

CURRICULUM VITAE

JoAnn M. Burkholder

Present Position

Professor and Director, Center for Applied Aquatic Ecology, North Carolina State University
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Research Interests

Eutrophication of freshwater and estuarine ecosystems; the biology, ecology and impacts of harmful algae; and the physiological ecology of seagrasses and other submersed aquatic plants

Education

Bachelor of Science - Zoology, with a Minor in Chemistry, Iowa State University (1975)
Master of Science - Aquatic Botany, University of Rhode Island (1981); major professor, R. Sheath
Doctor of Philosophy - Botanical Limnology, Michigan State University (1986; major professor, R.G. Wetzel)

Professional Experience

2000- Professor of Aquatic Ecology, Department of Plant Biology, NCSU, Raleigh, NC (and adjunct professor, Dept. of Marine, Earth and Atmospheric Sciences, NCSU).
1998- Director, Center for Applied Aquatic Ecology, Dept. of Plant Biology, NCSU, Raleigh.
1993 – 1997 Associate Professor of Aquatic Ecology, Department of Plant Biology, NCSU, Raleigh, (and adjunct professor, Dept. of Marine, Earth and Atmospheric Sciences, NCSU).
1987 – 1992 Assistant Professor of Aquatic Ecology, Department of Plant Biology, North Carolina State University, Raleigh.
1982 – 1986 Graduate Research Assistant, Michigan State University (W.K. Kellogg Biological Station), Hickory Corners, MI.
1981 (fall) Instructor, *Introductory Chemistry* (for science majors), Quinebaug Valley Community College, Danielson, CT.
1979 – 1980 Instructor of *Marine Botany*, summers, St. Georges College Prep. School, Newport, RI.
1977 – 1981 Graduate Research Assistant; Graduate Teaching Assistant in *Freshwater Botany*, *Marine Botany*, and *Phycology*; Instructor, *Introductory Botany Laboratory*, Department of Botany, University of Rhode Island, Kingston, RI.
1975 – 1977 Environmental Scientist, EcolSciences, Inc., Rockaway, NJ.
1974 – 1975 Research Assistant, Limnology Laboratory, Department of Animal Ecology, Iowa State University, Ames, IA.

Awards

Darbaker Prize, Botanical Society of America, for excellence in research on microalgae and harmful dinoflagellates (2007).

AAAS Fellow, American Association for the Advancement of Science, for distinguished contributions in the field of phycology (2004).

Honorary Doctorate, Knox College, Galesburg, IL (2003).

Provasoli Award, best paper of 2002 in the *Journal of Phycology* (2003).

Honorary Doctorate, Long Island University, Southampton, NY (2001).

Aldo Leopold Leadership Fellow, Ecological Society of America (2000).

Hutner Award, from the Society of Protozoologists (1999).

Scientific Freedom and Responsibility Award, from the American Association for the Advancement of Science (1998).

Distinguished Service in Environmental Education Award, Environmental Educators of North Carolina, Duke University (1998).

Distinguished Scholarly Achievement Award, NCSU Honors Convocation (1998).

Conservationist of the Year Award, National Wildlife Federation (1998).

Conservationist of the Year Award, from the Governor of North Carolina and the NC Wildlife Federation (1998).

Jack Bayless Award for the outstanding presentation of the year, *Impacts of the Toxic Dinoflagellate Pfiesteria on Estuarine Fish*, to the South Carolina Fishery Workers Association, the NC and SC chapters of the American Fisheries Society (1998).

Admiral of the Chesapeake Award, from Governor Glendening, Federal and State Leadership Summit, Washington, DC (1997).

Outstanding Achievement Award, Society of Business and Professional Women of North Carolina, Research Triangle Park, NC (1997).

Pew Fellow in Conservation and the Environment, the Pew Foundation (1997-2000).

Outstanding Research Award, NCSU Alumni Association (1994).

Other Honors (examples)

Plenary Speaker, Summer Meeting, American Society of Limnology and Oceanography, Victoria, BC, Canada (2006).

External Examiner (“Opponent”) of doctoral candidate Johannes Hagström, Kalmar University, Kalmar, Sweden (2006).

Keller Award to Dr. M. Parrow for his outstanding Ph.D. dissertation research (an honor, also, for his major professor, J. Burkholder), from NCSU – CALS (2004).

Alumni Hall of Fame, Rock Valley College, Rockford, IL (2001).

Convocation Speaker, Appalachian State University, Boone, NC (2000).

Invited Testimony, Congressional Hearing on the Value of Estuaries, U.S. Senate, Senate Environment and Public Works Committee (Estuary Habitat Restoration Act; Washington, DC, 1998).

Invited Briefing, U.S. Department of the Army - Toxic Algae (Washington, DC, 1998).

Invited Testimony, Congressional Hearing on Harmful Algal Blooms, U.S. Senate, Committee on Commerce, Science, and Transportation, Subcommittee on Oceans and Fisheries (Washington, DC, 1998).

Phi Kappa Phi, Special Recognition for Excellence in Research (1998).

Invited Testimony, Congressional Hearing on Fisheries Conservation, Wildlife and Oceans, U.S. House of Representatives, Committee on Resources (1 of 5 invited panel members; Washington, DC, 1997).

Invited Testimony, Congressional Hearing on *Pfiesteria* and Human Health, U.S. House of Representatives, Committee on Government Reform and Oversight, Subcommittee on Human Resources (Washington, DC, 1997).

Science Advisor, Governor's Commission on *Pfiesteria*; Governor Glendening of Maryland (1997).

Science Committee on Fish Disease, Pocomoke Estuary, Maryland Department of Natural Resources, Annapolis, MD (1997-).

Editorial Board, *Journal of Eukaryotic Microbiology* (appointed, 1996-1999).

Editorial Board, *Journal of Phycology* (appointed, 1995-1997).

Board of Directors (member-at-large), American Society of Limnology and Oceanography (1994-1997).

Coastal Futures Committee: Appointed by the governor, who designated 1994 as "The Year of the Coast." The committee's charge was to form recommendations about how to improve NC's Coastal Area Management Act (CAMA, in its 20th year) to strengthen protection of estuarine/marine waters through responsible land use planning and development, and through updated water quality regulations that involve science in the management process (1993-1994).

Board of Directors, Partnership for the Sounds, a professional group with focus on strengthening environmental education in NC, including regional environmental education centers (1993-1995).

North Carolina Marine Fisheries Commission: Member-at-Large (appointed by former [republican] governor of NC, 1992-1993; re-appointed by [democratic] governor, 1993-1997). Chair, Habitat and Water Quality Committee (1993-1997); member, Planning Committee (1994-1997).

