

Qian Zhang, Ph.D.

Associate Research Scientist

University of Maryland Center for Environmental Science

Watershed Effectiveness Data Analyst

USEPA Chesapeake Bay Program Office

1750 Forest Drive, Suite 130, Annapolis, MD 21401

Office: 410-267-5794; Email: qzhang@chesapeakebay.net, qzhang@umces.edu

Website: <http://www.umces.edu/qian-zhang>, <https://sites.google.com/view/qian-zhang>



Research Interests

To apply scientific principles and statistical approaches to examine nutrient and sediment loads from watersheds and better understand their drivers and impacts along the land-river-estuary continuum, including:

- Quantifying riverine water-quality loads and trends.
- Improving statistical methods for riverine water-quality load and trend estimation.
- Disentangling natural and anthropogenic controls of riverine water-quality loads and trends.
- Understanding impacts of riverine water-quality loads and trends on receiving waters (e.g., estuaries).

Education

Ph.D. Johns Hopkins University, **Environmental Engineering**, 2011-2016.

Thesis: Quantifying Nutrient and Sediment Export from the Chesapeake Bay Watershed: Retrospective Analyses and Method Improvements (Advisor: Professor William P. Ball)

M.S.E. Johns Hopkins University, **Applied Mathematics and Statistics**, 2013-2014.

M.S.E. Johns Hopkins University, **Environmental Engineering**, 2010-2011.

B.Eng. Nanyang Technological University, Singapore, **Environmental Engineering** (1st Class Honors), 2005-2009.

Appointments

- **Associate Research Scientist (Watershed Effectiveness Data Analyst)**, University of Maryland Center for Environmental Science / USEPA Chesapeake Bay Program, Annapolis, MD, 2023-present.
- **Assistant Research Scientist (Watershed Effectiveness Data Analyst)**, University of Maryland Center for Environmental Science / USEPA Chesapeake Bay Program, Annapolis, MD, 2016-2023.
- **Research Assistant**, Department of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, MD, 2010-2016.
- **Teaching Assistant**, Department of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, MD, 2011-2012.
- **Engineer**, LBW Consultants LLP, Singapore, 2009-2010.

Skills & Expertise

- **Programming:** R, Matlab, Python
- **Computer:** Microsoft Office, ArcGIS, AutoCAD, HEC-RAS, Adobe Illustrator
- **Environment:** Chesapeake Bay, Hydrology, Contaminant Transport, Physical/Chemical Processes
- **Analytics:** Statistics, Monte Carlo, Data Mining, Machine Learning, Time Series, Modeling

Honors & Awards

- **Recipient**, Expanding the Critical Zone Research Network Workshop Travel Grant, 2022
- **Recipient**, National Association of Government Communications (NAGC) Blue Pencil & Gold Screen Award (Award of Excellence, Technical or Statistical Reports), 2022
- **Recipient**, AGU Frontiers in Hydrology Meeting (FIHM) Early Career Travel Grant, 2022
- **Recipient**, Joint Aquatic Sciences Meeting (JASM) Early Career Travel Award, 2022
- **Recipient**, Coastal & Estuarine Research Federation (CERF) Student/Early Career Participation Award, 2021
- **Top Reviewers** in Environment and Ecology by Publons, 2019
- **Top Reviewers** in Environment and Ecology by Publons, 2018
- **Recipient**, Innovyze Excellence in Computational Hydraulics/Hydrology Award by American Academy of Environmental Engineers and Scientists (AAEES) [jointly selected with the Association of Environmental Engineering and Science Professors (AEESP)], 2017
- **Recipient**, Coastal & Estuarine Research Federation (CERF) Student/Early Career Travel Grant, 2017
- **Recipient**, Johns Hopkins Graduate Representatives Organization (GRO) Travel Grant, 2016
- **Research Fellow**, Maryland Water Resources Research Center (MWRRC), 2015
- **Recipient**, Geological Society of America (GSA) Student Travel Grant, 2015
- **Research Fellow**, Maryland Sea Grant Graduate (MDSG), 2013 - 2014
- **Graduate Student Scholar**, Community Surface Dynamics Modeling System (CSDMS), 2013
- **3rd Place Winner**, Chesapeake Water Environment Association (CWEA) Student Paper Competition, 2012
- **Awardee**, Dean's List Award, Nanyang Technological University (NTU), Singapore, 2008 - 2009
- **Awardee**, Dean's List Award, Nanyang Technological University (NTU), Singapore, 2007 - 2008
- **Winner**, Singapore National Concrete Canoe Competition (SNCCC), 2008
- **Undergraduate Fellow**, Ministry of Education (MOE), Singapore, 2005 - 2009

Journal Publications

- Zhang, Q.**, J.T. Bostic, R.D. Sabo, 2023. "Effects of point and nonpoint source controls on total phosphorus load trends across the Chesapeake Bay watershed," *Environmental Research Letters*, accepted, doi: [10.1088/1748-9326/ad0d3c](https://doi.org/10.1088/1748-9326/ad0d3c).
- Zhang, Q.**, J. D. Blomquist, R. M. Fanelli, J. L. D. Keisman, D. L. Moyer, and M. J. Langeland, 2023. "Progress in reducing nutrient and sediment loads to Chesapeake Bay: Three decades of monitoring data and implications for restoring complex ecosystems," *WIREs Water*, 10(5): e1671, doi: [10.1002/wat2.1671](https://doi.org/10.1002/wat2.1671).
- Xiang, J., T. Cui, X. Li, **Q. Zhang**, B. Mu, R. Liu, and W. Zhao, 2023. "Evaluating the effectiveness of coastal environmental management policies in China: The case of Bohai Sea," *Journal of Environmental Management*, 338: 117812, doi: [10.1016/j.jenvman.2023.117812](https://doi.org/10.1016/j.jenvman.2023.117812).
- Zhang, Q.**, T. R. Fisher, C. Buchanan, A. B. Gustafson, R. R. Karrh, R. R. Murphy, J. M. Testa, R. Tian, and P. J. Tango, 2022. "Nutrient limitation of phytoplankton in three tributaries of Chesapeake Bay: Detecting responses following nutrient reductions," *Water Research*, 226: 119099, doi: [10.1016/j.watres.2022.119099](https://doi.org/10.1016/j.watres.2022.119099).
- Zhang, Q.**, J.T. Bostic, R.D. Sabo, 2022. "Regional patterns and drivers of total nitrogen trends in the Chesapeake Bay watershed: Insights from machine learning approaches and management implications," *Water Research*, 218:118443, doi: [10.1016/j.watres.2022.118443](https://doi.org/10.1016/j.watres.2022.118443).
- Zahran, A.R., **Q. Zhang**, P. Tango, and E.P. Smith, 2022. "A water quality barometer for Chesapeake Bay: Assessing spatial and temporal patterns using long-term monitoring data," *Ecological Indicators*, 140:109022, doi: [10.1016/j.ecolind.2022.109022](https://doi.org/10.1016/j.ecolind.2022.109022).

