

G. Brooks Avery Jr.

Curriculum Vitae

Education

B.S., Chemistry, The University of North Carolina at Greensboro 1985
M.S., Coastal Biology, The University of North Carolina at Wilmington 1990.
Ph.D., Marine Sciences, The University of North Carolina at Chapel Hill 1997.

Employment

August 2013 Professor University of North Carolina Wilmington
2009 - 2013 Associate Professor University of North Carolina Wilmington
2004- 2008 Assistant Professor University of North Carolina Wilmington
2001-2003, Visiting Assistant Professor University of North Carolina Wilmington
1997-2001, Postdoctoral Research Associate, University of North Carolina Wilmington
1990-1996, Teaching and Research Assistant University of North Carolina Chapel Hill
1987-1990, Teaching and Research Assistant University of North Carolina Wilmington
1984-1986, Analytical Chemist, Burlington Research, Burlington, N.C.

Teaching Experience

Advanced Analytical (CHM 536, UNCW) 2001-2009
General Chemistry (CHM 101 and CHM 102, UNCW) 1999-present,
Environmental Chemistry (CHM 377, UNCW) 1999-present
Environmental Chemistry Labs (CHM 377L) 1999-present

Specific Research Interests

Cycling of globally important organic compounds in the atmosphere, water column, and sediments.

Fate and cycling of metals in the environment

Use of stable and radiogenic isotopes to determine source and fate of organic carbon.

Research Experience

Students

Graduate Students

Current: Katie Hodges, John Moore, Ben Lancaster, Aerial Potter, Chris Halbert
Graduated: Kate Tito 2020, Rachael Mott 2020, Rosa Sanchez 2020, Mekiyah Bailey 2018, Brittany Saleeby 2019, Sarah Summerland 2019, , Alex Taylor 2018, Robert Dixon 2017, Thomas Lathrop 2017, Wes Mickler 2016, Coleman Corzine 2016, Doug Rainey 2016, Rachel

Thomas 2016, Erin Dingess 2016, Jason Lindt 2015, Shannon Hammaker 2016, Misty Mangiacapre 2016, Jacquelin Powell 2016, Matt Casas 2016 Josh Humpfres 2014, Alan Roebuck 2014, Brent Dober, Joanna Hamilton 2014, Nefertari Mckoy 2013, Amanda Guy 2013, Michael Petterson 2013, Angela Carroll 2013, Jennifer Nguyen 2013, Emily Probst 2013, Donna Glinski 2012, Jade Byrd 2012, Alyssa Wetterauer 2012, Linda Larson 2011, Beth Butler 2010, Lauren Thompson 2010, Ashley Myers, Jeremy Smith 2009, Jennifer Dickson-Brown 2009, Gwen Shaughnessy 2008, Josh Vincent 2008 Josh Dixon 2008, Nicole Lancaster 2008, Kelly Taylor 2005, Yan Tang 1998, Mary Eyman 1998, Suzanne Sexton 2002, Lisa Thatcher 2005, Amanda Kahn Ph.D. 2008, John Burke 2008, David Felix 2007, Robert Lomax, Keven Rowland 2002, Kelley Williams 1998.

Committee member: Amanda Kahn Ph.D. 2008, John Burke 2008, David Felix 2007, Robert Lomax, Keven Rowland 2002, Kelley Williams 1998.

Honors Students: Advisor, Jennifer Dickson-Brown 2007, Elinor Wicks 2002, Aimee Fields, 1999

Honors Student Committees: Hannah Mitchell 2020, Shae Gradt 2020, Victoria Mineco 2020, Katy Nickel 2019, Samantha Badgett 2019, Peyton Clark 2019, Christian Manuelli 2019, Kaitlyn Hudson 2017, Rachael Shoemaker 2017, Amy Lohr 2017, Ciera Ames 2015, Michael Bowers 2015, Lyla Stanland 2016, Jaqueulin Gross 2015, Jamie Gerlach 2013, Casey Grieshaber 2013, Misty Willbanks 2013, Sara Eisler 2013, Ashely Thigpin 2013, Jason Lint 2013. Nikki Volmer 2003, Matthew Rhines, 1998, Benjamin B. Parrott 2005, Charles Foster 2005, Jason Whitehead 2005, Dannel Freed 2006, Stephanie Salisbury 2007, Sarah Hutchinson 2007, Carolyn Odenwelder 2008, Cory Dashiell 2008, Justin Isaacs 2008, Ashley Myers 2009, Jessica Makowski 2010, Catherine Luquire 2010, Robert McNeil 2011, Zachary Gillum 2011,

DIS students: Michelle Stambaugh 2019-20, Cathryn Miller, 2019, Isabelle Deflippo 2020, Arianna Frantz 2020, Samantha Kidney 2020, Eric Dzenis 2018, Hannah Doane 2018, Denise Rohlic 2017, Sarah Hill 2017, Emily Somero 2017, Andie Cuiffo 2016, Aquanette Sanders 2016, Kate Titi 2016, Michael Sparrel 2015, Jenna Punnill 2015, Alexandra Krall 2015, Ethan Lawson 2015, Emily Mullane 2015, Rachel Stearns 2015, Anita Harrington 2015, Emma Belcher 2014, William Carlson 2014, Matthew Casa 2014, Corina Cooling 2014, Robert Dixon 2014, Joseph Larsen 2013, Jeffrey Pyles 2013, Jaclyn Smith. 2013 Stephanie Chavez 2012, Khalid Hakeem 2012, Amy Sutton 2012, John Turman 2012, Jennifer Nguyen 2011, Alexandra Cotto, Hannah Goodwin 2011, Veronica Amatucci 2010, Angela Carrol 2010, Elizabeth Cox 2010, Hannah Goodwin 2010, Stephanie Kinney 2010, Zachary Gillum 2009, Emily Howell 2009, Katherine Johnson 2009, Hannah Redmon 2009, Samantha Perkins 2008, Lauren Thompson 2008, Joana Strikland 2008; Ariane Frappier 2007, Ashley Futral 2005, Brian Terlep 2004, Josh Vincent 2004, Nicholas Ottaway 2003, Jannet Ballard 2001, Justin Ceradini 1999-2000; Jacque Debois 1999-2000; Richard Walter, 1997

American Chemical Society Scholars Program Mentor: Corina Cooling 2012-2013

Collaborators: UNCW: Joan Willey, Robert Kieber, Steve Skrabal, Ralph Mead, Bart Jones, Pam Seaton, Martin Posey, Troy Alphin, Lynn Leonard, Rob Whitehead,

Other Universities:Chris Shank, University of Texas, Courtney Hackney, University of Northern Florida, Luciano Campos, University of Sao Paulo, Maurice Crawford, Elizabeth State University

Honors

Faculty Scholarship Award 2014
Five Million Dollar Club, UNCW 2012
Million Dollar Club, UNCW 2005
Camille and Henry Dreyfus Post-Doctoral Fellow, 1997 - 1999
ONR /ASSERT Fellow: 1993-1996.
DISCO fellowship (Dissertation Symposium on Chemical Oceanography) 1994.
Phi Kappa Phi,UNC-Wilmington, 1990

Service to the University and Community

Chair CMS Strategic Plan Subcommittee
Assistant Chair Department of Chemistry and Biochemistry June 2018-present
Chair Chemistry biotech position search 2018
Center for Marine Sciences Council 2018-2020
Faculty Advisory Committee Center for marine sciences 2016-1018
University College Advisor 1999 to present
Ocean Bowl science judge, 2003, 2004
Science Olympiad 2005, 2006, 2007, 2008, 2009, 2010, 2011
Earth Watcher Summer Camp 2001, 2002, 2003
Chemistry Graduate Committee 2005-
Scholarship Committee Chair 2005-
Faculty Review Committee 2005-
Postdoc Hiring Committee 2005-
Publicity Committee 2005-
Center for Marine Sciences Internal Advisory Committee 2005-2007
Center for Marine Sciences Education Committee 2006- present
Faculty Scholarship Award Committee 2008
Geology and Geography Geochemist Search Committee 2010

Publications (peer reviewed) (64) student co-authors (54)

In prep:

Submitted:

2020 Jennifer Harfmann, Avery, G. B. , Jr. Jr. *, Douglas Rainey, Ralph N. Mead, Stephen A. Skrabal, Robert J. Kieber, David J. Felix and John Helms.
Bioavailability of photochemically released dissolved organic carbon from resuspended sediments. In revisions.