Professional Memberships

American Association for the Advancement of Science, American Society of Limnology and Oceanography, Estuarine Research Federation, North American Lake Management Society, Phycological Society of America, Sigma Xi

Funding (past five years) – NSF, U.S. EPA, NOAA, DoD, Foundation, Z. Smith Reynolds Foundation, CDC via the NC Department of Health and Human Services, NC General Assembly

Teaching

Designed courses at NCSU include:

- *Environmental Issues in Aquatic Ecology* (BO595W, 3 credits, 1990- alternate years): special topics/current events graduate course; series of detailed handouts and readings restructured every time the course is taught and available electronically.
- *Aquatic Plant Ecology* (BO 595A, 4 credits, 1987-; alternate years): special topics graduate course; based upon a series of detailed handouts and readings that are updated each time the course is taught, and available electronically.
- *Phycology* (BO/MB 774, 3 credits including laboratories, 1987-; alternate years): graduate course cross-listed with Microbiology; series of detailed handouts updated each time the course is taught, and available electronically.
- *Ecology, Evolution, and Diversity* (BO 595E) – mini-course (one of eight modules) on aquatic vascular plants as bioinvaders (2003; course coordinator, Dr. J. Stuckey).
- *Botany Colloquium* (BO 824C) – special topics graduate course to train students on giving presentations, writing grant proposals, and critiquing grant proposals (co-taught).

Graduate Students

M.S. (also including information about the first professional employment post-degree)

Deborah (Everitt) Tan, M.S. (1991), population dynamics of stream-inhabiting macroalgae and angiosperms (became professionally employed at the Maryland Department of Natural Resources).

Phumelele Gama, M.S. (1992), reservoir phytoplankton and sediment/phosphorus loading (reservoir specialist in South Africa).

Virginia L. Coleman, M.S. (1994), seagrass epiphytes under water-column nitrate enrichment (water quality/periphyton specialist at the NC Department of Environment, Health and Natural Resources).

Leslie (Taylor) Taggett, M.S. (1995), nitrate reductase activity in 'weedy' species of marine macroalgae under water-column nitrate enrichment (water quality specialist at the NC Department of Environment, Health and Natural Resources; later moved to a technical laboratory position at Monsanto).

Elizabeth E. Fensin, M.S. (1997), seasonal dynamics of Neuse Estuary phytoplankton including *Pfiesteria*/ *Pfiesteria*-like species (phytoplankton specialist at the NC Department of Environment and Natural Resources – please note that the agency name changed in 1997).

Naomi Tsurumi, M.A. (2000), environmental policy of concentrated animal operations (enrolled at Duke University for a graduate program in environmental policy).

Jeffrey J. Springer, M.S. (2000), impacts of toxic *Pfiesteria* on adult and larval stages of commercially and ecologically important shellfish (continued at the Center for Applied Aquatic Ecology as a research associate).

Paul J. Cancellieri, M.S. (2001), behavioral responses of actively toxic, temporarily nontoxic, and non-inducible *Pfiesteria* spp. to live fish (employed in a CT marine sciences teaching program for gifted high school and college students; then became a middle-school science teacher).

Susan E. Pate, M.S. (2006), impacts of the toxic dinoflagellate, *Alexandrium monilatum*, on three commercially and ecologically important shellfish species (research associate at Duke University).

Ph.D.

L. Michael Larsen (1995; co-chair), reservoir zooplankton responses to suspended sediment and nutrient loading (assistant professor of biology at Campbell University, NC [now professor and department chair]) (co-major professor with S. Mozley of the Department of Zoology).

Brant W. Touchette (1999), physiological responses of the critical habitat seagrass, *Zostera marina*, to water-column nitrate enrichment (assistant professor of biology at Elon University, Burlington, NC).

Howard B. Glasgow Jr. (2000), the biology and impacts of toxic *Pfiesteria* complex species in the Neuse Estuary, NC (continued as a research associate at the Center for Applied Aquatic Ecology until disabled by illness).

Matthew W. Parrow (2003), life histories and reproduction of toxic *Pfiesteria* complex species (assistant professor of biology at the University of North Carolina Charlotte).

Meghan S. Rothenberger (2007), watershed influences on nutrient loading to the Neuse Estuary (post-doctoral research and teaching associate at the University of North Carolina Greensboro)

Hayley M. Skelton (expected, spring 2008), nutritional ecology of *Pfiesteria* and other heterotrophic dinoflagellates (through the Department of Marine, Earth and Atmospheric Sciences; co-major professor with D. Kamykowski).

Kimberly A. Null (expected, spring 2009), ammonium transport and fate in the Neuse Estuary (through the Dept. of Marine, Earth and Atmospheric Sciences; co-major professor with D. DeMaster).

Publications

In Scientific Journals, Books and Symposia Volumes (Peer-Reviewed)

- 1) Burkholder, J.M. and R.W. Bachmann (1979) Potential phytoplankton productivity in three Iowa streams. *Proceedings of the Iowa Academy of Sciences* 86:22-25.
- 2) Sheath, R.G. and J.M. Burkholder (1983) Morphometry of *Batrachospermum* populations intermediate between *B. boryanum* and *B. ectocarpum* (Rhodophyta). *Journal of Phycology* 19:324-331.
- 3) Burkholder, J.M. and R.G. Sheath (1984) The seasonal distribution, abundance and diversity of desmids (Chlorophyta) in a softwater, north temperate stream. *Journal of Phycology* 20:159-172.
- 4) Sheath, R.G. and J.M. Burkholder (1985) Characteristics of softwater streams in Rhode Island. II. Composition and seasonal dynamics of macroalgal communities. *Hydrobiologia* 128:109-118.
- 5) Burkholder, J.M. and R.G. Sheath (1985) Characteristics of softwater streams in Rhode Island, U.S.A. I. A comparative analysis of physical and chemical features. *Hydrobiologia* 128:97-108.
- 6) Bachmann, M.D., R.G. Carlton, J.M. Burkholder and R.G. Wetzel (1986) Symbiosis between salamander eggs and green algae: Microelectrode measurements inside eggs demonstrate effects of photosynthesis on oxygen concentrations. *Canadian Journal of Zoology* 64:1586-1588.
- 7) Sheath, R.G., J.M. Burkholder, J.A. Hambrook, A. Hogeland, E. Hoy, M.E. Kane, M.O. Morison, A.D. Steinman and K.L. Van Alstyne (1986) Characteristics of softwater streams in Rhode Island. III. Distribution of macrophytic vegetation in a small drainage basin. *Hydrobiologia* 140:183-191.
- 8) Sheath, R.G., J.M. Burkholder, M.O. Morison, A.D. Steinman and K.L. Van Alstyne (1986) Effect of tree canopy removal by gypsy moth larvae on the macroalgae of a Rhode Island headwater stream. *Journal of Phycology* 22:567-570.
- 9) Moeller, R.E., J.M. Burkholder and R.G. Wetzel (1988) Significance of sedimentary phosphorus to a rooted submersed macrophyte (*Najas flexilis*) and its algal epiphytes. *Aquatic Botany* 32:261-281.
- 10) Sheath, R.G. and J.M. Burkholder (1988) Stream macroalgae, pp. 53-59. In: *Freshwater and Marine Plants of Rhode Island*, by R.G. Sheath and M.M. Harlin (eds.). Kendall/Hunt Publishers, Dubuque (IA), 149 pp.
- 11) Burkholder, J.M. and R.G. Wetzel (1989) Microbial colonization on natural and artificial macrophytes in a phosphorus-limited hardwater lake. *Journal of Phycology* 25:55-65.
- 12) Burkholder, J.M. and R.G. Wetzel (1989) Epiphytic microalgae on natural substrata in a hardwater lake: Seasonal dynamics of community structure, biomass, and ATP content. *Archives für Hydrobiologie/ Supplement* 83:1-56.
- 13) Burkholder, J.M. and R.G. Wetzel (1990) Epiphytic alkaline phosphatase on natural and artificial plants in an oligotrophic lake: Re-evaluation of the role of macrophytes as a phosphorus source for epiphytes. *Limnology and Oceanography* 35:736-747.
- 14) Burkholder, J.M., R.G. Wetzel and K.L. Klomparens (1990) Direct comparison of phosphate uptake by adnate and loosely attached microalgae within an intact biofilm matrix. *Applied and Environmental Microbiology* 56:2882-2890.
- 15) Cuker, B.E., P. Gama and J.M. Burkholder (1990) Type of suspended clay influences lake productivity and phytoplankton community response to phosphorus loading. *Limnology and Oceanography* 35:830-839.
- 16) Burkholder, J.M. and B.E. Cuker (1991) Response of periphyton communities to clay and phosphate loading in a shallow reservoir. *Journal of Phycology* 27:373-384.
- 17) Everitt, D.T. and J.M. Burkholder (1991) Seasonal dynamics of macrophyte communities from a

