

Curriculum Vitae

through calendar year 2016

Thomas R. Fisher

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Certification

I have reviewed this Curriculum Vitae and here certify
that it is a current and accurate statement of my
professional record for this calendar year.



Signed: _____ Date: 15 Dec 2016

CURRICULUM VITAE

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I- Education

1968 B.A., University of Pennsylvania

1975 Ph.D., Duke University

II- Professional Background

1964-1968 Research Technician, University of Pennsylvania
1966 Research Technician, Scripps' Institute of Oceanography
1968-1970 Peace Corps Volunteer
1970-1972 Teaching Assistant, Duke University
1972-1973 Research Assistant, Duke University Marine Laboratory
1974-1975 Teaching Assistant, Duke University Marine Laboratory
1975-1978 Postdoctoral Research Associate, Duke University Marine Laboratory
1977 Postdoctoral Research Associate, North Carolina State University
1978-1983 Assistant Professor, University of Maryland, Horn Point Environmental Laboratory
1979-present Adjunct Research Associate, Duke University Marine Laboratory
1981-present Adjunct Assistant Professor, Fundacao Universidade de Amazonas
1983-1994 Associate Professor, University of Maryland, Horn Point Environmental Laboratory
1994-present Professor, University of Maryland, Horn Point Laboratory

III- Research

A. Areas of professional expertise

My primary research interests are atmospheric deposition, terrestrial nutrient processing and export, aquatic nutrient cycling, and primary productivity. I have concentrated primarily on terrestrial and aquatic systems in the basins of Atlantic estuaries and in the Amazon River floodplain, but I have also investigated periphyton and macrophytes as well as

the benthic microflora of carbonate sands on coral reefs. Processes examined are atmospheric deposition, historical land use changes, stream chemistry, nutrient processing in streams and estuaries, and primary productivity. Common tools are GIS, remote sensing, water chemistry monitoring, and hydrochemical modeling.

B. Peer-Reviewed Publications

- Fisher, T. R., R. F. Coburn, and R. E. Forster. 1969. Carbon monoxide diffusion capacity in the bullhead catfish. *J. Appl. Physiol.* 25: 161-169
- Fisher, T. R. 1975. Bioenergetics, growth, and reproduction of the solitary tunicate *Styela plicata*. Ph.D. thesis, Duke University.
- Fisher, T. R. 1976. Oxygen uptake of the solitary tunicate *Styela plicata*. *Mar. Biol.* 41: 361-369.
- Fisher, T. R. 1977. Metabolic maintenance costs of the suspension feeder *Styela plicata*. *Mar. Biol.* 41: 361-369.
- Hayne, D.W., A. Witherspoon, and T. R. Fisher. 1977. Algal diversity and transport in small streams. pps. 593-606, IN: D. L. Correll (ed), Proceedings of a Workshop on Watershed Research in Eastern North America. Smithsonian Press.
- Fisher, T. R. 1978. Plankton and primary production in aquatic systems of the Central Amazon Basin, IN: A. Riggs III, collected papers of the Amazon IV Alpha Helix Expedition. *J. Comp. Biochem. Physiol.* 62A: 31-38 (also appeared in Portuguese in *Suppl. Acta Amazonica* 8: 43-54)
- Fisher, T. R., E. B. Haines, and R. J. Volk. 1979. A comment on the calculation of atom percent enrichment of stable isotopes. *Limnol. Oceanogr.* 24: 593-595
- Fisher, T. R., and P. E. Parsley. 1979. Amazon lakes: water storage and nutrient stripping. *Limnol. Oceanogr.* 24: 547-553
- Fisher, T. R., P. R. Carlson, and R. T. Barber. 1980. Some problems in the interpretation of ammonium uptake kinetics. *Mar. Biol. Lett.* 2: 33-44
- Fisher, T. R., P. R. Carlson, and R. T. Barber. 1981. Sediment nutrient regeneration in three North Carolina estuaries. *Est. Coastal Mar. Sci.* 14: 101-116
- Fisher, T. R., P. R. Carlson, and R. T. Barber. 1982. Carbon and nitrogen productivity in three North Carolina estuaries. *Est. Coastal Mar. Sci.* 15: 621-644
- Melack, J. M., P. Kilham, and T. R. Fisher. 1982. Responses of phytoplankton to experimental fertilization with ammonium and phosphate in an African soda lake. *Oecologia* 52: 321-326
- Fisher, T. R., J. M. Melack, B. Robertson, E. Hardy, and L. Fernando. 1983. A diel study of water chemistry, phytoplankton, and zooplankton in an Amazon River floodplain lake, Lago Calado (Brazil). *Acta Amazonica* 13: 475-487
- Yarbro, L. A., P. R. Carlson, J. P. Chanton, T. R. Fisher, and W. M. Kemp. 1983. A sediment budget for the Choptank River estuary in Maryland, USA. *Est. Coastal Mar. Sci.* 17: 555-570
- Melack, J. M., and T. R. Fisher. 1983. Diel oxygen variations and their ecological implications in Amazon floodplain lakes. *Arch. Hydrobiol.* 98: 422-442
- Fisher, T. R. and K. M. Morrissey. 1985. A new method for the recovery of ammonium from natural waters for the measurement of ¹⁵N composition in isotope dilution experiments. *Mar. Chem.* 16: 11-21
- Williams, S. L. and T. R. Fisher. 1985. Kinetics of nitrogen-15 labelled ammonium uptake by *Caulerpa cupressoides* (Chlorophyta). *J. Phycol.* 21: 287-296
- Fisher, T. R. 1985. Nitrogen and phosphorus inputs to Chesapeake Bay. pps. 58-62 IN: V. Chase (ed.) The Chesapeake: prologue to the future. Proc. Ches. Bay Symp. NMEA Conf. National Aquarium, Balt. MD.
- Harding, L. W., B. W. Meeson, and T. R. Fisher. 1985. Photosynthesis patterns in Chesapeake Bay phytoplankton: short- and long-term responses of P-I curve parameters to light. *Mar. Ecol. Prog. Ser.* 26: 99-111