- 2020** Mead, R.N., Saleeby, B.; Shimizu, M.; Sanchez Garcia, R.; Avery, G.B.; Kieber, R.J.; Skrabal, S.A. "Isomers of Emerging Per- and Polyfluoroalkyl Substances in Water and Sediment from the Cape Fear River, North Carolina, USA" submitted to *Chemosphere*.
- 2020** Willey, J.D., Felix, J.D., Shimizu, S., Cala, J., Summerlin, S., Avery, G.B., Kieber, R.J. and Mead, R.N. "Impact of Biofuel Ethanol on Ethanol Cycling in the Troposphere" submitted to *Atmos. Environ.*

Published:

- 2020** Shimizu, M., Summerlin*, S.L., Felix, J.D., Halls, J., Avery, G.B., Kieber, R.J., Lane, C.S., Mead, R.N. and Willey, J.D. "Variable Ethanol Concentrations and Stable Carbon Isotopes Reveal Anthropogenic Ethanol Contributions to Rainwater" *Atmos. Environ.* 234, 117578.
- 2019** Felix, J.D., Roebuck, J.A., Mead, R.N., Willey, J.D., Avery, G.B. and Kieber, R.J. "Methanol and Ethanol Concentrations in a Greenland Ice Core: Implications for Atmospheric Oxidation Chemistry" *Atmos. Environ.* 217, 116948..
- 2019** Felix, J.D., Thomas*, R., Casas*, M., Shimizu, M.S., Avery, G.B., Kieber, R.J., Mead, R.N., Lane, C.S., Willey, J.D., Guy*, A. and Campos, M.L. "Compound-Specific Carbon Isotopic Composition of Ethanol in Brazil and US Vehicle Emissions and Wet Deposition." *Environ. Sci. Technol.* 53(3), 1698-1705.
- 2019** Willey, J. D., G. B. Avery, J. D. Felix, R. J. Kieber, R. N. Mead, and M. Shimizu. Rapidly increasing ethanol concentrations in rainwater and air. *Nature Partner Journal, Climate and Atmospheric Science*. 2. Article number 3.
- 2018** Mullaugh, K.M., Felix, J.D., Kieber, R.J., Willey, J.D., Avery, G.B., Mead, R.N., Payne, C.A. and Shimizu, M. "Variability of ethanol concentration in rainwater driven by origin versus season in coastal and inland North Carolina, USA". *Chemosphere* 195, 793-799.
- 2018** Skrabal, S.A., Wetterauer, A.M., Larson, L.A., Avery, G.B., Kieber, R.J. and Mead, R.N. "Photodissolution of Dissolved Copper from Resuspended Coastal Marine Sediments" in press *Limnol. Oceanogr.*
- 2018** Mead, R.N., Cala, J., Felix, D., Avery, G.B., Kieber, R.J., and Willey, J.D. A static headspace GC-MS/MS method for the determination of ethanol, isobutanol and n-butanol at nanomolar concentrations in aqueous environmental samples. *Limnology and Oceanography Methods* **2017**, 15, 1007-1014.
- 2018** Mead, R.N., Luquire, C., Southwell, M., Avery, G.B., Felix, J.D., Kieber, R.J. and Skrabal, S.A. "Photochemical Alteration of Sedimentary Molecular Markers

During Resuspension Events in a Shallow Estuary” in revision *Est. Coastal Shelf Sci.*

- 2017 Willey, J. D., Powell, J. P., Avery, G. B., Kieber, R. J., Mead, R. N. **2017**. Use of experimentally determined Henry's Law and salting-out constants for ethanol in seawater for determination of the saturation state of ethanol in coastal waters. *Chemosphere* 182:426-432. doi.org/10.1016/j.chemosphere.2017.05.044
- 2017 Felix, J. D., Willey, J. D., Thomas, R. K., Mullaugh, K. M., Avery, G. B., Kieber, R. J., Mead, R. N., Helms, J., Giubbina, F. F., Campos, M. L. A. M., Cala, J. **2017**. Removal of atmospheric ethanol by wet deposition. *Global Biogeochemical Cycles* 31(2), 348-356. doi:[10.1002/2016GB005516](https://doi.org/10.1002/2016GB005516).
- 2017 Kieber, R.J., Powell, J.P., Foley, L., Mead, R.N., Willey, J.D. and Avery, G.B. “Photochemical Variability of Gas Phase and Surface Water Ethanol in Southeastern North Carolina, USA” *Atmos. Environ.* 168, 55-61.
- 2017 Felix, J.D., Roebuck, A., Avery, G.B., Willey, J.D., Meade, R.N. and Kieber, R.J. “Methanol and ethanol record in a Greenland ice core: Implications for source changes and atmospheric oxidation chemistry” *Geophys. Res. Letters*, in Press.
- 2016 Felix, J.D., Avery, G.B., Mead, R.N., Kieber, R.J., and Willey, J.D. “Nitrogen Content and Isotopic Composition of Spanish Moss (*Tillandsia usneoides* L.): Reactive Nitrogen Variations and Source Implications Across an Urban Air Shed” *Environ Process.* 3(4) 711-722.
- 2017 Avery, G.B., Jr. W. Mickler, E. Probst, R. N. Mead, S. A. Skrabal, R. J. Kieber, J David Felix. Photochemical released of sediment bound brevetoxin (PbTx-2) from resuspended sediments. *Marine Chemistry.* V 189. 25-31.
- 2017 Kieber, R. J., Lindsey Hartrey, Davis Felix, Coleman Corzine, G. Brooks Avery Jr., Ralph N. Mead, Stephen A. Skrabal. Photorelease of microcystin-LR from resuspended sediments. *Harmful Algae.* V 63, 1-6.
- 2016 J. Alan Roebuck, Jr.*, G. Brooks Avery, J. David Felix, Robert J. Kieber, Ralph N. Mead, and Stephen A. Skrabal. "Biogeochemistry of Ethanol and Acetaldehyde in Freshwater Sediments". *Aquatic Geochemistry* V. 22. 177-195...
- 2015 Felix, J.D., Elliot, E.M., Avery, G.B., Kieber, R.J., Mead, R.N., Willey, J.D. and Mullaugh, K.M. “Isotopic Composition of Nitrate in Sequential Hurricane Irene Precipitation samples: Implications for Changing NO_x Sources” *Atmos. Environ.* 106, 191-195.
- 2015 Mead, R.N., Felix, J.D., Avery, G.B., Kieber, R.J., Willey, J.D. and Podgorski,

- D.C. “Characterization of CHOS Compounds in Rainwater From Continental and Coastal Storms by Ultrahigh Resolution Mass Spectrometry” *Atmos. Environ.* 162-168.
- 2016 Avery, G.B., Carrol, A., Roebuck, J. Foley, L., Guy, A., Mead, R. N., Kieber, R. F. , Willey, . D., Skrabal, S., J. D. Felix, K. M. Mullaugh and J. Helms. Surface waters as a sink and source for atmospheric gas phase ethanol. *Chemosphere.* V144. 360—365.
- 2015 Mullaugh KM, Hamilton JM, **Avery GB**, Felix JD, Mead RN, Willey JD, Kieber RJ. Temporal and spatial variability of trace organic compounds in rainwater. *Chemosphere.* 34:203-209.
- 2015 Willey, J.D., Kieber, R.J., Humphreys, J., Rice, B.C., Hopwood, M.J., Avery, G.B. and Mead, R.N. “The Role of Fossil Fuel Combustion on the Stability of Dissolved Iron in Rainwater” *Atmos. Environ.* 187-193.
- 2014 Dixon, J.L., Helms, J.R., Kieber, R.J. and Avery, G.B. “Biogeochemical Alteration of Dissolved Organic Material in the Cape Fear River Estuary as a function of Freshwater Discharge” in revision *Est. Coastal Shelf Sci.* V 149. P 273-282
- 2014 Mead, R.N., Probst, E.M., Helms, J.R., Avery, G.B., Kieber, R.J., Skrabal, S.A., Enhanced Detection of the Algal Toxin, PbTx-2, in Marine Waters by Atmospheric Pressure Chemical Ionization Mass Spectrometry. *Rapid Communication in Mass Spectrometry* 28, 2455-2460.
- 2014 Hackney, C. T. and Avery, G.B. Tidal Wetland Community Response to Varying Levels of Flooding by Saline Water. *Wetlands.* 35: pp 227-236.
- 2014 Mullaugh, K.M., Byrd, J.N., Avery, G.B., Mead, R.N., Willey, J.D. and Kieber, R.J. “Characterization of Carbohydrates in Rainwater from the Southeastern United States” in press *Chemosphere.*
- 2014 Helms, J.R., Glinski, D.A., Mead, R.N., Southwell, M., Avery, G.B., Kieber, R.J. and Skrabal, S.A. “Photochemical Dissolution of Organic Matter from Resuspended Riverine Sediments: Insights From Molecular Markers” in revision *Geochim. Cosmochim. Acta*
- 2014 Felix, J.D., Jones, S.B., Avery, G.B., Willey, J.D., Meade, R.N. and Kieber, R.J. “Temporal and Spatial Variations in Rainwater Methanol” *Atmos. Chem. Phys.* doi:10.5194/acpd-14-1-2014.
- 2014 Kieber, R.J., Tatum, S.K., Willey, J.D., Avery, G.B. and Mead, R.N. “Variability of Ethanol and Acetaldehyde Concentrations in Rainwater” *Atmos. Environ.* 84c, 172-177.