- stream flowing over granite flatrock in North Carolina, U.S.A. *Hydrobiologia* 222:159-172.
- 18) Burkholder, J.M. (1992) Phytoplankton and episodic suspended sediment loading: Phosphate partitioning and mechanisms for survival. *Limnology and Oceanography* 37:974-988.
 - 19) Burkholder, J.M., K.M. Mason and H.B. Glasgow (1992) Water-column nitrate enrichment promotes decline of eelgrass (*Zostera marina* L.): Evidence from seasonal mesocosm experiments. *Marine Ecology Progress Series* 81:163-178.
 - 20) Burkholder, J.M., E.J. Noga, C.W. Hobbs, H.B. Glasgow and S.A. Smith (1992) New "phantom" dinoflagellate is the causative agent of major estuarine fish kills. *Nature* 358:407-410, *Nature* 360:768.
 - 21) Mallin, M.A., J.M. Burkholder and M.J. Sullivan (1992) Benthic microalgal contributions to coastal fishery yield. *Transactions of the American Fisheries Society* 121:691-695.
 - 22) Martin, T.H., L.B. Crowder, C.F. Dumas and J.M. Burkholder (1992) Indirect effects of fish on macrophytes in Bays Mountain Lake: Evidence for a littoral trophic cascade. *Oecologia* 89:476-481.
 - 23) Noga, E.J., S.A. Smith, J.M. Burkholder, C.W. Hobbs and R.A. Bullis (1993) A new ichthyotoxic dinoflagellate: Cause of acute mortality in aquarium fishes. *Veterinary Record* 133:48-49.
 - 24) Burkholder, J.M., H.B. Glasgow and J.E. Cooke (1994) Comparative effects of water-column nitrate enrichment on eelgrass *Zostera marina*, shoalgrass *Halodule wrightii*, and widgeongrass *Ruppia maritima*. *Marine Ecology Progress Series* 105:121-138.
 - 25) Coleman, V.L. and J.M. Burkholder (1994) Community structure and productivity of epiphytic microalgae on eelgrass (*Zostera marina* L.) under water-column nitrate enrichment. *Journal of Experimental Marine Biology and Ecology* 179:29-48.
 - 26) Burkholder, J.M. and H.B. Glasgow (1995) Interactions of a toxic estuarine dinoflagellate with microbial predators and prey. *Archiv für Protistenkunde* 145:177-188.
 - 27) Burkholder, J.M., H.B. Glasgow and C.W. Hobbs (1995) Distribution and environmental conditions for fish kills linked to a toxic ambush-predator dinoflagellate. *Marine Ecology Progress Series* 124:43-61.
 - 28) Burkholder, J.M., H.B. Glasgow and K.A. Steidinger (1995) Stage transformations in the complex life cycle of an ichthyotoxic "ambush-predator" dinoflagellate, pp. 567-572. In: *Harmful Marine Algal Blooms*, by P. Lassus, G. Arzul, E. Erard, P. Gentien and C. Marcaillou (eds.). Lavoisier, Intercept Ltd., Paris.
 - 29) Coleman, V.L., and J.M. Burkholder (1995) Response of microalgal epiphyte communities to nitrate enrichment in an eelgrass (*Zostera marina* L.) meadow. *Journal of Phycology* 31:36-43.
 - 30) Glasgow, H.B., J.M. Burkholder, D.E. Schmechel, P.A. Fester and P.A. Rublee (1995) Insidious effects of a toxic dinoflagellate on fish survival and human health. *Journal of Toxicology and Environmental Health* 46:501-522.
 - 31) Lewitus, A.J., R.V. Jesien, T.M. Kana, J.M. Burkholder, H.B. Glasgow and E. May (1995) Discovery of the "phantom" dinoflagellate in Chesapeake Bay. *Estuaries* 18:373-378.
 - 32) Mallin, M.A., J.M. Burkholder, L.M. Larsen and H.B. Glasgow (1995) Response of two zooplankton grazers to an ichthyotoxic estuarine dinoflagellate. *Journal of Plankton Research* 17:351-363.
 - 33) Steidinger, K.A., E.W. Truby, J.K. Garrett and J.M. Burkholder (1995) The morphology and cytology of a newly discovered toxic dinoflagellate, pp. 83-88. In: *Harmful Marine Algal Blooms*, by P. Lassus, G. Arzul, E. Erard, P. Gentien and C. Marcaillou (eds.). Lavoisier, Intercept Ltd., Paris.

