

Curriculum Vitae
Rachel Todd Noble

The University of North Carolina at Chapel Hill
Institute of Marine Sciences
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Education

University of Southern California. Ph. D. Marine Biology, 1998.
Dissertation: *Fates of Viruses in the Marine Environment*

Carnegie Mellon University. B.Sc. Molecular Biology, 1991.

Professional Experience

Mary and Watts Hill Jr. Distinguished Professor **July 2015-present**

University of North Carolina at Chapel Hill, Institute of Marine Sciences: Joint appointment between the Institute of Marine Sciences and the Institute for the Environment, with additional Joint appointment to Department of Environmental Sciences and Engineering in the Gillings School of Global Public Health and the Department of Marine Sciences

Director **August 2003-present**

Institute for the Environment Morehead City Field Site

Associate Professor/Full Professor **July 2007-June 2015**

University of North Carolina at Chapel Hill, Institute of Marine Sciences: Joint appointment between the Institute of Marine Sciences and the Institute for the Environment, with additional Joint appointment to Department of Environmental Sciences and Engineering in the Gillings School of Global Public Health and the Department of Marine Sciences

Assistant Professor **July 2001 to June 2007**

University of North Carolina at Chapel Hill, Institute of Marine Sciences: Joint appointment between the Institute of Marine Sciences and the Carolina Environmental Program

Research Faculty/Post-doctoral Researcher **1998-2001**

Joint appointment between the Southern California Coastal Water Research Project (SCCWRP) and the USC Wrigley Institute for Environmental Studies

Graduate Research Assistant **1991-1998**

Department of Biological Sciences, University of Southern California

Visiting Researcher **1996-1997**

Danish Research Academy, University of Copenhagen, Denmark

Honors

Distinguished Professor Endowment and Recognition, July 2015
Recipient of UNC Chapel Hill Junior Faculty Development Award, December 2006
Recipient of an ISEA Travel Grant Award for Young Investigators, August 2002
DIALOG III, October 1999, Selected to represent recent doctorates in Aquatic Sciences,
Bermuda Biological Research Station, Bermuda
Danish Research Academy, Visiting Research Fellowship, 1996-1997
ARCS Society Scholarship Award, 1995-1998
Trojan League Award, May 1996
Recipient of the Award for Southern California American Society for Microbiology
Doctoral Candidate Poster Presentation, 1993, 1994

Bibliography

Peer-reviewed Journal Articles (indicates mentored undergraduate and graduate students and postdoctoral associates, 84):*

Rastelli, E., Dell'Anno, A., Corinaldesi, C., Middelboe, M., Noble, R. T., and R. Danovaro. 2016 Quantification of viral and prokaryotic production rates in benthic ecosystems: a methods comparison. *Frontiers in Microbiology*. *Front Microbiol*. 2016 Sep 22;7:1501. eCollection 2016.

Raszl, S. M., B. A. Froelich, C. R. W. Vieira, A. D. Blackwood and R. T. Noble. 2016. Accepted. *Vibrio vulnificus* and *Vibrio parahaemolyticus* in South America: Water, Seafood, and Human Infections. *Journal of Applied Microbiology* ISSN 1364-5072. doi:10.1111/jam.13246

Danovaro, R., Dell'Anno, A., Corinaldesi, C., Rastelli, E., Cavicchioli, R., Krupovic, M., Noble, R., Nunoura, T., and D. Prangishvili. 2016. Virus-mediated archaeal hecatomb in the deep seafloor. *Journal of Science Advances*. Vol. 2, #10, e1600492. DOI: 10.1126/sciadv.1600492

Froelich B.A., and R. T. Noble. 2016. *Vibrio* bacteria in raw oysters: managing risks to human health. *Phil. Trans. R. Soc. B*. 371. 20150209. <http://dx.doi.org/10.1098/rstb.2015.0209>

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Williams, H. N. Lymperolopoulou, D. S., Athar, R., Chauhan, A., Dickerson, T., Chen, H., Laws, E., Berhane, T., Flowers, A., Bradley, N., Young, S., Blackwood, A. D., Murray, J., Mustapha, O., Blackwell, C., Tung, Y., and R. T. Noble. 2015. *Halobacteriovorax*, an underestimated predator on bacteria: potential impact

- relative to viruses on bacterial mortality. International Society for Microbial Ecology. <http://dx.doi.org/10.1038/ismej.2015.129>.
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- *Ghazaleh, M. N. *Froelich, B. A. and **R. T. Noble**. 2014. The effect of storage time on *Vibrio* spp. and fecal indicator bacteria in an Isco autosampler. J. Microbiol. Methods. 104:109-16. doi: 10.1016/j.mimet.2014.06.021. Epub 2014 Jul 6.
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- *Froelich, B. A. and **R. T. Noble**. 2014. Factors affecting the uptake and retention of *Vibrio vulnificus* bacteria in oysters. Applied and Environmental Microbiology. 80(24):7454-9. doi: 10.1128/AEM.02042-14. Epub 2014 Sep 26.
- Gulbransen, D., *Gonzalez, R., *Froelich, B., Oliver, J., **Noble, R.**, and K. McGlathery. 2014. Association of *Gracilaria vermiculophylla*, a non-native, mat forming macroalga, with increased concentrations of *Vibrio* bacteria in sediment, water, and oysters on intertidal mudflats. Marine Ecology Progress Series. 505: 29–36, 2014. doi: 10.3354/meps10771.
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- *Gonzalez, R. A. and **R. T. Noble**. 2014. Comparisons of statistical models to predict fecal indicator bacteria concentrations enumerated by qPCR- and culture-based methods. Water Research. 48:296-305
- *Froelich, B. A., Bowen, J. D., Gonzalez, R. A., Snedeker, A., and **R. T. Noble**. 2013. Mechanistic and Statistical Models of Total *Vibrio* Abundance in the Neuse River Estuary. Water Research. DOI:10.1016/j.watres.2013.06.050. 47 (15):5783-5793.

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- Wetz, J. A., *Williams, Z. A., Blackwood, A. D., and **R. T. Noble**. 2013. Quantification of *Vibrio vulnificus* in an estuarine environment: a multi-year analysis using QPCR. OI 10.1007/s12237-013-9682-4. Estuaries and Coasts. Estuaries and Coasts (2014) 37:421-435.
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their application to the identification of *Enterococcus* species in environmental samples. *Applied and Environmental Microbiology*. 79(1):196-204.

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Heaney, C. D., Sams, E., Dufour, A., Brenner, K., Haugland, R., Wymer, L., Wing, S., Marshall, S., Serre, M., Seed, R., Beach, M., Love, D., **Noble, R.T.**, and T.J. Wade. 2012. Fecal indicators in sand, sand contact, and risk of enteric illness among beach-goers. *Epidemiology*. 23 (1) 95-106.