- 2013 Avery, G. B., Karabi, B., Southwell, M., Mead, R., Kieber, R. J. , and J. D. Willey. Carbon isotopic composition of hydrophobic organic material in rainwater. *Atmospheric Environment*, 68, 230-234.
- 2013 Kieber, R.J., Guy, A.L., Roebuck, J.A., Carroll, A.L., Mead, R.N., Jones, S.B., Giubbina, F.F., Campos, M.L., Willey, J.D., and Avery, G.B. “Determination of Ambient Ethanol Concentrations in Aqueous Environmental Matricies by Two Independent Analyses” *Anal. Chem.* 85, 6095-6099.
- 2013 Seaton, P.J., Kieber, R.J., Willey, J.D., Avery, G.B., and Dixon, J.L. “Seasonal and Temporal Characterization of Dissolved Organic Matter in Rainwater by Proton Nuclear Magnetic Resonance Spectroscopy” *Atmos. Environ.* 65, 52-60.
- 2013 Mead, R. N., Mullaugh, K. Km., Avery, G. B., Kieber, R. J., Willey, J.D., Podgorski, D. C. Insights into Dissolved Organic Matter Complexity in Rainwater from Continental and Coastal Storms by Ultrahigh Resolution Fourier Transform Ion Cyclotron Resonance Mass Spectrometry *Atmos. Chem. Phys.* 13, 4829-4838
- 2013 Mullaugh, K. M.; Willey, J. D.; Kieber, R. J.; Mead, R. N.; Avery, G.B. Dynamics of the chemical composition of rainwater throughout HurricaneIrene² *Atmos. Chem. Phys.*, 2013: 13, 2321 - 2330.
- 2012 Avery, G.B., Kieber, R.J., Taylor, K.J. and Dickson-Brown, J.L. “Dissolved Organic Carbon Release from Surface Sand of a High Energy Beach Along the Southeastern Coast of North Carolina, USA . *Marine Chemistry.* 132-133, 23-27
- 2012 Kieber, R.J., Adams, M.B., Willey, J.D., Whitehead, R.F., Avery, G.B., Mullaugh, K.M. and Mead, R.N. “Short Term Temporal Variability in the Photochemically Mediated Alteration of Chromophoric Dissolved Organic Matter (CDOM) in Rainwater” *Atmos. Environ.* 50, 112-115.
- 2011 Mullaugh, K.M., Kieber, R.J., Willey, J.D. and Avery, G.B. “Long Term Temporal Variability in Hydrogen Peroxide Concentrations in Wilmington, North Carolina USA Rainwater” *Environ. Sci. Technol.* 45, 9538-9542.
- 2011 Southwell, M., Mead, R.N., Luquire, C.M., Barbera, A., Avery, G.B., Kieber, R.J. and Skrabal, S.A. “Influence of Organic Matter Source and Diagenetic State on Photochemical Fluxes of Dissolved Organic Matter and Nutrients From Resuspended Sediments” *Mar. Chem.* 126, 114-119.
- 2011 Willey, J.D., Glinski, D.A., Southwell, M., Long, M.S., Avery Jr., G.B. and Kieber, R.J. “Decadal variations of rainwater formic and acetic acid concentrations in Wilmington, NC, USA” *Atmos. Environ.* 45, 1010-1014.
- 2010 Kieber, R.J., Smith, J., Mullaugh, K.M., Southwell, M.W., Avery Jr., G.B. and Willey, J.D. “Influence of Dissolved Organic Carbon on Photochemically Mediated Cycling of Hydrogen Peroxide in Rainwater” *J. Atmos.Chem.* 64, 149-158.

- 2010 Southwell, M.W., Smith, J.D., Kieber, R.J. and Willey, J.D. "Photochemical Production of Formaldehyde from Rainwater Dissolved Organic Matter" *Atmos. Environ.* 44, 3638-3643.
- 2010 Southwell, M.W., Avery, G.B., Kieber, R.J., Mead, R.N. and Skrabal, S.A. "Effects of Sunlight on the Production of Dissolved Organic and Inorganic Nutrients from Resuspended Sediments" *Biogeochem.* 98, 115-126.
- 2009 Mead, R.N., Morgan, J.B., Avery, G.B., Kieber, R.J., Kirk, A., Skrabal, S.A., and Willey, J.D. "Occurrence of the Artificial Sweetener Sucralose in Coastal and Marine Waters" *Mar. Chem.* 116, 13-17.
- 2009 Avery, G.B., Kieber, R.J. and Taylor, K. "Nitrogen Release From Surface Sand of a High Energy Beach Face Along the Southeastern Coast of North Carolina, USA" *Biogeochem.* 89, 357-365.
- 2009 Avery, G.B., Dickson Brown, J.L., Willey, J.D. and Kieber, R.J. "Assessment of Rainwater Volatile Organic Carbon in Southeastern North Carolina, USA" *Atmos. Environ.* 43, 2678-2681.
- 2007 Hackney, C. T., G. B. Avery, L. A. Leonard, M. Posey', and T. Alphin. Biological, chemical, and physical characteristics of tidal freshwater swamp forests of the lower Cape Fear River/Estuary , North Carolina, Pages 183-221 In Conner, W.H., T.W. Doyle, and K.W. Krauss, eds. Ecology of Tidal Freshwater Forested Wetlands in the Southeastern United States. , Springer, Dordrecht, The Netherlands
- 2006 Avery, G.B., R.J. Kieber and Joan D. Willey. Carbon Isotopic Characterization of Dissolved Organic Carbon in Rainwater: Terrestrial and Marine Influences. *Atmospheric Environment* 40, 7539-7545.
- 2006 Joan D. Willey, Robert J. Kieber and G. Brooks Avery, Jr. The Changing Chemical Composition of Rainwater in the Continental USA. *Environmental Science and Technology* 40, 5675-5680.
- 2006 Avery, G.B., Witt, Melanie, Willey, J.D., Keiber R.J., Sources of Organic Acids inWilmington, North Carolina Rainwater Determined by Air mass Back-trajectory Analysis: *Atmospheric Environment* 40, 1683-1693.
- 2005 Avery, G.B., Cooper, W.J., Kieber, R.J., Willey, J.D., Hydrogen Peroxide at theBermuda Atlantic Time series Station: Temporal Variability of Seawater Hydrogen Peroxide. *Marine Chemistry* 97, 236-244.
- 2004 Avery, G.B., Willey, J.D., Kieber, R.J., Shank, G.C. and Whitehead, R.F. The Impact of Hurricanes on the Flux of Rainwater and Cape Fear River Water DOC to Long Bay, Southeastern United States. *Global Biogeochem. Cycles*, 18.