- Sabo, R.D., B. Sullivan, C. Wu, E. Trentacoste, **Q. Zhang**, G. Shenk, G. Bhatt, and L.C. Linker, 2022. "Major point and nonpoint sources of nutrient pollution to surface water have declined throughout the Chesapeake Bay watershed," *Environmental Research Communications*, 4:045012, doi: [10.1088/2515-7620/ac5db6](https://doi.org/10.1088/2515-7620/ac5db6).
- Murphy, R.R., J. Keisman, J. Harcum, R.R. Karrh, M. Lane, E.S. Perry, and **Q. Zhang**, 2022. "Nutrient improvements in Chesapeake Bay: Direct effect of load reductions and implications for coastal management," *Environmental Science & Technology*, 56(1):260-270, doi: [10.1021/acs.est.1c05388](https://doi.org/10.1021/acs.est.1c05388).
- Langendorf, R., V. Lyubchich, J. Testa, and **Q. Zhang**, 2021. "Inferring controls of dissolved oxygen criterion attainment in the Chesapeake Bay," *ACS ES&T Water*, 1: 1665-1675, doi: [10.1021/acsestwater.0c00307](https://doi.org/10.1021/acsestwater.0c00307).
- Chang, S.Y., **Q. Zhang**, D.K. Byrnes, N.B. Basu, and K.J. Van Meter, 2021. "Chesapeake legacies: The importance of legacy nitrogen to improving Chesapeake Bay water quality," *Environmental Research Letters*, 16: 085002, doi: [10.1088/1748-9326/ac0d7b](https://doi.org/10.1088/1748-9326/ac0d7b).
- Preisendanz, H.E., T.L. Veith, **Q. Zhang**, and J. Shortle, 2021. "Temporal inequality of nutrient and sediment transport: a decision-making framework for temporal targeting of load reduction goals," *Environmental Research Letters*, 16: 014005, doi: [10.1088/1748-9326/abc997](https://doi.org/10.1088/1748-9326/abc997).
- Zhang, Q.**, J. S. Webber, D. L. Moyer, and J. G. Chanut, 2021. "An approach for decomposing river water-quality trends into different flow classes," *Science of the Total Environment*, 755:143562, doi: [10.1016/j.scitotenv.2020.143562](https://doi.org/10.1016/j.scitotenv.2020.143562).
- Zhang, Q.**, T. R. Fisher, E. M. Trentacoste, C. Buchanan, A. B. Gustafson, R. Karrh, R. R. Murphy, J. Keisman, C. Wu, R. Tian, J. M. Testa, and P. J. Tango, 2021. "Nutrient limitation of phytoplankton in Chesapeake Bay: Development of an empirical approach for water-quality management," *Water Research*, 188C:116407, doi: [10.1016/j.watres.2020.116407](https://doi.org/10.1016/j.watres.2020.116407).
- Noe, G.B., M.J. Cashman, K. Skalak, A. Gellis, K.G. Hopkins, D. Moyer, J. Webber, A. Benthem, K. Maloney, J. Brakebill, A. Sekellick, M. Langland, **Q. Zhang**, G. Shenk, J. Keisman, and C. Hupp, 2020. "Sediment dynamics and implications for management: State of the science from long-term research in the Chesapeake Bay watershed, USA," *WIREs Water*, 7: e1454, doi: [10.1002/wat2.1454](https://doi.org/10.1002/wat2.1454).
- Roubeix V., C. Minaudo, J. Prats, N. Reynaud, **Q. Zhang**, F. Moatar, and P. Danis, 2020. "Adapting the dynamic LakeMab model to simulate seasonal variations of phosphorus concentration in reservoirs: a case study of Lake Bultière (France)," *Limnology*, 21: 233-244, doi: [10.1007/s10201-019-00606-x](https://doi.org/10.1007/s10201-019-00606-x).
- Zhang, Q.**, and R.M. Hirsch, 2019. "River water-quality concentration and flux estimation can be improved by accounting for serial correlation through an autoregressive model," *Water Resources Research*, 55: 9705–9723, doi: [10.1029/2019WR025338](https://doi.org/10.1029/2019WR025338).
- Testa, J.M., Lyubchich V., and **Q. Zhang**, 2019. "Patterns and trends in Secchi disk depth over three decades in the Chesapeake Bay estuarine complex," *Estuaries and Coasts*, 42(4): 927-943, doi: [10.1007/s12237-019-00547-9](https://doi.org/10.1007/s12237-019-00547-9).
- Zhang, Q.**, J.D. Blomquist, D.L. Moyer, and J.G. Chanut, 2019. "Estimation bias in water-quality constituent concentrations and fluxes: A synthesis for Chesapeake Bay rivers and streams," *Frontiers in Ecology and Evolution*, 7: 109, doi: [10.3389/fevo.2019.00109](https://doi.org/10.3389/fevo.2019.00109).
- Zhang, Q.**, P.J. Tango, R.R. Murphy, M.K. Forsyth, R. Tian, J. Keisman, and E.M. Trentacoste. 2018. "Chesapeake Bay dissolved oxygen criterion attainment deficit: Three decades of temporal and spatial patterns," *Frontiers in Marine Science*, 5: 422, doi: [10.3389/fmars.2018.00422](https://doi.org/10.3389/fmars.2018.00422).
- Zhang, Q.**, R.R. Murphy, R. Tian, M.K. Forsyth, E.M. Trentacoste, J. Keisman, and P.J. Tango. 2018. "Chesapeake Bay's water quality condition has been recovering: Insights from a multimetric indicator assessment of thirty years of tidal monitoring data," *Science of the Total Environment*, 637-638: 1617-1625, doi: [10.1016/j.scitotenv.2018.05.025](https://doi.org/10.1016/j.scitotenv.2018.05.025).
- Zhang, Q.**, C.J. Harman, and J.W. Kirchner. 2018. "Evaluation of statistical methods for quantifying fractal scaling in water quality time series with irregular sampling," *Hydrology and Earth System Sciences*, 22(2): 1175-1192, doi: [10.5194/hess-22-1175-2018](https://doi.org/10.5194/hess-22-1175-2018).

- Zhang, Q.** and J.D. Blomquist. 2018. “Watershed export of fine sediment, organic carbon, and chlorophyll-a to Chesapeake Bay: Spatial and temporal patterns in 1984–2016,” *Science of the Total Environment*, 619–620: 1066–1078, doi: [10.1016/j.scitotenv.2017.10.279](https://doi.org/10.1016/j.scitotenv.2017.10.279).
- Zhang, Q.** 2018. “Synthesis of nutrient and sediment export patterns in the Chesapeake Bay watershed: Complex and non-stationary concentration-discharge relationships,” *Science of the Total Environment*, 618: 1268–1283, doi: [10.1016/j.scitotenv.2017.09.221](https://doi.org/10.1016/j.scitotenv.2017.09.221).
- Zhang, Q.** and W.P. Ball. 2017. “Improving Riverine Constituent Concentration and Flux Estimation by Accounting for Antecedent Discharge Conditions,” *Journal of Hydrology*, 547: 387–402, doi: [10.1016/j.jhydrol.2016.12.052](https://doi.org/10.1016/j.jhydrol.2016.12.052).
- Zhang, Q.**, C.J. Harman, and W.P. Ball. 2016. “An Improved Method for Interpretation of Riverine Concentration-Discharge Relationships Indicates Long-Term Shifts in Reservoir Sediment Trapping,” *Geophysical Research Letters*, 43: 10215–10224, doi: [10.1002/2016GL069945](https://doi.org/10.1002/2016GL069945).
- Zhang, Q.**, R.M. Hirsch, and W.P. Ball. 2016. “Long-Term Changes in Sediment and Nutrient Delivery from Conowingo Dam to Chesapeake Bay: Effects of Reservoir Filling,” *Environmental Science & Technology*, 50(4): 1877–1886, doi: [10.1021/acs.est.5b04073](https://doi.org/10.1021/acs.est.5b04073).
- Zhang, Q.**, W.P. Ball., and D.L. Moyer. 2016. “Decadal-scale Export of Nitrogen, Phosphorus, and Sediment from the Susquehanna River Basin, USA: Analysis and Synthesis of Temporal and Spatial Patterns,” *Science of the Total Environment*, 563–564: 1016–1029, doi: [10.1016/j.scitotenv.2016.03.104](https://doi.org/10.1016/j.scitotenv.2016.03.104).
- Zhang, Q.**, D.C. Brady, W.R. Boynton, and W.P. Ball. 2015. “Long-term Trends of Nutrients and Sediment from the Non-tidal Chesapeake Watershed: An Assessment of Progress by River and Season,” *Journal of the American Water Resources Association*, 51(6): 1534–1555, doi: [10.1111/1752-1688.12327](https://doi.org/10.1111/1752-1688.12327).
- Zhang, Q.**, D.C. Brady, and W.P. Ball, 2013. “Long-term Seasonal Trends of Nitrogen, Phosphorus, and Suspended Sediment Load from the Non-tidal Susquehanna River Basin to Chesapeake Bay,” *Science of the Total Environment*, 452–453: 208–221, doi: [10.1016/j.scitotenv.2013.02.012](https://doi.org/10.1016/j.scitotenv.2013.02.012).

Manuscript (in Review)

- “Integrating monitoring and modeling information to develop an indicator of watershed progress toward nutrient reduction goals,” submitted to *Ecological Indicators*.
- “Legacy sediment as a potential source of orthophosphate: Preliminary conceptual and geochemical models for the Susquehanna River, Chesapeake Bay Watershed, USA,” submitted to *Science of the Total Environment*.
- “Evaluating water-quality trends in agricultural watersheds prioritized for management-practice implementation,” submitted to *Journal of the American Water Resources Association*.
- “Spatiotemporal variations of cropland phosphorus runoff loss in China,” submitted to *Journal of Hydrology*.

Book Chapter

- Zhang, Q., S. Cozzi, C. Palinkas, and M. Giani, 2020. “Recent Status and Long-Term Trends in Freshwater Discharge and Nutrient Inputs,” In: *Coastal Ecosystems in Transition: A Comparative Analysis of the Northern Adriatic and Chesapeake Bay*, T. C. Malone, A. Malej and J. Faganeli (Editors), doi: [10.1002/9781119543626.ch2](https://doi.org/10.1002/9781119543626.ch2). American Geophysical Union / John Wiley and Sons, Inc.

