

CURRICULUM VITAE

Niels Lyle Lindquist

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Personal:

DOB: January 17, 1959; married; 3 daughters

Education:

- 1989 Ph.D. in Oceanography (marine natural products chemistry/chemical ecology),
University of California, San Diego, Scripps Institution of Oceanography
1983 B.S. in Chemistry, University of Florida, Gainesville, Florida

Professional Positions:

- 2002 Professor, University of North Carolina at Chapel Hill, Institute of Marine Sciences and the Department of Marine Sciences
1998 Associate Professor, University of North Carolina at Chapel Hill, Department of Marine Sciences and the Institute of Marine Sciences
1997 Visiting Associate Professor, University of North Carolina at Chapel Hill, Department of Marine Sciences and the Institute of Marine Sciences
1993-1997 Research Assistant Professor, University of North Carolina at Chapel Hill, Curriculum in Marine Sciences and the Institute of Marine Sciences
1992-1993 U.S. DOE Global Change Distinguished Postdoctoral Fellow, Institute of Marine Sciences, University of North Carolina at Chapel Hill
1989-1991 NSF Postdoctoral Fellow in Marine Biotechnology and the Ocean Sciences, Institute of Marine Sciences, University of North Carolina at Chapel Hill

Honors and Awards:

- 2000-present Annual nominator for the Japan Prize, which carries a cash award of ¥50 million
1992-1993 U.S. DOE Global Change Distinguished Postdoctoral Fellowship, Institute of Marine Sciences, University of North Carolina at Chapel Hill
1989-1991 NSF Postdoctoral Fellowship in Marine Biotechnology and the Ocean Sciences, Institute of Marine Sciences, University of North Carolina at Chapel Hill
1988-1989 Dissertation Fellowship, Scripps Institution of Oceanography, University of California, San Diego
1983-1986 NSF Graduate Fellowship, Scripps Institution of Oceanography, University of California, San Diego
1982-1983 Richard H. Summerville Fellowship, Chemistry Department, University of Florida
1982 Summer Student Fellowship, Woods Hole Oceanographic Institute

1981 NSF-Undergraduate Research Program Fellowship, Chemistry Department,
Cornell University

Member Phi Beta Kappa Honor Society

Member Phi Kappa Phi Honor Society

Major Research Interests:

Oyster reef and estuarine ecology; oyster habitat restoration, coral reef ecology; chemical ecology; nutrient and organic matter cycling mediated by marine sponges; changing salinity regimes in North Carolina – past, present and future; chemical ecology; marine natural products

Research Grants:

2017 UNC KickStart Venture Services Commercialization Award to Sandbar Oyster Company (N Lindquist and D “Clammerhead Cessna) (\$34,000)

2016 NC IDEA Foundation, company startup grant to Sandbar Oyster Company, N Lindquist and D “Clammerhead” Cessna (\$50,000).

2015 Proof-of-Concept Testing of Novel Substrates and Reef-Building Processes Underpinning a New Oyster Production System (N Lindquist), UNC Chapel Hill Office of Technology Development (\$35,907)

2014-2015 Documenting Impacts of an Exceptional Freshet on Oyster Habitat in the Newport and North River Estuaries (N Lindquist), North Carolina Sea Grant, Mini-Grant Program (\$5,849)

2013-2015 Reproductive Timing, Larval Output, and Dispersal Potential of Oyster-Shell Eroding Sponges in North Carolina Estuaries and Sounds (N Lindquist), North Carolina Sea Grant, Blue Crab Shellfish Research Program (\$49,602)

2013-2015 Development of a Comprehensive North Carolina Salinity Database to Facilitate Management and Restoration of Critical Fish Habitats (Lindquist, N and Fegley, S) North Carolina Division of Marine Fisheries (\$150,922)

2013 Use of a Novel Restoration Method to Enhance Oyster Populations and Improve Water Quality in Tidal Creeks (Lindquist, N), APNEP (Albemarle-Pamlico National Estuary Program) (\$32,167)