- Harding, L. W., B. W. Meeson, and T. R. Fisher. 1985. Patterns of photosynthetic carbon metabolism in light - limited phytoplankton. *Mar. Biol.* 89: 121-133
- Smith, L. K. and T. R. Fisher. 1986. Nutrient fluxes and sediment oxygen demand associated with the sediment - water interface of two aquatic environments. pps. 343-366 IN: K. J. Hatcher (ed.) *Sediment Oxygen Demand: Processes, Modeling and Measurement*. Institute of Natural Resources, Univ. of Georgia, Athens, Ga.
- Harding, L. W., B. W. Meeson, and T. R. Fisher. 1986. Phytoplankton production in two East Coast estuaries: photosynthesis-light functions and patterns of carbon assimilation in Chesapeake and Delaware Bays. *Est. Coastal Shelf Sci.* 23: 773-806
- Harding, L. W., T. R. Fisher, and M. A. Tyler. 1987. Adaptive responses of photosynthesis in phytoplankton: specificity to time-scale of change in light. *Biol. Oceanogr.* 4: 403-437
- Fisher, T. R., and R. D. Doyle. 1987. Nutrient cycling in Chesapeake Bay. pps. 49-53 IN G. B. Mackiernan (ed.) *Dissolved Oxygen in the Chesapeake Bay: processes and effects*. MD Sea Grant Pub. no. UM-SG-TS-87-03
- Fisher, T. R., K. M. Morrissey, P. R. Carlson, L. F. Alves, and J. M. Melack. 1988. Nitrate and ammonium uptake by plankton in an Amazon floodplain lake. *J. Plankton Res.* 10:7-29
- Morrissey, K. M. and T. R. Fisher. 1988. Regeneration and uptake of ammonium by plankton in an Amazon floodplain lake. *J. Plankton Res.* 10: 31-48
- Fisher, T. R., L. W. Harding, D. W. Stanley, and L. G. Ward. 1988. Phytoplankton, nutrients, and turbidity in the Chesapeake, Delaware, and Hudson River estuaries. *Est. Coastal Shelf Sci.* 27: 61-93
- Fisher, T. R., R. D. Doyle, and E. R. Peele. 1988. Size-fractionated uptake and regeneration of ammonium and phosphate in a tropical lake. *Verh. Internat. Verein Limnol.* 23: 637-641
- Melack, J. M. and T. R. Fisher. 1988. Denitrification and nitrogen fixation in an Amazon floodplain lake. *Verh. Internat. Verein Limnol.* 23: 2232-2236
- Fisher, T. R. and L. F. Alves. 1989. Comment on P. Fearnside's "A prescription for slowing deforestation in Amazonia". *Environment Magazine* 31(7):4.
- Muller-Karger, F. E., C. R. McClain, T. R. Fisher, and W. E. Esaias. 1989. Pigment distribution in the Caribbean Sea: observations from space. *Progress in Oceanography* 23: 23-64
- Mulholland, P. J., C. N. Dahm, M. B. David, D. M. DiToro, T. R. Fisher, H. F. Hemond, I. Kogel-Knabner, H. M. Meybeck, J. L. Meyer, and J. R. Sedell. 1990. What are the temporal and spatial variations of organic acids at the ecosystem level? pps. 315-330 IN: E. M. Perdue and E. T. Gjessing (eds.) *Organic Acids in Aquatic Ecosystems* Dahlem Konferenzen. Chichester: John Wiley & Sons Ltd.
- Melack, J. M. and T. R. Fisher. 1990. Comparative limnology of tropical floodplain lakes with an emphasis on the central Amazon. *Acta Limnol. Brasil.* 3: 1-48
- Fisher, T. R., L. F. W. Lesack, and L. K. Smith. 1991. Input, recycling, and export of N and P on the Amazon floodplain at Lake Calado. pps. 34-53 IN: H. Tiessen, D. Lopez-Hernandez, and I. H. Salcedo (eds.), *Phosphorus Cycles in Terrestrial and Aquatic Ecosystems*. Regional Workshop 3: South and Central America. SCOPE Regional Workshop Proc., Maracay, Venezuela
- Melack, J. M., S. Sippel, D. Valeriano, and T. R. Fisher. 1991. Environmental conditions and change on the Amazon floodplain: an analysis with remotely sensed imagery. pps 377-387 IN: 24th International Symposium on Remote Sensing of Environment, Rio de Janeiro, Brazil, 27-31 May, 1991.
- Fisher, T. R., and D. R. S. Lean. 1992. Interpretation of radiophosphate dynamics in lake water. *Can. J. Fish. Aquatic Sci.* 49: 252-258
- Fisher, T. R., E. R. Peele, J. A. Ammerman, and L. W. Harding. 1992. Nutrient limitation of phytoplankton in Chesapeake Bay. *Mar. Ecol. Prog. Ser.* 82: 51-63
- Fisher, T. R. and M. A. Moline. 1992. Seasonal plant cover on the Amazon River floodplain determined with aerial videography and image analysis. pps. 207-216 IN: C. H. Blazquez (ed.), *Color Aerial Photography in the Plant Sciences and Related Fields*. Proc. 13th Biennial Workshop on Color Aerial Photography and Videography in the Plant Sciences, Amer. Soc. Photogram. Remote Sensing, Bethesda, MD, 230 pps.
- Fisher, T. R., W. R. Boynton, P. Sampou. 1993. Nitrogen and Phosphorus Loadings, pps. 25-27 IN: W. H. Bell (ed.), 1992 CEES Annual Report