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Recent Books and Book Chapters

Stumpf, C. A., Gonzalez, R. A. and **R. T. Noble**. 2012. Investigating the Coastal Water Quality of the Galapagos Islands, Ecuador. Chapter 10. In: *Science and Conservation in the Galapagos Islands: Frameworks & Perspectives*, eds. Walsh, S. J. and C. F. Mena. Springer Science & Business Media. ISBN1461457947, 9781461457947. 246 pp.

McQuaig, S. M., and R. T. Noble. 2011. Viruses as Tracers of Fecal Contamination. Chapter 5. In: *Microbial Source Tracking: Methods, Applications, and Case Studies*. Eds. C. Hagedorn, A. R. Blanch, and V. J. Harwood. Springer Science & Business Media, 2011. ISBN: 144199386X, 9781441993861. 642 pp.

Technical Reports (19)

Kinzelman, J., Bushon, R., Dorevitch, S., and **R.T. Noble**. 2011. Comparative evaluation of molecular and culture methods for fecal indicator bacteria for use in inland recreational waters. WERF PATH7R09. (*Peer-reviewed*)

Noble, R.T., Blackwood, A.D., Griffith, J.F., McGee, C.D., and S. B. Weisberg. 2009. Comparison of rapid QPCR-based and culture-based methods for enumeration of *Enterococcus* sp. and *Escherichia coli* in recreational waters. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report, Southern California Coastal Water Research Project. Costa Mesa, CA. (*Peer-reviewed*)

Converse, R. R., Blackwood, A.D., Kirs, M., **Noble, R.T.**, and J. F. Griffith. 2009. Rapid QPCR-based assay for fecal *Bacteroides* spp. as a tool for assessing fecal contamination in recreational waters. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report, Southern California Coastal Water Research Project. Costa Mesa, CA. (*Peer-reviewed*)

Band, L., and Salvesen, D. (eds.). Contributors: Andrews, P., Band, L.E., Berke, P., Bromberg, P., Brubaker, J., Burby, R., Characklis, G., Doyle, M., Godschalk, D. R., Gray-Little, B., Hornstein, D. T., Konrad, C., Koren, H. S., Luettich, R. A., MacDonald, J., McKee, B., McNelis, D., Mitchell, C., **Noble, R. T.**, Paerl, H., Peden, D., Peet, R., Piehler, M., Pinschmidt, Jr., R. K., Rial, J. Ries, J., Robinson, P., Rodriguez, D., Rodriguez, A., Salvesen, D., Smith, R., Song, C., Surge, D., Weber, D., West, J., Whisnant, R., and P. S. White. 2009. North Carolina Climate

- Change Committee Report. Edited by Larry Band and David Salvesen. Institute for the Environment Website. UNC Chapel Hill Press. (*Not Peer-reviewed*)
- Noble, R. T.** and J. F. Fries. 2007. Estuarine Sediment Beds as a Reservoir for Human Pathogens: Monitoring Transport of Populations of Enterococci and Vibrio Sp. in the Neuse River Estuary. Publisher: Water Resources Research Institute of the University of North Carolina Series/Report no.:368. 25 pp. (*Not Peer-reviewed*)
- Noble, R. T.,** Griffith, J. F., Blackwood, A. D., Fuhrman, J. A., Gregory, J. B., Hernandez, X., Liang, X., Bera, A. A. and K. Schiff. 2006. Multi-tiered approach using quantitative polymerase chain reaction for tracking sources of fecal pollution to Santa Monica Bay, California, pp. 181-193 in: S.B. Weisberg and K. Miller (eds.), Southern California Coastal Water Research Project 2005-06 Biennial Report. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)
- Noble, R. T.** Commission Internationale pour L'Exploration Scientifique de la Mer Mediterranee CIESM. 2003. Ecology of Marine Viruses. CIESM Workshop Monographs. Number 21. 94 p. Monaco.
www.ciesm.org/publications/Banyuls03.pdf (*Not Peer-reviewed*)
- Noble, R. T.,** Leecaster, M.K., McGee, C.D., Weisberg, S.B., and K. Ritter. 2002. Comparison of bacterial indicator analysis methods in stormwater affected coastal waters. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report 2001-2002. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)
- Noble, R. T.,** Lee, I.M., and K. Schiff. 2002. Inactivation of indicator bacteria from various sources of fecal contamination in seawater and freshwater. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report 2001-2002. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)
- Noble, R. T.,** Moore, D.F., Leecaster, M. K., McGee, C. D., and S. B. Weisberg. 2002. Comparison of total coliform, fecal coliform and *Enterococcus* bacterial indicator response for ocean recreational water quality testing. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report 2001-2002. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)
- Noble, R. T.,** Weisberg, S. B., Leecaster, M. K., McGee, C. D., Dorsey, J. H., Vainik, P. and Orozco-Borbón, V. 2002. Storm effects on regional beach water quality in southern California. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report 2001-2002. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)

- Noble, R.T.**, Dorsey, J.H., Leecaster, M.K., McGee, C.D., Moore, D. Orozco-Borbon, V., Vainik, P.M., and S.B. Weisberg. 2000. Southern California Bight 1998 Regional Monitoring Program: Volume III. Storm Event Shoreline Microbiology. Southern California Coastal Water Research Project. Westminster, CA. (*Not Peer-reviewed*)
- Weisberg, S. B., Dufour, A., Galt, F., Gold, M., Noble, M., **Noble, R.T.**, Reichard, E., Roberts, P., Rose, J., and D. Rosenblatt. 2000. Huntington Beach Closure Investigation. Technical Review USCSG-TR-01-2000. Sea Grant, University of Southern California, San Diego, CA. (*Not Peer-reviewed*)
- Noble, R. T.**, Dorsey, J. H., Leecaster, M. K., Orozco-Borbon, V., Reid, D., Schiff, K. C. and S. B. Weisberg. 2000. A regional survey of the microbiological water quality along the shoreline of the Southern California Bight. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report 1999-2000. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)
- Noble, R. T.**, and J. A. Fuhrman. 2000. Enterovirus detection by reverse transcriptase polymerase chain reaction from the coastal waters of southern California. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report 1999-2000. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)
- Noble, R. T.** 2000. Enterovirus detection in storm drain-impacted waters along the shoreline of the Southern California Bight. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report 1999-2000. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)
- Noble, R. T.**, Leecaster, M. K., Moore, D. F., Schiff, K. C. and S. B. Weisberg. 2000. Relationships among bacterial indicators during a regional survey of microbiological water quality along the shoreline of the Southern California Bight. S. B. Weisberg (ed.). Southern California Coastal Water Research Project Annual Report 1999-2000. Southern California Coastal Water Research Project. Westminster, CA. (*Peer-reviewed*)
- Noble, R.T.**, Dorsey, J.H., Leecaster, M.K., Mazur, M., McGee, C.D., Moore, D. Orozco-Borbon, V., Reid, D., Vainik, P.M., and S.B. Weisberg. 1999a. Southern California Bight 1998 Regional Monitoring Program: Volume I. Summer Shoreline Microbiology. Southern California Coastal Water Research Project. Westminster, CA. (*Not Peer-reviewed*)
- Noble, R.T.**, Dorsey, J.H., Leecaster, M.K., McGee, C.D., Moore, D. Orozco-Borbon, V., Vainik, P.M., and S.B. Weisberg. 1999b. Southern California Bight 1998 Regional Monitoring Program: Volume II. Winter Shoreline Microbiology. Southern California Coastal Water Research Project. Westminster, CA. (*Not Peer-reviewed*)