- 2004 Shank, G.C., Skrabal, S.A., Whitehead, R.F., Avery, G.B. and Kieber, R.J. "River Discharge of Strong Cu-Complexing ligands to South Atlantic Bight Waters" *Mar. Chem.*, 88, 41-51.
- 2004 Willey, J.D., Kieber, R.J. and Avery, G.B. "Effects of Rainwater Iron and Hydrogen Peroxide on Iron Concentrations and Phytoplankton Growth in Seawater Near Bermuda" 47, 2009-222. *J. Atmos. Chem.*
- 2003 Kieber, R.J., Willey, J.D. and Avery, G.B. "Temporal Variability of Rainwater Iron Speciation at the Bermuda Atlantic Time Series Station" *J. Geophys. Res.*, 108, 1-7.
- 2003 Avery, G.B., Willey, J.D., Kieber, R.J., Shank, G.C. and Whitehead, R.F. "The Flux and Bioavailability of Cape Fear River and Rainwater Dissolved Organic Carbon to Long Bay, Southeastern United States" *Global. Biogeochem. Cycles*, 17, 1042-1048.
- 2002 Kieber, R.J., Peake, B., Willey, J.D. and Avery, G.B. "Dissolved Organic Carbon and Organic Acids in Coastal New Zealand Rainwater" 36, 3557-3563, *Atmos. Environ.*
- 2002 Avery G.B., Jr., R. D. Shannon, J. R. White, C. S. Martens, and M. J. Alperin. Controls on Methane Production in a Tidal Freshwater Estuary and a Peatland: Methane Production via Acetate Fermentation and CO₂ Reduction. *Biogeochem.* Vol. 62: pp 19-37.
- 2001 Avery, G. B. Jr., J. D. Willey, and R. J. Kieber. "Diurnal Variations in Major Rainwater Components at a Coastal Site in North Carolina" *Atmos. Environ.* Vol. 35/23 pp 3927-3933.
- 2001 Avery, G. B., Jr, R. J. Kieber, and J. D. Willey. "Impact of Recent Urbanization on Formic and Acetic Acid Concentrations in Coastal North Carolina Rainwater. *Atmos. Environ.* Vol 35/19 pp 3353-3359.
- 2001 Kieber, R.J., Cooper, W.J., Willey, J.D. and Avery, G.B. 2001. "Hydrogen Peroxide at the Bermuda Atlantic Time Series Station. Part 1: Temporal Variability of atmospheric hydrogen peroxide and its influence on seawater concentrations" *J. Atmos. Chem.* 39, 1-13.
- 2001 Kieber, R.J., Willey, J.D., Williams, K.H., Skrabal, S.A., and Avery, G.B. "Iron Speciation in Coastal Rainwater: Concentration and Deposition to Seawater" *Mar. Chem.* 73, 83-95. 2001.
- 2000 Willey, J.D., Kieber, R.J., Williams, K.H., Crozier, J.S., Skrabal, S.A. and Avery, G.B. "Temporal Variability of Iron Speciation in Coastal Rainwater" *J. Atmos. Chem.* 37, 185-205. 2000
- 2000 Willey, J.D., Kieber, R.J., Eyman, M.S. and Avery, G.B. "Rainwater Dissolved Organic Carbon: Concentrations and Global Flux" *Global. Biogeochem. Cycles*, 14, 139-148.

- 1999 Avery, G. B. , Jr. and C. S. Martens. "Controls on the Stable Carbon Isotopic Composition of Biogenic Methane Produced in a Tidal Freshwater Estuarine sediment" *Geochim. Cosmochim. Acta*, 63, 1075-1082.
- 1999 Avery, G. B., Jr., R. D. Shannon, J. R. White, C. S. Martens, and M. J. Alperin. "The Effect of Seasonal Changes in Pathways of Methanogenesis on the $\delta^{13}\text{C}$ Values of Porewater Methane in a Michigan Peatland". *Global Biogeochem. Cycles Vol* , 475-484.
- 1999 Kieber, R. J., M. F. Rhines, J. D. Willey and G. B. Avery Jr., "Rainwater Formaldehyde: Concentration, Deposition and Photochemical Formation", *Atmos. Environ.*, 33(22), 3659-3667.
- 1999 Kieber, R. J., M. F. Rhines, J. D. Willey and G. B. Avery Jr., "Nitrite Variability in Coastal North Carolina Rainwater and its Impact on the Nitrogen Cycle in Rain", *Environ. Sci. and Technol.*. 33(3), 373-377.
- 1999 Willey, J. D., Avery, G. B. Jr., J. J. Manock, S. A. Skrabal, and C. F. Stehman, "Chemical Analysis of Soils: An Environmental Chemistry Laboratory for Undergraduate Science Majors," *J. Chem. Ed.*, 76: 1693-1694 (1999).
- 1991 Avery, G. B., Jr., J. D. Willey and C. A. Wilson, "Formic and Acetic Acids in Coastal North Carolina Rainwater." *Environ. Sci. and Technol.* 25: 1875-1880.

Technical Reports

- 2010 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 10: June 2009-May 2010. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr. (in prep.)
- 2009 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 9: June 2008-May 2009. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.
- 2008 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 8: June 2007-May 2008. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.

- 2007 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 7: June 2006-May 2007. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.
- 2006 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 6: June 2005-May 2006. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.
- 2005 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 5: June 2004-May 2005. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.
- 2004 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 4: June 2003-May 2004. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.
- 2003 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 3: June 2002-May 2003. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.
- 2002 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 2: June 2001-May 2002. Report prepared for the U.S. army Corps of Engineers, Wilmington District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.
- 2002 Avery G. B., Jr. Chapter 5. Marsh/Swamp Biogeochemistry In: Monitoring Effects of a Potential Increased Tidal Range in the Cape Fear River Ecosystem Due to Deepening Wilmington Harbor, North Carolina Year 1: June 2003-May 2004. Report prepared for the U.S. army Corps of Engineers, Wilmington

District. Authors: Hackney, C.T., M. Posey, L.L. Leonard, T. Alphin, and G.B. Avery Jr.

Presentations

Convener or Co-convener of Sessions at International Meetings.

2017 Co-convener session: AGU fall Meeting New Orleans LA December 10-16 2017.

2013 Co-convener session: Biogeochemistry of Re-suspended Sediments in Aquatic and Coastal Marine Environments. ASLO spring Meeting New Orleans LA February 10-16 2013.

2011 Co-convener session: Atmospheric Wet Deposition, Aqueous Phase Photochemistry, and Potential Impacts on Biogeochemical Cycles I Posters. AGU Fall Meeting San Francisco, CA. Dec. 5-9

2011 Co-convener session: Atmospheric Wet Deposition, Aqueous Phase Photochemistry, and Potential Impacts on Biogeochemical Cycles II AGU Fall Meeting San Francisco, CA. Dec. 5-9

2011 Co-convener session: Biogeochemistry of Re-suspended Sediments in Aquatic and Coastal Marine Environments. ASLO fall Meeting San Juan Puerto Rico. Feb. 13-18.

2009 Co-convener session: Effects of Increased Salinity on Estuarine and Coastal Ecosystems. Estuarine Research Federation Portland Oregon. November 1-5.

Presentations to the Public and Invited Talks

2017 G. Brooks Avery Jr. R. Mead., S. Skrabal and R. Kieber, Joan Willey, Pam Seaton. Non-point sources of GenX. Presented to the Emerging contaminants workshop. December 11 2017.

2017 G. Brooks Avery Jr. R. Mead., S. Skrabal and R. Kieber. Progress on HB56 GenX research. Presented to the Lower Cape Fear River Program November 28 2017.

2017 G. Brooks Avery Jr. R. Mead., S. Skrabal and R. Kieber. GenX research results from MACRL lab. Presented to the EPA and CFPWA November 30 2017.

2016 Bohrer, L.E., M.A. Mallin, M.R. McIver, L.B. Cahoon and G.B. Avery. 2016. "Primary productivity and respiration in fresh-to-oligohaline tidal creeks." Water Resources Research Institute Annual Conference, Raleigh, NC.