- 34) Burkholder, J.M. (1996) Interactions of benthic algae with their substrata, pp. 253-297. In: *Benthic Algae in Freshwater Ecosystems*, by R.J. Stevenson, M. Bothwell and R.L. Lowe (eds.). Academic Press, New York.
- 35) Noga, E.J., L. Khoo, J.B. Stevens, Z. Fan and J.M. Burkholder (1996) Novel toxic dinoflagellate causes epidemic disease in estuarine fish. *Marine Pollution Bulletin* 32:219-224.
- 36) Steidinger, K.A., J.M. Burkholder, H.B. Glasgow, C.W. Hobbs, E. Truby, J. Garrett, E.J. Noga and S.A. Smith (1996) *Pfiesteria piscicida* gen. et sp. nov. (Pfiesteriaceae, fam. nov.), a new toxic dinoflagellate with a complex life cycle and behavior. *Journal of Phycology* 32:157-164 (and cover photo by K. Steidinger's laboratory).
- 37) Burkholder, J.M. and H.B. Glasgow (1997) *Pfiesteria piscicida* and other toxic *Pfiesteria*-like dinoflagellates: Behavior, impacts, and environmental controls. *Limnology and Oceanography* 42:1052-1075.
- 38) Burkholder, J.M. and H.B. Glasgow (1997) Trophic controls on stage transformations of a toxic ambush-predator dinoflagellate. *Journal of Eukaryotic Microbiology* 44:200-205.
- 39) Burkholder, J.M., M.A. Mallin, H.B. Glasgow, L.M. Larsen, M.R. McIver, G.C. Shank, N. Deamer-Melia, D.S. Briley, J. Springer, B.W. Touchette and E.K. Hannon (1997) Impacts to a coastal river and estuary from rupture of a large swine waste holding lagoon. *Journal of Environmental Quality* 26:1451-1466.
- 40) Levin, E.D., D.E. Schmechel, J.M. Burkholder, H.B. Glasgow, N. Deamer-Melia, V.C. Moser and G.J. Harry (1997) Persistent learning deficits in rats after exposure to *Pfiesteria piscicida*. *Environmental Health Perspectives* 105:1320-1325.
- 41) Mallin, M.A., J.M. Burkholder, G.C. Shank, M.R. McIver, H.B. Glasgow, J. Springer and B.W. Touchette (1997) Comparative effects of poultry and swine waste lagoon spills on the quality of receiving streamwaters. *Journal of Environmental Quality* 26:1622-1631.
- 42) Burkholder, J.M. (1998) Implications of harmful marine microalgae and heterotrophic dinoflagellates in management of sustainable marine fisheries. *Ecological Applications* 8:S37-S62.
- 43) Burkholder, J.M., H.B. Glasgow and A.J. Lewitus (1998) Physiological ecology of *Pfiesteria piscicida* with general comments on "ambush-predator" dinoflagellates, pp. 175-191. In: *Physiological Ecology of Harmful Algae*, by D.M. Anderson, A. Cembella and G.M. Hallegraeff (eds.). NATO ASI Series G: Ecological Sciences, Vol. 41. Springer-Verlag, Berlin.
- 44) Burkholder, J.M., L.M. Larsen, H.B. Glasgow, K.M. Mason, P. Gama and J.E. Parsons (1998) Influence of sediment and phosphorus loading on phytoplankton communities in an urban piedmont reservoir. *Lake and Reservoir Management* 14:110-121.
- 45) Glasgow, H.B., A.J. Lewitus and J.M. Burkholder (1998) Feeding behavior of the ichthyotoxic estuarine dinoflagellate, *Pfiesteria piscicida*, on amino acids, algal prey, and fish vs. mammalian erythrocytes, pp. 394-397. In: *Harmful Microalgae*, by B. Reguera, J. Blanco, M.L. Fernandez and T. Wyatt (eds.). Proceedings, VIIth International Conference on Harmful Algal Blooms. Xunta de Galicia and Intergovernmental Oceanographic Commission of UNESCO, Paris.
- 46) Burkholder, J.M. and H.B. Glasgow (1999) Science ethics and its role in early suppression of the *Pfiesteria* issue. *Human Organization* 58:443-455.
- 47) Burkholder, J.M., M.A. Mallin and H.B. Glasgow (1999) Fish kills, bottom-water hypoxia, and the toxic *Pfiesteria* complex in the Neuse River and Estuary. *Marine Ecology Progress Series* 179:301-310.
- 48) Burkholder, J.M. and J.J. Springer (1999) Signaling in dinoflagellates, pp. 335-359. In: *Microbial Signaling and Communication*, by R.R. England, G. Hobbs, N.J. Bainton and D.McL. Roberts (eds.). Fifty-Seventh Symposium of the Society for General Microbiology. Cambridge University

Press.