Recent Published Abstracts/Contributions (since 2010, *denote students and postdoctoral associates):

- Steele, J. A., M.R. Raith, B. Layton, A. D. Blackwood, **R.T. Noble**, and J.F. Griffith. 2015. Comparison of Three Filtration Methods to Capture Pathogenic Viruses and Bacteria from Brackish Stormwater. 115th General Meeting of the American Society for Microbiology. New Orleans, LA. June 2015.
- *Froelich, B. A., *R. A. Gonzalez, A. D. Blackwood, *K.C. Lauer, and **R. T. Noble**. 2015. Total *Vibrio* Abundance is increasing in the Neuse River Estuary in Eastern North Carolina while *V. vulnificus* is undergoing rarefaction. 115th General Meeting of the American Society for Microbiology. New Orleans, LA. June 2015.
- *Froelich, B. A., *R.A. Gonzalez, A.D. Blackwood, R.P. Boyles, *A.H. Snedecker, *M.P. Verhoughstraete, and **R.T. Noble**; 2014 Multi-year changes in *Vibrio* populations in the Neuse River Estuary of North Carolina, USA; Vibrio 2014, Edinburgh, Scotland.
- *Froelich, B. A., M. Ayrapetyan, P. Fowler, **R.T. Noble**, and J.D. Oliver; 2014; The development of a decision matrix tool for predicting pathogenic *Vibrio* spp. in oysters harvested from North Carolina, USA; Vibrio 2014, Edinburgh, Scotland.
- *Ghazaleh, M., *B.A. Froelich, and **R.T. Noble**; 2014; The effect of storage time on *Vibrio* spp. and fecal indicator bacteria in estuarine water samples in an ISCO autosampler; presented at the 2014 Water Microbiology Conference: Microbial contaminants from watersheds to human exposure; Chapel Hill, NC.
- *Froelich, B. A., Blackwood, A. D., *Verhoughstrate, M.,*Gonzalez, R. A., Luettich, R. A., Paerl, H. W., Oliver, J. D., and **R. T. Noble**, 2013, The ecology of *Vibrio* bacteria in an estuarine system impacted by extreme climatic events. Invited Presentation at the Centre for Environment, Fisheries, and Aquaculture Science, Weymouth, Dorset, United Kingdom.
- *Froelich, B.A., D. Blackwood, *M. Verhoughstrate, *R. A. Gonzalez, R. Luettich, H. Paerl, J. Oliver, and R. Noble; 2013; The importance of long-term, cross disciplinary study of pathogen dynamics in relation to extreme climatic events in complex estuarine systems: an examination across scales; 2013 Ecology and Evolution of Infectious Diseases Conference, Athens, GA.
- *Froelich, B.A., *R. Gonzalez, D. Blackwood, M. Greene, R. Guajardo, S. Brothers, *M. Verhoughstraete, R. Luettich, H. Paerl, J. Oliver, and **R. Noble**; 2012; Pathogenic *Vibrio* species in the Neuse River Estuary, 2012. Ecology of Infectious Marine Disease Research Coordination Network Conference, Seattle, WA
- *Froelich, B.A., *R. Gonzalez, E. Crill, D. Blackwood, M. Greene, R. Guajardo, S. Brothers, R. Luettich, H. Paerl, J. Oliver, and **R. Noble**; 2012. *Vibrio vulnificus*

- population dynamics in the Neuse River estuary of eastern North Carolina; Gordon Research Conference on Oceans and Human Health; Biddeford, ME.
- *Froelich, B.A., *Gonzalez, R. A., Oliver, J. D., and **R. T. Noble**. Understanding the dynamics of total *Vibrio* and pathogenic *Vibrio* species in a complex estuarine system impacted by extreme events. Ecology and Evolution of Infectious Disease 2012. Berkeley, CA.
- Layton, B., Cao, Y., Balleste, E., Farnleitner, A., Gourmelon, M., Lee, J., Meijer, W., Noble., R. T., Peed, L., Reischer, G., Van De Werfhorst, L., Boehm, A., Holden, P., Jay, J., Shanks, O., and J. F. Griffith. Performance of Human Fecal-Associated PCR-based Methods in the California Source Identification Protocol Project. ASM General Meeting, San Francisco, CA. June 2012.
- *Froelich, B. A., Williams, T., **Noble, R. T.**, and J. D. Oliver. 2011. Harmful bacteria missing from North Carolina Oysters. North Carolina General Legislative Assembly.
- Oliver, J. D., **R.T. Noble**, and *B. Froelich. 2011. Drought Conditions Resulted in Loss of *Vibrio vulnificus* from North Carolina Waters and Oysters. Vibrio 2011. Santiago de Compostela, Spain. November 2011.
- Kinzelman, J., Bushon, R., Dorevitch, S. and **R. T. Noble**. 2011. Comparative Evaluation of Molecular and Culture Methods for Faecal Indicator Bacteria. Fecal Indicators, Problem or Solution, Edinburgh, Scotland. June 2011.
- Fuhrman, J., Griffith, J., **Noble, R.**, Sirimanne, R., and Witheridge, A., 2011, "Southern California Coastal Water Research Project A Microbial Source Identification Title: Project in the Lower San Luis Rey River and the Next Steps toward the Bacteria Phase I TMDL in Region 9," California Stormwater Quality Association (CASQA) Stormwater Conference, Monterey Bay, CA, Hyatt Regency.
- *Helmy, T., *Stumpf, C. H., Zhao, W., Niehaus, G. D., and **R. T. Noble**. New system for rapid detection of pathogens and fecal indicators in water using liquid crystals. ASM General Meeting, New Orleans, LA. May 2011.
- *Stumpf, C., Zhao, W., **Noble, R. T.**, *Helmy, T., Ammons, C., and G.D. Niehaus . Sample pre-processing and rapid liquid crystal based biosensor detection of *Escherichia coli* in water. ASM General Meeting, New Orleans, LA. May 2011.
- *Rhodes, S. M., Blackwood, A. D., *Gonzalez, R., Greene, M., and **R. T. Noble**. Quantification of *Vibrio Spp.* in the meat, mantle fluid and surface waters in oysters. ASM General Meeting, New Orleans, LA. May 2011.