2015 G. Brooks Avery Jr. Invited talk. "The importance of Methane as a Greenhouse

- Gas. Presented to the Osher Lifelong Learning Institute at UNCW. December 10, 2015.
- 2014** G. Brooks Avery Jr. Invited talk “Occurance and fate of biofuel ethanol in the environment” Presented to the Department of Marine Sciences UNC-Chapel Hill. March 26, 2014.
- 2013** Corina Cooling, Bonnie Monteleone*, Chase Needham, Emma Belcher, Dr. G. Brooks Avery Jr. *, Jaclyn Smith, James D. Norman, John Turman, Khalid Hakeem, and William Carlson Data Compilation on the Occurrence of Man-Made Debris on Southeastern North Carolina Beaches *Faculty Advisors. Presented at the Center for the Support of Undergraduate Research and Fellowships/CSURF April 18th 2013.
- 2011** G. Brooks Avery Jr. and Courtney Hackney. Invited talk “Influence of Sea Level Rise on Sediment Biogeochemistry”, Influence of Sea Level Rise on Natural Systems of the Greater Everglades meeting, USGS, Florida Atlantic University, Boca Raton, Florida April 5-7, 2011.
- 2011** G. Brooks Avery Jr. Invited talk: Coffee Colaborations and Climate Change.” Presented to the Baldhead Island Conservancy, Bald Head Island, NC. October 22, 2011.
- 2011** G. Brooks Avery Jr. Invited Talk: "Rainwater Fertilization of the Oceans: Implications for Uptake of Atmospheric Carbon Dioxide " UNCG Chemistry Department, Greensboro NC September 23, 2001.
- 2010** Avery, G. B. Coffee Colaborations and Climate Change. Presented to the Planet Ocean Seminar Series, Center For Marine Sciences, University of North Carolina Wilmington, February 19, 2010.
- 2009** Avery G. B. Where Does Beach Sand Come From? Presented on Earth Day 2009, to Pine Valley Elementary School Kindergarten and first grade students.
- 2008** Avery, G.B. The Global Warming Debate. What do scientists really know? Presented to the Ocean Oddey Lecture Series, Center For Marine Sciences, University of North Carolina Wilmington, May 1 2008.
- 2008** Avery G. B. Where Does Beach Sand Come From? Presented on Earth Day 2008, to Pine Valley Elementary School Kindergarten and first grade students.
- 2007** Avery, G.B. The Global Warming Debate. What do scientists really know? Presented to the Global Warming Conference, University of North Carolina Wilmington. 2007.
- 2004** Effect of Salt Water Intrusion on the Remineralization and Storage of Organic

Carbon in Wetland Sediments: Implications for Sea Level Rise, Global Warming and Wetland Loss. Invited talk Institute for Marine Sciences, University of North Carolina, Chapel Hill. November 2004.

- 2001** Avery, G.B. Jr “Impact of Increased Salinity on Cape Fear Estuary Geochemistry: A Model for Sea Level Rise.” Invited seminar UNC Wilmington Marine Sciences, November 12, 2001
- 2000** Willey, Joan D., Kieber, Robert J., Cooper, W. and Avery, G. Brooks. Photochemical production and atmospheric deposition of hydrogen peroxide at the Bermuda Atlantic Time Series Station. Invited presentation. American Chemical Society Pacificchem meeting, Honolulu, Hawaii.
- 1999** Avery, G.B., “Anthropogenic impacts on the Concentrations of Formic and Acetic Acids in Wilmington, NC” Invited seminar University of North Carolina at Chapel Hill.
- 1996** Avery, G.B. Jr “Rate and Mechanistic Controls on the Stable Isotopic Composition of Biogenic Methane in Wetland Environments” Abstract published in Dialog II Dissertation Initiative for the Advancement of Limnology and Oceanography.
- 1995** Avery G.B., “Controls on the Isotopic Composition of Biogenic Methane in a Tidal Freshwater Wetland” UNC-UNCW Teleconferenced Coastal Processes Seminar Series, Chapel Hill and Wilmington, N.C., (November, 1995)

Presentations at Scientific Meetings (97) Student co-presenters (89)

- 2020** Shimizu, M. S., Mott*, R. K., Potter*, A., Harfmann, J., Avery, G. B. Jr., Kieber, R. J., Mead, R. N., Skrabal, S., Willey, J. D., Zhou, J., Baumann, K., Turpin, B., Surratt, J. D., Bodnar, W., DeWitt, J., Sun, M., Swarthout, B., Darrow, B., Shank, C., “Per- and Polyfluoroalkyl Substances in Wet and Dry Deposition in North Carolina” Carolina Society of Toxicology and Chemistry 29th Annual Meeting
- 2019** Mott*, R. K., Shimizu, M. S., Avery, G. B. Jr., Kieber, R. J., Mead, R. N., Skrabal, S. “Targeted and Non-Targeted Analysis of Per- and Polyfluoroalkyl substances in Wet Deposition Events” Global Marine Summit, Wilmington, NC.
- 2019** Tito*, K. S., Kieber, R. J., Shimizu, M. S., Avery, G. B. Jr., Mead, R. N., Skrabal, S. “Biodegradation Rates of Perfluoro-2-propoxypropanoic Acid in Sediments of the Cape Fear River Estuary” Wilmington, NC.
- 2019** Sanchez*, R., Shimizu, M. S., Avery, G. B. Jr., Kieber, R. J., Mead, R. N., Skrabal, S. “Screening of Novel Per- and Polyfluorinated Alkyl Substances (PFAS) in Surface Sediments of Southeastern North Carolina” Global Marine Summit, Wilmington, NC.

- 2019** Mott*, R. K., Shimizu, M. S., Avery, G. B. Jr., Kieber, R. J., Mead, R. N., Skrabal, S. “Targeted and Non-Targeted Analysis of Per- and Polyfluoroalkyl substances in Rainwater” Society of Toxicology and Chemistry; PFAS Risk Assessment, Durham, NC.
- 2019** Sanchez*, R., Shimizu, M. S., Avery, G. B. Jr., Kieber, R. J., Mead, R. N., Skrabal, S. “Screening of Novel Per- and Polyfluorinated Alkyl Substances (PFAS) in Surface Sediments of Southeastern North Carolina” Society of Toxicology and Chemistry; PFAS Risk Assessment, Durham, NC.
- 2019** Tito*, K. S., Shimizu, M. S., Avery, G. B. Jr., Kieber, R. J., Mead, R. N., Skrabal, S. “Biodegradation Rates of Perfluoro-2-propoxypropanoic Acid in Sediments of the Cape Fear River Estuary” Society of Toxicology and Chemistry; PFAS Risk Assessment, Durham, NC.
- 2019** Summerlin*, L. S., Shimizu, M. S., Felix, J. D. Avery, G. B. Jr., Kieber, R. J., Mead, R. N., Lane, C. “Biofuel and Biogenic Contributions of Ethanol in Rainwater in Wilmington determined by compound specific stable carbon isotopes” NC Breathe 2019, Wilmington, NC.
- 2019** Mott*, R. K., Shimizu, M. S., Avery, G. B. Jr., Kieber, R. J., Mead, R. N., Skrabal, S. “Targeted and Non-Targeted Analysis of Per- and Polyfluoroalkyl substances in Rainwater” NC Breathe 2019, Wilmington, NC.
- 2019** J.Zhou, K.Baumann, J.D.Surratt, R.Mead, S.Skrabal, R.J.Kieber, G.B.Avery, J.D.Willey, M. Shimizu, W.Bodnar, Z.Zhang, J.C.DeWitt, M.Sun, L.B.Collins, B.J.Turpin “Per- and polyfluoroalkyl substances (PFAS) in fine particles (PM_{2.5}) in North Carolina” NC Breathe Charlotte NC
- 2019** J.Zhou, K.Baumann, J.D.Surratt, R.Mead, S.Skrabal, R.J.Kieber, G.B.Avery, J.D.Willey, M. Shimizu, W.Bodnar, Z.Zhang, J.C.DeWitt, M.Sun, L.B.Collins, B.J.Turpin “Air concentrations of per- and polyfluoroalkyl substances (PFAS) in North Carolina” SETAC.
- 2017 Avery, G.B., Shimizu, M.S., Willey, J.D., <Mead, R.N., Skrabal, S. A., Kiber, R.J., Lathrop, T.E., Felix, J.D., Fluxes of ethanol between the atmosphere and oceanic waters: implications for the fate of biofuel ethanol released into the environemtnAmerican Geophysical Meeting December 2017 New Orleans LA.
- 2017 Felix, J.D., Willey, J.D., Avery, G.B., Thomas, R., Mullaugh, K, Kieber, R.J., Mead, R. N., Helms, R.J., Campos, L., Shimizu, L., Guibbina, F., Removal of Atmospheric ethanol by wet deposition: a global flux estimate. American Geophysical Meeting December 2017 New Orleans LA.

