

Erik Michael Smith

CURRICULUM VITAE

North Inlet – Winyah Bay National Estuarine Research Reserve
Baruch Institute for Marine and Coastal Sciences, University of South Carolina
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Education:

Ph. D. Marine Science; University of Maryland, College Park, August 2000
M.S. Marine Science; University of Maryland, College Park, December 1994
B.A. Biology; New York University, June 1987

Research Interests:

Estuarine ecology, aquatic microbial ecology, carbon and nutrient biogeochemistry, terrestrial-aquatic coupling in the coastal zone, eutrophication, environmental monitoring and assessment of coastal ecosystems

Professional Appointments:

2004-Present Research Coordinator, North Inlet – Winyah Bay National Estuarine Research Reserve
2004-Present Research Assistant Professor, Baruch Institute for Marine and Coastal Sciences, University of South Carolina
2003-2004 Postdoctoral Fellow, Dept. of Biology, University of South Carolina
2001-2003 Postdoctoral Fellow, Dept. of Biology, University of Quebec at Montreal

Competitive Grant Funding

2016-2018 NOAA/South Carolina Sea Grant Consortium: “Quantification of sediment accumulation and nutrient sequestration in stormwater detention ponds,” Principle Investigator, \$123,799
2016-2018 South Carolina Sea Grant Consortium: “Potential importance of groundwater inputs to coastal eutrophication of coastal salt marshes. Co- Principle Investigator, \$147,366
2015-2018 NOAA/NERRS Science Collaborative: “Evaluating living shorelines to inform regulatory decision-making in South Carolina,” Co- Principle Investigator, \$127,273 (sub-award amount)
2016-2017 NOAA/South Carolina Sea Grant Consortium: “Geospatial inventory and classification scheme for stormwater ponds in coastal South Carolina,” Principle Investigator, \$29,967
2016-2017 Francis P. Bunnelle Foundation: “Eyes on the Bay: Real-time data display for NI-WB NERR visitor center,” Principle Investigator, \$14,403.

- 2016-2017 NOAA/Southeast Coastal Ocean Observing Regional Association: "Establishment of a Winyah Bay water quality monitoring station," Principle Investigator, \$39,936
- 2014-2015 Commission for Environmental Cooperation: "Spatial Variability in Carbon Storage within and Across Wetland Ecosystems of the National Estuarine Research Reserve System (NERRS): A Comparison of Methodologies and Study Regions," Co-Principle Investigator, \$19,607 (sub-award amount)
- 2014-2016 NOAA/South Carolina Sea Grant Consortium: "Hydrology and pollutant removal performance in detention ponds of the lower coastal plain of South Carolina," Principle Investigator, \$146,080.
- 2013-2014 NOAA/NERRS Science Collaborative: "Improving management outcomes of sea-level rise modeling through standardized sampling of a key model input: Total suspended sediments above tidal marshes," Co-Principle Investigator, \$26,515 (sub-award amount).
- 2012-2014 NOAA/South Carolina Sea Grant Consortium: "Assessing Aeration as a Means of Improving Storm water Pond Performance and Reduced Organic Loading to the Coastal Zone," Principle Investigator, \$167,515
- 2010-2014 NOAA/NERRS Science Collaborative: "Determining the role of estuarine 'swashes' on water quality impairment along the Grand Strand of South Carolina: Impacts of land use and stormwater runoff," Principle Investigator, \$872,732.
- 2010-2012 NOAA/South Carolina Sea Grant Consortium: "Linking residential development and organic matter loading to the coastal zone: the role of Stormwater Ponds as Sources of Bioreactive Organic Carbon and Nitrogen," Principle Investigator, \$127,125.
- 2012-2011 South Carolina Ocean and Coastal Resource Management: "Water quality dynamics in the nearshore ocean waters of Long Bay, South Carolina," Co-Principle Investigator, \$29,251 (sub-award amount).
- 2006-2008 NOAA/South Carolina Sea Grant Consortium: "Identification of coastal hypoxia mechanisms and hypoxia monitoring in inner shelf waters of Long Bay, SC" Co-PI, \$18,000 (sub-award amount).
- 2005-2007 NSF/ Division of Biological Infrastructure: "Improving and Expanding Organic Carbon and Nitrogen Analyses at the Baruch Marine Field Laboratory," Principle Investigator, \$73,771

Peer-Reviewed Publications:

- Baumann H, Smith EM (in press) Quantifying metabolically driven pH and Oxygen fluctuations in US nearshore habitats as diel to interannual time scales. *Estuaries and Coasts*.
- Raposa K, Wasson K, Smith E, Crooks J, Delgado P, Fernald S, Ferner M, Helms A, Hice L, Mora J, Puckett B, Sanger D, Shull S, Spurrier L, Stevens R, Lerberg S (2016) Assessing tidal marsh resilience to sea-level rise at broad geographic scales with multi-metric indices. *Biological Conservation* 204:263-275

- Wigand C, Davey E, Johnson R, Sundberg K, Morris J, Kenny P, Smith E, Holt M (2015) Nutrient Effects on Belowground Organic Matter in a Minerogenic Salt Marsh, North Inlet, SC. *Estuaries and Coasts* 38:1838-1853
- Hutchins PR, Smith EM, Koepfler ET, Viso RF, Peterson RN (2014) Metabolic responses of estuarine microbial communities to discharge of surface runoff and groundwater from contrasting landscapes. *Estuaries and Coasts* 37:736-750
- Wear EK, Koepfler ET, Smith EM (2014) Spatiotemporal variability in dissolved organic matter composition is more strongly related to bacterioplankton community composition than to metabolic capability in a blackwater estuarine system. *Estuaries and Coasts* 37(1):119-133
- Goldman EA, Smith EM, Richardson TL (2013) Estimation of chromophoric dissolved organic matter (CDOM) and photosynthetic activity of estuarine phytoplankton using a multiple-fixed-wavelength spectral fluorometer. *Water Research* 47:1616-1630
- Lawrenz E, Smith EM, Richardson TL (2013) Spectral irradiance, phytoplankton community composition and primary productivity in a salt marsh estuary, North Inlet, South Carolina, USA. *Estuaries and Coasts* 36:347-364
- Sanger DM, Smith EM, Voulgaris G, Koepfler ET, Libes SM, Riekerk GHM, Bergquist DC, Greenfield DI, Wren PA, McCoy CA, Viso RF, Peterson RN, Whitaker JD (2012) Constrained enrichment contributes to hypoxia formation in Long Bay, South Carolina (USA), an open water urbanized coastline. *Marine Ecology Progress Series* 461:15-30
- McCoy CA, Viso RF, Peterson RN, Libes SM, Lewis B, Ledoux J, Voulgaris G, Smith EM, Sanger DM (2011) Radon as an indicator of limited cross-shelf mixing of submarine groundwater discharge along an open ocean beach in the South Atlantic Bight during observed hypoxia. *Continental Shelf Research* 31:1306-1317
- Sanger DM, Hernandez D, Libes SM, Voulgaris G, Smith EM, Shuford R, Porter D, Koepfler ET, Bennett J (2010) A case history of the science and management collaboration in understanding hypoxia events in Long Bay, South Carolina, USA. *Environmental Management* 46:340-350
- Apple JK, Smith EM, Boyd TJ (2008) Temperature, salinity, nutrients and the covariation of bacterial production and chlorophyll *a* in estuarine ecosystems. *Journal of Coastal Research* 55:59-75
- Allen DM, Ogburn-Matthews V, Buck T, Smith EM (2008) Mesozooplankton responses to climate change and variability in a Southeastern US Estuary (1981-2003). *Journal of Coastal Research* 55:95-110
- Kemp WM, Boynton WR, Adolf JE, Boesch DF, Boicourt WC, Brush G, Cornwell JC, Fisher TR, Glibert PM, Hagy JD, Harding LW, Houde ED, Kimmel DG, Miller WD, Newell RIE, Roman MR, Smith EM, Stevenson JC (2005) Eutrophication of Chesapeake Bay: Historical trends and ecological interactions. *Marine Ecology Progress Series* 303:129
- Smith EM, Benner R (2005) Photochemical transformations of riverine dissolved organic matter: Effects on estuarine bacterial metabolism and nutrient demand. *Aquatic Microbial Ecology* 40:37-50