Bushon, R. Kinzelman, J., **Noble, R.**, Dorevitch, S., and Blackwood, D. Comparison of rapid and culture methods for indicator bacteria through wastewater treatment. ASM General Meeting, New Orleans, LA. May 2011.

Anan'eva, T., Kinzelman, J., Blackwood, D., Bushon, R., Dorevitch, S., and **R. Noble**. Examination of within and across laboratory qPCR inhibition from nationally distributed water samples. National USEPA Beaches Meeting, Miami, FL, March 2011.

Noble, R. T. 2011. Examining a range of approaches available for rapid beach water quality testing. National USEPA Beaches Meeting, Miami, FL, March 2011.

*Gonzalez, R., Blackwood, A. D. *Conn, K.E., Greene, M.R., and **R. T. Noble**. Predicting fecal indicator bacteria during storms in rural and agriculturally-dominated coastal systems. National USEPA Beaches Meeting, Miami, FL, March 2011.

Noble, R. T., Blackwood, A. D., Paerl, H. W., Luettich, R. A., Whipple, A. C., Neve, R. The ecology of autochthonous and allochthonous pathogens during extreme events. American Society for Limnology and Oceanography Ocean Sciences Meeting, San Juan, Puerto Rico, February 2011.

Bowen, J. D., Oliver, J. D., **Noble, R.T.**, Paerl, H. W., and R. A. Luettich. Testing simple mechanistic models of bacterial fate and transport for the Neuse River Estuary, North Carolina. American Society for Limnology and Oceanography Ocean Sciences Meeting, San Juan, Puerto Rico, February 2011.

*Hatcher, S.M, Binder, E., Blackwood, A.D., *Conn, K.E., *Helmy, T., Oliver, J.D., and **R. T. Noble**. The Interplay of Estuarine Dynamics and Pathogenic Members of the *Vibrio* Genus. American Society for Limnology and Oceanography Ocean Sciences Meeting, San Juan, Puerto Rico, February 2011.

*Froelich, B. A., Williams, T., **Noble, R. T.**, and J. D. Oliver. 2010. High salinity induced loss of *Vibrio vulnificus* populations in North Carolina oysters; Vibrios in the Environment Conference 2010; Biloxi, MS.

*Gonzalez, R. Blackwood, A. D., *Conn, K. E., and **R. T. Noble**. Assessment of fecal contamination sources, loading, and the role of reservoir fecal indicator bacteria in management of shellfish harvesting waters. 111th National ASM Meeting, San Diego, CA May 2010

*Stumpf, C. S., **Noble, R. T.**, Thompson, S., Piehler, M.F., and A. D. Blackwood. Combining molecular, hydrological, and conventional approaches for accurate characterization and source identification of fecal contamination in coastal creeks. 111th National ASM Meeting, San Diego, CA May 2010.

Cao, Y., *Converse, R.R., **Noble, R. T.**, McGee, C. D., and J. F. Griffith. Post-disinfection persistence of *Enterococcus* sp. in environmental waters: comparison of molecular and conventional methods. ASM 110th General Meeting. San Diego, CA May 2010.

Kinzelman, J. L., Lavender, J. S., **Noble, R. T.**, Dorevicch, S. S. and R. Bushon. Quantitative-PCR for rapid indicator measurement at inland waters. 111th National ASM Meeting, San Diego, CA May 2010.

Fuhrman, J. A., Jones, B. T., Griffith, J. F., **Noble, R. T.**, and J. A Steele. Microbial contamination of the coastal zone: experience linking research to policy. National ASLO Meeting. Seattle, WA February 2010.

Published Doctoral Dissertations (Primary Advisor)

Gonzalez, R. A. July 2013. Tools for predicting microbial water quality in estuaries used for recreation and shellfish harvesting. Doctoral dissertation for Department of Environmental Sciences and Engineering in the Gillings School of Global Public Health. UNC Chapel Hill. UNC Press, Chapel Hill, NC, USA.

Stumpf, C. H. April 2011. New approaches and technologies for quantifying fecal contamination in tidal creek and coastal receiving waters. Doctoral Dissertation for Department of of Marine Sciences at UNC Chapel Hill. UNC Press. Chapel Hill, NC, USA.

Converse, R. R. November 2009. Bridging the Gap between Molecular and Traditional Assessments of Recreational Water Quality. Doctoral Dissertation for Department of Marine Sciences at UNC Chapel Hill. UNC Press. Chapel Hill, NC, USA.

Coulliette, A. D. July 2008. Characterization of Fecal Contamination in the Newport River Estuary (North Carolina, USA). Doctoral Dissertation for Department of Environmental Sciences and Engineering at UNC Chapel Hill. UNC Press. Chapel Hill, NC, USA.

Teaching Activities

Human Impacts on Estuarine Processes (ENEC 471)

Fall 2016 [14]
Fall 2015 [11]
Fall 2014 [15]
Fall 2013 [14]
Fall 2012 [13]
Fall 2011 [13]
Fall 2010 [13]
Fall 2009 [8]
Fall 2008 [11]
Fall 2006 [6]
Fall 2005 [7]
Fall 2004 [7]

Fall 2003 [5]

Capstone: Analysis and Solution of Environmental Problems (ENEC 698)

Fall 2015 [2011]

Fall 2014 [15]

Fall 2013 [14]

Fall 2012 [13]

Fall 2011 [13]

Fall 2010 [13]

Fall 2009 [8]

Fall 2008 [11]

Fall 2006 [6]

Fall 2005 [7]

Fall 2004 [7]

Fall 2003 [5]

Fall 2003 [5]

Independent Research and Internship Experience (ENEC 395)

Fall 2016 [15]

Fall 2015 [11]

Fall 2014 [15]

Fall 2013 [14]

Fall 2012 [13]

Fall 2011 [13]

Fall 2010 [13]

Fall 2009 [8]

Fall 2008 [11]

Fall 2006 [6]

Fall 2005 [7]

Fall 2004 [7]

Fall 2003 [5]

Environmental Seminar (ENEC 204)

Fall 2015 [11]

Fall 2014 [15]

Fall 2013 [14]

Fall 2012 [13]

Fall 2011 [13]

Fall 2010 [13]

Fall 2009 [8]

Fall 2008 [11]