2013-2015 Testing Salinity-Based Predictions of Oyster Shell Cultch Planting Success (Lindquist, N), North Carolina Sea Grant, Fishery Resource Grant Program (\$15,000)

2012-2014 Acoustic tracking of red drum and sheepshead to evaluate restored habitat function, resident versus migratory life histories, and post capture mortality (J Fodrie and N Lindquist) North Carolina Division of Marine Fisheries (\$211,484)

2012-2014 Enhancing Oyster Reef Ecosystems in Coastal Tidal Creeks (Lindquist, N and Fodrie, J), APNEP (Albemarle-Pamlico National Estuary Program) (\$45,361)

2012 UNC Chapel Hill Institute of Marine Sciences portion of: Sustainable Estuarine Shoreline Stabilization: Research, Education and Public Policy in North Carolina (Fodrie, J; Rodriquez, T and Lindquist, N), NCDENR (\$74,959)

2011-2015 Collaborative Research: The role of sponges in the coastal nitrogen cycle (C.S. Martens, N. Lindquist, B. Popp – PIs), NSF Chemical Oceanography (\$973,000)

2011-2013 Identifying sustainable substrates for oyster restoration and artificial reefs (N. Lindquist and D. Eggleston – PIs), North Carolina Sea Grant, Fishery Resource Grant Program (\$123,000)

- 2011-2012 Physical and biogeochemical processes controlling temporal variability in ocean acidification at Conch Reef, Florida (C.S. Martens and N. Lindquist – PIs), NOAA-NURC UNCW (\$75,000)
- 2010-2011 Quantification of boring sponge abundance and biomass in North Carolina oyster reefs (N. Lindquist), North Carolina Sea Grant (\$47,570)
- 2010-2011 Evaluating restoration success for newly constructed oyster reefs spanning a critical tidal elevation (N. Lindquist, J. Fodrie, A. Rodriguez, PIs), NC DENR Albemarle-Pamlico National Estuary Program (\$67,364)
- 2007-2010 Distinguishing reef acidification processes: controls on Conch Reef pH by ambient water column variability versus benthic boundary layer processes, (C.S. Martens, N. Lindquist, R. Bryne) NOAA-NURC UNCW (\$150,000)
- 2007-2009 Roles of sponges in N cycling and total respiration in coral-reef ecosystems (N. Lindquist and C.S. Martens – PIs), NOAA-NURC UNCW (\$70,000)
- 2006-2010 *In situ* quantification of sponge N cycling in coastal ecosystems (C.S. Martens and N. Lindquist – PIs), NSF Chemical Oceanography (\$647,000)
- 2004-2006 Nitrogen fixation in marine sponges: A new nitrogen source for coastal ecosystems (Lindquist and Martens, PIs), NSF Chemical Oceanography (\$400,000)
- 2004-2006 Biogeochemical control on the stable C and N isotopic composition of marine sponges along natural environmental gradients (Lindquist and Martens, PIs), NOAA-NURC UNCW (\$70,000)
- 2002-2004 Biogeochemical control on the stable C and N isotopic composition of marine sponges along natural environmental gradients (Lindquist and Martens – PIs), NOAA-NURC UNCW (\$100,000)
- 2000-2003 Anti-predator defenses of marine hydroids: alternative strategies, biogeographic patterns, and ecological implications (Lindquist - PI) NSF Biological Oceanography (\$272,941)
- 2000-2001 Tracing marine sponge nutritional responses to water quality gradients and sources of bioactive metabolites utilizing stable C and N isotopes (C. Martens and N. Lindquist – PIs) NOAA-NURC UNCW (\$10,000)
- 2000-2001 Using natural abundance C and N stable isotope ratios to determine host vs. symbiont production of bioactive marine natural products (N. Lindquist - PI) UNC-CH University Research Council (\$4,000)
- 1999-2001 Effect of solar UVR exposure on larval and juvenile stages of Caribbean sponges (N. Lindquist -PI) NOAA-NURC UNCW (\$39,998)
- 1998 – 2000 Development of tambjamine alkaloids and related polypyrroles as DNA-targeting anticancer drugs (R. Manderville and N. Lindquist - PIs) North Carolina Biotechnology Center (\$40,000)
- 1998 – 1999 Complete evaluation of *Tridentata marginata* secondary chemistry (N. Lindquist - PI), PhycoGen, Inc. (\$28,697)
- 1998 – 2000 Impacts of beach nourishment and beach scraping on critical habitat and productivity of surf fishes (N. Lindquist - PI), North Carolina Sea Grant, Fishery Resource Grant Program (\$39,323)
- 1996 The role of floating *Sargassum* habitat in mediating predator-prey interactions among pelagic fishes on the continental shelf of North Carolina (C. H. Peterson, R. A. Luettich, N. Lindquist, and M. E. Hay - PIs) NOAA-NURC UNCW (\$5,000)