- 2017 Shimizu M.S., Felix, J.D., Casas, M., Avery, G.B., Kieber, R.J., Mead, R. N., Willey, J.D., Lane, C. High relative abundance of biofuel ethanol in precipitation in the US and Brazil determined using compound specific stable carbon isotopes. American Geophysical Meeting December 2017 New Orleans LA.
- 2017 Mead, R.N., Taylor, A. T., Shimizu, M.S., Avery, G. B., Kieber, R.J., Willey, J.D. A Bottom-Up approach investigating potential impacts of ethanol in atmospheric waters American Geophysical Meeting December 2017 New Orleans LA.
- 2016 Mead, R.N., *Mickler, W., *Probst, E., Avery, G.B., Felix, J.D., Kieber, R.J., and Skrabal, S.A. 2016. Photorelease and phototransformations of sedimentary bound brevetoxin (PbTx-2) upon resuspension. Ocean Sciences Meeting, New Orleans
- 2016 Mead, R.N., *Kipp, L.E., *Liberatore, H., *Sherard, S., *Steagall, M., and Skrabal, S.A. 2016. Undergraduates in the lab: Analyzing metal and organic contaminants in oysters and sediments from southeastern North Carolina. Ocean Sciences Meeting, New Orleans, LA.
- 2016 Kieber, R.J., *Hartrey, L.M., *Corzine, C., Avery, G.B., Mead, R.N., Felix, J.D., and Skrabal, S.A. 2016. Photorelease of microcystin-LR from resuspended sediments. Ocean Sciences Meeting, New Orleans, LA.
- 2016 Avery, G.B., *Rainey, D.H., Mead, R.N., Skrabal, S.A., Kieber, R.J., Felix, J.D., and Helms, J.R. 2016. Bioavailability of DOM photochemically released from resuspended sediments. Ocean Sciences Meeting, New Orleans, LA.
- 2014 Cala, J., Felix, J.D., Avery, G.B., Mead, R.N., Willey, J.D., Kieber, R.J., Tracing vehicle ethanol emissions and subsequent deposition to roadside ecosystems. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.
- 2014 Corzine, C. T., Avery, G.B., Skrabal, S.A., Felix, D.J., Mead, R.N., Kieber, R.J. Controls on the photorelease of microcystin in resuspended sediments. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.
- 2014 Dingess, E., Kieber, R.J., Willey, J.D., Felix, J.D., Mead, R.N., Avery, G.B. Ethanol's impacts on the composition and optical properties of chromophoric dissolved organic matter in rainwater in Wilmington, North Carolina. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.

- 2014** Dober, B., Felix, J.D., Brooks, G.B., Skrabal, S.A., Kieber, R.J., Mead, R.N. Effect of sediment biogeochemical setting on PBTX-2, -3 and MLR photochemical behavior. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.
- 2014** Hammaker, S., Avery, G.B., Skrabal, S.A., Felix, J.D., Mead, R. N., Kieber, R.J., Willey, J.D. Photoproduction of dissolved vanadium from resuspended sediments. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.
- 2014** Lindt, J. W., Avery, G.B., Skrabal, S.A., Felix, J.D., Mead, R.N., Kieber, R.J. Adsorption of brevetoxin onto model sediments. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.
- 2014** Magniacarpe, M., Avery, G.B., Skrabal, S.A., Felix, D.J., Mead, R.N., Kieber, R.J. Phototransformation of polycyclic aromatic hydrocarbons in crude oil amended marine sediment upon resuspension into the photic zone. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.
- 2014** Mickler, W. K., Mead, R.N., Kieber, R.J., Avery, G.B., Skrabal, S.A., Felix, J.D. Photo-transformations of sedimentary bound brevetoxin (PbTx-2) upon resuspension. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.
- 2014** Rainey, H.D., Avery, G.B., Skrabal, S.A., Felix, J.D., Mead, R.N., Kieber, R.J. Photochemical release of chromophoric and bioavailable dissolved organic carbon. Meeting of the Southeastern Estuarine Research Society Carolina Beach, NC.
- 2014** Mullaugh, K.M.; Hamilton, J.M.; Payne, A.; Felix, J.D.; Avery, G.B.; Mead, R.N.; Kieber, R.J.; Willey, J.D. "Quantification of ethanol and trace volatile organic compounds in rainwater using solid phase micro extraction." Talk presented at the South Eastern Regional Meeting of the American Chemical Society, Nashville, TN, October 18, 2014.
- 2014** Avery, G.B., Mead, R.N., Kieber, R.J., Willey, J.D., Skrabal, S.A. "Ethanol Distribution in Aquatic Systems: Potential Impact on Atmospheric Concentrations" American Society of Limnology and Oceanography, American Geophysical Union Ocean Sciences Meeting, Honolulu, Hawaii.
- 2014** Mead, R.N., Avery, G.B., Helm, J., Kieber, R.J., Mickler, W., Probst, E. and Skrabal, S.A. "Photochemical Transformations of the Algal Toxin PbTX2 on Resuspended Sediments in Coastal Ecosystems" American Society of Limnology and Oceanography, American Geophysical Union Ocean Sciences Meeting, Honolulu, Hawaii.

- 2013** Skrabal, S.A., *Wetterauer, A.M., *Larson, L.A., Avery, G.B., Kieber, R.J., Mead, R.N., and Helms, J.R., 2013. Photolytic release of dissolved copper and dissolved organic carbon from resuspended coastal marine sediments. American Chemical Society Spring National Meeting, New Orleans, LA.
- 2013** Helms, J. R., *Wetterauer, A. M., *Dingess, E. C., Avery, G. B., Kieber, R. J., Mead, R. N., Skrabal, S. and Mopper, K., 2013. Light induced flocculation and dissolution of chromophoric organic matter in natural waters. American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- 2013** Kieber, R. J., Avery, G. B., Helms, J. R., Mead, R. N., *Probst, E. E., and Skrabal, S. A., 2013. Photochemical transformations of the algal toxin PbTx-2 on resuspended sediments in coastal ecosystems. American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- 2013** Mead, R. N., *Hartrey, L., Helms, J. R., Avery, G. B.; Kieber, R. J., and Skrabal, S. A., 2013. Photochemical mobilization of sediment bound microcystins from resuspended sediment. American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- 2013** *Nguyen, J. C., Avery, G. B., Helms, J. R., Mead, R. N., Skrabal, S.A., Kieber, R. J., 2013. Photochemical release of amino acids from resuspended sediments. American Society of Limnology and Oceanography Ocean Sciences Meeting, New Orleans, LA.
- 2013** *Nguyen, J.C., Avery, G.B., Kieber, R.J., Skrabal, S.A., Mead, R.N., Helms, J.R. 2012. Photochemical release of free and combined amino acids from resuspended sediments. Southeastern Regional Meeting of the American Chemical Society, Raleigh, NC.
- 2013** *Probst, E.E., Avery, G.B., Kieber, R.J., Helms, J.R., Mead, R.N., Skrabal, S.A. 2012. **Improved ionization for liquid chromatography mass spectrometry detection of the marine dinoflagellate-produced toxin PbTx-2 (*Karenia brevis*).** Southeastern Regional Meeting of the American Chemical Society, Raleigh, NC.
- 2013** Skrabal, S.A., *Glinski, D., *Larson, L., *Wetterauer, A., Avery, G.B., Kieber, R.J., Mead, R.N. 2012. Photochemical fluxes from resuspended sediments as sources of dissolved copper and organic matter in riverine and coastal environments. Ocean Sciences Meeting, Salt Lake City, UT.
- 2012** *Wetterauer, A.M., Skrabal, S.A., Kieber, R.J., Avery, G.B., Mead, R.N. 2012. Copper photodissolution from resuspended estuarine sediments. Southeastern Regional Meeting of the American Chemical Society, Raleigh, NC.