- Doyle, R. D. and T. R. Fisher. 1994. Nitrogen fixation by periphyton and plankton on the Amazon floodplain at Lake Calado. *Biogeochem.* 26: 41-66
- Fisher, T. R. and A. J. Butt. 1994. The role of N and P in Chesapeake Bay Anoxia, pps. 1-43, IN: S. Nelson and P. Elliott (eds.), Perspectives on Chesapeake Bay: Advances in Estuarine Sciences, STAC.
- Conley, D. J., W. M. Smith, J. C. Cornwell, and T. R. Fisher. 1995. Transformation of particle-bound phosphorus across the land-sea interface. *Est. Coastal Shelf Sci.* 40: 161-176.
- Glibert, P. M., D. J. Conley, T. R. Fisher, L. W. Harding, Jr., and T. C. Malone. 1995. Dynamics of the 1990 winter/spring bloom in Chesapeake Bay. *Mar. Ecol. Prog. Ser.* 122:27-43
- Fisher, T. R., J. M. Melack, J. Grobbsell, and R. W. Howarth. 1995. Nutrient limitation of phytoplankton and eutrophication of estuarine and marine waters. pps. 301-322 IN: H. Tiessen (ed.) Phosphorus cycling in Terrestrial and Aquatic Ecosystems. SCOPE, Wiley.
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- Williams, M. R., T. R. Fisher, and J. M. Melack. 1996. Chemical composition and deposition of rain in the central Amazon, Brazil. *Atmos. Envir.* 31: 207-217
- Williams, M. R., T. R. Fisher, and J. M. Melack. 1997. Solute dynamics in soil water and groundwater in a central Amazon catchment undergoing deforestation. *Biogeochem.* 38: 303-335
- Fisher, T. R., J. D. Hagy, and E. J. Rochelle-Newall. 1998. Dissolved and particulate organic carbon in Chesapeake Bay. *Estuaries* 21: 215-229
- Fisher, T. R., K.-Y. Lee, H. Berndt, J. A. Benitez, and M. M. Norton. 1998. Hydrology and chemistry of the Choptank River basin in the Chesapeake Bay drainage. *Water Air Soil Poll.* 105: 387-397
- Rochelle-Newall, E. J., T. R. Fisher, C. Fan, and P. M. Glibert. 1999. Dynamics of chromophoric dissolved organic matter and dissolved organic carbon in experimental mesocosms. *Int. J. Rem. Sens.* 20: 627-641
- Fisher, T. R., A. B. Gustafson, K. Sellner, R. Lacutere, L. W. Haas, R. Magnien, R. Karrh, and B. Michael. 1999. Spatial and temporal variation in resource limitation in Chesapeake Bay. *Mar. Biol.* 133: 763-778
- Lee, K.-Y., T. R. Fisher, T. E. Jordan, D. L. Correll, and D. E. Weller. 2000. Modeling the hydrochemistry of the Choptank River basin using GWLF and Arc/Info: 1. Model calibration and validation. *Biogeochem.* 49: 143-173
- Norton, M. G. M. and T. R. Fisher. 2000. The effects of forest on stream water quality in two coastal plain watersheds of the Chesapeake Bay. *Ecol. Engin.* 14: 337-362
- Fisher, T. R., D. Correll, R. Costanza, J. T. Hollibaugh, C. S. Hopkins, R. W. Howarth, N. Rabalais, J. E. Richey, C. Vorosmarty, R. Wiegert. 2000. Synthesizing Drainage Basin Inputs to Coastal Systems, pps. 81-101 IN: J. E. Hobbie (ed.) *Estuarine Science: A Synthetic Approach to Research and Practice*, Island Press, Washington, DC, 539 pps.
- Lee, K.-Y., T. R. Fisher, and E. Rochelle-Newall. 2001. Modeling the hydrochemistry of the Choptank River basin using GWLF and Arc/Info: 2. Model Application. *Biogeochem.* 56: 311-348
- Rochelle-Newall, E. J. and T. R. Fisher. 2002. Chromophoric dissolved organic matter and dissolved organic carbon in Chesapeake Bay. *Mar. Chem.* 77: 23-41
- Rochelle-Newall, E. J. and T. R. Fisher. 2002. Production of chromophoric dissolved organic matter (CDOM) fluorescence: an investigation into the role of phytoplankton. *Mar. Chem.* 77: 7-21
- Fisher, T. R., A. B. Gustafson, G. R. Radcliffe, K. L. Sundberg, and J. C. Stevenson. 2003. A long-term record of photosynthetically active radiation (PAR) and total solar energy at 38.6° N, 78.2° W. *Estuaries* 26: 1450-1460
- Benitez, J. A. and T. R. Fisher. 2004. Historical land cover conversion (1665-1850) in the Choptank watershed, Eastern USA. *Ecosystems* 7: 219-232
- Mustard, J. F. and T. R. Fisher. 2004. Land use and hydrology. pps. 257-276, IN: Gutman, G., Janetos, A.C., Justice, C.O., Moran, E.F., Mustard, J.F., Rindfuss, R.R., Skole, D., Turner II, B.L., Cochrane, M.A. (Eds.), *Observing, Monitoring and Understanding Trajectories of Change on the Earth's Surface Series : Remote Sensing and Digital Image Processing*, Vol. 6, Kluwer Pub., 480 pps. ISBN:

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Mustard, J. F., R. S. Defries, T. R. Fisher, and E. Moran. 2004. Land use and land cover change pathways and impacts. pps. 411-429, IN: Gutman, G., Janetos, A.C., Justice, C.O., Moran, E.F., Mustard, J.F., Rindfuss, R.R., Skole, D., Turner II, B.L., Cochrane, M.A. (Eds.), *Observing, Monitoring and Understanding Trajectories of Change on the Earth's Surface Series : Remote Sensing and Digital Image Processing*, Vol. 6, Kluwer Pub., 480 pps. ISBN: 1-4020-2561-0

Newell, R.I.E. T.R. Fisher, R.R. Holyoke, and J.C. Cornwell. 2004. Influence of eastern oysters on N and P regeneration in Chesapeake Bay, USA. In: *The comparative Roles of Suspension Feeders in Ecosystems*. R Dame and S. Olenin (Eds.) NATO Science Series: IV - Earth and Environmental Sciences. Kluwer, Netherlands

Kemp, W. M., W. R. Boynton, J. E. Adolf, D. F. Boesch, W. C. Boicourt, G. Brush, J. C. Cornwell, T. R. Fisher, P. M. Glibert, J. D. Hagy, L. W. Harding, E. D. Houde, D. G. Kimmel, W. D. Miller, R. I. E. Newell, M. R. Roman, E. M. Smith, J. C. Stevenson. 2005. Eutrophication of Chesapeake Bay: Historical trends and ecological interactions. *Mar. Ecol. Prog. Ser.* 303: 1-29

Fisher, T. R., J. D. Hagy III, W. R. Boynton, and M. R. Williams. 2006. Cultural eutrophication in the Choptank and Patuxent estuaries of Chesapeake Bay. *Limnol. Oceanogr.* 51: 435-447

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Fisher, T. R., J. A. Benitez, K.-Y. Lee, and A. J. Sutton. 2006. History of land cover change and biogeochemical impacts in the Choptank River basin in the mid-Atlantic region of the US. *Int. J. Remote Sens.* 27: 3683-3703

Fisher, T. R. and M. W. Williams. 2007. Chlorophyll a contribution to dissolved oxygen impairments, pps. 24-36 IN: R. Batiuk (ed) *Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries. 2007 Chlorophyll Criteria Addendum*. US EPA 903-R-07-005

Engle, D. L., J. M. Melack, R. D. Doyle, and T. R. Fisher. 2008. High rates of net primary productivity and turnover for floating grasses on the Amazon floodplain: implications for aquatic respiration and regional CO₂ flux. *Global Change Biol.* 14: 369-381

Gitelson, A. A., G. Dall'Olmo, W. Moses, D. C. Rundquist, T. Barrow, T. R. Fisher, D. Gurlin, and J. Holz. 2008. A simple semi-analytical model for remote estimation of chlorophyll-a in turbid waters: validation. *Rem. Sens. Envir.* 112: 3582-3593

McCarty, G. W., L. L. McConnell, C. J. Hapeman, A. Sadeghi, C. Graff, W. D. Hively, M. L. Lang, T. R. Fisher, T. Jordan, C. P. Rice, E. E. Codling, D. Whitall, A. Lynn, J. Keppler, and M. L. Fogel. 2008. Water quality and conservation practice effects in the Choptank River watershed. *J. Soil Water Conserv.* 63: 461 - 474

Sutton, A. J., T. R. Fisher, and A. B. Gustafson. 2009. Historical changes in water quality at German Branch in the Choptank River basin. *Water Air Soil Poll.* 199: 353-369

Sutton, A. J., T. R. Fisher, and A. B. Gustafson. 2010. Effects of restored stream buffers (CREP) on water quality in non-tidal streams in the Choptank River basin. *Water Air Soil Poll.* 208: 101-118

Fisher, T. R., T. E. Jordan, K. W. Staver, A. B. Gustafson, A. I. Koskelo, R. J. Fox, A. J. Sutton, T. Kana, K. A. Beckert, J. P. Stone, G. McCarty, and M. Lang. 2010. The Choptank Basin in transition: intensifying agriculture, slow urbanization, and estuarine eutrophication, pps. 135-165, IN: M. J. Kennish and H. W. Paerl (eds), *Coastal Lagoons: Systems of Natural and Anthropogenic Change*, CRC Press.

