

Jennifer C. Murphy

Hydrologist
U.S. Geological Survey

Current Positions

November 2020 – Current: Harmful Algal Blooms (HABs) team lead for the Water Quality Proxies project, USGS Water Mission Area

August 2020 – Current: Hydrologist with USGS Central Midwest Water Science Center, DeKalb, Illinois

2019 – Current: Co-lead of water-quality status and trends project in the Delaware River Basin pilot of the USGS Integrated Water Availability Assessments (IWAAs) program

2014 – Current: Member of the USGS National Water Quality Assessment (NAWQA) Surface Water Status and Trends Team

2020 – Current: Co-instructor of USGS Environmental Statistics Class (Lead instructor: Karen Ryberg)

Current Projects

- Developing a nationally scalable proxy approach of estimating HABs in US rivers and streams
- Improving load and trend estimates of suspended sediment in the Lower Mississippi and Atchafalaya River Basin. Cooperators: Army Corps of Engineers and Tulane University
- Surface water quality trends in the Delaware River Basin using multisource data: IWAAs
- Update to national surface water-quality trends for the Nation (lead on the Weighted Regressions on Time, Discharge, and Season (WRTDS) model): NAWQA
- Technical advisor on load estimation and water quality characterization project for agricultural sites in the Mississippi Delta. Cooperators: Mississippi Department of Environmental Quality

Work History

2010–2020: Hydrologist with Lower Mississippi-Gulf Water Science Center, USGS, Nashville, Tennessee

2017 – 2019: Lead of Causal Analysis group of NAWQA Surface Water Trends Team

Fall 2008 – Spring 2011: Graduate student and teaching assistant at Vanderbilt University (Nashville, TN)

Fall 2007 – Spring 2009: Project geologist with Environmental Consulting Services, Inc. (Nashville, TN)

Summer 2007: Field geologist with Lewis and Clark National Forest (Great Falls, MT)

Fall 2006 – Spring 2007: Research assistant with Eastern Mineral Resources division, USGS (Reston, VA)

Education

May 2011, MS, Earth and Environmental Sciences, Vanderbilt University, Nashville, TN

June 2006, BA, Geology, Lawrence University, Appleton, WI

Journal & USGS Publications

Murphy, J.C. (2020) Changing suspended sediment in United States rivers and streams: linking sediment trends to changes in land use/cover, hydrology and climate. *Hydrology and Earth System Sciences* 24, 991–1010, <https://doi.org/10.5194/hess-24-991-2020>.

Murphy, J., Hicks, M. and Stocks, S. (2020) Assessing water quality changes in agricultural drainages: Examples from oxbow lake tributaries in northwestern Mississippi, United States, and simulation-based power analyses. *Journal of Soil and Water Conservation* 75 (2) 218-230, <https://doi.org/10.2489/jswc.75.2.218>.

Stets, Edward G., Sprague, Lori A., Oelsner, Gretchen P., Johnson, Hank M., **Murphy, Jennifer C.**, Ryberg, Karen, Vecchia, Aldo V., Zuellig, Robert E., Falcone, James A., and Riskin, Melissa L. (2020) Landscape Drivers of Dynamic Change in Water Quality of U.S. Rivers. *Environmental Science Technology* 54, 7, 4336–4343. <https://doi.org/10.1021/acs.est.9b05344>.

Falcone, J.A., **Murphy, J.C.**, and Sprague, L.A. (2019) Regional patterns of anthropogenic influences on streams and rivers in the conterminous United States, from the early 1970s to 2012. *Journal of Land Use Science*, 13:6, 585-614, <https://doi.org/10.1080/1747423X.2019.1590473>.

Murphy, J., and Sprague, L. (2019) Water-quality trends in US rivers: Exploring effects from streamflow trends and changes in watershed management. *Science of the Total Environment* 656, 645-658, <https://doi.org/10.1016/j.scitotenv.2018.11.255>.

Shoda, M.E., Sprague, L.A., **Murphy, J.C.**, and Riskin, M.L. (2019) Water-quality trends in U.S. rivers, 2002-2012: Relations to levels of concern. *Science of the Total Environment* 650:2, 2314-2324, <https://doi.org/10.1016/j.scitotenv.2018.09.377>.