Fall 2006 [6]

Fall 2005 [7]

Fall 2004 [7]

Fall 2003 [5]

Honors Project in Environmental Sciences and Studies* (ENEC 694H)

Spring 2016 [2]

Spring 2015 [1]

Fall 2014 [5]

Spring 2014 [1]

Spring 2013 [1]

Fall 2012 [1]

Spring 2011 [1]

Fall 2010 [2]

Fall 2008 [1]

Fall 2006 [1]

Spring 2006 [1]

Spring 2005 [1]

Honors Project in Geology*

Spring 2010 [1]

Student Mentoring Activities:

Primary Graduate Advisor

Jason Gregory (Completed M.Sc. Fall 2005)
Jennifer Hsieh (Completed M.P.H. Fall 2005)
Tanya Bean-McGhee (Completed M.Sc. Fall 2005)
Angela Coulliette (Ph. D. Conferred July 2008)
Reagan Converse (Ph. D. Conferred November 2009)
Curtis Stumpf (Ph. D. Conferred, April 2011)
Sandra Mesquita (Ph. D. Conferred, Fall 2012)
Raul Gonzalez (Ph. D. Conferred, Summer 2013)
Kellen Lauer (M. Sc. Conferred July 2015)
Kelsey Jessor (Ph. D. Candidate)
Simone Moraes Raszl (Ph. D. Student)
Justin Hart (M. Sc. Student)

Thesis Committee Member

Emily Bailey (Ph. D. student, ESE)
Sarah Rhodes (Ph. D. student, ESE)
Yvonne Yuen (Ph. D. student, ESE)
Stephanie Wear (Ph. D. 2015, DUML)
Charmaine Yung, (Ph. D. 2016, DUML)
Brianna Young (M. Sc. 2016, ESE)
Teri O'Meara (Ph. D., 2014)
Timothy Otten (Ph.D., 2012)
Jen Gentry-Shields (Ph. D., 2012)
Dendy Lofton (Ph. D. 2012)
Emma Susick (M. Sc. April 2010)
Benjamin Peierls (Ph. D. July 2009)
Leigh-Anne Krometis (Ph. D. April 2009)

Andrew Gronewold (Ph. D. 2008, Duke University)
Stephanie Friedman (Ph. D. July 2008)
Jennifer Joyner (Ph. D. July 2007)
David Love (Ph. D. April 2007)
Galen Johnson (Ph. D. July 2006)
Jennifer Murphy (Ph. D. May 2006)
Jeremy Weisz (Ph. D. April 2006)
Julie Dyble, (Ph. D. Fall 2003)

Honors Thesis Advisor: All below completed Honors Theses and graduated with highest honors. They also presented their research at national-level research conferences

Allison Kline (Fall 2014, Spring 2016)
Rachel Voorhis (Fall 2014, Spring 2016)
Alexandra Lorentz (Spring 2015)
Maite Ghazaleh (Spring 2014)
Alexandra Snedeker (Spring 2013)
Sarah Rhodes (Spring 2011)
Sarah Hatcher (Fall 2010)
Sarah Hiser (Spring 2010)
Zachary Williams (Fall 2006)
Doug McIntyre (Spring 2006)
Jennifer Parker (Spring 2005)

SPGRE Advisor

Vanessa Michelou (Summer 2004)

Undergraduate Research Advisor

Kate Morrison (NSF REU)
Michael McKay Glasgow (NSF REU)
Doug McIntyre
Florian Moeller
Jennifer Parker (NSF REU)
Jereka Parker-Hunt
Ginger Kelly
Zachary Williams (NSF REU)
Brentley McNeill
Luke Myers (NSF REU)
Sarah Hiser (NSF REU)
Sarah Hatcher (NSF REU)
Sarah Rhodes (NSF REU)
Chelsea Berg (NSF REU)
Maria Walker (NSF REU)
Sunny Choi
Zeph Pendleton
Stephanie Walker (NSF REU)
Marie English
Sara Posey
Alexandra Snedeker

Visiting International Scholars	Mary Jo Weiss (NSF REU)
	Steven Morgan (NSF REU)
	Larissa Bennett
	Ryan Leighton
	Sandra Sengo Mesquita (University of Algarve, PT, 2006-2008)
Post-doctoral Research Scholars	Diana Conduto Antonio (University of Algarve, PT, Fall 2009)
	Simone Moraes Raszl (University of Brazil, Florianopolis, Fall 2014 and 2015-2016)
	Dr. Luiz Pimental (University of Brazil, Florianopolis, 2015-2016)
	J. Steve Fries
	Kathy Conn
	Mussie Habteselassie
	Tamer Helmy
Marc Verhougstraete	
Raul Gonzalez	
Brett Froelich	

Projects and Funding (listed in reverse chronological order):

Active Projects:

- Lead PI: Revolutionizing and commercializing rapid molecular diagnostics for viral and bacterial pathogen quantification in marine waters and seafood. Funding Agency: University of North Carolina General Administration. Project Duration: February 2015 to February 2018. \$684,805.
- Co-PI: Evaluation of the Role of Salinity in Determining Levels of *Vibrio vulnificus* and *Vibrio parahaemolyticus* in North Carolina Oysters and Clams. Prime Funding Agency: NOAA. Funded as Subcontract to UNC Charlotte. Project Duration: July 2014 to June 2016. \$75,048.
- Co-PI: Meteorological and environmental conditions leading to increases in virulent *Vibrio vulnificus* abundances in shellfish. Funding Agency: USDA-NIFA. Postdoctoral Research Fellowship to Brett Froelich. Project Duration: January 2014 to January 2016. \$160,000.
- Sole PI: Virus quantification and recovery from complex matrices in San Diego, CA. Funding Agency: Southern California Coastal Water Research Project. Project Duration: February 2014 to December 2015. \$22,113.
- Sole PI: Microbiological Assessment of Industrial Wastewater Discharge from the RockTenn Paper Mill in West Point, VA. Funding Agency: Oakwood Laboratories and RockTenn Paper Mills. Project Duration: July 2014 to December 2015. \$36,000.
- Sole PI: Molecular Analyses for Quantitative Microbial Risk Assessment Study in Tecolote Creek, CA. Prime Funding Agency: City of San Diego, CA. Part of a

- large multi-institutional QMRA Project. Project Duration: June 2014 to June 2015. \$187,000.
- Lead PI: Studying Stormwater Runoff to Better Protect Public Health at North Carolina Beaches. Prime Funding Agency: NC Sea Grant. Student Fellowship Stipend Plus Grant Award. Project Duration: February 2014 to February 2016. \$73,000.
 - Sole PI: Assessing the role of resuspension of fecal indicator bacteria and markers of fecal contamination. Funded by Hampton Roads Sanitation District and the City of Virginia Beach, VA. Project Duration: November 2011 to December 2015. \$349,600.
 - Sole PI: Quantitative Assessment of Rapid Molecular Methods for Rehabilitation of Drinking Water Infrastructure. Funded by 3M. Project Duration: May 2013 to June 2015. \$55,000.
 - Sole PI: Quantitative analysis of fecal bacteria in Wrightsville Beach stormwater outfalls. Funded by Town of Wrightsville Beach. Project Duration: February 2011 to June 2015. \$83,960.