Whitall, D., W. D. Hively, A. K. Leight, C. J. Hapeman, L. L. McConnell, T. R. Fisher, C. P. Rice, E. Codling, G. W. McCarty, A. M. Sadeghi, A. Gustafson, and K. Bialek. 2010. Pollutant fate and spatio-temporal variability in the Choptank River estuary: factors influencing water quality. *Science of the Total Environment* 408: 2096-2108

Fisher, T. R. 2010. Summary of water quality trends in the Choptank and its tributaries and recommendations for remediation. pps. 2-4, CREB Conservancy, summer 2010

Quigg, A., J. B. Sylvan, A. B. Gustafson, T. R. Fisher, R. L. Oliver, S. Tozzi, and J. W. Ammerman. 2011. Going West: nutrient limitation of primary production in the Northern Gulf of Mexico and the importance of the Atchafalaya River. *Aquatic Geochem.* 17: 519-544

Beckert, K. A., T. R. Fisher, J. M. O'Neil, and R. V. Jesien. 2011. Characterization and comparison of stream nutrients, land use, and loading patterns in Maryland Coastal Bay watersheds. *Wat Air Soil Poll DOI* 10.1007/s11270-011-0788-7

Hively, W. D., C. J. Hapeman, L. L. McConnell, T. R. Fisher, C. P. Rice, G. W. McCarty, P. M. Downey, G. T. Nino de Gusman, K.

Bialek, M. W. Lang, A. M. Sadeghi, D. R. Whittall, A. B. Gustafson, A. J. Sutton, K. A. Sefton, J. A. H. Fetcho. 2011. Relating nutrient and herbicide fate with landscape features of 15 subwatersheds of the Choptank River watershed. *Sci. Total Environ.* 409: 3866-3878

Koskelo, A. I., T. R. Fisher, R. Utz, and T. E. Jordan. 2012. A new precipitation-based method of baseflow separation and event identification for small watersheds (<50 km²). *J. Hydrol.* 450-451: 267-278

Carruthers, T. J. B., K. Beckert, W. C. Dennison, J. P. Kumer, T. Saxby, C. A. Schupp, B. Sturgis, J. Thomas, M. Williams, T. Fisher, and C. S. Zimmerman. 2013. Improving management of a mid-Atlantic coastal barrier island through assessment of habitat condition. *sub. to Est. Coastal Shelf Sci.* 116: 74-86

Harding, Jr., L. W., R. A. Batiuk, T. R. Fisher, C. L. Gallegos, T. C. Malone, W. D. Miller, M. R. Mulholland, H. W. Paerl, and P. Tango. 2014. Scientific bases for numerical chlorophyll criteria in Chesapeake Bay. *Estuaries and Coasts* 37: 134-148

Denver, J. M., S. W. Ator, M. W. Lang, T. R. Fisher, A. B. Gustafson, R. Fox, J. W. Clune, and G. W. McCarty. 2014. Nitrate fate and transport through current and former depressional wetlands in an agricultural landscape, Choptank watershed, Maryland, United States. *J. Soil Water Cons.* 69: 1-16

Fox, R. J., T. R. Fisher, A. B. Gustafson, T. E. Jordan, T. M. Kana, and M. W. Lang. 2014. Searching for the missing nitrogen: biogenic nitrogen gases in groundwater and streams. *J. Agricult. Science* 152: S96-S106

Gardner, J., T. R. Fisher, T. C. Jordan, and K. Knee. 2016. Missing nitrogen in streams: estimating in-stream and groundwater-derived N₂ and N₂O production using open channel methods. *Biogeochem.* 127: 231-253 DOI 10.1007/s10533-015-0177-1

Harris, L., T. R. Fisher, J. Hagy, D. Liang, M. Sutula. 2016. Scientific and Technical Advisory Committee Peer Review for the James River Chlorophyll-a Criteria Re-evaluation. STAC Publication 16-007

Manuscripts in press:

Manuscripts submitted for publication:

Bunnell-Young, D., T. Rosen, T. R. Fisher, T. Moorshead, and D. Koslow. in review. Exponential decay of groundwater nitrate after application of post-agricultural conservation practices. *sub. to Biogeochem.* (sub. Apr 2016, in revision)

Koskelo, A., T. R. Fisher, A. J. Sutton, A. B. Gustafson. in review. Biogeochemical storm response in agricultural watersheds of the Choptank River basin, Delmarva Peninsula, USA. *sub. to Biogeochem.* (sub. Aug 2016, in revision)

Book Reviews:

Fisher, T. R. 1981. Review of E. Olausson and I. Cato. Chemistry and Biogeochemistry of Estuaries. *Ecology* 62: 1126-1127

Fisher, T. R. 1983. Review of F. Schiemer. Limnology of Parakrama Samudra - Sri Lanka. *Quart. Rev. Biol.* 59: 195

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Meeting Abstracts: (last five years)

Denver, J. M., S. W. Ator, M. W. Lang, G. W. McCarty, T. R. Fisher, R. J. Fox, and A. B. Gustafson. 2010. Wetlands in an agricultural landscape - potential for mitigation of nitrate in groundwater and streams, upper Choptank River Watershed, Maryland. Society of Wetland Scientists, April 2010, Denver CO

Fisher, T. R., R. J. Fox, T. Jordan, M. Fogel, M. Altabet, A. B. Gustafson, A. Bullock, J. Miklas, and N. Goff. 2011. The search for the missing anthropogenic N, Feb 2011, San Juan PR

Fisher, TR, AB Gustafson, RJ Fox, TE Jordan, MW Lang. 2011. A comparison of groundwater properties in natural wetlands, restored wetlands, and well-drained agricultural land in the Choptank Basin, Mar 2011, Society of Wetland Scientists, Reston VA

Fox, RJ, TR Fisher, AB Gustafson, MW Lang. 2011. Nutrient and dissolved gas concentrations and fluxes in groundwater across restored riparian wetland transects in the Choptank River basin, Mar 2011, Society of Wetland Scientists, Reston VA

Gustafson, AB, RJ Fox, TR Fisher, TE Jordan, MW Lang. 2011. Farmed wet spots and flow controlled drainage ditches, areas of enhanced NO₃ reduction? Mar 2011, Society of Wetland Scientists, Reston VA