- 2011** Willey J.D., Mullaugh, K.M., Kieber, R.F., Avery, G.B., Mead R.N. The Redox Chemistry of Rainwater, presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 2011.** Kieber R.J., Avery, G.B., Willey, J.D., Mead R.N., Kinney, S. Ethanol Variability in Coastal North Carolina, USA Rainwater and its Impact on the Atmospheric Carbon Cycle. presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 2011** Mullaugh, K.M., Kieber, R.J., Willey, J.D., Avery G.B., Effect of Reduced Sulfur Dioxide Emissions on Hydrogen Peroxide Concentrations in Wilmington, NC, USA Rainwater. presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 2011** G.B. Avery, Jr. Farhana, B.K., Southwell M., Kieber, R.J., Willey, J.D., Mead, R.N., Mullaugh K.M Carbon Isotopic Composition of Rainwater Chromophoric Dissolved Organic Material presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 2011** Mead, R.N., Podgorski, D.C., Mullaugh, K.M., Avery, G.B., Kieber, R.J., Willey, J.D., Cooper, W.T. Characterization of Rainwater Dissolved Organic Matter by Ultrahigh Resolution Fourier Transform Ion Cyclotron Resonance Mass Spectrometry. presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 2011** Skrabal, S.A., Larson, L., Thompson, L., Avery, G.B., Kieber, R.J., Mead, R.N. “Photochemical Release of Dissolved Copper from Resuspended Sediments” American Society of Limnology and Oceanography, San Juan, Puerto Rico. February 13-18.
- 2011** G. Brooks Avery Jr., Lauren Thompson, Ralph N. Mead, Melissa Southwell, Robert J. Kieber and Stephen A. Skrabal “Influence of Sea Level Rise on the Photolytic Release of Dissolved Organic Carbon from Resuspended Estuarine Sediments” American Society of Limnology and Oceanography, San Juan, Puerto Rico. February 13-18.
- 2011** Ralph N. Mead, Catherine Luquire, Amy Barbera, G. Brooks Avery Jr., Robert J. Kieber, Steve Skrabal, Melissa Southwell “Characterization of Sedimentary Organic Matter Upon Exposure of Resuspended Sediments to Simulated Sunlight: A Bulk and Molecular Marker Approach” American Society of Limnology and Oceanography, San Juan, Puerto Rico. February 13-18.
- 2011** Kieber, R.J., Southwell, M., Skrabal, S. A., Avery, G. B., and Mead, R. N. “Photochemical Production of Dissolved Organic and Inorganic Nutrients from Resuspended Sediments” American Society of Limnology and Oceanography, San Juan, Puerto Rico. February 13-18.
- 2010** Whitehead, R.F., Kieber, R.J., Willey, J.D., Avery, G.B. Mead, R.N. Adams, B.;

- Smith, J.; Mullaugh, K.M. "Photo Mediated Changes in Rainwater Chromophoric Dissolved Organic Matter" Pacificchem, Honolulu, HI.
- 2010** Kieber, R.J., Southwell, M., Luquire, C., Thompson, L., Barbera, A., Skrabal, S.A., Avery, G.B., Mead, R.N. "Photochemical Production of Dissolved Organic and Inorganic Nutrients from Resuspended Sediments" Pacificchem, Honolulu, HI.
- 2010** Mullaugh, K.M., Kieber, R.J., Willey, J.D., Mead, R.N., Jones, S.B., Avery, G.B., Kinney, S.M. "Ethanol Variability in Coastal North Carolina Rainwater and its Impact on the Atmospheric Carbon Cycle" Pacificchem, Honolulu, HI.
- 2010** Mead, R.N., Laquire, C., Barbera, A., Southwell, M., Avery, G.B., Kieber, R.J. and Skrabal, S.A. "Characterization of sedimentary organic matter upon exposure of resuspended sediments to simulated sunlight: A bulk and molecular marker approach" Ocean Sciences, Portland, OR.
- 2010** Kieber, R.J., Willey, J.D., Mullaugh, K.M., Avery, G.B., Mead, R.N. "Ethanol Variability in Coastal North Carolina Rainwater and its Impact on the Atmospheric Carbon Cycle" American Geophysical Union Meeting of the Americas, Brazil.
- 2010** Skrabal, S.A., Southwell, M., Thompson, L., Larson, L., Avery, G.B., Kieber, R.J., Mead, "Photochemistry of Resuspended Estuarine Sediments: Effects on Dissolved Organic and Inorganic Nutrients, and Trace Metals" American Geophysical Union Meeting of the Americas, Brazil.
- 2010** Southwell M., Avery G.B., Kieber R.J., Mead R.N., Skrabal S.A. "Spatial variability and organic matter source effects on elemental ratios of nutrient fluxes during photolysis of resuspended sediments." Ocean Sciences, Portland, OR
- 2010** Skrabal S.A., Larson L., Avery G.B., Kieber R.J., Mead R.N., Skrabal S.A. "Behavior of Metals After Sunlight Photolysis of Resuspended Estuarine Sediments" Ocean Sciences, Portland, OR
- 2009** Jennifer Culbertson, Brooks Avery, Jason Hall. Effects of Drought Conditions on Remineralization Pathways in Brackish Marshes and Freshwater Tidal Swamps along the Cape Fear River, NC. ERF Portland Oregon. November 1-5.
- 2009** Courtney Hackney, Lynn Leonard, Jennifer Culbertson, G. Brooks Avery, Martin Posey, Troy Alphin, Maurice Crawford. Hydrological Characteristics of Tidal Swamps. . ERF Portland Oregon. November 1-5.
- 2009** Aleksandra Kirk, Ralph N. Mead*, G. Brooks Avery, Robert J. Kieber, Jeremy B. Morgan, Stephan A. Skrabal, Joan D. Willey "Occurrence of the Artificial Sweetener Sucralose in Marine Waters" 238th National American Chemical Society Meeting, Washington DC.

- 2009** Kieber, R.J., Southwell, M., Skrabal, S.A., Avery Jr., G.A. and Mead, R. "Photochemical Production of Dissolved Organic and Inorganic Nutrients From Resuspended Sediments" American Society of Limnology and Oceanography Aquatic Sciences Meeting, Nice, France.
- 2009** Hackney, Courtney T., 2009 Society of Wetland Scientists Annual meeting in Madison, Wisconsin "Impacts of Drought on Tidal Swamps in the Southeastern U.S." with M. Posey, L. Leonard, B. Avery, T. Alphin, & J. Culbertson.
- 2007** Alphin, T.D., L. Leonard, M.H. Posey, G.B. Avery, and C.T. Hackney. Tidal wetland habitat response to changes in tidal amplitude, saltwater and freshwater input. In Science and management observations synthesis and solutions. 19th Biennial International Conference of the Estuarine Research Federation. Estuarine Research Federation, Port Republic, MD 20676.
- 2007** Kieber, R.J., Willey, J.D., Whitehead, R.F., Miller, C. and Avery, G.B. "Photodegradation of Chromophoric Dissolved Organic Matter (CDOM) in Atmospheric Waters and Its Influence on the Redox Chemistry of the Troposphere" American Geophysical Union Joint Assembly Meeting, Acapulco Mexico
- 2007** Avery, G.B., Kieber, R.J., Willey, J.D., Miller, C. and Seaton, P.J. "Chemical and Isotopic Characterization of rainwater Dissolved Organic Carbon and Chromophoric Dissolved Organic Matter" American Geophysical Union Joint Assembly Meeting, Acapulco Mexico
- 2005** G. Brooks Avery Jr., Robert J. Kieber, Joan D. Willey, G. Christopher Shank, and Robert F. Whitehead. The Impact of Hurricanes on the Flux of Rainwater and Cape Fear River Water Dissolved Organic Carbon to Long Bay, Southeastern United States. Presented at the Biennial Conference of the Estuarine Research Federation, October 2005.
- 2004** Avery, G.B., Jr., Robert J. Kieber, Joan D. Willey, G. Christopher Shank, and Robert F. Whitehead. The Impact of Hurricanes on the Flux of Rainwater and Cape Fear River Water Dissolved Organic Carbon to Long Bay, Southeastern United States. American Society of Limnology and Oceanography Meeting, Honolulu, Hawaii, February 2004.
- 2003** Thatcher, Lisa and G. B. Avery Jr., Effects of saltwater Intrusion on Carbon Storage in Freshwater Wetlands: Implications for Global Warming. Presented at the 17th Biennial Conference of the Estuarine Research Federation, Seattle, Washington, November 2003.
- 2003** Avery, G.B., Jr., and Suzanne Sexton. Rates of Carbon Remineralization in Coastal Wetland Sediments Under Sulfate Reducing and Methanogenic Conditions: Implications For Sea Level Rise. American Chemical Society Meeting, New Orleans L. A.