Reports

- Sullivan, B., K. Gootman, A. Gunnerson, C. Johnson, C. Mason, E. Perry, G. Bhatt, J. Keisman, J. Webber, J. Harcum, M. Lane, O. Devereux, **Q. Zhang**, R. Murphy, R. Karrh, T. Butler, V. Van Note, and Z. Wei, 2023. “James Tributary Summary: A summary of trends in tidal water quality and associated factors, 1985–2021,” Chesapeake Bay Program, Annapolis, MD.

- Webber, J.S., J.W. Clune, A.M. Soroka, M.J. Cashman, O.H. Devereux, R.M. Fanelli, K.E. Faunce, K.G. Hopkins, J.L. Keisman, R.E. Langendorf, C.A. Mason, R.R. Murphy, M.R. Nardi, R.D. Sabo, G.W. Shenk, P.J. Tango, J.M. Testa, and Q. Zhang, 2022. “Summarizing Scientific Findings for Common Stakeholder Questions to Inform Nutrient and Sediment Management Activities in the Chesapeake Bay Watershed”, <https://www.usgs.gov/centers/chesapeake-bay-activities/science/summarizing-scientific-findings-common-stakeholder>.
- Clune, J. W., P. D. Capel, M. P. Miller, D. A. Burns, A. J. Sekellick, P. R. Claggett, R. H. Coupe, R. M. Fanelli, A. M. Garcia, J. P. Raffensperger, S. Terziotti, G. Bhatt, J. D. Blomquist, K. G. Hopkins, J. L. Keisman, L. C. Linker, G. W. Shenk, R. A. Smith, A. M. Soroka, J. S. Webber, D. M. Wolock and **Q. Zhang**, 2021. Nitrogen in the Chesapeake Bay watershed—A century of change, 1950–2050, *U.S. Geological Survey Circular 1486*. U.S. Geological Survey, New Cumberland, PA, [doi: 10.3133/cir1486](https://doi.org/10.3133/cir1486).
- Bastille, K., S. Hardison, S. Lucey, C. Schillaci, J. Walden, P. Fratantoni, J. Caraccappa, G. DePiper, B. Vogt, C. Pellerin, R. Vogel, **Q. Zhang**, K. Hyde, Z. Chen, L. Colburn, C. Weng, S. Gaichas, L. Smith, A. Beet, R. Gamble, V. Saba, M. Wuenschel, G. Roskar, C. Orphanides, G. Saba, H. Walsh, K. Friedland, T. White, G. Shield, A. Gangopadhyay, A. Silva, D. Lyons and R. Morse, 2021. Technical Documentation, State of the Ecosystem 2021. Northeast Fisheries Science Center. <https://repository.library.noaa.gov/view/noaa/29277>.
- Hyer, K. E., S. W. Phillips, S. W. Ator, D. L. Moyer, J. S. Webber, R. Felver, J. L. Keisman, L. A. McDonnell, R. Murphy, E. M. Trentacoste, **Q. Zhang**, W. C. Dennison, S. Swanson, B. Walsh, J. Hawkey, and D. Taillie, 2021. “Nutrient trends and drivers in the Chesapeake Bay Watershed,” *U.S. Geological Survey Fact Sheet 2020–3069*. U.S. Geological Survey, Baltimore, MD, p. 4. [doi: 10.3133/fs20203069](https://doi.org/10.3133/fs20203069).
- Keisman, J., R. R. Murphy, O. H. Devereux, J. Harcum, R. Karrh, M. Lane, E. Perry, J. Webber, Z. Wei, **Q. Zhang**, and M. Petenbrink, 2020. “Potomac Tributary Report: A summary of trends in tidal water quality and associated factors, 1985-2018,” Chesapeake Bay Program, Annapolis, MD. <https://pubs.er.usgs.gov/publication/70216971>.
- Keisman, J., C. Friedrichs, R. Batiuk, J. Blomquist, J. Cornwell, C. Gallegos, S. Lyubchich, K. Moore, R. Murphy, R. Orth, L. Sanford, P. Tango, J. Testa, M. Trice, and **Q. Zhang**, 2019. “Understanding and explaining 30 years of water clarity trends in the Chesapeake Bay’s tidal waters,” *Chesapeake Bay Program STAC Publication Number 19-004*, Edgewater, MD, p. 25. http://www.chesapeake.org/pubs/411_Keisman2019.pdf.

Dissertation

- Zhang, Q.** 2016. Quantifying Nutrient and Sediment Export from the Chesapeake Bay Watershed: Retrospective Analyses and Method Improvements. *Johns Hopkins University Doctoral Dissertations*, Baltimore, MD. <https://jscholarship.library.jhu.edu/handle/1774.2/40327>. (PDF attached)

Data Publications

- Zhang, Q.** 2022. “Nutrient limitation of phytoplankton in three tributaries of Chesapeake Bay: Detecting responses following nutrient reductions,” *Mendeley Data*, [doi: 10.17632/bzzthwgpj.2](https://doi.org/10.17632/bzzthwgpj.2).
- Zhang, Q.** 2020. “Data for: Nutrient limitation of phytoplankton in Chesapeake Bay: Development of an empirical approach for water-quality management,” *Mendeley Data*, [doi: 10.17632/8wt3wh2mwr.3](https://doi.org/10.17632/8wt3wh2mwr.3).
- Webber, J.S, and **Q. Zhang**. 2020. Chesapeake Bay Nontidal Network 1985-2018: Daily High-Flow and Low-Flow Concentration and Load Estimates (ver. 1.1, November 2021). *U.S. Geological Survey data release*, [doi: 10.5066/P9LBJEY1](https://doi.org/10.5066/P9LBJEY1).
- Zhang, Q.**, C.J. Harman, and W.P. Ball. 2016. “Data associated with An Improved Method for Interpretation of Riverine Concentration-Discharge Relationships Indicates Long-Term Shifts in Reservoir Sediment Trapping,” *Johns Hopkins University Data Archive*, [doi: 10.7281/T18G8HM0](https://doi.org/10.7281/T18G8HM0).

Zhang, Q. and W.P. Ball. 2016. “Data associated with Decadal-scale export of nitrogen, phosphorus, and sediment from the Susquehanna River basin, USA: Analysis and synthesis of temporal and spatial patterns,” *Johns Hopkins University Data Archive*, doi: 10.7281/T1QN64NW.

Zhang, Q. and W.P. Ball. 2014. “Data associated with Long-term seasonal trends of nutrients and sediment from the nontidal Chesapeake Bay Watershed,” *Johns Hopkins University Data Archive*, doi: 10.7281/T1VD6WC7.

Zhang, Q. and W.P. Ball. 2014. “Data associated with Long-term seasonal trends of nitrogen, phosphorus, and suspended sediment load from the non-tidal Susquehanna River Basin to Chesapeake Bay,” *Johns Hopkins University Data Archive*, doi: 10.7281/T1KW5CX5.

App Products

[Chesapeake Bay Water Quality Standards Attainment Deficit \(1985-2021\)](#)

[Chesapeake Bay Water Quality Standards Attainment Indicator \(1985-2021\)](#)

[Chesapeake Bay TMDL Indicator \(Non-Tidal Network Stations\)](#)

Conference Sessions

Co-convener, session “Advancements in Watershed Modeling to Support Water Management” in *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 11-15, 2023.

Lead convener, session “Developing new insights from environmental data through innovative analysis approaches” in *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Portland, OR, November 12-16, 2023.

Co-convener, session “Advancements in Watershed Modeling to Support Water Management” in *American Geophysical Union (AGU) Fall Meeting*, Chicago, IL, December 12-16, 2022.

Lead convener, session “Water-quality patterns and trends in the Chesapeake Bay and its watershed: Integrated monitoring, modeling, and science communication approaches to advance science and inform management” in *Chesapeake Community Research Symposium*, Annapolis, MD, June 6-8, 2022.

Lead convener, session “Advancements in Watershed Modeling to Support Water Management” in *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 13-17, 2021.

Lead convener, session “Developing new insights from environmental data through innovative analysis approaches” in *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, virtual conference, November 1-11, 2021.

Lead convener, workshop “Use R to Manipulate and Visualize Environmental Data” in *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, virtual conference, November 1-11, 2021.

Co-convener, session “Advancements in Watershed Modeling to Support Water Resources Management” in *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 1-17, 2020.