Completed Projects:

- Lead PI: Further assessment of fecal contamination and related risks from ocean outfalls of stormwater in Dare County, North Carolina. Funded by Moffat and Nichol, with Prime Funding Agency, NCDENR. Project Duration: September 2010 to March 2015. \$347,514.
- Lead PI: Whalebone Junction Supplement to the existing UNC CH Project-Monitoring, prioritization and assessment of ocean outfalls of stormwater in Dare County, North Carolina". Project Duration: July 2008 to June 2015. \$85,017.
- Lead PI: North Carolina Department of Transportation. Monitoring, Prioritization, and Assessment of Ocean Outfalls of Stormwater in Dare County, North Carolina. Project Duration: May 2006 to June 2015. \$861,313.
- Sole PI: Specific Quantitative Microbial Source Tracking Investigation in Wilmington, NC. Funding Agency: Coastal Planning and Engineering. Project Duration: February 2014 to February 2015 \$4,800.
- Lead PI: Linkage of Bacterial Pathogens to Human infectious Disease in an Estuary Subjected to Extreme Climatic Events. National Science Foundation/National Institutes of Health Ecology of Infectious Disease Program. Collaborative Research within Ocean Sciences. Project Duration: September 2008 to August 2014. \$1,527,729.
- Sole PI: Preliminary Assessment of Potential Sources of Fecal Contamination in Nanney's Creek, Back Bay, VA. Funded by Hampton Roads Sanitation District and the City of Virginia Beach, VA. Project Duration: January 2013 to June 2014. \$61,000.
- Sole PI: Understanding the dynamics of microbial contaminant fate and transport in rural and agricultural lands. United States Department of Agriculture National Research Initiative Program. Project Duration: September 2008 to August 2013. \$397,136.

- Sole PI: Quantitative Analysis of Markers of Fecal Contamination at Falls Lake Beaches. Funded by Wake County Environmental Services. Project Duration: September 2011 to September 2013. \$12,151.
- Sole PI: Development of a molecular training facility in eastern North Carolina. Funded by the North Carolina Biotechnology Center. Project Duration: December 2012 to August 2013. \$40,000.
- PI: NSF HBCU-RISE Center for Microbial Ecology, Molecular Biology and Biotechnology. National Science Foundation, in collaboration with Florida A & M University. Project Duration: November 2009 to April 2013. \$67,000.
- Sole PI: Assessing source of fecal contamination in high priority creeks in the Hampton Roads Region. Project Duration: January 2010 to April 2012. \$252,000.
- Co-PI: Defense Coastal/Estuarine Research Program, Aquatic/Estuarine Monitoring and Research Module 2, SERDP. Project duration: July 2006 to June 2012. \$186,000.
- Sole PI: Supplement to the development of hybridization assays for water quality assessment. Funded by Crystal Diagnostics. Project Duration: January 2010 to December 2011. \$44,206.
- Lead PI: Challenges and opportunities in the Ecology of Infectious Disease. Funded by NSF Biological Oceanography Directorate. Project Duration: November 2010 to November 2011. \$49,922.
- Sole PI: Virginia Beach Fecal Contamination Blind Study. Funded by Hampton Roads Sanitation District. Project Duration: May 2011 to October 2011. \$12,432.
- Sole PI: Development of new assays for water quality assessment. Crystal Diagnostics. Project Duration: January 2010 to December 2011. \$38,900.
- Sole PI: Bacterial Source Tracking in the Lower San Luis Rey River. City of Oceanside/State of California. Project Duration: May 2008 to August 2011. \$190,137.
- PI: Comparative Evaluation of Molecular and Culture Methods for Fecal Indicator Bacteria for Use in Inland Recreational Waters. Water Environment Research Foundation. Project Duration: January 2010 to December 2010. \$83,620.
- Sole PI: Training for Rapid Fecal Indicator Bacteria QPCR Technical Demonstration for *Enterococcus* spp. at Southern California Beaches. Funded by SCCWRP. Project Duration: June 2010 to December 2010. \$26,973.
- Sole PI: Examining aquatic microbial contamination using current and novel methods for water quality analysis in the Galapagos Islands. Seed Grant from UNC Center for Galapagos Studies. Project Duration: January 2010 to January 2011. \$6,500.
- Sole PI: Determining sources of fecal contamination at Mill Dam Creek. Hampton Roads Sanitation District. Project Duration: June 2009 to May 2010. \$40,000.
- Sole PI: Development of hybridization assays for water quality assessment. Pathogen Systems Incorporated. Project Duration: April 2009 to March 2010. \$32,332.
- Sole PI: Ecology of Infectious Disease Research Experience for Undergraduates. Project Duration: May 2010 to June 2011. \$14,000.
- Sole PI: Bacterial DNA Analyses for Town of Atlantic Beach. Town of Atlantic Beach. Project Duration: September 2009 to October 2009. \$14,208.
- Sole PI: Tracking microbial indicator and pathogen transport through conventional on site septic systems. Prime funding agency: North Carolina Division of Water Quality/EPA. Project duration: October 2005 to August 2009. \$383,569.