- Fisher, TR, RJ Fox, TE Jordan, ML Fogel, MA Altabet, AB Gustafson, A. Bullock, J Miklas, NM Goff. 2011. The Missing N: Nitrogen Imbalances in Watersheds, April 2011, IGBP Science Symposium, Bethesda MD
- Gustafson, AB, RJ Fox, TR Fisher, TE Jordan, MW Lang, GW McCarthy, JM Denver, and SW Ator. 2011. The effects of water control structures in agricultural drainage ditches on groundwater levels, nitrate concentrations, and excess N₂. July 2011, Soil Water Conservation Society, Washington DC
- Fox, RJ, TR Fisher, AB Gustafson, MW Lang, GW McCarthy, JM Denver, SW Ator, TE Jordan. 2011. Temporal and spatial variability of N₂O and CH₄ in groundwater of wetland and agricultural areas in the Choptank Basin. July 2011, Soil Water Conservation Society, Washington DC
- Hill, C. T. E. Jordan, D. C. Brenner, A. Snyder, V. E. Leviton, T. R. Fisher and A. B. Gustafson. 2012. The fate of agricultural N and the biogeochemical variability of groundwater emerging from an agricultural watershed. Oct 2012, ASLO, New Orleans LA
- Silaphone, K., H. Bhaskaran, J. Whitelock, L. A. Murray, and T. R. Fisher. 2014. High School Science Teachers Apply ArcGIS and Web Maps in Water Quality Research, Oct. 2014, URISA's 7th GIS Caribbean Conference, Curacao
- Dylla, N. P, T. R. Fisher, and R. Fox. 2015. A potent greenhouse gas: nitrous oxide emission during baseflow and stormflow in agriculturally dominated streams of the Choptank River basin. ASLO winter meeting, Grenada Spain.
- Fisher, T. R., R. J. Fox, K. L. Kvalnes, A. B. Gustafson, M. Lepori-Bui, D. Bunnell-Young, J. W. Lewis, J. Winsten, and R. Wieland. 2015. The Choptank Coastal SEES Project: creating sustainable agricultural watersheds with good water quality. ESA meeting, Baltimore.
- Gustafson, A. B., T. R. Fisher, R. J. Fox, M. Lepori-Bui, and D. Bunnell-Young. 2015. The Choptank Coastal SEES Project: Biogeochemical monitoring at three spatial scales. ESA meeting, Baltimore
- Jordan, T. E., D. Brenner, T. R. Fisher, J. Gardner, A. B. Gustafson, C. Hill, K. L. Knee, and J. Miklas. 2015. Emerging groundwater carries evidence of biogenic N₂ production rates and processes in an agricultural watershed. ESA meeting, Baltimore MD
- Knee, K. L., J. Gardner, D. C. Brenner, J. Miklas, T. R. Fisher, and T. E. Jordan. 2015. Improving the application of open channel methods to estimate watershed-scale denitrification. ESA meeting Baltimore MD.
- Fox, R. J., J. Gardner, T. E. Jordan, K. L. Knee A. B. Gustafson, T. Kana, and T. R. Fisher. 2015. Watershed Missing N: Can biogenic N gas fluxes account for it? ESA meeting, Baltimore MD.
- Kvalnes, K. L., A. B. Gustafson, R. J. Fox, J. Lewis, and T. R. Fisher. 2015. The Choptank Coastal SEES Project: changing minds and attitudes in an atmosphere of mistrust. ESA meeting, Baltimore MD
- Thomas E. Jordan, Dana C. Brenner, Thomas R. Fisher, John R. Gardner, Anne B. Gustafson, Christina H. Hill, Karen L. Knee, and Joseph J. Miklas. 2015. Drainage ditch with a view: delivery of nitrate from cropland via emerging groundwater. GSA meeting, Baltimore MD, Nov. 2015

C. Contracts and Grants

- Society of Sigma Xi grant-in-aid of research, 1972
- Duke University graduate research award, 1973
- UNESCO travel award to present lectures on marine science at four institutions in South America, 1976
- NSF grant for scientific research, marine chemistry program, 1977-1979
- Southern Regional Education Board grant for use of uncommon facilities, 1977-1978
- Md. Dept. Natural Resources, Coastal Zone Management Contract, 1979-1981
- NSF travel grant for initiation of an international research project, 1979
- NSF grant for scientific research, ecosystem studies program, 1979-1981
- NSF grant for scientific research, ecosystem studies program, 1981-1984
- NSF grant for scientific research, marine chemistry program, 1981-1983
- NOAA grant for use of HYDROLAB, national undersea research program, 1984-1985
- NSF grant for scientific research, ecosystem studies program, 1985-1986
- NASA grant for student thesis support, 1985-1988
- US Fish and Wildlife Service contract, 1986-1989
- Md. Dept. Natural Resources, Tidewater Administration contract, 1987-1988
- NSF grant for scientific research, ecosystem studies program, 1987-1990
- NOAA grant for use of AQUARIUS, national undersea research program, 1987-1988
- NSF grant for scientific research, ecosystem studies program, 1988-1995
- National Geographic Society grant for scientific research, 1989-1991
- MD Dept. Environment, nutrient limitation bioassays, 1990-1995

NSF grant for scientific research, ecosystem studies program, continuing funds, 1991
 MD Dept. Natural Resources, nutrient limitation bioassays, 1995-2005
 US Fish and Wildlife Service contract, 1992-1997
 NASA, SeaWiFS program, 1993-1997
 NASA, LCLUC program, 1997 - 2000, 2001 - 2005, 2005 - 2009
 EPRI contract, Aquatic program, 1998-1999
 EPA grant, Effects of Atmospheric N Deposition, 1999-2000
 MD Dept. of Natural Resources, supplemental funds for Effects of Atmospheric N deposition, 1999-2000
 MD Dept. of Natural Resources, supplemental funds for examining nutrient distributions in Ches. Bay. 2000-2001
 MD Dept. of Environment, Nutrient criteria for MD and DE streams, lakes and estuaries, 2000-2001
 MD Dept. of Environment, Development of a coupled modeling system for the Patuxent basin, 2001-2005
 US Dept. of Agriculture, Forest Service, Effectiveness of CREP: reducing nutrient loads to Chesapeake Bay, 2002-2004
 Clayton Fund, Web Access for Water Quality Data on Maryland's Eastern Shore, 2003-2004
 US Dept. of Interior, USGS, GIS Metadata Capacity Development for the UMCES, 2003-2004
 MD Dept. of Environment (through VIMS), Development of Coliform TMDLs for Shellfish Growing Waters in the Chesapeake Bay, 2003-2006
 US Dept. of Agriculture, ARS, Assessment of conservation resource conservation practice effectiveness within the Choptank watershed, 2004-2008
 US Dept. of Agriculture, CSREES Program, Effects of agricultural conservation practices on nitrate losses from croplands of the Choptank River basin, 2005-2007
 MD Dept. of Environment (through VIMS), GIS information for watershed model in 2005-2006
 US Dept of Agriculture, ARS, Assessment of Wetland water quality services across an alteration gradient in the Choptank River watershed, 2007-2009
 MD Dept. Natural Resources, subcontract from Little Blackwater Watershed Advisory Committee, Denitrification in groundwater of the Little Blackwater watershed, 2008
 US Dept of Agriculture, subcontract from Univ. of Vermont, Educating Chesapeake Bay stakeholders in the use of performance-based incentives for agricultural pollution control: demonstrations in the Choptank River watershed, 2009 - 2011
 NSF grant for scientific research, The Missing Anthropogenic N - assessing denitrification at the watershed scale, 2009-2012
 US Dept of Agriculture, subcontract from Winrock International, "Incorporating environmental performance into farm business decision-making through performance-based incentives and market signals. 2011-2013.
 NSF grant for scientific research, Supplement for The Missing Anthropogenic N, 2012-2013
 NSF grant for scientific research, Coastal SEES Program, "Improving Chesapeake Bay water quality by creating sustainable coastal watersheds", 2013-2018
 NFWF, subcontract with Midshore Riverkeeper Consortium, "BMPs for better water quality on Delmarva", 2014-2016
 US Dept of Agriculture, NIFA, "On-Farm Research on Drainage Water Management to Reduce Nitrogen and Phosphorus Leaching: Trade-offs with N₂O and CH₄ Emissions", with Eric Davidson, Mark Castro, and Rebecca Fox, 2016-2019
 Chesapeake and Atlantic Coastal Trust Fund, "Application of gypsum in agricultural fields to reduce phosphorus losses", with John Rhoderick and John Shepard (MD Dept of Agriculture), 2016-2017