Lead convener, session “Water-quality patterns and trends in the Chesapeake Bay and its watershed: Integrated monitoring and modeling approaches to advance science and inform management” in *Chesapeake Community Research Symposium*, virtual conference, June 8-10, 2020.

Co-convener, session “Linking Social and Ecological Needs to Build Floodplain Resilience” in *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 9-13, 2019.

Lead convener, session “Innovative approaches for estuarine/watershed data analysis, mining, and visualization” in *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Mobile, AL, November 3-7, 2019

Co-convener, session “Aquatic Ecosystem Responses to Human Disturbances and Management: A Comparative Discussion of Inland and Coastal Ecosystems and Their Contributing Watersheds” in *American Geophysical Union (AGU) Fall Meeting*, Washington, D.C., December 10-14, 2018.

- Co-convener**, session “Modeling and Assessment of Complex Watershed-River-Estuary Systems: Chesapeake Bay as a Case Study of Ecosystem Restoration and Management” in *American Water Resources Association (AWRA) Annual Conference*, Baltimore, MD, November 4-8, 2018.
- Co-convener**, session “Chesapeake Bay Water Quality Standards Criteria Assessment for Dissolved Oxygen, Water Clarity, and Chlorophyll-a: Method Development and Implementation for Ecosystem Management” in *American Water Resources Association (AWRA) Annual Conference*, Baltimore, MD, November 4-8, 2018.
- Co-convener**, session “Explaining conditions and trends: Integrated monitoring and modeling approaches to describe water-quality change in the watershed and estuary” in *Chesapeake Research and Modeling Symposium*, Annapolis, MD, June 12-14, 2018.

Conference Presentations

- Zhang, Q.**, T. Fisher, C. Buchanan, A. Gustafson, R. Karrh, R. Murphy, J. Testa, R. Tian, and P. Tango. 2023. “Nutrient limitation of phytoplankton in three tributaries of Chesapeake Bay: Detecting ecosystem recovery following nutrient reductions,” oral presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Portland, OR, November 12-16, 2023.
- Clune, J.W., P.D. Capel, M.P. Miller, D.A. Burns, A.J. Sekellick, P.R. Claggett, R.M. Fanelli, J.P. Raffensperger, G. Bhatt, G.W. Shenk, **Q. Zhang**, and L.C. Linker. 2023. “Nitrogen in the Chesapeake Bay Watershed: A Century of Change, 1950 – 2050,” oral presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Portland, OR, November 12-16, 2023.
- Zhang, Q.** 2023. “Improvement of riverine concentration and loading estimation with the consideration of flow anomalies,” oral presentation at *U.S. Geological Survey Great Lakes / Chesapeake Bay Joint Meeting*, Catonsville, MD, October 26, 2023.
- Bertani, I., **Q. Zhang**, and M. Evans. 2023. “Introduction to AI within Watershed Management,” oral presentation at *Chesapeake Bay Program Modeling Quarterly Review Meeting*, Annapolis, MD, October 17-18, 2023.
- Tango, P., and **Q. Zhang**. 2023. “Adaptive Monitoring for Adaptive Management,” invited oral presentation at *California Stormwater Quality Association (CASQA) Monitoring and Science Subcommittee Meeting*, virtual, October 16, 2023.
- Bertani, I., **Q. Zhang**, and M. Evans. 2023. “Introduction to AI within Watershed Management,” oral presentation at *Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) Quarterly Meeting*, Baltimore, MD, September 12-13, 2023.
- Zhang, Q.** 2023. “Progress in reducing nutrient loads to Chesapeake Bay: A synthesis of three decades of monitoring data and research,” invited seminar, Nanjing University, Nanjing, China, July 19, 2023.
- Zhang, Q.** 2023. “Progress in reducing nutrient loads to Chesapeake Bay: A synthesis of three decades of monitoring data and research,” invited seminar, Nanjing Institute of Geography & Limnology, Nanjing, China, July 19, 2023.
- Guo, D., C. Minaudo, **Q. Zhang**, R. Dupas, S. Liu, K. Zhang., U. Bende-Michl, C. Duver, and A. Lintern. 2023. “Australia’s water quality trends over two decades,” oral presentation at *25th International Congress on Modelling and Simulation*, Darwin, NT, Australia, July 9-14, 2023.
- Duarte, A.C., M. Rodríguez-Blanco, and **Q. Zhang**. 2023. “Sensing the hydrology and water quality in a small agro-forestry basin,” oral presentation at *Agriculture 4.0: Current reality, potentialities and policy proposals*, virtual, July 14, 2023.
- Zhang, Q.** 2023. “Progress in reducing nutrient loads to Chesapeake Bay: A synthesis of three decades of monitoring data and research,” invited seminar, School of Earth System Science, Tianjin University, Tianjin, China, July 7, 2023.
- Zhang, Q.** 2023. “Progress in reducing nutrient loads to Chesapeake Bay: A synthesis of three decades of monitoring data and research,” invited seminar, College of Environmental Science and Engineering, Nankai University, Tianjin, China, July 7, 2023.

- Zhang, Q.** 2023. “Progress in reducing nutrient loads to Chesapeake Bay: A synthesis of three decades of monitoring data and research,” invited seminar, School of Atmosphere Sciences, Sun Yat-Sen University, virtual, July 4, 2023.
- Zhang, Q.** 2023. “Progress in reducing nutrient loads to Chesapeake Bay: A synthesis of three decades of monitoring data and research,” invited seminar, College of Environmental and Resource Sciences, Zhejiang University, Hangzhou, China, June 27, 2023.
- Zhang, Q.** 2023. “Progress in reducing nutrient loads to Chesapeake Bay: A synthesis of three decades of monitoring data and research,” invited seminar, College of the Environment and Ecology, Xiamen University, Xiamen, China, June 24, 2023.
- Zhang, Q.,** J. Blomquist, R.M. Fanelli, J. Keisman, D. Moyer, and M. Langland. 2023. “Progress in reducing nutrient loads to Chesapeake Bay: A synthesis of three decades of monitoring data and research,” oral presentation at the *International Association for Great Lakes Research (IAGLR) Annual Conference*, Toronto, Canada, May 8-12, 2023.
- Shenk, G. and **Q. Zhang.** 2023. “Integrated watershed-wide indicator of the TMDL-required reduction of nitrogen and phosphorus,” oral presentation at *Chesapeake Bay Program Modeling Quarterly Review Meeting*, Annapolis, MD, April 4-5, 2023.
- Zhang, Q.** 2023. “Progress in reducing nutrient and sediment loads to Chesapeake Bay: Three decades of monitoring data and implications for restoring complex ecosystems,” invited oral presentation at *UMCES Horn Point Seminars*, Cambridge, MD, March 29, 2023.
- Webber, J., J. Chanat, J. Clune, O. Devereux, N. Hall, R. Sabo, and **Q. Zhang.** 2023. “Evaluating water-quality trends in watersheds prioritized for management-practice implementation,” oral presentation at *Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) Workshop: Using Local Monitoring Results to Inform the Chesapeake Bay Program's Watershed Model*, Fairfax, VA, March 7-8, 2023.
- Zhang, Q.,** J. Blomquist, R.M. Fanelli, J. Keisman, D. Moyer, and M. Langland. 2022. “Progress in reducing nutrient and sediment loads to Chesapeake Bay: Three decades of monitoring data and implications for restoring complex ecosystems,” poster presentation at *American Geophysical Union (AGU) Fall Meeting*, Chicago, IL, December 12-16, 2022.
- Zhang, Q.,** T. Fisher, C. Buchanan, A. Gustafson, R. Karrh, R. Murphy, J. Testa, R. Tian, and P. Tango. 2022. “Nutrient limitation of phytoplankton in three tributaries of Chesapeake Bay: Detecting ecosystem recovery following nutrient reductions,” poster presentation at *American Geophysical Union (AGU) Fall Meeting*, Chicago, IL, December 12-16, 2022.
- Chang, S.Y., **Q. Zhang,** N.B. Basu, and K.J. Van Meter. 2022. “Dams, nutrients, and water quality: A study of time-explicit reservoir ecological functions in the Chesapeake Bay Watershed,” oral presentation at *American Geophysical Union (AGU) Fall Meeting*, Chicago, IL, December 12-16, 2022.
- Zhang, Q.** 2022. “Progress in reducing nutrient and sediment loads to Chesapeake Bay: Three decades of monitoring data and implications for restoring complex ecosystems,” invited presentation at *4th International Conference on Resources and Environmental Research*, virtual conference, December 2-4, 2022.
- Zhang, Q.,** J. Bostic, and R.D. Sabo. 2022. “Regional patterns and drivers of total nitrogen trends in the Chesapeake Bay watershed: Insights from machine learning approaches and management implications,” oral presentation at *Frontiers in Hydrology Meeting (FIHM)*, San Juan, Puerto Rico, June 19-24, 2022.
- Zhang, Q.,** J. Blomquist, R.M. Fanelli, J. Keisman, D. Moyer, and M. Langland. 2022. “Progress in reducing nutrient and sediment loads to Chesapeake Bay: Three decades of monitoring data and implications for restoring complex ecosystems,” poster presentation at *Frontiers in Hydrology Meeting (FIHM)*, San Juan, Puerto Rico, June 19-24, 2022.
- Zhang, Q.,** T. Fisher, C. Buchanan, A. Gustafson, R. Karrh, R. Murphy, J. Testa, R. Tian, and P. Tango. 2022. “Nutrient limitation of phytoplankton in three tidal tributaries of Chesapeake Bay: A machine learning approach for detecting ecosystem recovery following nutrient reductions,” oral presentation at *Chesapeake Community Research Symposium*, Annapolis, MD, June 8-10, 2022.