- Lead PI: Assessment of microbial contaminants pertinent to swimming related illnesses at Doheny Beach, Orange County, CA. SCCWRP. Project Duration: May 2007 to March 2008. \$70,000.
- Lead PI: Assessment of microbial contaminants pertinent to swimming related illnesses at Doheny Beach, Orange County, CA. University of New Hampshire/CICEET/NOAA. Project Duration: May 2007 to April 2009. \$228,002.
- Sole PI: Junior Faculty Development Award. Investigating Human Viral Pathogens in the Effluent of Coastal Stormwater Outfalls in Coastal North Carolina. Project Duration: January 2007 to December 2007. \$7,500.
- Sole PI: National Estuarine Research Reserve Graduate Fellowship Program. Characterization and source identification of microbial contaminants in North Carolina estuarine waters. Project duration: June 2006 to May 2007 (renewed for three years). \$83,572.
- PI: Development of Fecal Coliform TMDLs using Bayesian Modeling and Novel Molecular Monitoring Approaches. Prime funding agency: North Carolina Division of Water Quality/EPA, Subcontract with Duke University. Project Duration: March 2005 to February 2008. \$281,261.
- Lead PI: Estuarine sediment beds as a reservoir for human pathogens: monitoring transport of populations of *Vibrio* sp. and *Enterococcus* through the Neuse River Estuary. North Carolina Water Resources Research Institute. Project duration: March 2005 to February 2006. \$39,911.
- PI: Multiple nitrogen utilization strategies and phytoplankton species diversity: Nitrate assimilation in N₂-fixing bloom-forming cyanobacteria. National Science Foundation. Project duration: March 2005 to February 2008. \$461, 218 (funding for co-PI Noble for only Year 1, with co-PI Hans Paerl).
- PI: Genomics Proposal: Assessment of contaminant load in North Carolina's stormwater using novel molecular techniques. Funded through the UNC Office of the President. Project duration: January 2005 to June 2006. \$43,049.
- PI: Developing bacterial and viral indicators of estuarine ecological condition Atlantic Coast Environmental Indicators Consortium (ACE-INC) Research Program: United States EPA STAR Program. Project duration: November 2003 to February 2006. \$80,088.
- PI: Impacts of Anthropogenic Change on the Ecology of Human Pathogens in a Eutrophying Estuary: The Neuse River Estuary, NC: NSF/NIH Ecology of Infectious Disease Program. Project duration: October 2003 to September 2007. \$1,760,000. Renewed.
- Lead PI: National Estuarine Research Reserve Graduate Fellowship Program. Use of modern molecular techniques for monitoring and assessing estuarine water quality. Project duration: June 2003 to May 2006. \$83,903.
- Sole PI: Comparison study for multiple microbial source tracking techniques. Southern California Coastal Water Research Project. Project duration: October 2002 to March 2003. \$24,998.
- Sole PI: Use of viral pathogens as tools to differentiate between and quantify sources of fecal contamination in three different watersheds: USDA National Research Initiative. Project duration: September 2002 to August 2006. \$265,000.

- PI: Ecosystem effects of antibiotics: Proof of Concept. North Carolina Sea Grant Program. Project Duration: June 2002 to February 2003. \$10,000.
- Sole PI: Implementation of Coliform TMDL for Santa Monica Bay Beaches using Standard Methods and Rapid Indicator Detection Technologies. California State Water Quality Control Board/Southern California Coastal Water Research Project. Project duration: March 2002 to February 2005. \$236,058.

Patents Approved:

- **US Patent:** Enterococcus and Fecal Bacteroides for Rapid Water Quality Assessment. US2010/042889, Published. February 10, 2011. Abandoned January 2015.
- **US Patent:** Methods and compositions for the detection and quantification of *E. coli* and *Enterococcus*. US2008/0233572. Filled January 2006. Claims approved January 2012. Patent issued April 2012.

University Service

Undergraduate Semester Planning Committee, UNC Chapel Hill Institute of Marine Sciences (2014-present)

Performance Committee, UNC Chapel Hill Institute of Marine Sciences (2003-Present)

Institute for the Environment Faculty Advisory Committee (2010-present)

Department of Marine Sciences Biological Oceanographer Professor Search Committee (Fall 2009 to Spring 2010)

Department of Environmental Sciences and Engineering Assistant Professor Search Committee (2007)

UNC Chapel Hill Center for Galapagos Studies Facilities Committee (2010-present)

Professional Service:

Major Conference Organization:

UNC Water Microbiology Conference, May 2017, Organizing Committee, Abstract Review and Side Event Convener

UNC Water Microbiology Conference, May 2016, Organizing Committee, Abstract Review and Side Event Convener

UNC Water Microbiology Conference, May 2015, Organizing Committee, Abstract Review and Side Event Convener

UNC Water Microbiology Conference, May 2014, Organizing Committee, Abstract Review and Side Event Convener

Originating Founder, Water Institute and Institute of Marine Sciences Communities of Practice Initiative, January 2015

Session Chair Opportunities:

Session Chair, Abstract Review and Convener, UNC Water Microbiology Conference, May 2016

Session Chair, Abstract Review and Convener, UNC Water Microbiology Conference, May 2015

Session Chair, Abstract Review and Convener, UNC Water and Health Conference.
October 2014
Session Chair, UNC Water and Health Conference. Water Quality and Quantity. October
2013.
Session Chair, UNC Water and Health Conference. Water Quality and Rapid Methods,
October 2011.
Session Chair, Challenges in Ecology of Infectious Disease, American Society for
Limnology and Oceanography, Aquatic Sciences Meeting, February 2011
Session Chair: UNC Water and Health Conference, Health: Water Quality and Diarrheal
Disease, and Health: Health Risks, Chapel Hill, NC, October 2010
Session Chair, A cruise through aquatic viral ecology, ASLO International Meeting,
January 2009, Nice, France
Session Chair, Rapid methods for indicator analyses, EPA BEACHES National Water
Quality Meeting, Niagara Falls, NY, October 2006
Session Chair, Water quality in the 21st Century: From Genomics to Climate, ASLO
National Meeting, February 2005, Salt Lake City, UT
Session Chair, Dynamics of Pathogens in Marine Systems, ASLO Ocean Sciences
Meeting, February 2004, Honolulu, HI
Session chair, Aquatic Chemistry and Ecotoxicology, ASLO 2000 International Meeting,
Copenhagen, DK.

Invited Presentations and Workshops (since 2009):

Invited Panelist, EPA Coliphage Experts Workshop, March 2016
Organizer and Co-Convener, Open Session on Coliphage Criteria for Wastewater, UNC
Water Microbiology Conference, May 2015, Chapel Hill, NC
Invited Speaker and Panelist, UNC Water and Health 2015, Diarrheal Disease, October
2015
Invited Speaker and Panelist, April 2014, USGS qPCR Rapid Diagnostics Panel, NWQMC
National Meeting, Cincinnati, OH
Invited Speaker, March 2014, Lower Cape Fear Technical Advisory Committee
Invited Speaker, November 2012, Back Bay Restoration Initiative Forum, VA Beach, VA
Invited Speaker, October 2012. Economic Development Forum, UNC Wilmington.
Invited Speaker, NOAA NCCOS Laboratory, Beaufort, NC, January 2012
Invited Speaker, Coastal Science Café, Contaminated Waters, January 2012
Convener, Rapid Methods Workshop as a part of UNC Water and Health Conference
October 2011, Chapel Hill, NC
Convener and PI, National Science Foundation Workshop, “Challenges and Opportunities
in Ecology of Marine Infectious Diseases”, San Juan, Puerto Rico, Workshop run in
conjunction with American Society of Limnology and Oceanography International
Meeting, February 2011
Invited Speaker, USEPA Region 1 Environmental Genomics Workshop, November 2011
Invited Speaker, National Weather Service and National Oceanographic and Atmospheric
Association All Hazards Conference, November 2011, Raleigh, NC
Invited Speaker, Climate and Public Health in North Carolina Symposium, August 2011,
Chapel Hill, NC

Invited Speaker, Rapid Methods Session, USEPA National Beaches Meeting, Miami, FL.
March 2011.