- 1994-1995 The role of floating macroalgal habitat in promoting the biodiversity of the *Sargassum* ecosystem (C. H. Peterson, R. A. Luetlich, N. L. Lindquist, and M. E. Hay - PIs) NOAA – Cooperative Institute for Fisheries Oceanography (\$24,765)
- 1994 Survivorship and chemical defenses in larval and juvenile sponges: effects of fishes and mesopredators (N. Lindquist – PI), NOAA-NURC UNCW (\$17,000; total value of award including operational support for undersea systems, vessels, and shore support - \$111,810)
- 1993 Reduction in invertebrate egg and larval mortality from predation and UV exposure by secondary metabolites (N. Lindquist and M. Hay - PIs) NOAA-NURC UNCW (\$20,000; total value of award including operational support for vessels, equipment and shore support - \$43,306)
- 1993 Fish-seaweed-urchin interactions on temperate reefs of the continental shelf (M. Hay and N. Lindquist – PI) NOAA-NURC UNCW (\$23,000; total value of award including operational support for vessels, equipment, and shore support - \$53,826)
- 1992-1993 The effect of natural and enhanced UV fluxes on pelagic life stages of benthic marine invertebrates and fishes (N. L. Lindquist - PI) U.S. Department of Energy through Oak Ridge Associated Universities (\$72,000)
- 1992 Chemical adaptations of invertebrate larvae against predation and UV exposure (N. Lindquist and M. Hay - PIs) NOAA-NURC UNCW (\$20,000; total value of award including operational support for vessels, equipment, and shore support - \$35,603)
- 1992 Fish-seaweed-urchin interactions on temperate reefs on the continental shelf (M. Hay and N. Lindquist -PIs) NOAA-NURC UNCW (\$20,000; total value of award including operational support for vessels, equipment, and shore support - \$53,003)
- 1991 The chemical ecology of invertebrate larvae (M. Hay and N. Lindquist – PIs) NOAA-NURC UNCW (\$7,014; total value of award including operational support for vessels, equipment, and shore support - \$19,004)
- 1989-1991 Interactive aspects of seaweed chemical defenses and a functional evaluation of ascidian secondary metabolites (N. Lindquist w/M. Hay as faculty sponsor) NSF Biological Oceanography (\$81,960)

Publications:

- Fodrie FJ, AB Rodriguez, RK Gittman, JH Grabowski, NL Lindquist, CH Peterson, MF Piehler and JT Ridge. Oyster reefs as carbon sources and sinks. *Proceeding of the Royal Society B* (accepted with minor revisions)
- DR Hoer, PJ Gibson, JP Tommerdahl, NL Lindquist and CS Martens. Consumption of dissolved organic carbon by Caribbean reef sponges. *Limnology & Oceanography* (accepted with minor revisions)
- Ridge, JT, AB Rodriguez, FJ Fodrie, NL Lindquist, MC Brodeur, SE Coleman, JH Grabowski and EJ Theuerkauf. 2015. Maximizing oyster-reef growth supports green infrastructure with accelerating sea-level rise. *Scientific Reports* 5; Article number 14785; doi:10.1038/srep14785
- Gloeckner, V, Wehrl, L Moitinho-Silve, C Gernert, P Schupp, JR Pawlik, NL Lindquist, D Erpenbeck, G Worheide and U Hentschel. 2014. The HMA-LMA dichotomy revisited: an electron microscopical survey of 56 sponge species. *Biological Bulletin* 227:78-88.