- 49) Fairey, E.R., J.S. Edmunds, N.J. Deamer-Melia, H. B. Glasgow, F.M. Johnson, P.R. Moeller, J.M. Burkholder and J.S. Ramsdell (1999) Reporter gene assay for fish killing activity produced by *Pfiesteria piscicida*. *Environmental Health Perspectives* 107:711-714.
- 50) Harvell, C.D., K. Kim, J.M. Burkholder, R.R. Colwell, P.R. Epstein, J. Grimes, E.E. Hofmann, E. Lipp, A.D.M. E. Osterhaus, R. Overstreet, J.W. Porter, G.W. Smith and G. Vasta (1999) Emerging marine diseases: Climate links and anthropogenic factors. *Science* 285:1505-1510.
- 51) Levin, E.D., B.B. Simon, D.E. Schmechel, H.B. Glasgow, N.J. Deamer-Melia, J.M. Burkholder, V.C. Moser, K. Jensen and G.J. Harry (1999) *Pfiesteria* toxin and learning performance. *Neurotoxicology and Teratology* 21:215-221.
- 52) Lewitus, A.J., H.B. Glasgow and J.M. Burkholder (1999) Kleptoplastidy in the toxic dinoflagellate, *Pfiesteria piscicida*. *Journal of Phycology* 35:303-312.
- 53) Lewitus, A.J., B.M. Willis, K.C. Hayes, J.M. Burkholder, H.B. Glasgow, P.M. Glibert and M.K. Burke (1999) Mixotrophy and nitrogen uptake by *Pfiesteria piscicida* (Dinophyceae). *Journal of Phycology* 35:1430-1437.
- 54) Rublee, P.A., J. Kempton, E. Schaefer, J.M. Burkholder, H.B. Glasgow and D. Oldach (1999) PCR and FISH detection extends the range of *Pfiesteria piscicida* in estuarine waters. *Virginia Journal of Science* 50:325-336.
- 55) Burkholder, J.M. (2000) Critical needs in harmful algal bloom research, pp. 126-149. In: *Opportunities for Environmental Applications of Marine Biotechnology*. National Academy of Sciences – National Research Council, Washington, DC.
- 56) Burkholder, J.M. (2000) Chronic impacts from toxic microalgae on finfish, shellfish and human health. Invited chapter in: *Proceedings of the Symposium on Conservation Medicine*, by C. Barakatt (ed.). School of Veterinary Medicine, Tufts University. Academic Press, New York.
- 57) Bowers, H.A., T. Tengs, H.B. Glasgow, J.M. Burkholder, P.A. Rublee and D.W. Oldach (2000) Development of real-time PCR assays for rapid detection of *Pfiesteria piscicida* and related dinoflagellates. *Applied and Environmental Microbiology* 66:4641-4648.
- 58) Glasgow, H.B. and J.M. Burkholder (2000) Water quality trends and management implications from a five-year study of a eutrophic estuary. *Ecological Applications* 10:1024-1046.
- 59) Levin, E.D., A.H. Rezvani, N.C. Christopher, H.B. Glasgow, N.J. Deamer-Melia, J.M. Burkholder, V.C. Moser and K. Jensen (2000) Rapid neurobehavioral analysis of *Pfiesteria piscicida* effects in juvenile and adult rats. *Neurotoxicology and Teratology* 22:533-540.
- 60) Levin E.D., D.E. Schmechel, H.B. Glasgow, N.J. Deamer-Melia and J.M. Burkholder (2000) *Pfiesteria* toxin, pp. 975-976. In: *Experimental and Clinical Neurotoxicology* (2nd edition), by P.S. Spencer, H.S. Shaumburg and A.C. Ludolph (eds.). Oxford University Press, New York.
- 61) Mallin, M.A., J.M. Burkholder, L.B. Cahoon and M.H. Posey (2000) The North and South Carolina Coasts. In: *The Seas at the Millennium*, by C. Shepherd (ed.). Academic Press, New York. Also among several contributions selected from this multi-volume set, for publication in *Marine Pollution Bulletin* (vol. 41, pp. 56-75).
- 62) Oldach, D.W., C.F. Delwiche, K.S. Jakobsen, T. Tengs, E.G. Brown, J.W. Kempton, E.F. Schaefer, H. Bowers, H.B. Glasgow, J.M. Burkholder, K.A. Steidinger and P.A. Rublee (2000) Heteroduplex mobility assay guided sequence discovery: elucidation of the small subunit (18S) rDNA sequence of *Pfiesteria piscicida* and related dinoflagellates from complex algal culture and environmental sample DNA pools. *Proceedings of the National Academy of Sciences (USA)* 97:4303-4308.
- 63) Touchette, B.W. and J.M. Burkholder (2000) Overview of the physiological ecology of carbon metabolism in seagrasses. *Journal of Experimental Marine Biology and Ecology* 250:169-205.

- 64) Touchette, B.W. and J.M. Burkholder (2000) Review of nitrogen and phosphorus metabolism in seagrasses. *Journal of Experimental Marine Biology and Ecology* 250:133-167.
- 65) Burkholder, J.M. (2001) Chronic impacts from toxic microalgae on finfish, shellfish and human health, pp. 103-126. *In: Waters in Peril*, by L. Bendell-Young and P. Gallagher (eds.). Kluwer Academic Publishers, Dordrecht, the Netherlands.
- 66) Burkholder, J.M. (2001) Eutrophication and oligotrophication, pp. 649-670. *In: Encyclopedia of Biodiversity*, Vol. 2, by Simon Levin (ed.). Academic Press, New York.
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Publications for Environmental Policy and the General Citizenry (examples)

- Burkholder, J.M. (1993) Vital grasses need clean water to grow. In: *Currents*, News Letter of the Pamlico-Tar River Foundation. Vol. 13, Fall, p.7, Washington, NC.
- Burkholder, J.M. (1993) A newly discovered toxic alga and its relationship to fish kills, pp.48-58. In: *Proceedings from the Second North Carolina Marine Recreational Fishing Forum*. NC Sea Grant Report UNC-SG-93-06. UNC Sea Grant, NCSU, Raleigh, NC, 61 pp.
- Burkholder, J.M. (1993) Golf course runoff: View from below the water surface, pp. 18-23. In: *Is Golfing Green? The Impact of Golf Courses on the Coastal Environment*. Symposium Proceedings (sponsored by the NC Coastal Federation and the NC Cooperative Extension Service through the NC Sea Grant College Program), Wilmington, NC.
- Coastal Futures Committee (1994) *Charting a Course for our Coast - A Report to the Governor of North Carolina*. L.R. Preyer, Chair. Raleigh, NC Department of Environment, Health and Natural Resources, 106 pp. [As the only scientist on the 15-member committee, I contributed substantially to all sections related to water quality, habitat, and fisheries in the document, and to the executive summary of prioritized recommendations.]
- Burkholder, J.M. (1995) Fish kills' message: Get serious about reducing nutrient over-enrichment to our estuaries, pp. 1-3. In: *WaterWise*, by B. Doll (Ed.). Vol. 1, 2nd Quarter. UNC Sea Grant News Letter. Raleigh, NC.
- Burkholder, J.M. (1997) *Pfiesteria* and Nutrient Pollution. Requested by Maryland's Governor Glendening for a summit meeting of five governors of states in the Chesapeake Bay watershed, Annapolis, MD.
- President's Committee of Advisors on Science and Technology (PCAST) (1998) *Teaming with Life: Investing in Science to Understand and Use America's Living Capital*. Section I: Make Use of Current Knowledge in Managing Biodiversity and Ecosystems of the U.S., p.27. PCAST Panel on Biodiversity and Ecosystems, Washington, DC.
- Burkholder, J.M. (2006) A major potable water supply reservoir poised for increased cyanobacteria blooms. *LakeLine* (summer), pp. 49-51.

Workshops

Light Microscope-Autoradiography of Microalgae – a five-day workshop designed and presented to the Department of Biology, Bowling Green State University (Bowling Green, OH, March 1987).

Teaching Aquatic Botany to High School Students – a one-day workshop designed and presented to selected high school instructors from North Carolina, NCSU (Raleigh, NC, March 1987, April 1988).

Improved Standards for Protecting Water Quality in the Albemarle-Pamlico Estuarine System – invited participant at a two-day workshop sponsored by the U.S. EPA and the State of North Carolina (Washington, NC, Dec. 1991).

Water Quality Regulations for Protection of Seagrass Habitat on the Gulf Coast – invited participant; sponsored by the U.S. EPA (Sarasota, FL, Jan. 1992).

Improved Data Base and Optimal Approaches for Modeling Water Quality in the Albemarle-Pamlico Estuarine System – invited participant at a one-day workshop sponsored by the U.S. EPA and the North Carolina Department of Environment, Health and Natural Resources (Albemarle-Pamlico Estuarine Study), hosted by Research Triangle Institute (Research Triangle Park, NC, March 1992).

Target Issues for Funding Support of Research on Toxic Phytoplankton – invited participant; sponsored by NOAA-NMFS (Charleston, SC, April 1992).