- Chang, S.Y., **Q. Zhang**, D.K. Byrnes, N.B. Basu, and K.J. Van Meter. 2022. “Chesapeake legacies: The importance of legacy nitrogen to improving Chesapeake Bay water quality,” oral presentation at *Chesapeake Community Research Symposium*, Annapolis, MD, June 8-10, 2022.
- Murphy, R., J. Keisman, J. Harcum, R. Karrh, M. Lane, E. Perry, and **Q. Zhang**. 2022. “Nutrient improvements in Chesapeake Bay: Direct effect of load reductions and implications for coastal management,” oral presentation at *Chesapeake Community Research Symposium*, Annapolis, MD, June 8-10, 2022.
- Zhang, Q.**, J. Bostic, and R.D. Sabo. 2022. “Regional patterns and drivers of total nitrogen trends in the Chesapeake Bay watershed: Insights from machine learning approaches and management implications,” oral presentation at *European Geosciences Union (EGU) General Assembly*, virtual conference, May 23-27, 2022.
- Zhang, Q.**, J. Bostic, and R.D. Sabo. 2022. “Regional patterns and drivers of total nitrogen trends in the Chesapeake Bay watershed: Insights from machine learning approaches and management implications,” poster presentation at *HydroML Symposium*, State College, PA, May 18-20, 2022.
- Zhang, Q.**, T. Fisher, C. Buchanan, A. Gustafson, R. Karrh, R. Murphy, R. Tian, J. Testa, J. Keisman, and P. Tango. 2022. “Nutrient Limitation of Phytoplankton in Three Tidal Tributaries to Chesapeake Bay: Detecting Ecosystem Recovery Following Nutrient Reductions,” oral presentation at *Joint Aquatic Sciences Meeting (JASM)*, Grand Rapids, MI, May 14-20, 2022.
- Chang, S.Y., **Q. Zhang**, D.K. Byrnes, N.B. Basu, and K.J. Van Meter. 2022. “Chesapeake legacies: The importance of legacy nitrogen to improving Chesapeake Bay water quality,” oral presentation at *Joint Aquatic Sciences Meeting (JASM)*, Grand Rapids, MI, May 14-20, 2022.
- Tian, R., **Q. Zhang**, and P. Tango. 2022. “DO criteria assessment and data inventory,” oral presentation at *Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) Workshop: Advancing Monitoring Approaches to Enhance Tidal Chesapeake Bay Habitat Assessment including Water Quality Standards for Chesapeake Bay Dissolved Oxygen, Water Clarity/SAV and Chlorophyll a Criteria*, virtual conference, May 11, 2022.
- Zhang, Q.**, T. Fisher, E. Trentacoste, C. Buchanan, A. Gustafson, R. Karrh, R. Murphy, J. Keisman, C. Wu, R. Tian, J. Testa, and P. Tango. 2021. “Nutrient limitation of phytoplankton in Chesapeake Bay: Development of an empirical approach for water-quality management,” oral presentation at *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 13-17, 2021.
- Zhang, Q.**, J. Bostic, and R.D. Sabo. 2021. “Regional patterns and drivers of nitrogen trends in a human-impacted watershed and management implications,” oral presentation at *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 13-17, 2021.
- Chang, S.Y., **Q. Zhang**, D.K. Byrnes, N.B. Basu, and K.J. Van Meter. 2021. “Chesapeake legacies: the importance of legacy nitrogen to improving Chesapeake Bay water quality,” poster presentation at *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 13-17, 2021.
- Van Meter, K.J., S.Y. Chang, N.B. Basu, S.P. Inamdar, and **Q. Zhang**. 2021. “Dams, Reservoirs, and Nutrients in the Chesapeake Bay Watershed: Past trajectories and Future Horizons (Invited),” oral presentation at *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 13-17, 2021.
- Sabo, R.D., B. Sullivan, C. Wu, E.M. Trentacoste, **Q. Zhang**, G. Shenk, G. Bhatt, and L. Linker. 2021. “Major sources of point and nonpoint source nutrient pollution to surface water have declined throughout the Chesapeake Bay watershed,” oral presentation at *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 13-17, 2021.
- Zhang, Q.**, T. Fisher, E. Trentacoste, C. Buchanan, A. Gustafson, R. Karrh, R. Murphy, J. Keisman, C. Wu, R. Tian, J. Testa, and P. Tango. 2021. “Nutrient limitation of phytoplankton in Chesapeake Bay: Development of an empirical approach for water-quality management,” oral presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, virtual conference, November 1-11, 2021.
- Chang, S.Y., **Q. Zhang**, D.K. Byrnes, N.B. Basu, and K.J. Van Meter. 2021. “Chesapeake legacies: The importance of legacy nitrogen to improving Chesapeake Bay water quality,” oral presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, virtual conference, November 1-11, 2021.

- Langendorf, R.E., V. Lyubchich, J. M. Testa, and **Q. Zhang**. 2021. “Inferring controls of dissolved oxygen criterion attainment in Chesapeake Bay,” oral presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, virtual conference, November 1-11, 2021.
- Tango, P.J., B. Sullivan, **Q. Zhang**, R.R. Murphy, and L. Chudoba. 2021. “New water quality monitoring data: Filling gaps for Chesapeake Bay Program decision-support,” oral presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, virtual conference, November 1-11, 2021.
- Zhang, Q.**, P. Tango, R. Murphy, M. Forsyth, R. Tian, J. Keisman, and E. Trentacoste. 2021. “Long-term Changes in Chesapeake Bay Water Quality: An Integrated Assessment of Dissolved Oxygen, Chlorophyll-a, and Water Clarity,” oral presentation at *ECOA 58 - EMECS 13 Estuaries and coastal seas in the Anthropocene*, virtual conference, September 6-9, 2021.
- Chang, S.Y., **Q. Zhang**, D.K. Byrnes, N.B. Basu, and K.J. Van Meter. 2021. “Chesapeake legacies: The importance of legacy nitrogen to improving Chesapeake Bay water quality,” oral presentation at *Society for Freshwater Scientists (SFS) Annual Meeting*, virtual conference, May 23-27, 2021.
- Preisendanz, H., T. Veith, **Q. Zhang**, J. Biertempfel, and J. Shortle. 2021. “Coupling C-Q and Lorenz Inequality Analyses to Create a Temporal Targeting Framework for Watershed-Scale Decision-Making,” oral presentation at *European Geosciences Union (EGU) General Assembly*, virtual conference, April 19-30, 2021.
- Zhang, Q.**, J.S. Webber, D.L. Moyer, and J.G. Chanut. 2021. “Estimating river water-quality trends under different flow conditions,” oral presentation at *European Geosciences Union (EGU) General Assembly*, virtual conference, April 19-30, 2021.
- Zhang, Q.**, J.S. Webber, D.L. Moyer, and J.G. Chanut. 2021. “An Approach for Decomposing River Water-Quality Trends Into Different Flow Classes,” oral presentation at *National Monitoring Council Annual Conference*, virtual conference, April 19-23, 2021.
- Zhang, Q.**, T. Fisher, E. Trentacoste, C. Buchanan, A. Gustafson, R. Karrh, R. Murphy, J. Keisman, C. Wu, R. Tian, J. Testa, and P. Tango. 2021. “Chesapeake Bay nutrient limitation: A re-analysis of long-term monitoring data and implications for water-quality management,” oral presentation at *National Monitoring Council Annual Conference*, virtual conference, April 19-23, 2021.
- Zhang, Q.**, J.S. Webber, D.L. Moyer, and J.G. Chanut. 2020. “An approach for decomposing estimated river water-quality trends into different flow classes,” oral presentation at *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 1-17, 2020.
- Van Meter, K.J., S. Chang, N.B. Basu, **Q. Zhang**, and D.K. Byrnes. 2020. “Chesapeake Legacies: Implications of Legacy N Accumulation for Water Quality Improvements in the Chesapeake Bay,” invited oral presentation at *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 1-17, 2020.
- Wu, C., B. Sullivan, **Q. Zhang**, R. Sabo, and E. Trentacoste. 2020. “Chesapeake Bay Watershed County-Wide Nutrient Inventory: Assessing Spatial Patterns and Trends to Inform Management Decisions,” poster presentation at *American Geophysical Union (AGU) Fall Meeting*, virtual conference, December 1-17, 2020.
- Zhang, Q.**, T. Fisher, E. Trentacoste, C. Buchanan, R. Murphy, J. Keisman, C. Wu, R. Tian, A. Gustafson, R. Karrh, J. Testa, and P. Tango. 2020. “Chesapeake Bay nutrient limitation: A re-analysis of long-term monitoring data and implications for water-quality management,” oral presentation at *Maryland Water Monitoring Council Annual Conference*, virtual conference, December 3-4, 2020.
- Zhang, Q.**, T. Fisher, E. Trentacoste, C. Buchanan, R. Murphy, J. Keisman, C. Wu, R. Tian, A. Gustafson, R. Karrh, J. Testa, and P. Tango. 2020. “Nutrient Limitation in Three Major Tributaries to Chesapeake Bay,” oral presentation at *Chesapeake Bay Program Modeling Quarterly Review Meeting*, virtual meeting, October 6-7, 2020.
- Zhang, Q.**, R. Tian, and L. Linker. 2020. “Estimated Tidal Bay Nutrient Limitation with Applications to the 2017 Bay Model,” oral presentation at *Chesapeake Bay Program Modeling Workgroup Conference Call*, virtual meeting, September 10, 2020.