- Fodrie, FJ, AB Rodriguez, CJ Baillie, MC Brodeur, SE Coleman, RK Gittman, DA Keller, MD Kenworthy, AK Poray, JT Ridge, EJ Theuerkauf and NL Lindquist. 2014. Classic paradigms in a novel environment: inserting food web and productivity lessons from rocky shores and saltmarshes into biogenic reef restoration. *Journal of Applied Ecology* 51:1314-1325.
- Rodriguez, AB, FJ Fodrie, JT Ridge, NL Lindquist, EJ Theuerkauf, SE Coleman, JH Grabowski, MC Brodeur, RK Gittman, DA Keller and MD Kenworthy. 2014. Oyster reefs can outpace sea-level rise. *Nature Climate Change* 4:493-497.
- Robert P. Dunn, R. P., D. B. Eggleston and N. Lindquist. 2014. Oyster-sponge interactions and bioerosion of reef-building substrate materials: implications for oyster restoration. *Journal of Shellfish Research* 33:727-738.
- Robert P. Dunn, R. P., D. B. Eggleston and N. Lindquist. 2014. Effects of substrate type on demographic rates of eastern oyster (*Crassostrea virginica*). *Journal of Shellfish Research* 33:177-185.
- Gloeckner V., N. Lindquist, S. Schmitt and U. Hentschel. 2013. *Ectyoplasia ferox*, an experimentally tractable model for vertical microbial transmission in marine sponges. *Microbial Ecology* 65(2): 462-474.
- Angermeier, H., V. Glöckner, J. R. Pawlik, N. Lindquist and U. Hentschel. 2013. Sponge white patch disease affecting the Caribbean sponge *Amphimedon compressa*. *Diseases of Aquatic Organisms* 99:95-102.
- Angermeier, H., J. Kamke, U.R. Abdelmohsen, G. Krohne, Pawlik, Joseph, N.L. Lindquist, and U. Hentschel. 2013. The pathology of sponge orange band disease affecting the Caribbean barrel sponge *Xestospongia muta*. *FEMS Microbial Ecology* 75:218-230.
- Schmitt, S., P. Tsai, J. Bell, J. Fromont, M. Ilan, N. Lindquist, T. Perez, A. Rodrigo, P. Schupp, J. Vacelet, N. Webster, U. Hentschel and M. W. Taylor. 2012. Assessing the complex sponge microbiota - core variables and species-specific bacterial communities in marine sponges. *ISME Journal* 6:564-576
- Angermeier, H., J. Kamke, U. R. Abdelmohsen, G. Krohne, J. R. Pawlik, N. Lindquist and U. Hentschel. 2011. The pathology of sponge orange band disease affecting the Caribbean barrel sponge *Xestospongia muta*. *FEMS Microbial Ecology* 75:218-230.
- Monismith, S. G., K. A. Davis, G. G. Shellenbarger, J. L. Hench, N. J. Nidzieko, A. E. Santoro., M. A. Reidenbach, J. H. Rosman, R. Holtzman, C. S. Martens, N. L. Lindquist, M. W. Southwell, and A. Genin. 2010. Flow effects on benthic grazing on phytoplankton by a Caribbean reef. *Limnol. Oceanogr.* 55:1881-1892.
- Schmitt, S., H. Angermeier, R. Schiller, N. Lindquist and U. Hentschel. 2008. Molecular microbial diversity survey of sponge reproductive stages and mechanistic insights into vertical transmission. *Applied and Environmental Microbiology* 74:7694-7708.
- Southwell, M.W., J.B. Weisz, C.S. Martens and N. Lindquist. 2008. *In situ* measurements of dissolved inorganic nitrogen fluxes from the sponge community on Conch Reef, Key Largo, Florida. *Limnol. Oceanogr.* 53:986-996
- Weisz, J.B., N. Lindquist and C.S. Martens. 2008. Do associated microbial abundances impact marine demosponge pumping rates and tissue densities. *Oecologia* 155:367-376.