- Hopkinson CS, Smith EM (2005) Chapter 8: Estuarine respiration: An overview of benthic, pelagic and whole system respiration. In PA del Giorgio and PJleB Williams (eds), Respiration in aquatic ecosystems. Oxford University Press. pp 123-147
- Cammack WKL, Kalff J, Prairie YT, Smith EM (2004) Fluorescent dissolved organic matter in lakes: Relationships with heterotrophic metabolism. *Limnology and Oceanography* 49:2034-2045
- Smith EM, Prairie YT (2004) Bacterial metabolism and growth efficiency in lakes: The importance of phosphorus availability. *Limnology and Oceanography* 49 (1): 137-147
- Smith EM, Kemp WM (2003) Planktonic and bacterial respiration along an estuarine gradient: responses to carbon and nutrient enrichment. *Aquatic Microbial Ecology* 30: 251-261
- Smith EM, del Giorgio PA (2003) Low fractions of active bacteria in natural aquatic communities? *Aquatic Microbial Ecology* 31: 203-208
- Lomas, MW, Glibert PM, Shiah F-K, Smith EM (2002) Microbial processes and temperature in Chesapeake Bay: Current relationships and potential impacts of regional warming. *Global Change Biology* 8: 51-70
- Smith EM, Kemp WM. (2001) Size structure and the production/respiration balance in a coastal planktonic community. *Limnology and Oceanography* 46: 473-484. With errata 46: 1578.
- Kemp WM, Faganeli J, Puskaric S, Smith EM, Boynton WR (1999) Pelagic-benthic coupling and nutrient cycling. In: Malone TC, Smodlaka, Harding LH, Malej A (Eds.), Trends in Land-Use, Water Quality and Fisheries: A Comparison of the Northern Adriatic Sea and the Chesapeake Bay. Coastal and Estuarine Studies Series, AGU, Washington, D.C.
- Smith EM (1998) Coherence of microbial respiration rate and cell-specific bacterial activity in a coastal planktonic community. *Aquatic Microbial Ecology* 16: 27-35.
- Hopkinson C, Buffam I, Hobbie J, Vallino J, Perdue M, Prahl F, Covert J, Hodson R, Moran M, Smith E, Baross J, Crump B, Findlay S, Forman K (1998) Terrestrial inputs of organic matter to coastal ecosystems: An intercomparison of chemical characteristics and bioavailability. *Biogeochemistry* 43: 211-234.
- Kemp WM, Smith EM, Marvin-DiPasquale M, Boynton WR (1997) Organic carbon balance and net ecosystem metabolism in Chesapeake Bay. *Marine Ecology Progress Series* 150: 229-248.
- Smith EM, Kemp WM (1995) Seasonal and regional variations in plankton community production and respiration for Chesapeake Bay. *Marine Ecology Progress Series* 103: 217-231

Book Chapters

- Peterson L, Peterson RN, Smith EM, Libes SM (2016) Quantifying groundwater export from an urban reservoir: A case study from coastal South Carolina. In: Fares, A. (Ed.). *Emerging Issues in Groundwater Resources*. Springer, New York. p336-388.
- Buskey EJ, Bundy M, Ferner M, Porter DE, Reay WG, Smith EM, Trueblood D (2015) Chapter 21: System-Wide Monitoring Program of the National Estuarine Research Reserve System: Research and Monitoring to Address Coastal Management Issues, in L Yonggang, H

Kerkering, RH Weisberg (Eds.) Coastal Ocean Observing Systems. Academic Press, New York. pp 392-415

Hopkinson CS, Smith EM (2005) Chapter 8: Estuarine respiration: An overview of benthic, pelagic and whole system respiration. In PA del Giorgio and PJeB Williams (Eds.), Respiration in aquatic ecosystems. Oxford University Press. pp 123-147

Kemp WM, Faganeli J, Puskaric S, Smith EM, Boynton WR (1999) Pelagic-benthic coupling and nutrient cycling. In: Malone TC, Smodlaka, Harding LH, Malej A (Eds.), Trends in Land-Use, Water Quality and Fisheries: A Comparison of the Northern Adriatic Sea and the Chesapeake Bay. Coastal and Estuarine Studies Series, AGU, Washington, D.C.