Choquette, A.F., Hirsch, R.M., **Murphy, J.C.**, Johnson, L.T., and Confesor Jr., R.B. (2019) Tracking changes in nutrient delivery to western Lake Erie: Approaches to compensate for variability and trends in streamflow. *Journal of Great Lakes Research* 45:1, 21-39. <https://doi.org/10.1016/j.jglr.2018.11.012>.

Mize, S.V., **Murphy, J.C.**, Diehl, T.H., and Demcheck, D.K. (2018) Suspended-sediment concentrations and loads in the lower Mississippi and Atchafalaya rivers decreased by half between 1980 and 2015. *Journal of Hydrology* 564, 1-11, <https://doi.org/10.1016/j.jhydrol.2018.05.068>.

Lee, C.J., **Murphy, J.C.**, Crawford, C.G., and Deacon, J.R (2017) Methods for computing water-quality loads at sites in the U.S. Geological Survey National Water Quality Network: U.S. Geological Survey Open-File Report 2017–1120, 20 p., <https://doi.org/10.3133/ofr20171120>.

Oelsner, G.P., Sprague, L.A., **Murphy, J.C.**, Zuellig, R.E., Johnson, H.M., Ryberg, K.R., Falcone, J.A., Stets, E.G., Vecchia, A.V., Riskin, M.L., De Cicco, L.A., Mills, T.J., and Farmer, W.H. (2017) Water-quality trends in the Nation’s rivers and streams, 1972–2012—Data preparation, statistical methods, and trend results: U.S. Geological Survey Scientific Investigations Report 2017–5006, 136 p., <https://doi.org/10.3133/sir20175006>.

Murphy, J., Crawford, C., Lee, C. (2016) Water-Quality Comparison of NWQN sites in the Lower Mississippi-Atchafalaya River Basin. Internal White Paper for USGS NAWQA. Final version October 3, 2016.

Pellerin, B.A., Bergamaschi, B.A., Gilliom, R.J., Crawford, C.G., Saraceno, J.F., Frederick, C.P., Downing, B.D., and **Murphy, J.C.** (2014) Mississippi River Nitrate Loads from High Frequency Sensor Measurements and Regression-Based Load Estimation. *Environmental Science & Technology*, 48 (21), 12612-12619, <http://doi.org/10.1021/es504029c>.

Knight R. R., **Murphy J. C.**, Wolfe W. J., Saylor C. F., and Wales A. K. (2014) Ecological limit functions relating fish community response to hydrologic departures of the ecological flow regime in the Tennessee River basin, United States, *Ecohydrology* 7: 1260–1280, <http://doi.org/10.1002/eco.1460>.

Murphy, J. C.; Hirsch, R. M.; Sprague, L. A. (2014) Antecedent flow conditions and nitrate concentrations in the Mississippi River basin. *Hydrology and Earth System Sciences*, Volume 18, Issue 3, pp.967-979. <http://doi.org/10.5194/hess-18-967-2014>.

Murphy, J. C., Hornberger, G. M. and Liddle, R. G. (2014) Concentration–discharge relationships in the coal mined region of the New River basin and Indian Fork sub-basin, Tennessee, USA. *Hydrological Processes* 28: 718–728. <http://doi.org/10.1002/hyp.9603>.

Murphy, J. C., Knight, R. R., Wolfe, W. J. and S. Gain, W. (2013) Predicting ecological flow regime at ungagged sites: A comparison of methods, *River Research and Applications* 29: 660–669. <http://doi.org/10.1002/rra.2570>.

Diehl, T.H., Harris, M.A., **Murphy, J.C.**, Hutson, S.S., and Ladd, D.E., (2013), Methods for estimating water consumption for thermoelectric power plants in the United States: U.S. Geological Survey Scientific Investigations Report 2013–5188, 78 p., <http://dx.doi.org/10.3133/sir20135188>.

Murphy, J.C., Hirsch, R.M., and Sprague, L.A., (2013), Nitrate in the Mississippi River and its tributaries, 1980–2010—An update: U.S. Geological Survey Scientific Investigations Report 2013–5169, 31 p., <http://pubs.usgs.gov/sir/2013/5169/>.

Perrone, D., **Murphy, J.**, and Hornberger, G. (2011), Gaining Perspective on the Water–Energy Nexus at the Community Scale. *Environ. Sci. Technol.*, 2011, 45 (10), pp 4228–4234, <https://doi.org/10.1021/es103230n>.