- Schmitt, S., M. Wehrl, N. Lindquist, J.B. Weisz and U. Hentschel. 2007. Morphological and molecular analyses of microorganisms in Caribbean reef adult sponges and in corresponding reproductive material. In: Custódio, M.R., G. Lôbo-Hajdu, E. Hajdu and G. Muricy (eds.). *Porifera Research: Biodiversity, Innovation and Sustainability*. Séries Livros 28 Rio de Janeiro. pp. 561-568.
- Weisz, J.B., U. Hentschel, N. Lindquist, and C.S. Martens. 2007. Linking abundance and diversity of sponge-associated microbial communities to metabolic differences in host sponges. *Mar. Biol.* **152**:475-483
- Schmitt, S., J. Weisz, N. Lindquist, U. Hentschel. 2007. Vertical transmission of a phylogenetically complex microbial consortium in the viviparous sponge *Ircinia felix*. *Applied and Environmental Microbiology* **73**:2067-2078.
- Lopanik, N.B., N. Targett, and N. Lindquist. 2006. Ontogeny of a symbiont-produced chemical defense in *Bugula neritina* (Bryozoa). *Marine Ecology Progress Series* **327**:181-191
- Lopanik, N.B., N. Targett, and N. Lindquist. 2006. Isolation of two polyketide synthase gene fragments from the microbial symbiont of the marine bryozoan *Bugula neritina* (Bryozoa). *Applied and Environmental Microbiology* **72**:7941-7944..
- Lindquist, N., P. H. Barber and J. B. Weisz. 2005. Epibiotic microbes as food and defense for marine isopods: unique symbioses in a hostile environment. *Proceedings of the Royal Society of London: Biological Sciences* **272**:1209-1216.
- Lopanik, N., K. R. Gustafson, and N. Lindquist. 2004. Structure of bryostatin 20: a symbiont produced chemical defense for larvae of the host bryozoan, *Bugula neritina*. *J. Nat. Prod.* **64**:1412-1414.
- Lopanik, N., N. Lindquist, and N. Targett. 2004. Potent cytotoxins produced by a microbial symbiont protect host larvae from predation. *Oecologia* **139**:131-139.
- Taylor, R. B., M. E. Hay, N. Lindquist and J. Kubanek. 2003. Intraspecific variation in palatability and defensive chemistry of brown seaweeds: effects on herbivore fitness. *Oecologia* **136**:412-423.
- Manning, L. M. and N. Lindquist. 2003. Helpful habitant or pernicious passenger: interactions between an infaunal bivalve, an epifaunal hydroid and three potential predators. *Oecologia* **134**:415-422.
- Lindquist, N. 2002. Chemical defense of early life stages of benthic marine invertebrates. *J. Chem. Ecol.* **28**:1987-2000.
- Lindquist, N. 2002. Tridentatols D-H, nematocyst products and precursors of the activated chemical defense in the marine hydroid *Tridentata marginata* (Kirchenpauer 1864). *J. Nat. Prod.* **65**:681-684.
- Greg Cronin, G., D. M. Lodge, M. E. Hay, M. Miller, A. M. Hill, T. Horvath, R. C. Bolser, N. Lindquist, and M. Wahl. 2002. Crayfish feeding preferences for freshwater macrophytes: the influence of plant structure and chemistry. *J. Crustacean Biology* **22**:708-718.
- Melvin, M. S., K. E. Wooton, C. C. Rich, G. R. Saluta, G. L. Kucera, N. Lindquist and R. A. Manderville. 2001. Copper-nuclease efficiency correlates with cytotoxicity for the 4-methoxypyrrolic natural products. *J. Inorg. Biochem.* **87**:129-135.
- Kubanek, J., M. E. Hay, P. J. Brown, N. Lindquist and W. Fenical. 2001. Lignoid chemical defenses in the freshwater macrophyte *Saururus cernuus*. *Chemoecology* **11**:1-8
- Kubanek, J., W. Fenical, M. E. Hay, P. J. Brown, and N. Lindquist. 2000. Two new antifeedant lignans from the freshwater macrophyte *Saururus cernuus* (Saururaceae). *Phytochemistry* **54**:281-287.