- Zhang, Q.**, T. Fisher, E. Trentacoste, C. Buchanan, R. Murphy, J. Keisman, C. Wu, R. Tian, A. Gustafson, R. Karrh, J. Testa, and P. Tango. 2020. “Refined Analysis of Tidal Bay Nutrient Limitation and Potential Applications to the 2017 Bay Model,” oral presentation at *Chesapeake Bay Program Modeling Quarterly Review Meeting*, virtual meeting, July 7-8, 2020.
- Zhang, Q.**, T. Fisher, E. Trentacoste, C. Buchanan, R. Murphy, J. Keisman, C. Wu, R. Tian, A. Gustafson, R. Karrh, J. Testa, and P. Tango. 2020. “Chesapeake Bay nutrient limitation: A re-analysis of long-term monitoring data and implications for water-quality management,” oral presentation at *Chesapeake Community Research Symposium*, virtual conference, June 8-10, 2020.
- Preisendanz, H., **Q. Zhang**, and T. Veith. 2020. “Quantifying the Temporal and Spatial Inequality of Nutrient Transport to the Chesapeake Bay using Lorenz Inequality and Gini Coefficients,” oral presentation at *Chesapeake Community Research Symposium*, virtual conference, June 8-10, 2020.
- Bostic, J., **Q. Zhang**, and R. Sabo. 2020. “Classification of river discharge and nutrient export from the tributaries to Chesapeake Bay: Cluster analysis of riverine monitoring data in 1985-2016,” oral presentation at *Chesapeake Community Research Symposium*, virtual conference, June 8-10, 2020.
- Wu, C., B. Sullivan, **Q. Zhang**, R. Sabo, and E. Trentacoste. 2020. “Chesapeake Bay Watershed county-wide maps for nutrient inputs: Spatial and temporal patterns in 1985-2018,” oral presentation at *Chesapeake Community Research Symposium*, virtual conference, June 8-10, 2020.
- Sullivan, B., C. Wu, R. Sabo, **Q. Zhang**, and E. Trentacoste. 2020. “Illustrating the History of Nutrient Inputs from Counties in the Chesapeake Bay Watershed,” oral presentation at *Chesapeake Community Research Symposium*, virtual conference, June 8-10, 2020.
- Thomas, Z., O. Fovet, **Q. Zhang**, C. Rajanayaka, C. Zammit, and C. Gascuel-Oudou. 2020. “Main knowledge gaps in critical zone processes and behaviour: Extracting information from water quality time-series data and models outputs,” oral presentation at *EGU General Assembly 2020*, online, May 4-8, 2020.
- Chang, S., **Q. Zhang**, D. Byrnes, N. Basu, and K. Van Meter. 2019. “Water Futures: Legacy Nitrogen and Chesapeake Bay Water Quality,” poster presentation at *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 9-13, 2019.
- Wei, Z., J. Wolf, E. Trentacoste, **Q. Zhang**, R. Tian, and P. Tango. 2019. “Web-based Spatio-temporal Visualization of Water Quality and Habitat Status and Change in Chesapeake Bay,” poster presentation at *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 9-13, 2019.
- Zhang, Q.**, E. Trentacoste, C. Wu, C. Buchanan, A. Gustafson, and T. Fisher. 2019. “Revisiting Chesapeake Bay resource limitation: A re-analysis of bioassay and tidal monitoring data and implications for water-quality management,” oral presentation at *Maryland Water Monitoring Council Annual Conference*, virtual conference, December 6, 2019.
- Zhang, Q.**, P. Tango, R. Murphy, M. Forsyth, R. Tian, J. Keisman, and E. Trentacoste. 2019. “Long-term monitoring data and science-based assessment approaches combined to reveal water-quality changes in Chesapeake Bay,” poster presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Mobile, AL, November 3-7, 2019.
- Trentacoste, E., **Q. Zhang**, C. Buchanan, C. Wu, T. Fisher, and A. Gustafson. 2019. “Seasonal and spatial variations in phytoplankton resource limitation have changed over time in Chesapeake Bay,” poster presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Mobile, AL, November 3-7, 2019.
- Wei, Z., J. Wolf, E. Trentacoste, **Q. Zhang**, R. Tian, and P. Tango. 2019. “Web-based 4-Dimensional Visualization of Water Quality and Habitat Status and Change in Chesapeake Bay,” oral presentation at *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Mobile, AL, November 3-7, 2019.
- Wu, C., **B. Sullivan**, E. Trentacoste, **Q. Zhang**, and R. Sabo. 2019. “Integrating monitoring and modeling data to better inform management decisions,” poster presentation at *AGNR Cornerstone Event: Ensure a clean and healthy Chesapeake Bay*, College Park, MD, October 30, 2019.