Phytoplankton of the Southeastern United States, With Emphasis on Identification Techniques for the New Toxic Dinoflagellate – invited seminar speaker at a two-day workshop sponsored by the NC Division of Environment, Health and Natural Resources, and by Duke Power Company (Charlotte, NC, April 1992).

Target Issues: Development of RFP guidelines for a New NOAA Coastal Ocean Program Initiative on Harmful Algal Blooms – invited participant; sponsored by NOAA (Silver Spring, MD, June 1992).

Techniques in Sampling and Identification of the New Toxic Dinoflagellate – a one-day workshop presented to NOAA-NMFS (Beaufort, NC, June 1992); Florida Department of Natural Resources – Florida Marine Research Institute (St. Petersburg, FL, July 1992); Bodega Marine Laboratory (Bodega Bay, CA, Nov. 1992); Maryland Department of Natural Resources / NOAA Oxford Laboratory (Oxford, MD, Feb. 1993); Maryland Division of Water Quality (Baltimore, MD, Feb. 1993); and the Delaware Division of Water Quality laboratory and University of Delaware (Lewes, DE, Feb. 1993).

Seagrasses and Eutrophication Impacts – invited participant at a workshop to assess the response of seagrass communities to coastal nutrient enrichment, including identification of potentially useful indicators of plant stress; sponsored by the U.S. EPA and the Sarasota Bay National Estuary Program (Sarasota, FL, July 1993).

Harmful Algal Blooms - Research Initiative Development – invited participant in a workshop to develop a strategy document for presentation to various funding agencies. Sponsored by NSF and NOAA (Snow Mountain, CO, Aug. 1994).

Golf and the Environment: Charting a Sustainable Future – invited participant and speaker in a workshop to develop rapport and collaborations between the golf course industry and environmental concerns. Coordinated by the Center for Resource Management (Pebble Beach, CA, Jan. 1995).

National Nutrient Assessment Workshop – participant in the "Estuaries" section and helped form directives about information needed to address impacts of cultural eutrophication on toxic phytoplankton and seagrasses. Coordinated by the U.S. EPA (Washington, DC, Dec. 1995).

Disease Events, Ecology, and Meteorology along the U.S. Atlantic Coast – invited participant in a workshop to organize datasets and construct an integrated geographic information system. Coordinated by Dr. P. Epstein, Harvard Medical School (Cambridge, MA, Dec. 1995).

Management of Sustainable Marine Fisheries – invited participant. Organized by the Ocean Studies Board of the National Academy of Sciences (Monterey, CA, Feb. 1996).

Control of Blue-Green Algae in Rainbow Springs, Florida – invited participant. Organized by the Department of Fisheries and Aquaculture, University of Florida (Gainesville, FL, Oct. 1996).

Developing an Environmental Education Video on Water Resource Issues in North Carolina – invited academic representative. Sponsored by the Z. Smith Reynolds Foundation (Winston-Salem, NC, Jan. 1997).

Climate Variability and Human Health: An Interdisciplinary Perspective – invited participant. Organized by the American Society of Microbiology (Montego Bay, Jamaica, June 1997).

Fish Disease on the Pocomoke River, Maryland – invited participant and speaker. Organized by the Maryland Department of Natural Resources (Salisbury, MD, Aug. 1997).

Harmful Algal Blooms and Human Health – invited participant and speaker. Organized by NIEHS (Research Triangle Park, NC, Aug. 1997).

Impacts of Toxic *Pfiesteria*-like Dinoflagellates on Fisheries and Human Health – invited speaker in various forums of national and state government officials from the mid-Atlantic, northeastern, and southeastern U.S. Organized by the U.S. EPA (Philadelphia, PA, Sept. 1997; Washington, DC, Oct. 1997; Pensacola, FL, Oct. 1997); also presented to the Delaware Department of Environment and Water Resources (Dover, DE; Oct. 1997).

The Cambridge *Pfiesteria*/Nutrients Workshop, convened by Governor Glendening of Maryland to assess the validity of the nutrient pollution - *Pfiesteria* connection (Cambridge, MD, Oct. 1997). The final report, *The Cambridge Consensus*, was used by the governor and the Maryland legislature to change policy about non-point water pollution control in tributaries to Chesapeake Bay and led to passage of the Maryland Water Quality Act of 1998.

The Toxic *Pfiesteria* Complex: Known Biology, Impacts, and Environmental Controls – invited speaker, *Pfiesteria* Workshop, 14th Biennial International Conference of the Estuarine Research Federation, Providence, RI (Oct. 1997); Marine Biotechnology Institute of the University of Maryland, Baltimore, MD (Oct. 1997).

Maryland Technical Advisory Committee Workshop on *Pfiesteria*, Fish Kills, and Water Quality Monitoring – invited participant and speaker. Sponsored by the Maryland Department of Natural Resources, Baltimore, MD (Feb. 1998).

State / Federal *Pfiesteria* Working Group - Monitoring Protocols – Invited participant. Sponsored by the U.S. EPA and NOAA, involving environmental agency representatives from Delaware, Maryland, Virginia, North Carolina, and Florida, Patuxent Wildlife Research Center, Laurel, MD (March 1998).

Maryland Workshop - *Pfiesteria* and Human Health – invited participant. Sponsored by the Maryland Department of Health and Mental Hygiene and the Maryland Medical Team, University of Maryland and Johns Hopkins; Baltimore, MD (May 1998).

Planning Ahead for Toxic Outbreaks of *Pfiesteria* – keynote address. Sponsored by U.S. EPA, Region IV, Atlanta, GA (June 1998).

Pfiesteria Workshop - Sampling and Identification Protocols – organized by J. Burkholder and H. Glasgow for researchers from four states; NCSU, Raleigh, NC (May 1998); invited speaker and participant at an overview workshop on sampling/identification protocols that was conducted by the Centers for Disease Control and Prevention, Atlanta, GA (June 1998).

Coastal Marine Areas and Nutrient Pollution – invited speaker at a workshop to evaluate the marine sciences programs of the Institut für Meereskunde, Salzgau, Germany (Sept. 1998).

Pfiesteria – invited speaker, EUROHAB Workshop – EUROHAB Science Initiative on Harmful Algal Blooms. Sponsored by the MAST program of the European Commission, University of Kalmar, Kalmar, Sweden (Nov. 1998).

Pfiesteria and Water Quality Monitoring Standards Workshop – invited speaker. Sponsored by NOAA, Silver Spring, MD (Dec. 1998).

1998 *Pfiesteria* Retrospective – keynote speaker; invited speaker (3 other presentations). Sponsored by the U.S. EPA Region III, Baltimore, MD (Jan. 1999).

Conservation Medicine Workshop – invited speaker. Sponsored by the Center for Conservation Medicine of Tufts University, Jacksonville, FL (April 1999).