Software

Hirsch, R., DeCicco, L., and **Murphy, J.** (2018) EGRETci: Exploration and Graphics for RivEr Trends (EGRET) Confidence Intervals, version 2.0.0. CRAN <https://cran.r-project.org/web/packages/EGRETci/index.html>.

Hirsch, R., DeCicco, L., Watkins, D., Carr, L., and **Murphy, J.** (2018) EGRET: Exploration and Graphics for RivEr Trends (EGRET) version 3.0.0. CRAN. <https://cran.r-project.org/web/packages/EGRET/index.html>

Data Releases

Murphy, J.C., Shoda, M.E. and Follette, D.D. (2020) Water-quality trends for rivers and streams in the Delaware River Basin using Weighted Regressions on Time, Discharge, and Season (WRTDS) models, Seasonal Kendall Trend (SKT) tests, and multisource data, Water Year 1978-2018: U.S. Geological Survey data release, <https://doi.org/10.5066/P9KMWNJ5>.

Shoda, M.E., **Murphy, J.C.**, Falcone, J.A., and Duris, J.W. (2019) Multisource surface-water-quality data and U.S. Geological Survey streamgage match for the Delaware River Basin: U.S. Geological Survey data release, <https://doi.org/10.5066/P9PX8LZO>.

Murphy, J.C., Farmer, W.H., Sprague, L.A., De Cicco, L.A., and Hirsch, R.M. (2018) Water-quality trends and trend component estimates for the Nation's rivers and streams using Weighted Regressions on Time, Discharge, and Season (WRTDS) models and generalized flow normalization, 1972-2012: U.S. Geological Survey data release, <https://doi.org/10.5066/F7TQ5ZS3>.

De Cicco, L.A., Sprague, L.A., **Murphy, J.C.**, Riskin, M.L., Falcone, J.A., Stets, E.G., Oelsner, G.P., and Johnson, H.M. (2017) Water-quality and streamflow datasets used in the Weighted Regressions on Time, Discharge, and Season (WRTDS) models to determine trends in the Nation's rivers and streams, 1972-2012: U.S. Geological Survey data release, <http://dx.doi.org/10.5066/F7KW5D4H>.

Ryberg, K.R., **Murphy, J.C.**, Falcone, J.A., Riskin, M.L., Wieben, C.M., and Vecchia, A.V. (2017) Pesticide concentration and streamflow datasets used to evaluate pesticide trends in the Nation's rivers and streams, 1992-2012: U.S. Geological Survey data release, <http://dx.doi.org/10.5066/F7BC3WPC>.

Farmer, W.H., **Murphy, J.C.**, Riskin, M.L., Ryberg, K.R., and Zuellig, R.E. (2017) Daily streamflow datasets used to analyze trends in streamflow at sites also analyzed for trends in water quality and ecological condition in the Nation's rivers and streams: U.S. Geological Survey data release, <http://www.dx.doi.org/10.5066/F7D798JN>.

Mills, T.J., Sprague, L.A., **Murphy, J.C.**, Riskin, M.L., Falcone, J.A., Stets, E.G., Oelsner, G.P., and Johnson, H.M. (2017) Water-quality and streamflow datasets used in Seasonal Kendall trend tests for the Nation's rivers and streams, 1972-2012: U.S. Geological Survey data release, <http://dx.doi.org/10.5066/F7QN64VT>.

Murphy, J., Farmer, J., and Layton, A. (2016) Water-quality data and Escherichia coli predictions for selected karst catchments of the upper Duck River watershed in central Tennessee, 2007–10: U.S. Geological Survey Data Series 1003, 17 p., <http://dx.doi.org/10.3133/ds1003>.

USGS Fact Sheets

Murphy, J.C., and Shoda, M.E. (2020) Pooling Resources Across Organizations—Multisource Water-Quality Data for the Delaware River Basin. USGS Fact Sheet 2020-3006, <https://doi.org/10.3133/fs20203006>.

Murphy, J.C., and Shoda, M.E. (2020) A Historical Look at Changing Water Quality in the Delaware River Basin. USGS Fact Sheet 2020-3007, <https://doi.org/10.3133/fs20203007>.