

CURRICULUM VITA

WILLIAM PARKS BALL

Director, Chesapeake Research Consortium
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EDUCATION

- Ph.D. Department of Civil Engineering, Stanford University, Stanford, CA (January, 1990)
Dissertation: "Equilibrium Sorption and Diffusion Rate Studies with Halogenated Organic Chemicals and Sandy Aquifer Material"; Advisor: P.V. Roberts
- M.S. Department of Civil Engineering, Stanford University, Stanford, CA (May, 1977)
- B.S. Department of Civil Engineering, University of Virginia, Charlottesville, VA (June, 1976)

PROFESSIONAL EXPERIENCE

Executive Director, Chesapeake Research Consortium, Edgewater, MD; Jan 2015 – present.

Professor, Dept. of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, MD;
July 2001 to present (joint appointment with Dept. of Civil Engineering).

Adjunct Visiting Scientist, Chesapeake Research Consortium, Inc., Edgewater, MD; 2007 to present.

Associate Professor, Dept. of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, MD; July 1998 to present July 2001 (joint appointment with Dept. of Civil Engineering).

Assistant Professor, Dept. of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, MD; August 1992 to July 1998 (joint appointment with Dept. of Civil Engineering)

Assistant Professor, Dept. of Civil and Environ Engineering, Duke University, Durham, NC; Jan. 1990 - Aug. 1992.

Lecturer, Dept. of Civil and Environmental Engineering, Duke University, Durham, NC; Sept. 1989 - Dec. 1989.

Graduate Assistant, Stanford University, Stanford, CA; Sept. 1983 - Aug. 1989.

Supervising Engineer, James M. Montgomery Consulting Engineers, Washington, DC; Oct. 1980 - Jul. 1983.
Headed an on-site engineering team responsible for process research and testing, data analysis, and technical report writing associated with the 3-year operation, maintenance and performance evaluation of a 0.5 MGD experimental water treatment plant; U.S. Army Corps of Engineers project reviewed by NRC Committee.

Senior Engineer, James M. Montgomery Consulting Engineers, Reston, VA; May 1980 - Oct. 1980.
Project engineer on the study of a pretreatment facility to treat wastewater from a major brewery and a large cheese processing plant in Lehigh County, Pennsylvania.

Associate Engineer, James M. Montgomery Consulting Engineers, Walnut Creek, CA, and Williamsburg, VA; Aug. 1978 - May 1980. Assistant project engineer for the design and resident engineer for the construction of a major upgrade to a 19 MGD wastewater treatment plant in Williamsburg, VA.

Teaching Assistant, Ecole Nationale Supérieure des Arts et Industries de Strasbourg, Strasbourg, France. September 1977 - June 1978.

Laboratory Research Assistant, Infilco Degrémont, S.A., Paris, France. June 1977 - August 1977.

PROFESSIONAL REGISTRATION

Professional Engineer, Commonwealth of Virginia, License No. 12676.
Board Certified Environmental Engineer, American Academy of Environmental Engineers

PROFESSIONAL SOCIETIES

American Chemical Society (Environmental Chemistry Div.), American Geophysical Union (Hydrology Sect.), American Society of Civil Engineers (Environmental Engineering Div.), American Water Works Association, Association of Environmental Engineering Professors, Coastal and Estuarine Research Federation, Engineers Without Borders-USA (JHU Faculty Advisor, 2004-2015), International Water Association, Sigma Xi Scientific Research Society, Water Environment Federation

HONORS AND AWARDS

Diversity Recognition Award, Johns Hopkins Institutions Diversity Leadership Council, 2009

Capers and Marion McDonald Award for Excellence in Mentoring and Advising, 2008
JHU Office of Student Involvement Outstanding Student Organization Advisor Award, 2007
AEESP Outstanding Publication Award, 2006 (w/ PhD advisor, Paul V. Roberts)
AEESP/CH2M Hill Doctoral Thesis Award, 2006 (w/ advisee T. Helen Nguyen)
Excellence in Review Award, *Environmental Science and Technology*, 2004
Braun Intertec Visiting Professor, University of Minnesota, 2000
Rudolph Hering Medal, American Society of Civil Engineers, 1999 (with A. Braghetta and F.A. DiGiano).
Advisor; Outstanding student paper award, 1998 AGU Spring Meeting (G. Xia)
Advisor, 1997 API/NGWA Scholarship (C. Liu)
Presidential Young Investigator Award; National Science Foundation, 1991
Academic Achievement Award -- Second Place Doctoral Dissertation; American Water Works Assoc., 1991

RESEARCH INTERESTS AND CURRENT ACTIVITIES

Research Interests: Physical and chemical processes affecting chemical fate and treatment in natural environments and engineered systems with focus on integration of modeling with observational data at multiple scales to obtain better process understanding in complex aquatic systems.