D. Invited Seminars and Presentations at Professional Meetings

Invited speaker, UMS Conference on Bioremediation and P Reduction, UMES, September 1994
 Invited speaker, Capitol Hill Day School, Washington, DC, Jan. 1997
 Participant, Potomac Integrated Project, Interstate Commission on the Potomac River basin, Feb. 1997- present
 Participant, STAC workshop on watershed response to changes in nutrient loads, May 1997
 Invited speaker, Nutrient Subcommittee, EPA CBP, Harper's Ferry, WV, Feb. 1998
 Participant, VA Tributary Strategy workshop, VIMS, April 1998
 Invited speaker, Aug 1998. Nutrient inputs, distributions, and cycling in Chesapeake Bay. Ecological Society of America. Baltimore, MD
 Invited speaker, Oct. 1998. Linking watersheds and the bay: land use, export, and the biogeochemistry of Chesapeake Bay. American Society of Agronomy. Baltimore, MD
 Invited speaker, Dec. 1998. Linking watersheds and the bay: land use, export, and the biogeochemistry of Chesapeake Bay. Dept. of Geology, U. of MD, College Park, MD.
 Invited speaker, Dec. 1998. Time scales of land use change in the Choptank River basin. Appalachian Laboratory. Frostberg, MD
 Invited speaker, Sept. 1999 MD DNR, Annapolis, MD
 Invited speaker, Dec. 1999, CBPO Monitoring subcommittee, Annapolis, MD
 Invited speaker, Feb. 2000, CBPO Air subcommittee, Annapolis, MD
 Invited speaker, June 2000, AGU meeting, Washington, DC
 Invited speaker, Sept. 2000, Data Analysis Workshop, Chesapeake Bay Program, Norfolk, VA
 Invited speaker, Oct. 2000, NADP Annual meeting, Saratoga, NY
 Invited speaker, Dec. 2000, Implementation Committee, Chesapeake Bay Program
 Invited speaker, Jan. 2001, MD DNR Tributary Team Meeting, Annapolis, MD
 Invited speaker, Jan. 2001, USGS, Reston, VA
 Invited speaker, Feb. 2001, ASLO, Albuquerque, NM

Invited speaker, Mar. 2001 Adkins Arboretum, Greensboro, MD
 Invited speaker, May 2001, AGU, Boston, MA
 Invited speaker, Aug. 2001, CBPO Air subcommittee, Annapolis, MD
 Invited speaker, Nov. 2001, ERF, St. Petersburg, FL
 Invited speaker, Jan. 2002, Remote Sensing in Chesapeake Bay, Annapolis MD
 Invited speaker, June 2002, CRC Modeling Workshop, Annapolis MD
 Invited speaker, Nov. 2002, NASA Science Team meeting, College Park MD
 Invited speaker, Dec. 2002, AGU, San Francisco CA
 Invited speaker, Feb. 2003, ASLO, Salt Lake City UT
 Invited speaker, Aug. 2003, Symposium on Remote Sensing and GIS in the Coastal Zone, Kemer Turkey
 Invited speaker, Mar. 2004, AERS, Salisbury MD
 Invited speaker, Dec. 2004, AAAS, Washington DC
 Invited speaker, Apr. 2005, Geography Dept, UMCP, College Park MD
 Invited speaker, May 2006, AGU, Baltimore MD
 Invited speaker, Sept 2007, WAMU Community Dialogue Luncheon, Washington DC
 Invited speaker, May 2008, MD DNR, Annapolis MD
 Invited speaker, Apr 2009, STAC Small Watershed Monitoring Workshop, Baltimore MD
 Invited presenter, July 2009, Gordon Conference (Catchment Science), Andover NH
 Invited speaker, Feb 2010, UMBC, Baltimore MD
 Invited speaker, Feb 2011, ASLO, San Juan PR
 Invited speaker, April 2011, IGBP, Bethesda MD
 Invited speaker, March 2012, CBL, Solomons MD
 Invited speaker, March 2013, Texas A&M, Galveston TX
 Invited speaker, May 2015, AL UMCES
 Invited speaker, July 2015, Delmarva Conservancy, TNC, Wye Mills MD
 Invited speaker, Nov 2015, Book Signing of Horton and Harp's book on Choptank, Salisbury Univ, Salisbury MD
 Invited speaker, Farm to Phrag meeting, SESYNC, Feb 2016
 Invited speaker, April 2016, STAC, HPL
 Invited speaker, April 2016, Monitoring workshop on Choptank, Wye Mills MD
 Invited speaker, April 2016, NOAA ("Envision the Choptank"), Easton MD
 Invited speaker, April 2016, Bay 101 talk, HPL
 Invited speaker, Aug 2016, Choptank Symposium, Wye Mills MD
 Invited speaker, Jan 2017, Delmvara Conservation Partnership, Wye Mills MD

E. Symposia Organized/Chaired for Professional Meetings

ASLO Meeting, Feb.1999, Estuaries and Continental Shelves, Santa Fe, NM
 ERF Meeting, Sept. 1999, Land use change and nutrient export to estuaries, Sept.1999, New Orleans, NM
 Resource Limitation Workshop, HPL, May 2001
 Planning Committee for Remote Sensing of Land Use Effects in Coastal Zones, Kemer Turkey, Aug. 2003
 CERF Meeting, Quantifying Environmental Targets for Effective Management of Coastal Ecosystems, Nov. 2009