Invited Speaker, Training Workshop USEPA National Beaches Meeting, Miami, FL.
March 2011

Panelist: EPA BEACHES Stakeholder meeting, Chicago, IL, October 2009

Invited Workshop “IDEXX Laboratories Water Leaders Forum” June 2009. Portland
Maine

Invited Speaker, Polytechnic University of Le Marche, May 2009

Visiting Researcher and Professor, Polytechnic University of Le Marche, Italy, Department
of Marine Sciences, Spring 2009

Peer Review Service

Ecology and Evolution of Infectious Disease, NSF Program Panel, 2014-2015

California Sea Grant Proposal Review Panel, 2013-2015

AAAS Review, Rhode Island Sea Grant, Fall 2014

Abstract Review and Selection, UNC Water Microbiology Conference, 2014-present

Abstract Review, Symp. for Aquatic Microbial Ecology, Stresa, Italy, September 2013

Abstract Review, UNC Water and Health Conference, 2013-present

Abstract Review, Scientific Funding Agency, Portugal

Outside Examiner, Flinders University, Australia, Natalie Bolton, June 2012

Chair, Peer Review Team , USEPA Fall 2011, Criteria Development in Surface Waters

NIEHS Bioavailability in Sediment Peer Review Panel, Raleigh, NC, May 2011

Abstract Review Committee, National Water Quality Monitoring Council, Fall 2011

Abstract Review and Editing Committee, UNC Water and Health Conference 2011

Peer Review and Synthesis of Tropical Indicators Report for USEPA, November 2010

External Review for South African Medical Research Council, October 2010

Associate Editor, *Advances in Limnology and Oceanography* (October 2009- present)

Mail reviewer (2001-Present) for Florida Sea Grant, Delaware Sea Grant, Texas Sea
Grant, North Carolina Sea Grant, California Sea Grant, NOAA Oceans and Human
Health, USDA, National Research Initiative, USEPA, National Institutes for
Environmental Health Sciences, National Science Foundation, Water Resources
Research Institute, Cooperative Institute for Coastal and Estuarine Environmental
Technology, and National Water Resources Institute, NOAA Center for Coastal
Ocean Research MERHAB Program, North Carolina Water Resources Research
Institute, University of Rhode Island, University of New Hampshire, Great Lakes
Beach Initiative.

Anonymous Technical Editor for CNRS (FR) (2001-present). Assisting international
scientists and colleagues (serving to assist their students to write as English as
second language writers)

External Review for Austrian Science Fund, November 2009

External Review Hong Kong Research Council, April 2009

Peer reviewed journal manuscripts for the following journals (from 2001-2015):

-PLoS Biology,

-Journal of Water Research,

-Nature,

- Aquatic Microbial Ecology,
- Applied and Environmental Microbiology,
- Journal of Applied Microbiology
- Journal of Environmental Microbiology
- Limnology and Oceanography
- Limnology and Oceanography: Methods
- Journal of Water and Health
- Microbial Ecology
- Hydrobiologia
- The Biological Bulletin
- FEMS Microbiology Ecology
- FEMS Microbial Ecology Reviews
- Journal of the Marine Biological Association
- Marine Ecology Progress Series
- Ecological Applications
- Estuaries and Coasts
- Journal of Environmental Engineering
- Environmental Science and Technology
- Environmental Health Perspectives
- Environmental Microbiology and Environmental Microbiology Reports
- Geophysical Research Letters
- Journal of Biotechnology
- Journal of Environmental Monitoring
- Journal of Environmental Monitoring and Assessment
- Journal of Microbiological Methods
- Science of the Total Environment
- PLoS One
- Proceedings of the Natural Academy of the Sciences

Professional Service: Nominated Panels and Steering Committees

Town of Beaufort, Stormwater Advisory Committee, Invited Member

Invited Expert, EPA Coliphage Experts Workshop, March 2016

ASTM, Section D19 Voting Representative in Regulatory Affairs for Water (June 2012 to present)

Chair (January 2006-present), Standard Methods Part 9230, Fecal

Enterococcus/Streptococcus Groups, resulting in complete revision of section

Chair (January 2006-present), Standard Methods Committee, Part 9211 Rapid Detection Methods

Advisor (January 2002-present) to recreational water quality sampling program for the Shellfish Sanitation Section, North Carolina Division of Water Quality

Nominated (January 2003-present) steering committee member, NC Division of Water Quality Storm Drain Rules Committee

Nominated Representative (January 2004-present) from American Society of Limnology and Oceanography to the National Water Quality Monitoring Council

Nominated (October 2006-October 2009) to the Epi-Net Science Board, Purdue University

Nominated (August 2006-August 2009) Advisory Committee for Biotechnology in Eastern North Carolina

Nominated (July 2006-June 2009) Chair, American Society for Limnology and Oceanography Committee on Public Policy

Invited Panelist (March 2003-March 2006), Advanced Environmental Monitoring and Control Panel for the NASA Jet Propulsion Research Laboratories

Local Teaching, Volunteer, and Educational Engagements

Stormwater in the Rachel Carson Estuarine Reserve, Beaufort Middle School 7th Grade, October 2016

Summer Camper Training Program on Oysters and Bacteria, North Carolina Coastal Federation, Summer 2015

The Water Cycle and Stormwater to Your Beach, Learning Module for 2nd graders at St. Egbert Elementary School

Senior Project on Public Health, Graduating Senior Cici Capps, February 2015 (later admitted to UNC Chapel Hill as an undergraduate)

Marine Plastics Exhibit, Organizer, Institute of Marine Sciences, December 2014, an opportunity to teach students of all ages about the marine plastics

Leader and Organizer, Water Quality Test Kit Fundraiser in collaboration with Clear Cambodia, Spring 2014

Chair St. Egbert Silent Auction Committee

Teaching Elementary Students Water Quality, Water Conservation and Water Testing Approaches, Spring 2014, St. Egbert Catholic School, all grades, all classes.

Teaching Elementary Students Meiofauna Dynamics, March 2013, St. Egbert Elementary School

College Success Foundation, Training to Inner City High School Students in Marine Science, August 2011

Elementary Level education in Stormwater Runoff and Prevention, DNA: The Blueprint of Life, St. Egbert Catholic School, 2010-present

Carteret County Community College, Science Club, Visiting speaker to science students regarding careers in the natural sciences (ongoing)