J.N. 1999. PCB Concentrations in Fishes and Benthic Insects from the Housatonic River, Connecticut, in 1984 to 1998. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 50 pages.
- Bouchard, R., Acker, F., Grant, R., Hart, D.D., Horwitz, R.J., McNair, J.N. and Velinsky, D. 1999. 1998 Savannah River Biological Surveys for Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 246 pages.
- McNair, J.N., Acker, F., Bouchard, R., Hart, D.D., Horwitz, R.J., and Velinsky, D. 1998. Aquatic field studies in the Congaree River near Columbia, South Carolina, 1997. Prepared for the Carolina Eastman Division of Eastman Chemical Company. Academy of Natural Sciences of Philadelphia. 139 pages.
- McNair, J.N., Acker, F., Bouchard, R., Hart, D.D., Horwitz, R.J. and Velinsky, D. 1998. Aquatic field studies in the vicinity of Kingsport, Tennessee, 1997. Prepared for Tennessee Eastman Division of Eastman Chemical Company. Academy of Natural Sciences of Philadelphia. 213 pages.
- Bouchard, R., Acker, F., Grant, R., Horwitz, R.J., Marshall, B., McNair, J.N. 1998. 1997 Savannah River biological surveys for Westinghouse Savannah River Company. Prepared for Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 201 pages.
- McNair, J.N. and Horwitz, R.J. 1997. PCB concentrations in fishes and benthic insects from the Housatonic River, Connecticut, in 1984 to 1996. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 47 pages.
- McNair, J.N. 1997. An assessment of the U.S. Fish and Wildlife Service’s literature review of mercury effects on fish and wildlife resources. Prepared for Aluminum Company of America. Academy of Natural Sciences of Philadelphia. 185 pages.

- McNair, J.N., Bouchard, R., Grant, R., Hart, D.D., Horwitz, R.J. and Velinsky, D. 1997. Aquatic field studies in the White River near Batesville, Arkansas. Prepared for Arkansas Eastman Division of Eastman Chemical. Academy of Natural Sciences of Philadelphia. 172 pages.
- Bouchard, R., Acker, F., Grant, R., Hart, D.D., Horwitz, R.J., McNair, J.N. and Velinsky, D. 1997. 1996 Savannah River biological surveys for Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 336 pages.
- McNair, J.N., Grant, R., Hart, D.D. and Horwitz, R.J. 1996. Savannah River cursory surveys for Westinghouse Savannah River Company, 1995. Prepared for Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 131 pages.
- McNair, J.N. 1996. An assessment of the U.S. Fish and Wildlife Service's Phase II report on accumulation of mercury in sediments, prey, and shorebirds of Lavaca Bay. Aluminum Company of America. Academy of Natural Sciences of Philadelphia. 11 pages.
- McNair, J.N. 1996. Addendum to Academy of Natural Sciences Report No. 94-23F: Potential biological impacts of altered metal and nutrient loadings to the Guadalupe River. Prepared for E.I. du Pont de Nemours & Company, Victoria, Texas. Academy of Natural Sciences of Philadelphia.
- Bouchard, R., Grant, R., Hart, D.D., Horwitz, R.J., McNair, J.N., and Velinsky, D. 1996. 1995 Sabine River studies for Texas Eastman Company. Prepared for Texas Eastman Division of Eastman Chemical Company. Academy of Natural Sciences of Philadelphia. 193 pages.
- Bouchard, R., Grant, R., Hart, D.D., Horwitz, R.J., Isquith, M. and McNair, J.N. 1996. 1995 Savannah River biological survey in the vicinity of Georgia Power and Light's Vogtle Nuclear Power Plant Site for Westinghouse Savannah River Company. Prepared for Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 221 pages.
- McNair, J.N. and Horwitz, R.J. 1995. PCB concentrations in fishes and benthic insects from the Housatonic River, Connecticut, in 1984 to 1994. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 103 pages.
- McNair, J.N. 1995. Potential biological impacts of altered metal and nutrient loadings to the Guadalupe River. Prepared for E.I. du Pont de Nemours & Company, Victoria, Texas. Academy of Natural Sciences of Philadelphia. 23 pages.
- McNair, J.N. 1995. Biological and mixing zone studies on the upper Delaware River. Final Report. Prepared for Hoffmann LaRoche, Inc. Academy of Natural Sciences of Philadelphia. 128 pages.
- Bouchard, R., Grant, R., Hermanson, Hart, D.D., Horwitz, R.J., Isquith, M. and McNair, J.N. 1995. 1994 Savannah River biological survey in the vicinity of Georgia Power and Light's Vogtle Nuclear Power Plant site for Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 196 pages.
- McNair, J.N. and Riedel, F. 1994. Projected impacts of altered metal and nutrient loadings to the Guadalupe River. Prepared for E.I. du Pont de Nemours & Company, Victoria, Texas. Academy of Natural Sciences of Philadelphia. 16 pages.
- McNair, J.N. and Newbold, J.D. 1994. Issues regarding estimated impacts of the lower Susquehanna River reservoir system on sediment and nutrient discharge to Chesapeake Bay. Prepared for Safe Harbor Water Power Corp. Academy of Natural Sciences of Philadelphia. 20 pages.
- McNair, J.N. 1994. Preliminary assessment of data from the U.S. Fish and Wildlife Service's 1991-1992 Lavaca Bay injury study. Aluminum Company of America. Academy of Natural Sciences of Philadelphia. 22 pages.