F. Active Memberships in Professional Societies

ASLO, AGU, AAAS, ASPRS, ERF, ESA

IV. Teaching and Training

A. University of Maryland courses

MEES 621, "Ecology of Marine and Estuarine Environments", UMCP, 3 credit lecture course with 15-30 students, spring semester (team-taught with R. Newell and J. Purcell, 1989-1992).
 MEES 621, "Biological and Chemical Oceanography", IVN, 3 credit lecture course with 15-30 students, spring semester, team-taught with D. Stoecker, 1993-1996.
 MEES 622, 1 credit lab for MEES 621 with 19 students, spring semester, team-taught with D. Stoecker, 1994
 MEES 699, "Nutrient cycling and limitation", HPEL, 3 credit reading course with 2 students, fall semester 1992
 MEES 699F, 1 credit reading courses with various graduate students
 MEES 608J, "Phosphorus Biogeochemistry", 1 credit lecture course with 8 students, team-taught with J. Cornwell, Spring 1997
 MEES 698R, "Ecosystem Ecology", guest lecture on fate of nutrient inputs to Chesapeake Bay, fall 1998
 MEES 698I, "Land Margin Interactions", 4 credit lecture/field course co-taught with Bill Currie and Walt Boynton, fall 2001-fall 2002
 MEES 699 section 0605, "GIS and Remote Sensing", 3 credit course, spring 2002

MEES 698I, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2003
 MEES 698I, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2004
 MEES 699 section 0605, "Introduction to GIS", 1 credit course, spring 2005
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2005
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2006
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2007
 MEES 699 section 0605, "Introduction to GIS", 1 credit course, spring 2007
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2008
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2009
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2010
 MEES 699, section 0305, "Readings in N and P Biogeochemistry", 1 credit for Keota Silaphone, fall 2010
 MEES 699 section 0605, "Introduction to GIS", 1 credit course, spring 2011
 MEES 699 section 0101, "Colorimetric Measurements of Nutrients", 1 credit course, summer 2011
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2011
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2012
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2013
 MEES 699, section 0305, "Readings in BMP biogeochemistry", 1 credit for Keota Silaphone, spring 2013
 MEES 610, "Land Margin Interactions", 4 credit lecture/field course co-taught with Mark Castro and Walt Boynton, fall 2014
 MEES 609, "Foundation xxxx", guest lecture on watershed restoration, Oct 2016

B. Graduate Students supervised

Susan Williams, PhD 1981
 Andrea Figueiredo, MS 1983
 Luiz F. Alves, MS 1983
 Patricia Pinheiro, MS 1985
 Lesley K. Smith, PhD 1988
 Frank Muller-Karger, PhD 1988
 Kevin Morrissey, MS 1989
 Claudia Walters, MS 1990
 Robert Doyle, PhD 1991
 Michael Williams, MS 1992
 Luiz F. Alves, PhD 1993
 Margaret Mayers Norton, PhD 1998
 Brian Jerome, MS terminated
 Lisa Rexrode Vanderbloemen, MS 1998
 Emma Rochelle-Newall, PhD 1999
 Heather Berndt, MS 1999
 Kuang-Yao Lee, PhD 2000
 Jorge Benitez, PhD 2002
 Jason Traband, MS 2003
 Amy Macdonald, MS in progress (transferred 2005)
 Adrienne Sutton, PhD 2007
 Antti Koskelo, MS 2008
 Rebecca Fox, PhD 2011
 Lindsay Tempinson, MS 2015
 Dana Young, PhD in progress
 Keota Silaphone, PhD in progress
 John Gardner, MS 2014

C. Internships

Jorge Viera da Cunha, The Field School, Washington, DC, January 1995
 Mark Lighten, Wales, UK, fall 1998
 Alessandro Liboni, Italy, spring/summer 1999
 Tony Goodyear, Parkside High School, Salisbury MD, summer 2001-2003 (with Laura Murray)
 Mike Davis, Cambridge South Dorchester High School, Cambridge MD, summer 2003
 Josh Stone, Home Schooled, Royal Oak MD, fall 2004-2006
 Ryan Saba, 2013-2014

V. Outreach and Service

A. Public service

1. State/Regional Service

expert witness for Patuxent Landowners Association, Baltimore, MD, 1985
advisor to US Fish & Wildlife Service on land use management and stream water quality in Choptank River basin, 1985-present
PI and participant in Maryland Dept. Environment program on nutrient limitation of phytoplankton populations in Chesapeake Bay, 1990-1995
member of review committee for positions at the Smithsonian Environmental Research Center, Edgewater, MD, 1992.
PI and participant in Maryland Dept. Natural Resources program on nutrient limitation of phytoplankton populations in Chesapeake Bay, 1995-present
participant, Potomac Integrative Analysis Project, Interstate Commission on the Potomac River basin, 1997-present
participant, STAC and Modeling Subcommittee of EPA Ches. Bay Program workshop on watershed response to changes in nutrient loads, May 1997
invited speaker, Friends of the Upper Choptank, Denton, MD, July 1997
Chair, promotion committee, Smithsonian Environmental Research Center, Jan. 1998
invited speaker, Nutrient Subcommittee, EPA CBP, Harper's Ferry, WV, Feb. 1998
participant, VA Tributary Strategy workshop, VIMS, April 1998
invited speaker, Earth Day Service of Third Haven Quaker Meeting, Easton, MD, April 1998
participant, EPA Bay Program Conference, CBL, July 1998
invited speaker, Sept. 1999 MD DNR, Annapolis, MD
invited speaker, Dec. 1999, CBPO Monitoring subcommittee, Annapolis, MD
invited speaker, Feb. 2000, CBPO Air subcommittee, Annapolis, MD
participant, EPA CBPO Data Analysis Workgroup, June 2000, Sept. 2000
invited speaker, CBPO Implementation Committee, Dec. 2000
invited speaker, Annual MD Tributary Team, Jan. 2001
invited speaker, Adkins Arboretum, Mar. 2001
invited speaker, Shore Leadership, May 2001
invited lecturer, Environmental Policy Course, Washington College (Wayne Bell), May 2001
invited speaker, Choptank tributary team, July 2001
invited speaker, CBPO Modeling Subcommittee, July 2001
invited speaker, CBPO Air Subcommittee, Aug. 2001
invited speaker, Chesapeake Bay Ecology for Educators (Laura Murray), Sept. 2001
participant, CBPO TMAW workgroup, Sept. 2001
invited speaker, Talbot League of women voters, Mar. 2002
member, CBPO Chla criteria development team, Annapolis MD, 2002
invited speaker, TMAW workshop, June 2003
invited speaker, Choptank Tributary Team, Dec 2003
invited speaker, Dorchester League of women voters, Mar. 2004
invited speaker, DoD Commander's Conference, Patuxent Naval Air Station, Apr. 2004
invited speaker, MDE Public Hearing on wastewater plants, Cambridge MD, July 2004
invited speaker, Ches. Bay Foundation lecturer, HPL, Cambridge MD, Aug. 2004
invited speaker, STAC, Ches. Bay Program, Annapolis MD, Sept. 2004
invited speaker, Subcommittee on Fisheries Conservation, Wildlife and Oceans, House Committee on Resources, Annapolis MD, Dec. 2004
invited speaker, Egypt Road Testimony, Cambridge City Council, Cambridge MD, Mar. 2005
member, CBPO Chla criteria development team, Annapolis MD, 2005
member, Little Blackwater River Advisory Group, Cambridge MD, 2006
member, Chesapeake Bay Advisory Group (Gerald Winegrad), Annapolis MD, 2008-present
member, Midshore Riverkeeper Conservancy, Board of Directors, 2008-present
participant, Dorchester Co Chamber of Commerce, Cambridge, Jan 2009
invited speaker, Chesapeake Futures Meeting, Chesapeake Bay Maritime Museum, St. Michaels MD, Jan 2009
invited speaker, Choptank River Forum, Caroline Co Planning Commission, Denton MD, June 2009
invited speaker, Caroline Co Planning Commission, Denton MD, Denton MD, Oct 2009
invited contributor, Caroline County Sewage Commission, Feb 2010
invited speaker, UMBC, seminar on land use and watershed ecology, Feb 2010
invited reviewer, CBP STAC, EPA document on agricultural practices for AFOs, irrigation, and grazing, Mar 2010
invited speaker, MD State Geographic Information Committee, GIS applications on Delmarva, Apr 2010
invited contributor, Upper Chester River Pilot Project, May 2010
participant, Congressional Staff visit to HPL, Sept 2010
participant, fishing trip with Secretary Wilson of MDE to discuss Bay issues, Oct 2010
invited speaker, HPL seminar series, March 2011
invited speaker, HPL fundraiser, Out of the Fire Restaurant, March 2011
invited reviewer, GAO Review of EPA TMDL Program, March 2011
participant, Innovating Policy for Chesapeake Bay Restoration, EPA, Hyatt-Regency Hotel, Cambridge MD, March 2011