Re-evaluation of Microbial Water Quality: Powerful New Tools for Detection and Risk Assessment – Invited participant. Sponsored by the American Academy of Microbiology, Amelia Island, FL (March 2000).

Harmful Algae – Technical Advisory Committee Workshop – invited participant. Sponsored by the Maryland Departments of Natural Resources and Environment, Annapolis, MD (March 2000, 2001, 2002).

Estuarine Fish Disease – invited participant. Sponsored by the Delaware Department of Natural Resources and Environmental Control, Dover, DE (Oct. 2000).

Concentrated Animal Feed Operations – invited speaker at the Conflicted Science / Integrity in Science Conference and workshop. Sponsored by the Center for Science in the Public Interest, Washington, DC (June 2003).

Aquaculture for the Future – an aquaculture-and-the-public-interest workshop sponsored by the Sierra Club, with key representation by the National Shellfish Association, Darling Center, ME (Sept. 2003).

Social and Environmental Impacts of Concentrated Animal Feed Operations – invited participant; speaker on water quality impacts. Sponsored by the University of Iowa and NIEHS, Iowa City, IA (March 2004).

National Plan for Harmful Algal Research – 1 of 45 invited participants nationwide. Sponsored by the Ecological Society of America and NOAA, NOAA-NOS, Charleston, SC (March 2004).

Occurrence of Toxicogenic Cyanobacteria in the U.S., part of the International Symposium on Cyanobacterial Harmful Algal Blooms (ISOC-HAB), Research Triangle Park, NC (Sept. 2005).

Scientific Presentations (examples in the past five years, from more than 460)

“*Pfiesteria* – Science and Science Ethics at the Science/Policy Border” - Voices of Discovery keynote speaker, Elon University, Burlington, NC (February 2003); invited speaker, International EnviroVet Program, Harbor Branch Oceanographic Institute, Fort Pierce, FL (July 2003).

“Water Quality Impacts of Concentrated Animal Feed Operations” - Invited presentation, Conflicted Science Conference, Center for Science in the Public Interest, Washington, DC (July 2003).

“The Role of Scientists’ Conduct in Environmental Issues” - Invited presentation, NSF Environmental Education Program, NCSU – Science Education, Raleigh, NC (July 2003); keynote presentation, 36th Annual Conference of the Metropolitan Association of College and University Biologists, Wagner, College, NY (Oct. 2003).

“Water Quality Trends in the Neuse Estuary Based on a Decadal Data Set, and Policy / Political Implications” - Invited presentation, Department of Biology, Cornell University, Ithaca, NY (April 2004); Department of Marine Sciences, University of Connecticut, Groton, CT (Oct. 2004).

“Intraspecific Variability in Toxicity, Behavior and Nutrition in Toxicogenic Microalgae,” plenary presentation by J.M. Burkholder and P.M. Glibert*. XIth International Conference on Harmful Algae, Cape Town, South Africa (Nov. 2004; plenary presentation, with published abstract).

“Intraspecific Variation in Nutrition and Toxicity in Toxicogenic Microalgae” - Invited presentation, GEOHAB Symposium on the Nutritional Ecology of Harmful Algae, Baltimore, MD (March 2005; with published abstract).

“Toxicogenic Cyanobacteria in North Carolina Potable Water Supply Reservoirs” - by J. Burkholder*, B. Touchette, E. Hannon and J. Alexander. Invited presentation, Annual Meeting, Southeast Chapter of the North American Lake Management Society, Asheville, NC (April 2005; with published abstract).

“Increasing Importance of Ammonium in Eutrophic Estuaries” - by J. Burkholder*, D. Dickey, C. Kinder, R. Reed, M. Mallin, M. McIver, L. Cahoon and C. Brownie. 18th Biennial Conference of the

Estuarine Research Federation, Norfolk, VA (Oct. 2005; with published abstract).

“Variable Toxicity of Strains of *Pfiesteria* spp. to Fish and Mammalian Cells: Influences of Assay Techniques and Culturing Methods” - by J. Burkholder*, A. Gordon, H. Marshall, P. Moeller, K. Coyne, A. Lewitus and M. Law. 18th Biennial Conference of the Estuarine Research Federation, Norfolk, VA (Oct. 2005; with published abstract).

“A Perspective on Toxigenic Cyanobacteria in U.S. Freshwaters” - Keynote presentation, Annual Conference of the North American Lake Management Society, Madison, WI (Oct. 2005; with published abstract).

“Biology and Impacts of Toxigenic *Pfiesteria*: Research at the Science / Policy Border” - Invited presentation, Kalmar University, Kalmar, Sweden (Feb. 2006).

“Emerging Linkages Between Cultural Eutrophication and Harmful Algal Blooms” - Plenary presentation, American Society of Limnology and Oceanography, Victoria, British Columbia, Canada (June 2006).

“CAAE Falls Lake Monitoring and Research Program (FALMOR)”, by J.M. Burkholder* R.E. Reed, E.H. Allen, C. Kinder and J. James. Annual Conference of the UNC Water Resources Research Institute, Raleigh, NC (March 2007; with published abstract).

“Seasonal Dynamics of Groundwater and Benthic Nitrogen Flux in the Neuse River Estuary, North Carolina”, by K. Null*, J. Burkholder, D. DeMaster, C. Thomas and R. Reed. Annual Conference of the UNC Water Resources Research Institute, Raleigh, NC (March 2007; poster with published abstract).

“Long-Term Impacts of Changing Land-Use Practices on Water Quality and Phytoplankton Assemblages in the Neuse River Ecosystem, NC”, by M.B. Rothenberger*, J.M. Burkholder and C. Brownie. Annual Conference of the UNC Water Resources Research Institute, Raleigh, NC (March 2007; poster with published abstract).

“Inorganic Nitrogen Flux From Groundwater and Across the Sediment-Water Interface in the Neuse River Estuary, North Carolina: Implications for Ammonium Increase”, by K. Null*, J. Burkholder, D. DeMaster, C. Thomas and R. Reed. Annual Conference of the North Carolina Academy of Science, Greenville, NC (March 2007; poster with published abstract).

“Status of North Carolina’s Potable Water Reservoirs: Encroaching Development, Deteriorating Water Quality, and the Potential for Increased Harmful Cyanobacteria Blooms.” Invited presentation at the conference, Water Initiatives: What’s on the Horizon for Lake Users and Managers?”, Greensboro, NC (May 2007).

“Cyanobacteria in Eutrophic, Turbid Impoundments of the North Carolina Piedmont,” by J. Burkholder*, E. Allen, C. Kinder, B. Touchette and J. James. Annual Meeting of Phycological Society of America, Providence, RI (August 2007; poster with published abstract).