- Lindquist, N., S. Nobuharu and L. Pannell. 2000. Corydendramines A and B, defensive natural products of the marine hydroid *Corydendrium parasiticum* (Linneaus 1767). *J. Nat. Prod.* **63**:1290-1291.
- Melvin, M. S., J. T. Tomlinson, N. Lindquist and R. A. Manderville. 2000. Double-strand DNA Cleavage by Copper•Prodigiosin. *J. Am. Chem. Soc.* **122**:6333-6334.
- Stachowicz, J. J. and N. Lindquist. 2000. Hydroid defenses against predators; the importance of secondary metabolites vs. nematocysts. *Oecologia* **124**:280-288.
- Bullard, S., N. Lindquist and M. E. Hay. 1999. Susceptibility of invertebrate larvae to predators: How common are post-capture larval defenses? *Mar. Ecol. Prog. Ser.* **191**:153-161.
- Melvin, M. S., D. C. Ferguson, N. Lindquist and R. A. Manderville. 1999. DNA binding by 4-methoxypyrrrolic natural products. Preference for intercalation at AT sites by tambjamine E and prodigiosin. *J. Org. Chem.* **64**:6861-6869.
- Johnson, M. K., K. E. Alexander, N. Lindquist and G. Loo. 1999. Potent antioxidant activity of a dithiocarbamate-related compounds from a marine hydroid. *Biochem. Pharm.* **53**:1313-1319.
- Wilson, D.M., W. Fenical, M Hay, N. Lindquist, and R. Bolser. 1999. The structure of habenariol, a freshwater feeding deterrent from the aquatic orchid, *Habenaria repens* (Orchidaceae). *Phytochemistry* **50**:1333-1336.
- Schmitt, T. M., N. Lindquist, and M. E. Hay. 1998. Seaweed secondary metabolites as antifoulants: effects of *Dictyota* spp. diterpenes on survivorship, settlement, and development of marine invertebrate larvae. *Chemoecology* **8**:125-131.
- Johnson, M. K., K. E. Alexander, N. Lindquist, and G. Loo. 1998. A phenolic antioxidant from the freshwater orchid, *Habenaria repens*. *Comp. Biochem. Physiol. Part C* **122**:211-214.
- Hay, M. E., J. J. Stachowicz, E. Cruz-Rivera, S. Bullard, M. Deal, and N. Lindquist. 1998. Bioassay with marine and freshwater macroorganisms. Pages 39-141, in J. G. Millar and K. F. Haynes (eds.), *Methods in Chemical Ecology*, Chapman and Hall, New York
- Bolser, R.C., M.E. Hay, N. Lindquist, W. Fenical, and D. Wilson. 1998. Chemical defenses of freshwater macrophytes against crayfish herbivory. *J. Chem. Ecol.* **24**:1639-1658.
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- Lindquist, N., R. Bolser, and K. Laing. 1997. Timing of larval release for two Caribbean demosponges. *Mar. Ecol. Prog. Ser.* **155**:309-313.
- Stachowicz, J. J. and N. Lindquist. 1997. Chemical defense among hydroids on pelagic *Sargassum*; predator deterrence and absorption of solar UV radiation by secondary metabolites. *Mar. Ecol. Prog. Ser.* **155**:115-126.
- Lee, N.-K., W. Fenical, and N. Lindquist. 1997. Alternatamides A-D: new bromotryptamine antibiotics from the Atlantic marine bryozoan *Amathia alternata*. *J. Natural Products* **60**:697-699.
- Lindquist, N. 1996. Palatability of invertebrate larvae to corals and anemones. *Marine Biology* **126**:745-755.
- Lindquist, N. and M. E. Hay. 1996. Palatability and chemical defense of marine invertebrate larvae. *Ecological Monographs* **66**:431-451.
- Lindquist, N., E. Lobkovsky, and J. Clardy. 1996. Tridentatols A-C, novel natural products of the marine hydroid *Tridentata marginata*. *Tetrahedron Letters* **73**:9131-9134.