Current Activities: As CRC Director, I am responsible for identifying and expanding research activities in or relevant to the Chesapeake Bay watershed for the extensive scientific community within the CRC member institutions as well as other regional scientists. I am especially interested in effectively tapping the depth and breadth of available research expertise to bring creative new solutions to tough environmental problems and to promote the Chesapeake Bay as an appropriate test bed for ground-breaking environmental research. Additionally, I am committed to the advancement of strongly inter-disciplinary approaches that can serve to ensure effective transfer of research results to regional managers and policy makers in understandable formats and manners. As Executive Secretary of the Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC), I am responsible for administering activities of this standing experts committee. As a continuing Professor at Johns Hopkins University, I am on 75% Leave of Absence for CRC activities but continue to teach one graduate level course and advise students on existing research projects on new projects that do not conflict with my CRC responsibilities.

PUBLICATIONS (* indicates student advisee)

Refereed Journal Articles (submitted or in press)

1. Zhang,* Q., D.C. Brady, W.R. Boynton, W.P. Ball, "Long-term Seasonal Trends of Nutrients and Sediment from the Non-tidal Chesapeake Bay Watershed: An Assessment of Progress," *Journal of the American Water Resources Association*, in press (2015)

Refereed Journal Articles (LAST 10 YEARS)

1. Murphy,* R.R., Perlman, E., Ball, W.P., and Curriero, F.C. "Water-Distance-Based Kriging in Chesapeake Bay." *J. Hydrol. Eng.*, doi: 10.1061/(ASCE)HE.1943-5584.0001135, 05014034 (2014).
2. Kelley,* C.D., A. Krolick, L. Brunner,* A. Burklund,* D. Kahn,* W. P. Ball,* and M. Weber-Shirk, "An Affordable Open-Source Turbidimeter," *Sensors*, 14(4): 7142-7155; doi:10.3390/s140407142 (2014).
3. Yang,* J.; Bitter, J. L.; Smith, B. A.; Fairbrother, D. H.; Ball, W. P., Transport of multi-walled carbon nanotubes through porous media: influences of aquatic chemistry, surface oxidation, and natural organic matter. *Environ. Sci. Technol.*, 47(24): 14034-14043 (2013).
4. Zhang,* Q., D.C. Brady, W.P. Ball, "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*, vol. 452-453: 208-221, ISSN 0048-9697, DOI 10.1016/j.scitotenv.2013.02.012 (2013).
5. Murphy,* R.R., Kemp, W.M., Ball, W.P., "Long-Term Trends in Chesapeake Bay Seasonal Hypoxia, Stratification, and Nutrient Loading. *Estuaries and Coasts*, 34(6): 1293-1309; DOI 10.1007/s12237-011-9413-7 (2011).
6. Silliman, S., R.H. Mohtar, K.G. Paterson and W.P. Ball, "Engineering Academic Programs for Hydrophilanthropy: Commonalities and Challenges," Universities Council on Water Resources: *Journal of Contemporary Water Research & Education*, 145: 5-29 (2010).
7. Perlman, R. Burns, M. Kazhdan, R. Murphy*, W.P. Ball, and N. Amenta. "Organization of Data in Non-Convex Spatial Domains," *22nd International Conference on Scientific and Statistical Database Management*, June 31 July 2, 2010, Heidelberg, Germany (2010).