- Zhang, Q.** 2019. “Synthesis of long-term trends of nutrient and sediment loads to the Chesapeake Bay,” invited oral presentation at *Appalachian Laboratory Visiting Scholar Seminar Series*, Frostburg, MD, October 3, 2019.
- Zhang, Q.** 2019. “Spatial and Temporal Patterns in Chesapeake Bay Resource Limitation,” oral presentation at *Chesapeake Bay Program Modeling Quarterly Review Meeting*, Annapolis, MD, July 17, 2019.
- Wei, Z., J. Wolf, E. Trentacoste, **Q. Zhang**, R. Tian, and P. Tango. 2019. “Web-based 4D Visualization of Water Quality and Habitat Status in Chesapeake Bay,” poster presentation at *USGS Chesapeake Bay Workshop*, Shepherdstown, WV, June 25-27, 2019.
- Zhang, Q.**, P. Tango, R. Murphy, M. Forsyth, R. Tian, J. Keisman, and E. Trentacoste. 2019. “Chesapeake Bay Water Quality Standards and Criteria Attainment: Temporal and Spatial Patterns in 1985-2016,” poster presentation at *USGS Chesapeake Bay Workshop*, Shepherdstown, WV, June 25-27, 2019.
- Zhang, Q.**, P. Tango, R. Murphy, M. Forsyth, R. Tian, J. Keisman, and E. Trentacoste. 2018. “Water quality status and trends in Chesapeake Bay and its tidal tributaries in 1985-2016: Temporal and spatial patterns uncovered through criteria attainment assessments,” poster presentation at *National Monitoring Conference*, Denver, CO, March 25-29, 2019.
- Zhang, Q.** 2019. “Characteristics and temporal trends of nutrient and sediment loads from the nontidal Chesapeake watershed,” oral presentation at *Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) Workshop: Assessing the Environment in Outcome Units (AEIOU): Using Eutrophying Units for Management*, Annapolis, MD, March 20-21, 2019.
- Zhang, Q.**, P. Tango, R. Murphy, M. Forsyth, R. Tian, J. Keisman, and E. Trentacoste. 2018. “Water quality status and trends in Chesapeake Bay and its tidal tributaries in 1985-2016: Temporal and spatial patterns uncovered through criteria attainment assessments,” oral presentation at *American Geophysical Union (AGU) Fall Meeting*, Washington, D.C., December 10-14, 2018.
- Van Meter, K. J., **Q. Zhang**, and N. Basu. 2018. “Chesapeake Legacies: Implications of Groundwater N Accumulation for Water Quality Improvements in the Chesapeake Bay (Invited),” oral presentation at *American Geophysical Union (AGU) Fall Meeting*, Washington, D.C., December 10-14, 2018.
- Zhang, Q.**, R. Murphy, M. Forsyth, R. Tian, E. Trentacoste, J. Keisman, and P. Tango. 2018. “Long-Term Status and Trends in Chesapeake Bay Water Quality: Insights from Criteria Attainment Assessments and Linkage to Nutrient Load Management,” oral presentation at *American Water Resources Association (AWRA) Annual Conference*, Baltimore, MD, November 4-8, 2018.
- Blomquist, J., R. Fanelli, J. Keisman, **Q. Zhang**, D. Moyer, and M. Langland. 2018. “A History of Nutrient and Sediment Inputs to Chesapeake Bay, 1985-2016: Three Decades of Monitoring and Coordinated Restoration in the Chesapeake Watershed,” oral presentation at *American Water Resources Association (AWRA) Annual Conference*, Baltimore, MD, November 4-8, 2018.
- Zhang, Q.** 2018. “Synthesis of long-term trends of nutrient and sediment loads to Chesapeake Bay: Insights from statistical analyses of monitoring data,” invited oral presentation at *University of Maryland Eastern Shore Seminar Series*, Princess Anne, MD, October 11, 2018.
- Zhang, Q.** 2018. “Synthesis of long-term patterns of nutrient and sediment export from the Chesapeake Bay watershed: What have we learned from statistical analyses of monitoring data?,” invited oral presentation at *UMCES Horn Point Seminars*, Cambridge, MD, July 5, 2018.
- Zhang, Q.**, R. Murphy, R. Tian, M. Forsyth, E. Trentacoste, J. Keisman, and P. Tango. 2018. “Status and trends of the Chesapeake Bay water quality standards criteria attainment in 1985-2016: Insights from assessment of thirty years of tidal water quality monitoring data,” oral presentation at *Chesapeake Research & Modeling Symposium*, Annapolis, MD, June 12-14, 2018.
- Zhang, Q.**, and J. Blomquist. 2018. “Watershed export of fine sediment, organic carbon, and chlorophyll-a to Chesapeake Bay: Spatial and temporal patterns in 1984-2016,” oral presentation at *Chesapeake Research & Modeling Symposium*, Annapolis, MD, June 12-14, 2018.

- Zhang, Q.**, D. Ha, H. Wei, and W. Ball. 2018. “Retrospective analysis of sediment-associated phosphorus concentration in the major tributaries to Chesapeake Bay,” oral presentation at *Chesapeake Research & Modeling Symposium*, Annapolis, MD, June 12-14, 2018.
- Staver, K., **Q. Zhang**, and W.P. Ball. 2018. “Improving estimates of sub-scour storm flow loads to Chesapeake Bay from the Susquehanna watershed,” oral presentation at *Chesapeake Research & Modeling Symposium*, Annapolis, MD, June 12-14, 2018.
- Testa, J., **Q. Zhang**, and V. Lyubchich. 2018. “Patterns and trends in Secchi disk depth over three decades in the Chesapeake Bay estuarine complex,” oral presentation at *Chesapeake Research & Modeling Symposium*, Annapolis, MD, June 12-14, 2018.
- Van Meter, K. J., P. Van Cappellen, **Q. Zhang**, and N. Basu. 2018. “Landscape legacies: Long-term nitrogen trajectories in the Chesapeake Bay watershed and beyond,” oral presentation at *Chesapeake Research & Modeling Symposium*, Annapolis, MD, June 12-14, 2018.
- Blomquist, J., R. Fanelli, J. Keisman, **Q. Zhang**, D. Moyer, and M. Langland. 2018. “A history of nutrient and sediment inputs to Chesapeake Bay: 1985-2016,” oral presentation at *Chesapeake Research & Modeling Symposium*, Annapolis, MD, June 12-14, 2018.
- Keisman, J., C. Friedrichs, C. Buchanan, R. Batiuk, J. Blomquist, J. Cornwell, M. Lane, S. Lyubchich, K. Moore, R. Murphy, G. Noe, R. Orth, E. Porter, L. Sanford, J. Testa, M. Trice, **Q. Zhang**, and R. Zimmerman. 2018. “Examining trends in water clarity in the Chesapeake Bay: A synthesis of findings from recent STAC workshops,” oral presentation at *Chesapeake Research & Modeling Symposium*, Annapolis, MD, June 12-14, 2018.
- Zhang, Q.** 2018. “Synthesis of decadal-scale patterns of nutrient and sediment delivery from Susquehanna River to Chesapeake Bay: What have we learned from long-term monitoring records?” **invited** oral presentation at *Chesapeake Biological Laboratory Distinguished Scholar Seminar Series*, Solomons, MD, March 7, 2018.
- Keisman, J., R. Murphy, R. Karrh, M. Lane, **Q. Zhang**, M. Merritt, and P. Tango. 2018. “Tidal Water Quality Status and Trends: Aquatic Conditions Respond to Watershed Changes,” oral presentation at *Chesapeake Bay Program Principle Staff Committee Meeting*, Baltimore, MD, March 2, 2018.
- Zhang, Q.**, R. Tian, and P. Tango. 2017. “Status and Trends of the Chesapeake Bay Water Quality Standards Criteria Attainment,” oral presentation at *Maryland Water Monitoring Council Annual Conference*, Linthicum Heights, MD, December 8, 2017.
- Zhang, Q.** and J.D. Blomquist. 2017. “Quantification of Fine Sediment, Organic Carbon, and Chlorophyll-a Export from Major Tributaries to Chesapeake Bay,” oral presentation at the *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Providence, RI, November 5-9, 2017.
- Ball, W.P. and **Q. Zhang**. 2017. “Net Deposition behind Conowingo Dam under Different Flow Conditions: Trends and Uncertainties,” poster presentation at the *Coastal & Estuarine Research Federation (CERF) Biennial Conference*, Providence, RI, November 5-9, 2017.
- Zhang, Q.** and W.P. Ball. 2017. “Synthesis of Long-term Patterns of Nutrient and Sediment Export from the Chesapeake Bay Watershed,” **invited** oral presentation at the *International Association for Great Lakes Research (IAGLR) Annual Conference*, Detroit, MI, May 15-19, 2017.
- Zhang, Q.** 2017. “Evaluation of Results from the HDR Conowingo Sediment Transport Model,” oral presentation at *Chesapeake Bay Program Modeling Quarterly Review Meeting*, Annapolis, MD, February 14, 2017.
- Zhang, Q.** and J.D. Blomquist. 2017. “Long-term Riverine Inputs from Major Tributaries to Chesapeake Bay Relevant to Water Clarity,” oral presentation at *Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) Workshop: Understanding and Explaining 30+ Years of Water Clarity Trends in the Bay's Tidal Waters*, Solomons, MD, February 6-7, 2017.
- Zhang, Q.**, C.J. Harman, and W.P. Ball. 2016. “An Improved Method for Interpretation of Concentration-Discharge Relationships in Riverine Water-Quality Data,” poster presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA, December 12-16, 2016.