- Montanari, A. M., W. Fenical, N. Lindquist, A. Y. Lee, and J. Clardy. 1996. Volutamides A-E, halogenated alkaloids with antifeedant properties from the Atlantic bryozoan *Amathia convoluta*. *Tetrahedron* **52**:5371-5380.
- Lindquist, N. and M. E. Hay. 1995. Can small rare prey be chemically defended? The case for marine larvae. *Ecology* **76**:1347-1358.
- Schmitt, T. M., M. E. Hay, and N. Lindquist. 1995. Constraints on chemically-mediated coevolution: Multiple functions for seaweed secondary metabolites. *Ecology* **76**:107-123.
- Cronin, G. A., N. Lindquist, M. E. Hay, and W. Fenical. 1995. Effects of storage and extraction procedures on yields of lipophilic metabolites from the marine algae *Dictyota ciliolata* and *Dictyota menstrualis*. *Mar. Ecol. Prog. Ser.* **119**:265-273.
- Cronin, G., M. E. Hay, W. Fenical, and N. Lindquist. 1995. An outbreak of a specialist nudibranch on sea fans in the Florida Keys: its distribution, density, and sequestration of host chemical defenses. *Mar. Ecol. Prog. Ser.* **119**:177-189.
- Lindquist, N. 1994. Anticancer Drugs from Animals, Plants, and Microorganisms. *Bulletin of the Association of Southeastern Biologists* **42**:29-30 (book review).
- Lindquist, N. 1993. Ecological Roles of Marine Natural Products. *Ecology* **75**:376 (book review).
- Lindquist, N., M. E. Hay, and W. Fenical. 1992. Defense of ascidians and their conspicuous larvae: adult vs. larval chemical defenses. *Ecological Monographs* **62**:547-568.
- Lindquist, N. and W. Fenical. 1991. New tambjamine class alkaloids from the marine ascidian *Atapozoa* sp. and its nudibranch predators - origin of the tambjamins in *Atapozoa*. *Experientia* **47**:504-506.
- Lindquist, N., W. Fenical, L. Parkanyi, and J. Clardy. 1991. Polyclinal, a new sulfonated polyhydroxy benzaldehyde from the marine ascidian *Polyclinum planum*. *Experientia* **47**:503-504.
- Lindquist, N., W. Fenical, G. Van Duyne, and J. Clardy. 1991. Isolation and structure determination of diazonamides A and B, unusual cytotoxic metabolites from the marine ascidian *Diazona chinensis*. *J. Am. Chem. Soc.* **113**:2303-2304.
- Lindquist, N. and M. E. Hay. 1991. A Secret World - Natural Products of Marine Life. *Limnology and Oceanography* **36**:1068 (book review).
- Lindquist, N. and W. Fenical. 1990. Polyandrocarpamides A-D, novel metabolites from the marine ascidian *Polyandrocarpa* sp. *Tetrahedron Lett.* **31**:2521-2524.
- Lindquist, N. and W. Fenical. 1990. Novel antifungal metabolites from the marine ascidian *Polycarpa aurata*. *Tetrahedron Lett.* **31**:2389-2392.
- Lindquist, N. 1989. Secondary metabolite production and chemical adaptations in the class Ascidiacea. University of California, San Diego 206 p. (Ph.D. dissertation)
- Paul, V. J., N. Lindquist, and W. Fenical. 1989. Chemical defenses of the tropical ascidian *Atapozoa* sp. and its nudibranch predators *Nembrotha* spp. *Mar. Ecol. Prog. Ser.* **59**:109-118.
- Lindquist, N. and W. Fenical. 1989. Ascidiatrienolides A-C, novel lactonized eicosanoids from the colonial marine ascidian *Didemnum candidum*. *Tetrahedron Lett.* **30**:2735-2738.
- McKee, T., C. M. Ireland, N. Lindquist, and W. Fenical. 1989. The complete spectral assignment of didemnin B and nordidemnin B. *Tetrahedron Lett.* **21**:3053-3056.
- Lindquist, N., W. Fenical, G. D. Van Duyne, and J. Clardy. 1988. New alkaloids of the Lamellarin class from the marine ascidian *Didemnum chartaceum* (Sluiter, 1909). *J. Org. Chem.* **53**:4570-4574.