8. Chen, K.L., B.A. Smith, W.P. Ball, and D.H. Fairbrother, "Assessing the Colloidal Properties of Engineered Nanoparticles in Water: Case Studies from Fullerene C60 Nanoparticles and Carbon Nanotubes," invited review, *Environmental Chemistry*, 7: 10-27, doi:10.1071/EN09112 (2010)
9. Cho, H-H, K. Wepasnick, B.A. Smith, F. K. Bangash, D. Howard Fairbrother, and W.P. Ball, "The Roles of Graphenic Carbon and Carboxyl Functional Groups on the Sorption of Zn(II) by Multi-Walled Carbon Nanotubes in Aqueous Solution," *Langmuir* 26(2), 967–981, DOI: 10.1021/la902440u (2010).
10. Murphy,* R., F.C. Curriero, W.P. Ball, "Comparison of Spatial Interpolation Methods for Water Quality Evaluation in the Chesapeake Bay," invited paper, DOI:10.1061/(ASCE)EE.1943-7870.0000121, *ASCE J. of Environmental Engineering*, 136(2):160-171 (2010).
11. Bai*, J., C. Liu, and W.P. Ball, "Study of Sorption-Retarded U(VI) Diffusion in Hanford Silt/Clay Material," 43 (20), pp 7706–7711, DOI: 10.1021/es901306c, *Environmental Science and Technology* (2009).
12. Smith, B., K. Wepasnick, K.E. Schrote, H-H Cho, W.P. Ball, D.H. Fairbrother, "Influence of Surface Oxides on the Colloidal Stability of Multi-Walled Carbon Nanotubes: A Structure-Property Relationship," *Langmuir* 25(17), 9767–9776, DOI: 10.1021/la901128k (2009).
13. Smith, B.A., K.W. Wepasnick, K.E. Schrote, A.R. Bertele, W.P. Ball, C.R. O'Melia, and D.H. Fairbrother, "Colloidal Properties of Aqueous Suspensions of Acid-Treated, Multi-Walled Carbon Nanotubes," *Environmental Science and Technology*, 43(3): 819-825 (2009).
14. CBEO Project Team (W.P. Ball, D. Brady, M. Brooks, R. Burns, B. E. Cuker, D.M. Di Toro, T.F. Gross, W.:M. Kemp, L. Murray, R. Murphy*, E. Perlman; M. Piasecki, J. Testa, I. Zaslavsky), "A Prototype System for Multi-Disciplinary Shared Cyberinfrastructure –Chesapeake Bay Environmental Observatory (CBEO)," *ASCE Journal of Hydrologic Engineering*, 13(10): 960-970 (2008).
15. Cho, H-H, B.A. Smith, J.D. Wnuk, D.H. Fairbrother, and W.P. Ball, "Influence of Surface Oxides on the Adsorption of Naphthalene onto Multiwalled Carbon Nanotubes," *Environmental Science and Technology*, 42(8): 2899–2905 (2008).
16. DiGenova, T., B. Yohannes, D. Hill, W. P. Ball, R. Shklyan, Y. Li, and D. Alcock, "Sustainable engineering requires community collaboration," *World Water and Environmental Engineering*, January/February, 34-37 (2008).
17. Haws, N.W., W.P. Ball, and E.J. Bouwer, "Implications of intraparticle contaminant distributions on desorption modeling and long-term availability," *Journal of Environmental Quality*, 36 (Sept-Oct): 1392-1402 (2007).
18. Hammes, K., M.W.I. Schmidt, L.A. Currie, W.P. Ball, T.H. Nguyen, and 35 others, "Comparison of quantification methods to measure fire-derived (black/elemental) carbon in soils and sediments using reference materials from soil, water, sediment and the atmosphere," *Global Biogeochemical Cycles*, doi:10.1029/2006GB002914, 21 (3), art. no. GB3016 (2007).
19. Nguyen,* T.H., H-H Cho, D. L. Poster, and W.P. Ball, "Evidence for a Pore-Filling Mechanism in the Adsorption of Aromatic Hydrocarbons to a Natural Wood Char," *Environmental Science and Technology*, 41(4): 1212-1217 (2007).
20. Haws, N. W., M. R. Paraskewich, Jr.,* M. Hilpert, and W. P. Ball, "Effect of fluid velocity on model-estimated rates of radial solute diffusion in a cylindrical macropore column," *Water Resour. Res.*, 43, W10409, doi:10.1029/2006WR005751 (2007)
21. Nguyen,* T.H. and W.P. Ball, "Absorption and Adsorption of Hydrophobic Organic Contaminants to Diesel and Hexane Soot," *Environmental Science and Technology*, 40(9), 2958-2964 (2006).
22. Dong, W.,G. Xie, T.R. Miller, M.P. Franklin, T.P. Oxenberg, E.J. Bouwer, W.P. Ball, R.U. Halden, "Sorption and Bioreduction of Hexavalent Uranium at a Military Facility by the Chesapeake Bay," *Environmental Pollution*, 142: 132-146 (2006).
23. Brown,* R.A., A.K. Kercher, T.H. Nguyen,* D.C. Nagle, and W.P. Ball, "Development of Synthetic Wood Chars as Models of Naturally Occurring Carbon Sorbents," *Organic Geochemistry*, 37: 321-333 (2006).
24. Haws, N.W., E.J. Bouwer, and W.P. Ball, "The influence of biogeochemical conditions and level of model complexity when simulating cometabolic biodegradation in sorbent-water systems," *Advances in Water Resources*, 29: 571-589 (2006).
25. Haws, N.W., W.P. Ball, and E. J. Bouwer, "Modeling and Interpreting Bioavailability of Organic Contaminant Mixtures in Subsurface Environments," *Journal of Contaminant Hydrology*, 82(3-4) 255-292 (2005).
26. Dong, W., W.P. Ball, C. Liu, Z. Wang, A.T. Stone, J. Bai*, and J. Zachara, "Influence of Calcite and Dissolved Calcium on U(VI) Sorption to a Hanford Subsurface Sediment," *Environmental Science and Technology*, 39(20); 7949-7955. DOI: 10.1021/es0505088 (2005).