- Horwitz, R.J. and McNair, J.N. 1994. PCB concentrations in fishes from the Housatonic River, Connecticut, in 1984 to 1992: Addendum. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 17 pages.
- Bouchard, R., Grant, R., Hart, D.D., Horwitz, R.J. and McNair, J.N. 1994. Progress report on 1993 river quality surveys conducted by The Academy of Natural Sciences of Philadelphia on the Savannah River. Prepared for the Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia. 17 pages.
- Bouchard, R., Acker, F., Grant, R., Hart, D.D., Hermanson, Horwitz, R.J. and McNair, J.N. 1994. Savannah River biological surveys, 1993. Prepared for the Westinghouse Savannah River Company. Academy of Natural Sciences of Philadelphia.
- McNair, J.N., Kiry, P., Bouchard, R., Sweeney, B. and Horwitz, R.J. 1993. White River studies, 1991. Prepared for the Arkansas Eastman Division of the Eastman Chemical Company. Academy of Natural Sciences of Philadelphia. 197 pages.
- McNair, J.N. 1993. Rainbow trout acute toxicity tests for Quaker Chemical Corporation. Prepared for Quaker Chemical Corporation. Academy of Natural Sciences of Philadelphia. 12 pages.
- Horwitz, R.J. and McNair, J.N. 1993. PCB concentrations in fishes from the Housatonic River, Connecticut in 1984-1992. Prepared for General Electric Company. Academy of Natural Sciences of Philadelphia. 146 pages.
- 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)

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 macroinvertebrates: 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.

Professional Societies

Association for the Sciences of Limnology and Oceanography (formerly: American Society of Limnology and Oceanography)

American Water Resources Association

Ecological Society of America

Society for Freshwater Science (formerly: North American Benthological Society)

International Association for Great Lakes Research

Courses Taught

At Grand Valley State University

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.

Fisheries Management — A graduate-level course I teach with Carl Ruetz, covering basic methods and models of fisheries management.

At other universities

Ecology — A dual-level course emphasizing population dynamics and community ecology.

Evolution — A dual-level course emphasizing population genetics, molecular evolution, and speciation.

Mathematical Ecology — A graduate-level course covering difference equation models, ordinary differential equation models, and continuum transport models (parabolic and hyperbolic partial differential equation models).

Theoretical Ecology — A dual-level course covering a selection of basic methods in applied mathematics (e.g., linear algebra, difference equations, Markov chains, differential equations, systems, stability analysis) and some of their specific applications in theoretical population, community, and behavioral ecology.

Postdoctoral Fellows Trained

Adriana Araújo (PhD, Nagasaki University, Japan)

Margot Bram (PhD, Rutgers University)

Rob Witmer (PhD, Virginia Tech)

Master's Students Mentored

Meagan Sesselmann McPherson (current Master's student at Grand Valley State University)

Syndell Parks (current Master's student at Grand Valley State University)

Lindsey Schulte (current Master's student at Grand Valley State University)

Service on Graduate Student Committees in the Last 10 Years

Tony Weinke (current: Master's committee, Grand Valley State University)

Susan Munster (current: Master's committee, Grand Valley State University)

Leon Gereaux (current: Master's committee, Grand Valley State University)

Nicole Horne (current: 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

Ariana Carlson (biostatistics graduate student; Fall 2014)

Jonathon Minard (Computing and Information Systems undergrad; did CIS490 internship with me, Winter 2014)

Kathy Roberts (biostatistics graduate student; Fall 2013)

Janae Wilson (biostatistics graduate student; Fall 2012)

Alex Ebenstein (geography, natural resources management undergraduate; summer 2012)

Zachary Madaj (mathematics, statistics undergraduate; summer 2011)

Meagan Sesselmann (chemical engineering undergraduate from Purdue University; summer 2010)

Anusha Sunkara (biostatistics graduate student; summer 2009, 2010)

Allison Flood (mathematics, biology undergraduate; summer 2009)

Carson Pritchard (natural resources management undergraduate; co-mentor, spring and summer 2009)