panel member, Sierra Club Talbot County Clean Water Forum, Avalon Theatre, Easton MD, Nov 2011
 invited participant, Lets Be Shore Forum, Salisbury MD, Oct 2012
 participant, RCN International N Initiative, Bethesda MD, Nov 2012
 invited participant, Chesapeake Bay Commission, HPL, Jan 2013
 invited speaker, Gifted and Talented Summer Program, HPL, Aug 2013
 organizer, South Forge watershed team meeting, UMD extension Office, Denton MD, Aug 2013
 participant, RCN International NUE conference, Kansas City, MO, Aug. 2013
 organizer, South Forge, Oldtown, and Spring watershed team meetings, NRCS conference room, Denton MD, Feb. 2014
 presenter, CBF Clean Water Concerts, Easton MD, June 2014
 invited speaker, COG Board Retreat, HPL, July 2014
 invited speaker, Gifted and Talented Summer Program, HPL, Aug 2014
 presenter, Caroline Summer Fest, Denton MD, Sept. 2014
 organizer, meeting on home denitrifying septic systems, Adkins Arboretum, Oct. 2014
 invited participant, Lake Williston Expert Review Panel, MD DNR, Oct 2014
 organizer, South Forge, Oldtown, and Spring watershed team meetings, NRCS conference room, Denton MD, Feb. 2015
 invited speaker, RCPP meeting, Centreville MD, Feb 2015
 invited participant, NOAA meeting on Choptank, Grasonville MD, Mar 2015
 participant, CBPO Ag Work Group meeting, Annapolis MD, Nov 2015
 participant, CBPO Nutrient Management Panel, Annapolis MD, Feb, Mar, Apr, May, June, July 2016
 participant, Water Management of Farms, US FWS, Annapolis MD, Mar 2016
 participant, STAC, James River Chla Criterion Review, Annapolis MD, Aug, Sept 2016
 invited speaker, Leadership MD, Henson Scout Reservation, Sept 2016
 invited speaker, Tidewater Farm Club, Cambridge MD, Oct 2016
 participant, NOAA Ches Bay Office, Advisory Group, Harris Creek Project, Jan 2017

2. Service outside region

advisor to Instituto Nacional de Pesquisas da Amazonia (INPA, Manaus, Brazil) on biogeochemistry and deforestation effects on the Amazon River floodplain, 1979-1990.
 invited participant to workshops of National Research Council, SCOPE, and World Bank on development and eutrophication in the tropics, 1987
 participant, NOAA working group for a 5 year Federal Plan for Ocean Pollution Research, Development, and Monitoring, 1987-1988
 member, steering committee, Antarctic Palmer LTER (Ray Smith, lead PI, UCSB), 1991-present.
 panel member, USDA NRI Competitive Grants Program, aquatic ecosystem studies, 1994
 external examiner, PhD thesis, University of Waterloo, Waterloo, ON, Canada, April, 1997
 panel member, NSF/EPA/USDA water and watersheds program, 1998
 external examiner, PhD thesis, University of South Australia, 1999
 external reviewer, tenure/promotion decision, University of Vermont, 1999
 student poster judge, ASLO meeting, Feb. 2001
 panel member, NASA IDS Program, June 2003
 panel member, NSF Ecosystems Studies Program, Ultra-Ex panel, July 2009
 panel member, NASA IDS Program, Jan 2010
 panel member, NASA LCLUC Program, Jan 2011
 panel member, NASA LCLUC program, Aug 2011
 panel member, NSF Coastal SEES Program, Mar 2014
 participant, NSF Coastal SEES Science Team meeting, Jan. 2015
 panel member, NSF Coastal SEES Program, Dec 2015

B. University of Maryland (* = current)

member, UMCEES Ship Acquisition Committee
 member, HPEL Analytical Services Committee
 chair, joint UMCEES/Sea Grant Remote Sensing Position Search Committee
 member, UMCEES AEL Faculty Development Committee
 member, UMCP Radiation Safety Committee
 chair, HPEL Safety Board
 member, HPEL Planning Committee
 member, UMCEES Research Vessel Oversight Committee
 co-chair, MEES Oceanography Track Committee
 HPEL Senator to UMCEES faculty Senate
 Secretary of UMCEES Faculty Senate
 chair, CEES Hazardous Materials Committee
 member, HPEL Seminar Committee

head, LMER Water Column Group
member, AEL Faculty Development Committee
member, AEL Faculty Search Committee
member, AEL Director Search Committee
member, HPEL CES Committee
Chair, HPEL 1997 Open House Committee
Chair, HPL Library Committee
member, HPL Safety Board
member, HPL Facilities and Equipment Committee
member, seminar committee
chair, PPE committee
chair, Library committee
member, Analytical Services Committee
member, Facilities Committee
chair, Seminar Committee 2001-2004
member, Education Committee, 2001-2002
member, AL director search committee, 2003-2004
chair, HPL Analytical Services Committee, 2004-2012
member, HPL Analytical Services Committee, 2012- present *
member, Education Committee 2008-2010
member, HPL Library Committee, 2014-2015
member, Dave Nelson (AL) promotion committee, 2014
member, Graduate Faculty Council, 2014-present *
member, Comprehensive Review Committee for Elizabeth North (HPL), Chris Rowe (AL), and Dave Secor (CBL), 2014
chair, Comprehensive Review Committee for Bill Dennison (UMCES), 2015