27. Nguyen,* T. H., I. Sabbah, and W.P. Ball, "Immobilization of Soot Particles in a Silica Matrix: A Solvent-Carrier System for Studying Organic Chemical Sorption," *Environmental Science and Technology*, DOI: [10.1021/es048271n](https://doi.org/10.1021/es048271n); *39*(17): 6527-6534 (2005).
28. Sabbah, I., W.P. Ball, D.F. Young, and E.J. Bouwer, "Misinterpretations in the Modeling of Contaminant Desorption from Environmental Solids when Equilibrium Conditions Are Not Fully Understood," *Environmental Engineering Science*, *22*(3) 350-356 (2005).
29. Nguyen,* T. H., K-U Goss, and W.P. Ball, "Polyparameter Linear Free Energy Relationships for Estimating the Equilibrium Partition of Organic Compounds between Water and the Natural Organic Matter in Soils and Sediments," *Environmental Science and Technology*, DOI: 10.1021/es048839s, *39* (4) 913-924 (2005).

Other Refereed Publications (LAST 10 YEARS)

1. Fairbrother, D.H., B.A. Smith, J. Wnuk, K. Wespanick, W.P. Ball, H-H Cho, and F.K. Bangash, "Surface Oxides on Carbon Nanotubes (CNTs): Effects on CNT Stability and Sorption Properties in Aquatic Environments," pp 131-156 in *Nanoscience and Nanotechnology*, V.H. John Wiley & Sons, Inc. (2008).
2. Liu, C. and W.P. Ball, "Application of the Generalized Integral Transform Technique for Solute Transport Modeling in Heterogeneous Porous Media," Chapter IV in *Hybrid Methods in Environmental Transport Phenomena*, R.M. Cotta, R. Goldstein, P.F.L. Heilbron, M.J. Unga (Eds.), Center for Analysis and Simulations in Environmental Engineering (CASEE), Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil, pp. 59-81 (2005).

Conference Presentations and Proceedings Publications (LAST THREE YEARS, presenter underlined)

1. Wilusz,* D. C., C. J. Harman, W. P. Ball, "The Modeling of Time-Varying Stream Water Age Distributions: Preliminary Investigations with Non-Conservative Solutes", Oral Presentation at American Geophysical Union (AGU) Fall Meeting, December 15-19, San Francisco, CA, Abstract H21L-02; (2014).
2. Ball,* W.P., Q. Zhang*, D.C. Brady, and W.R. Boynton, "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 (AGU) Fall Meeting, December 15-19, San Francisco, CA, Abstract H23G-0958; (2014).
3. Zhang,* Q., C.J. Harman, and W.P. Ball, "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 (AGU) Fall Meeting, December 15-19, San Francisco, CA, Abstract H13D-1151; (2014).
4. Wei,* H., D. Ha,* Q. Zhang,* and W.P. Ball, "Effectiveness of Nitrogen Assimilation in the Non-Tidal Chesapeake Bay Watershed: Evaluations Based on Thirty Years of Data", Poster presentation at American Geophysical Union (AGU) Fall Meeting, December 15-19, San Francisco, CA, Abstract H23G-0959; (2014).
5. Wei, H,* D. Ha, Q. Zhang, and W.P. Ball, "Retrospective Analysis of Phosphorus Source Input and Riverine Output in the Chesapeake Bay Watershed", Poster presentation at Maryland Water Monitoring Council (MWMC) 20th Annual Conference, Linthicum Heights, MD; November 21 (2014).
6. D. Ha,* H. Wei,* Q. Zhang,* and W.P. Ball, "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 (MWMC) 20th Annual Conference, Linthicum Heights, MD; November 21 (2014).
7. D. Ha,* H. Wei,* Q. Zhang,* and W.P. Ball, "Retrospective Analysis of Sediment-associated Phosphorus Concentration in the Non-Tidal Chesapeake Bay Watershed", Poster presentation at Maryland Water Monitoring Council (MWMC) 20th Annual Conference, Linthicum Heights, MD; November 21 (2014).
8. MacDonald,* L.A.S., E. Schoenberger, W.P. Ball, "Household Water Treatment & Safe Storage: Knowledge Development & Diffusion in the Scientific Literature & Its Potential Impact on Practice" Poster Presentation at Water and Health: Where Science Meets Policy, October, Chapel Hill, NC, (2014)
9. Ball, W.P. and J. Yang, * "Effects of Surface Oxides and Natural Organic Matter on the Aquatic Behavior of Carbon Nanotubes," **invited** seminar, University of Texas at Austin, Austin, TX, July 14 (2014).
10. Zhang,* Q. and W.P. Ball, "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 (GRC) - Environmental Sciences: Water, June 22-27, Holderness, NH; (2014).
11. Zhang,* Q. and W.P. Ball, "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 (ChesMS), May 28-29, Annapolis, MD (2014).