- W.P. Ball and **Q. Zhang**. 2016. "Improving Riverine Constituent Concentration and Flux Estimation by Accounting for Antecedent Discharge Conditions," oral presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA, December 12-16, 2016.
- Zhang, Q.** 2016. "Decadal-Scale Changes in Sediment and Nutrient Delivery from Conowingo Reservoir to Chesapeake Bay: Statistical Evaluations of Reservoir Trapping Using Long-Term Monitoring Data," **invited** oral presentation at *Chesapeake Bay Program Scientific, Technical Assessment and Reporting (STAR) Team Meeting*, Annapolis, MD, October 27, 2016.
- Zhang, Q.**, R.M. Hirsch, and W.P. Ball. 2016. "Temporal Changes in Net Deposition of Sediment and Nutrients behind Conowingo Dam under Different Flow Conditions: Statistical Evaluations of Monitoring Data between 1987 and 2013," oral presentation at *Chesapeake Modeling Symposium*, Williamsburg, VA, June 1-2, 2016.
- Zhang, Q.**, D.C. Brady, W.R. Boynton, and W.P. Ball. 2016. "Nutrient and Sediment Trends from the Nontidal Chesapeake Bay Watershed: Synthesis of Progress by Season for the Nine Major Tributaries," oral presentation at *Chesapeake Modeling Symposium*, Williamsburg, VA, June 1-2, 2016.
- Zhang, Q.**, R.M. Hirsch, and W.P. Ball. 2016. "Effects of Reservoir Filling on Sediment and Nutrient Delivery from Susquehanna River to Chesapeake Bay: Input-Output Analyses based on Long-Term Monitoring," **invited** oral presentation at *U.S. Geological Survey MD-DE-DC Water Science Center Seminars*, Baltimore, MD, April 12, 2016.
- Zhang, Q.**, R.M. Hirsch, and W.P. Ball. 2016. "Effects of Reservoir Filling on Sediment and Nutrient Removal in the Lower Susquehanna River Reservoir System: An Input-Output Analysis based on Long-Term Monitoring," **invited** oral presentation at *Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) Workshop: Conowingo Infill Influence on Chesapeake Water Quality*, Annapolis, MD, January 13-14, 2016.
- Zhang, Q.** and W.P. Ball. 2015. "Non-stationary Concentration-Discharge Relationships for Nitrogen, Phosphorus, and Sediment for Nine Major Tributaries of the Chesapeake Bay," oral presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA, December 14-18, 2015.
- W.P. Ball, **Q. Zhang**, and R.M. Hirsch. 2015. "Effects of Reservoir Filling on Sediment and Nutrient Removal in the Lower Susquehanna River Reservoir: An Input-Output Analysis Based on Long-Term Monitoring," oral presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA, December 14-18, 2015.
- Zhang, Q.** and W.P. Ball. 2015. "Concentration-Discharge Relationships for Nutrients and Sediment in Major Tributaries to Chesapeake Bay: Typical Patterns and Non-Stationarity," poster presentation at *Maryland Water Monitoring Council Annual Conference*, Linthicum Heights, MD, November 13, 2015.
- Zhang, Q.**, W.P. Ball., and D.L. Moyer. 2015. "Long-Term Export of Nitrogen, Phosphorus, and Sediment in the Susquehanna River Basin: Analysis of Decadal-Scale Trends and Sub-Basin Mass Balances," oral presentation at *Geological Society of America Annual Meeting*, Baltimore, MD, November 1-4, 2015.
- Ball, W.P., **Q. Zhang**, D.C. Brady, and W.R. Boynton. 2015. "Long-term Trends of Nutrients and Sediment from the Non-tidal Chesapeake Watershed: An Assessment of Progress by River and Season," oral presentation at *Association of Environmental Engineering and Science Professors Annual Conference*, New Haven, CT, June 13-16, 2015.
- Zhang, Q.**, C.J. Harman, and W.P. Ball. 2014. "Evaluation of Methods for Estimating Long-Range Dependence in Water Quality Time Series with Missing Data and Irregular Sampling," poster presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA, December 15-19, 2014.
- Ball, W.P., **Q. Zhang**, D.C. Brady, and W.R. Boynton. 2014. "Long-Term Loads of Nutrients and Sediment from Non-Tidal Regions of the Chesapeake Bay Watershed: An Assessment of Seasonal Trends and Progress," poster presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA, December 15-19, 2014.
- Wei, H., D. Ha, **Q. Zhang**, and W.P. Ball. 2014. "Effectiveness of Nitrogen Assimilation in the Non-Tidal Chesapeake Bay Watershed: Evaluations Based on Thirty Years of Data," poster presentation at *American Geophysical Union Fall Meeting*, San Francisco, CA, December 15-19, 2014.

- Ha, D., H. Wei, **Q. Zhang**, and W.P. Ball. 2014. Retrospective Analysis of Sediment-associated Phosphorus Concentration in the Non-Tidal Chesapeake Bay Watershed, poster presentation at *Maryland Water Monitoring Council Annual Conference*, Linthicum Heights, MD, November 21, 2014.
- Ha, D., H. Wei, **Q. Zhang**, and W.P. Ball. 2014. Nitrogen Source Input from the Non-Tidal Chesapeake Bay Watershed and Output in the Major Rivers: Evaluation of Changes Based on Long-term Data, poster presentation at *Maryland Water Monitoring Council Annual Conference*, Linthicum Heights, MD, November 21, 2014.
- Wei, H., D. Ha, **Q. Zhang**, and W.P. Ball. 2014. “Retrospective Analysis of Phosphorus Source Input and Riverine Output in the Chesapeake Bay Watershed,” poster presentation at *Maryland Water Monitoring Council Annual Conference*, Linthicum Heights, MD, November 21, 2014.
- Zhang, Q.** and W.P. Ball. 2014. “Decadal-scale Trends of Nutrients and Sediment from the Non-tidal Chesapeake Bay Watershed: Are We Making of Progress in Loading Reduction,” poster presentation at *Gordon Research Conference - Environmental Sciences: Water*, Holderness, NH, June 22-27, 2014.
- Zhang, Q.** and W.P. Ball. 2014. “Nutrient and Sediment Delivery from the Susquehanna River to Chesapeake Bay: Long-term Changes in Loading Trend and Reservoir Sedimentation,” oral presentation at *Chesapeake Modeling Symposium*, Annapolis, MD, May 28-29, 2014.
- Zhang, Q.** and W.P. Ball. 2014. “Long-term trends and mass-balance of nutrient and sediment loadings in the Lower Susquehanna River Watershed,” invited oral presentation at *Chesapeake Bay Program Modeling Quarterly Review Meeting*, Annapolis, MD, January 7, 2014.
- Zhang, Q.** and W.P. Ball. 2013. “Long-term Seasonal Trends of Nutrients and Sediment from the Non-tidal Chesapeake Bay Watershed: An Assessment of Progress in Loading Reduction,” oral presentation at *American Water Resources Association Annual Conference*, Portland, OR, November 4-7, 2013.
- Zhang, Q.** and W.P. Ball. 2013. “Nutrient and Sediment Loads Delivered through the Conowingo Reservoir,” invited oral presentation at *Maryland Department of Natural Resources Conowingo Dam Sediment Load Meeting*, Annapolis, MD, August 19, 2013.
- Zhang, Q.**, D.C. Brady, and W.P. Ball. 2013. “Application of a USGS Statistical Tool (WRTDS) toward Assessing Watershed Management and Reservoir Function in the Susquehanna River Basin,” poster presentation at *Association of Environmental Engineering and Science Professors 50th Anniversary Conference*, Golden, CO, July 14-16, 2013.
- Zhang, Q.**, D.C. Brady, and W.P. Ball. 2013. “Long-term Seasonal Trends of Nitrogen, Phosphorus, and Suspended Sediment Load from the Non-tidal Susquehanna River Basin to Chesapeake Bay,” poster presentation at *Community Surface Dynamics Modeling System Annual Meeting*, Boulder, CO, March 23-25, 2013.
- Zhang, Q.** and W.P. Ball. 2012. “Long-term Seasonal Nutrient Trends for the Non-tidal Portions of the Major Tributaries to Chesapeake Bay,” poster presentation at *Chesapeake Modeling Symposium*, Annapolis, MD, May 21-22, 2012.

Editorial Services

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Media Reports

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'Windows of opportunity' crucial for cutting Chesapeake nutrient, sediment loads by The Penn State News
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Experts say Chesapeake Bay water quality is the best since monitoring began by The Daily Press
Chesapeake Bay water quality highest since testing began by The NBC12
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Conowingo battle: sides look for alternative as fight drags on by Delmarva Now / Salisbury Daily Times
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The Chesapeake Bay hasn't been this healthy in 33 years, scientists say by The Washington Post
First Move: Industry Eyes Permitting Program Changes • Safety Board Recommendations • Chesapeake Bay Cleanup by The Bloomberg BNA

A Bay in a box: How scientific findings could help a computer model keep the Chesapeake Bay on its pollution diet by The Chesapeake Quarterly

Modeling studies provide new insights on dam's influence on water quality in Chesapeake Bay by Maryland Sea Grant

Qian Zhang wins national award for research on Chesapeake Bay by University of Maryland Center for Environmental Science (UMCES)

Qian Zhang received an award from the AAEES by Johns Hopkins University

2017 Innovyze Excellence in Computational Hydraulics/Hydrology Award by American Academy of Environmental Engineers and Scientists (AAEES)