Contributed Abstracts (first authored presentations only)

- 2016 Smith EM, Defore A, Buck T, Cohen C, Waldorf A, Peterson R, "Pollutant removal performance in stormwater ponds typical of coastal South Carolina," South Carolina Water Resources Conference, Columbia, SC
- 2015 Smith EM, Cohn C, Buck T, Denham S, "Nutrient dynamics in coastal stormwater detention ponds in South Carolina, USA: implications for coastal eutrophication," CERF, Portland, OR
- 2014 Smith EM, Buck T, Denham S, "Ecological functioning of coastal stormwater ponds and their impacts on marine receiving waters," American Ecological Engineers Society, Charleston, SC
- 2014 Smith EM, Defore A, Peterson L, Peterson R, Libes S, Sanger D, "Stormwater hydrology and material transport in urbanized watersheds of the Grand Strand, South Carolina," South Carolina Water Resources Conference, Columbia, SC
- 2013 Smith EM, Buck T, Willman A, Denham S, "Importance of suspended sediments in controlling heterotrophic metabolism in nearshore waters of Long Bay, South Carolina, USA" ASLO Aquatic Sciences Meeting, New Orleans, LA
- 2013 Smith EM, Ide M, "Temporal variability in estuarine pH: A decade of high-frequency measurements from 15 US estuaries," CERF, San Diego, CA
- 2012 Smith EM, "Nutrient-organic matter dynamics in stormwater ponds: Implications for stormwater management and the role of ponds as sources of coastal water quality impairment," South Carolina," South Carolina Water Resources Conference, Columbia, SC
- 2011 Smith EM, Buck T, "Resource control of pelagic heterotrophy in Long Bay, South Carolina, USA: Implications for hypoxia potential," ASLO Aquatic Sciences Meeting, San Juan, Puerto Rico
- 2011 Smith EM, Willman A, Plunket J, Riggs A, "Impacts of stormwater management on watershed-coastal zone linkages: Detention ponds as biogeochemical hotspots in coastal South Carolina, USA," CERF, Daytona Beach, FL
- 2009 Smith EM, Willman A, Lakish B, Plunket J, "Impacts of stormwater management on carbon and nutrient biogeochemistry at the land-ocean interface in South Carolina, USA" CERF, Portland, OR

- 2009 Smith EM, Buck TL, Bennett J, Koepfler ET, Libes SM, "Pelagic oxygen demand and the influence of nutrient enrichment on bacterioplankton metabolism in Long Bay, South Carolina," SEERS, Conway, SC
- 2007 Smith EM, Buck T, Lakish B, Willman A, "Microbial Heterotrophy in tidal creeks of a southeastern US salt marsh estuary," ERF, Providence, RI
- 2004 Smith EM, Benner R, "Photochemical transformations of riverine dissolved organic matter: Effects on estuarine bacterial metabolism and nutrient demand," ASLO, Savannah GA
- 2002 Smith EM, Prairie YT, "Variations in bacterial metabolism and DOC use along a nutrient gradient in temperate lakes," ASLO, Victoria, Canada
- 2001 Smith EM, Kemp WM, "Production-respiration coupling across trophic gradients in Chesapeake Bay," ASLO, Albuquerque, NM
- 2000 Smith EM, Kemp WM, "Variability in plankton respiration along the estuarine gradient of Chesapeake Bay," ASLO, Copenhagen, Denmark
- 1999 Smith EM, Kemp WM, "Bacterioplankton respiration and growth efficiency along an estuarine gradient: Effects of phosphorus and carbon additions," ERF, New Orleans, LA.
- 1999 Smith EM, Kemp WM, "Bacterial community respiration as a function of individual cell activity," ASLO, Santa Fe, NM.
- 1998 Smith EM, Kemp WM. "Plankton community structure and the balance of autotrophy and heterotrophy in a coastal marine ecosystem," ASLO, St. Louis, MO. *Invited Talk*
- 1997 Smith EM, Kemp WM. "Variations in the balance of plankton community production and respiration along a depth gradient in Chesapeake Bay," ASLO, Santa Fe, NM
- 1997 Smith, EM, Harding LW, Mallonee ME, Kemp WM. "Effects of river flow on plankton community dynamics and net metabolism," ERF, Providence RI
- 1995 Smith EM, Kemp WM, Whipp K, Madden C. "Contributions of shallow-water regions to net ecosystem metabolism of Chesapeake Bay," ERF, Corpus Christi, TX
- 1993 Smith EM, Kemp WM. "Production and respiration of the plankton community and integrated ecosystem of Chesapeake Bay: Implications for nutrient and carbon balances," ASLO/SWS, Edmonton, Alberta, Canada.
- 1993 Smith EM, Kemp WM, Madden C, Whipp K, Boynton WR. "Regulation of particulate organic deposition by planktonic community metabolism in spring," ERF, Hilton Head, SC