- 2002** Avery, G.B., Jr “Impact of Increased Salinity on Cape Fear Estuary Geochemistry: A Model for Sea Level Rise.” Invited seminar National Institute of Standards and Technology, Hollings Marine Laboratory, Charleston, SC, April 2002.
- 2002** Avery, G.B. Jr, Robert J. Kieber and Joan D. Willey. “Rainwater as a Removal Mechanism for Fossil Fuel Derived Dissolved Organic Carbon. Ocean Sciences Meeting, Honolulu Hawaii, February 2002.
- 2001** Avery, G.B. Jr “Impact of Increased Salinity on Cape Fear Estuary Geochemistry: A Model for Sea Level Rise.” Presented at the 16th Biennial Conference of the Estuarine Research Federation, November 4- 8, 2001
- 2001** Hackney, C.T., A.R. Clark, M.H. Posey, L.L. Leonard, G.B. Avery and T.D. Alphin. “Impacts of an artificial increase in sea level on wetlands in the Cape Fear River Basin” Presented at the Annual Society of Wetland Scientists Meeting in Chicago, IL May 2001.
- 2001** Willey, J.D., Kieber, R.J. and Avery, G.B. Effects of Rainwater Fe(II), Fe(III) and Hydrogen Peroxide on Chlorophyll a in Bermuda Area Time Series Station Bioassays: A Delicate Balance. Invited presentation, American Society of Limnology and Oceanography meeting, Albuquerque, New Mexico.
- 2001** Willey, Joan D., Kieber, Robert J., Cooper, W. and Avery, G. Brooks. Photochemical production and atmospheric deposition of hydrogen peroxide at the Bermuda Atlantic Time Series Station, 5th UNCW Symposium on Chemistry and Biochemistry, Wilmington North Carolina
- 2000** Avery, G. B., “Flux and Bioavailability of Rain and River Water Dissolved Organic Carbon to Coastal Waters” Paper presented at the Ocean Sciences Meeting, February 2000, San Antonio, Texas.
- 1999** Willey, Joan D., Kieber, Robert J., Avery, G. Brooks., and Eyman, Mary S. Rainwater dissolved organic carbon as a part of the global carbon cycle. The American Society of Limnology and Oceanography National Meeting, February 2, 1999, Santa Fe, New Mexico.
- 1999** Willey, J.D., Kieber, R.J., Eyman, M. and Avery, G.B. "Rainwater dissolved organic carbon: Concentrations and flux" Gordon Conference on Atmospheric Chemistry, Newport, RI, June 13-18.
- 1998** Avery, G.B., Jr. “Bioavailability of DOC in the Cape Fear River Estuary” Thirteenth Duke/UNC Oceanographic Consortium Symposium held in Beaufort, North Carolina.

- 1997** Avery, G. B., "Controls on the Isotopic Composition of Biogenic Methane Produced in Two Different Wetlands" (poster presented at the Gordon Conference on Chemical Oceanography) New Hampshire, August 1997.
- 1996** Avery, G.B., "Causes of Isotopic Variation in $\delta^{13}\text{C}$ of Methane Produced in a Tidal Freshwater Estuary and a Peatland" (paper presented at the Fourth Symposium on the Biogeochemistry of Wetlands.) New Orleans, LA., March 1996.
- 1994** Martens, C.S., D.B. Albert and G. B. Avery. "Controls on the Stable Isotopic Composition of Methane in Rapidly Accumulating Coastal Sediments." (paper presented at the third annual meeting of the Shallow Gas Group, Texel, The Netherlands, 1994.)
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- 1988** Willey, J.D., G. B. Avery and J.R. Kucklick. "Intrastorm Variation in the Composition of Rain in Wilmington, North Carolina." (paper presented to the 5th Annual Gatlinburg Acid Rain Conference, Gatlinburg Tennessee, 1988)
- 1987** Willey J.D., J.R. Kucklick, and G.B. Avery. "Rainwater-Surface Water Interactions in Southeastern North Carolina." (paper presented at 39th Southeast Regional Meeting of the American Chemical Society, Orlando Florida, 1987) Abstract No. 243.

Grants obtained: Total >\$5,000,000 :Current Grants in Bold \$558,479

Current:

\$299,942 Mead, R.N., Avery, G.B., Kieber, R.J. and Skrabal, S.A. 2018 -2020 "Per and Polyfluoroalkyl Substance Testing" North Carolina Policy Collaboratory,.

\$313,872 Kieber, R.J., Mead, R.N., Willey, J.D., Avery, G.B. 2015-2019 "RUI: Ramifications of Ethanol Usage as a Biofuel: Quantifying Sources and Impacts on the Light Absorbing Properties of Rainwater" National Science Foundation, Atmospheric Chemistry Division.

\$34,641 Mead, R.N., Avery, G.B., Kieber, R.J. and Skrabal, S.A. 2018-2019 "Analysis of non-Targeted Perfluoroalkyl Substances in Water Treated for Aquifer Storage and Recovery" Cape Fear Public Utility Authority.

\$250,000 Mead, R.N., Avery, G.B., Kieber, R.J. and Skrabal, S.A. 2017-2019
“Analysis of Perfluorinated Organic Compounds in Sediments of Cape Fear River”.
NC House Bill 56,.

\$64,607 Mead, R.N., Avery, G.B., Kieber, R.J. and Skrabal, S.A. 2018-2019.
Analysis of Perfluorinated Organic Compounds in Raw and Finished Drinking
Cape Fear Public Utility Authority

Previous:

- \$678, 515** Mead, R.N., Avery, G.B., Kieber, R.J. and Skrabal, S.A. “RUI: Photochemical Transformations of Algal Toxins (PbTx-2, PbTx-3 and Microcystin-LR) on Resuspended Sediments in Coastal Ecosystems” National Science Foundation, Marine Chemistry Division.
- \$622, 400** Kieber, R.J., Avery, G.G., Willey, J.D. and Mead, R.N. 2010-2013 “Impact of Chaning Fuel Usage on the Atmospheric Cycling of Ethanol, Optically Active Organic Compounds and Iron (Fe) in Rainwater” National Science Foundation, Atmospheric Chemistry Division.
- \$84,000** Ralph N. Mead, G. Brooks Avery, Jr., Robert J. Kieber, Stephen A. Skrabal, Bongkeun Song, Craig R. Tobias, Joan D. Willey Biogeochemical processes in water and sediments of estuarine plumes, southeastern United States. June 2008. Duke/UNC Consortium of Oceanographic Research
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- \$509,912** 2004 Hackney, C.T, Posey, M. Leonard,L. Avery, G.B., Alphin, T. “Monitoring the effects of a potential increase in tidal range in the Cape Fear River Ecosystem due to deepening of the Wilmington Harbor, NC. U.S. Corps of Engineers.

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- \$108,002** 2003 Hackney, C.T, Posey, M. Leonard, L. Avery, G.B., Alphin, T. "Monitoring the effects of a potential increase in tidal range in the Cape Fear River Ecosystem due to deepening of the Wilmington Harbor, NC. U.S. Corps of Engineers.
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- \$362,376** 2000 Hackney, C.T, Posey, M. Leonard, L. Avery, G.B., Alphin, T. "Monitoring the effects of a potential increase in tidal range in the Cape Fear River Ecosystem due to deepening of the Wilmington Harbor, NC. U.S. Corps of Engineers.
- \$329,112** 1999 Hackney, C.T, Posey, M. Leonard, L. Avery, G.B., Alphin, T. "Potential effect of increased tidal range on the Cape Fear River Ecosystem due to deepening and widening of the Wilmington Harbor, NC. U.S. Corps of Engineers.
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