12. Wilusz, * D.C., W.P. Ball, "Simulating the Effects of Intra-Monthly Rainfall Variability on Chesapeake Bay Water Quality under a Changing Climate", Poster presentation at the Chesapeake Modeling Symposium (ChesMS), May 28-29, Annapolis, MD; (2014).
13. MacDonald, * L.A.S., E. Schoenberger, W.P. Ball, "Safe Water Provision in Ghana: A Scaled Approach," Invited Talk at Carnegie Mellon Chapter of the Environmental Water Resource Institute, Pittsburgh, PA, February (2014).
14. Zhang, * Q. and W.P. Ball, "Long-term Trends and Mass-Balance of Nutrient and Sediment Loadings in the Lower Susquehanna River Watershed", Oral presentation at Chesapeake Bay Program Modeling Quarterly Review Meeting, Annapolis, MD; January 7 (2014).
15. Zhang, * Q., and W.P. Ball, "Long-term Seasonal Trends of Nutrients and Sediment from the Non-tidal Chesapeake Bay Watershed: An Assessment of Progress in Loading Reduction," oral presentation, 2013 AWRA Annual Water Resources Conference, Portland, OR, Nov. 4-7(2013).
16. MacDonald, * L.A.S., W.P. Ball, and E. Schoenberger, "Household water treatment and safe storage in Ghana: Challenges and policy implications," oral presentation, 2013 Water and Health Conference, Chapel Hill, N.C., Oct. 14-18 (2013).
17. Zhang, * Q., D.C. Brady, and W.P. Ball, "Application of a USGS Statistical Tool (WRTDS) toward Assessing Watershed Management and Reservoir Function in the Susquehanna River Basin," poster presentation, 2013 AEESP Education and Research Conference ("Environmental Engineers and Scientists of 2050: Education, Research, and Practice"), Colorado School of Mines, July 14-16 (2013).
18. MacDonald, * L.A.S., W.P. Ball, and E. Schoenberger, "Household water treatment and safe storage in Ghana: Challenges and policy implications," oral presentation, 2013 AEESP Education and Research Conference ("Environmental Engineers and Scientists of 2050: Education, Research, and Practice"), Colorado School of Mines, July 14-16 (2013).
19. Yang*, J., J. L. Bitter, D. H. Fairbrother, W. P. Ball, "Transport of Oxidized Multi-walled carbon nanotubes Through porous media: Experimental and Modeling Analysis," ACS Division of Environmental Chemistry, 244th National Meeting, Philadelphia, PA, Aug 19-23, 2012.
20. Yang, * J., B. A. Smith, J. L. Bitter, D. H. Fairbrother, W. P. Ball, "Effects of Surface Oxides on the Behavior of Carbon Nanotubes and their Influence on the Mobility of Other Contaminants in Aquatic Environments," SETAC North America 33rd Annual Meeting, Long Beach CA, 11-15 Nov., 2012.
21. Murphy, * R.R., Ball, W.P., and F.C. Curriero, "Estuary-Specific Spatial Interpolation Methods for Water Quality and Model Performance Evaluation," Chesapeake Community Modeling Program's Chesapeake Modeling Symposium 2012. Annapolis, MD, May 2012.