Invited Public Education/Outreach Presentations (last 5 years only):

- 2017 "Taking the pulse of Winyah Bay: Continuous real-time water quality monitoring," Waccamaw River Conference, Conway, SC
- 2016 "Nutrient dynamics in stormwater detention ponds of coastal South Carolina," Coastal Waccamaw Stormwater Education Consortium's Biannual Meeting, Conway, SC

- 2016 “A geospatial inventory of stormwater ponds in the eight coastal counties of South Carolina,” South Carolina Sea Grant Consortium’s Stormwater Pond Research and Management Collaborative Stakeholder Workshop, Charleston, SC
- 2016 “The role of stormwater ponds in coastal South Carolina,” Opening Plenary Presentation, Charleston Area Stormwater Pond Management Conference, Charleston, SC
- 2015 “An introduction to stormwater ponds and their ecology,” Opening Plenary Presentation, Neighbors for Clean Water Stormwater Pond Conference, Bluffton, SC
- 2014 “Stormwater ponds in coastal SC: A review of key research findings to date,” presentation to South Carolina Department of Health and Environmental Control Office of Coastal Resource Management and Bureau of Water’s Permitting Department staff, Georgetown, SC.
- 2014 “An introduction to stormwater ponds and their ecology,” Opening Plenary Presentation, Charleston Area Stormwater Pond Management Conference, Charleston, SC
- 2013 “Stormwater ponds and their connection to coastal water quality,” Waccamaw Regional Council of Governments, Georgetown SC
- 2013 “How the Myrtle Beach Urbanized Area Used Its Collaborative Educational Outreach Program to Develop Water-Quality Monitoring to Meet NPDES Phase II Stormwater Requirements” Panel presentation, StormCon, Myrtle Beach, SC

Teaching Experience:

2014 – 2017 Instructor, University of South Carolina, MSCI 460, Field and Laboratory Investigations in Marine Science.

Professional Service / Synergistic Activities (last 3 years only)

Chair, NOAA National Estuarine Research Reserve System’s Data Management Committee (2010 to present). Committee responsible for establishment and oversight of protocols and data management priorities for the NERRS System-wide Monitoring Program.

Representative, National Estuarine Research Reserve Association (2016-2018)

President, Southeastern Estuarine Research Society (2016-2018).

Treasurer, Coastal and Estuarine Research Federation (2017 to present)

Member, Coastal Salinity Working Group, Carolina Integrated Sciences and Assessment (2016 to present)

Member, NOAA/NERRS Technical Advisory Group for the development of annual NERRS Status Reports

Member, Carolinas Integrated Sciences and Assessment, Coastal Salinity Index Working Group (2016 to present)

Member, National Estuarine Research Reserve System’s Sentinel Site Coordinating Committee (2015-2017)

Member, Technical Advisory Committee, Alliance for Coastal Technologies, Dissolved Oxygen Sensor Verification (2014-2015)

Member, South Carolina Sea Grant Consortium's Stormwater Pond Research and Management Collaborative (2015 to present)

Member, Technical Advisory Committee, US EPA/SC DHEC/GA DNR Working Group on an approach to developing numeric nutrient criteria for Georgia and South Carolina Estuaries (2015)

Invited Panelist, "Science, Industry, and Management: Perception of Ocean Acidification and Fisheries in the Carolinas," Southeast Ocean and Coastal Acidification Network (SOCAN) virtual townhall, August 1, 2015

Panel Member, South Carolina Sea Grant Consortium's biannual national review, September 1-2, 2015

Member of the Board, Slocum-Lunz foundation (2014 to present). Non-profit foundation advancing scientific knowledge through grants to South Carolina students in the field of marine biology and natural science.

Peer Reviewer for: Limnology and Oceanography; Biogeochemistry; Aquatic Microbial Ecology; Estuarine, Coastal and Shelf Science; Estuaries and Coasts; Deep-Sea Research Part 1; Marine Ecology Progress Series; US Environmental Protection Agency Technical Manuscript Review.

Grant Proposal Reviewer for: US EPA; North Carolina Sea Grant; US Geological Survey; National Institutes for Water Resources.

Professional Memberships:

American Society for Limnology and Oceanography
Coastal and Estuarine Research Federation
Southeastern Estuarine Research Society