“Axenic Cultivation of the Heterotrophic Dinoflagellate, *Pfiesteria shumwayae*, and Observations on Feeding Behavior,” by H. Skelton*, J. Burkholder and M. Parrow. Annual Meeting of Phycological Society of America, Providence, RI (August 2007; poster with published abstract).

“Littoral Algae, Star Players of Aquatic Ecosystems Across the Salinity Gradient.” Invited presentation, Society of International Limnologists (SIL) 2007 – 30th Congress of the International Association of Theoretical and Applied Limnology, Montreal, Quebec, Canada (August 2007; with published abstract).

Professional Service (examples)

Guest Co-Editor – *Harmful Algae*, special issue on the Ecology of *Pfiesteria* (2006, with P. Glibert).

Editorial Advisory Board - *Journal of Phycology* (1995-1997; *Journal of Eukaryotic Microbiology* (1999-2001), *Harmful Algae* (2002–), *Journal of Experimental Marine Biology and Ecology* (2005–).

Journals Refereed - *American Midland Naturalist, Aquaculture, Applied and Environmental Microbiology, Archives für Hydrobiologie, Biogeochemistry, Estuaries, Harmful Algae, Journal of Experimental Marine Biology and Ecology, Journal of Phycology, Lake and Reservoir Management, Limnology and Oceanography, Marine Ecology Progress Series, Nature, Oecologia.*

Symposium Refereed - Aquatic Macrophytes (Savannah River Ecology Laboratory, 1987).

Proposals Reviewed - Mississippi / Alabama Sea Grant Consortium, National Science Foundation, New York Sea Grant, North Carolina Albemarle/Pamlico Estuary Study Program, North Carolina Agricultural Research Service, Florida Sea Grant, NOAA Ecohab, South Florida Water Management District, University of California Sea Grant, University of Florida Sea Grant, University of Maryland Sea Grant, University of North Carolina Sea Grant, University of North Carolina Water Resources Research Institute.

Committees Served

- Chair, Hutchinson Award Committee, American Society of Limnology and Oceanography (1996).
- Member, Ethics Committee, American Society of Limnology and Oceanography (1996-1997).
- Member, Harmful Algae Technical Advisory Committee, Maryland DNR (1998-).
- Member, Organizing Committee, National Symposium on Harmful Algae (2000, 2002).

Symposia Chaired -

- "Phytoplankton" session, Annual Meeting of the American Society of Limnology and Oceanography (Boulder, CO, June 1988).
- "Ecology of Freshwater Algae" session, Joint Meeting of the International Phycological Congress and the Phycological Society of America (Durham, NC, Aug. 1991).
- "Harmful Algal Blooms" session, Joint Meeting of the American Society of Limnology and Oceanography and the American Geophysical Union (Santa Fe, NM, Feb. 1997; co-chair with E. Granéli).
- "Harmful Algal Blooms" session, Annual Summer Meeting of the American Society of Limnology and Oceanography (St. Louis, MO, June 1998; co-chair with S. Shumway).
- "Harmful Algae" session, 15th Biennial International Conference of the Estuarine Research Federation (New Orleans, LA, Sept. 1999).
- "New Harmful Algae," 10th International Conference on Harmful Algal Blooms (Hobart, Tasmania, Australia, Feb. 2000).
- "*Pfiesteria* in the southeastern U.S.," Symposium on Harmful Algae in the U.S. (Woods Hole, MA, Dec. 2000).
- "Ecology of Aquatic Protozoa," XIth Meeting of the International Congress of Protozoology (Salzburg, Austria, July 2001).

Community Service – Environmental Education Outreach (examples from more than 750)

"Environmental Science as a Profession for Women" - Invited presentation at the Math, Science and Technology Workshop for Girls (Secondary and high school students), Rock Valley Community College, Rockford, IL (April 2000).

"Pressing Water Quality Issues of the New Decade" - Invited presentation, University and Industry Consortium 2000 Fall Meeting (for industry officials), Research Triangle Park, NC (Oct. 2000).

"Water Quality Issues in North Carolina" - Invited presentation, freshmen orientation, NCSU, Raleigh,

NC (Aug. 2001); Environmental Issues Club (undergraduate), School of Design, NCSU, Raleigh, NC (Oct. 2001); Honors Biology senior class, Randleman High School, Charlotte, NC (Oct. 2001); Honors Biology and Ecology junior and classes, Durant Middle School, Raleigh, NC (Oct. 2001).

“Harmful Algae in North Carolina Estuaries” - Invited presentation, NC Aquarium, Fort Fisher, NC (May 2003).

“Scientists’ Conduct – Role in Natural Resource Protection” - Keynote address, 36th Annual Conference of the NY Metropolitan Association of College and University Biologists, Wagner College, NY (Nov. 2003); invited speaker for Earth Day, Rockland College, NY (April 2004); invited presentation, Wilkes Community College –Earth Day, Wilkesboro, NC (April 2004).

“How North Carolinians of All Ages Can Help Protect Our State’s Rivers and Estuaries” - Presentation to 8th grade classes, Leesvale Road Middle School, Raleigh, NC (March 2005).

“Environmental Health Issues and the Science / Policy Border” - Keynote presentation to the Annual Water Quality Conference, State of Washington Department of Ecology, Wenatchee, WA (Oct. 2005).

“Algae for High School Students” - Invited presentation, Kenan Fellows Program for High School Teachers, North Carolina State University, Raleigh, NC (Aug. 2006).

“How to Design a Scientifically Sound Experiment” - Presentation to the honors science class, Southwest Guilford High School, Greensboro, NC (Feb. 2006); and to the Kenan Fellows Program for High School Teachers, North Carolina State University, Raleigh, NC (July, Aug. 2006).

“Emerging Linkages Between Harmful Algae and Eutrophication, With Emphasis on Florida’s Red Tide” - Invited presentation sponsored by the TREE Foundation, for the general citizenry in coastal west-central Florida (Sarasota, FL, Oct. 2006).

“What Is Known About the Influence of Urea and Other Fertilizer Nutrients on *Karenia brevis*” - Invited presentation to the Secretary of the Florida Department of Environmental Protection, selected staff, and a Governor’s office representative (Tallahassee, FL, Oct. 2006).

“The Influence of Scientists’ Conduct On Progress In Environmental Health Issues” - Invited presentation to the Biology and Environmental Sciences classes of the North Carolina School of Science and Mathematics, also teleconferenced to Brunswick Community College (Durham, NC, March 2007); and invited presentation to the Honors Biology class of Fuquay-Varina High School (Fuquay-Varina, NC, April 2007).

“Careers in Aquatic Ecology, From Water Pollution Control to the Fascinating, Hidden World of the Algae”. Keynote address to the North Carolina Student Academy of Sciences State Competition (6th – 12th grade students, parents, teachers; Durham, NC, March 2007).