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- Whitten, W. M., N. H. Williams, W. S. Armbruster, M. A. Battiste, L. Streckowski, and N. Lindquist. 1986. Carvone oxide - an example of convergent evolution in euglossine pollinated plants. *Syst. Bot.* **11**:222-228.
- Lindquist, N., M. A. Battiste, W. M. Whitten, N. H. Williams, and L. Streckowski. 1985. Trans carvone oxide, a monoterpene epoxide from the fragrance of *Catasetum*. *Phytochemistry* **24**:863-865.
- Anderson, D. M. and N. L. Lindquist. 1985. Time-course measurements of phosphorus depletion and cyst formation in the dinoflagellate *Gonyaulax tamerensis* Lebour. *J. Exp. Mar. Biol. Ecol.* **86**:1-13.

Companies Created:

2014 Sandbar Oyster Company incorporated as an LLC in 2014 as the entity to license the patent rights for the novel oyster growing substrate and oyster production systems. Sandbar executed an exclusive license with UNC for the commercialization rights for the ephemeral substrate. In March 2017, Sandbar Oyster Company converted its corporate structure from LLC to C-corp.

Sandbar Oyster Company Media:

Web-based:

February 17th, 2016 (Tasting Table): <http://www.tastingtable.com/travel/national/green-oysters-north-carolina-fines-de-claires-gills-france-clammerhead>

March 29, 2016: http://endeavors.unc.edu/the_fisherman_and_the_scientist (also in print form)

April 14, 2016, North Carolina Coastal Federation, Coastal Review Online: <http://www.coastalreview.org/2016/04/13895>

June 9, 2016 <http://exitevent.com/article/ncidea-sandbar-oyster-company-boosts-oyster-growth-nc-and-beyond-with-IP-160609>

February 3, 2017, NOAA, National Sea Grant Program

<http://seagrant.noaa.gov/News/FeatureStories/TabId/268/ArtMID/715/ArticleID/731/Growing-Better-Bivalves-Science-local-knowledge-enhance-NC-business.aspx>

April 11, 2017, National Geographic Ocean Views

<http://voices.nationalgeographic.com/2017/04/11/oysters>

June 6, 2017, North Carolina Coastal Federation, Coastal Review Online:

<https://www.coastalreview.org/2017/06/can-new-reef-design-save-historic-shoreline/>

TV:

March 31, 2016 (Time Warner Cable News - Coastal): <http://www.twcnews.com/nc/north-carolina/news/2016/03/31/scientist-and-fisherman-collaborate-to-help-oyster-restoration-in-carteret-county.html>

May 5, 2016 Bird Shoal overwash - <http://www.wcti12.com/news/breach-at-bird-shoal-is-cause-for-concern/39401870>

June 3rd (WRAL, Raleigh, reporter Richard Adkins) - <http://www.wral.com/scientist-fisherman-combine-to-boost-oysters-off-nc-coast/15751275>

November 10th, 2016 UNC TV, NC NOW, Bob Garner - http://video.uncvtv.org/video/2365882336/?utm_content=buffer023d9&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer or <http://video.uncvtv.org/video/2365882298>

Radio:

April 6th, 2016 (The Talk Station WTKF-FM 107.1/WJNC-AM 1240): mp3 available

April 8 & 9, 2016, NPR Public Radio East – The Down East Journal, <http://publicradioeast.org/post/scientist-and-local-fisherman-work-restore-oysters-crystal-coast>

Newspaper

May 2nd, 2016 <http://www.newsobserver.com/news/technology/article74765387.html>

Webinar:

October 12, 2016 – Aquaculture Webinar Series; Branding Opportunities for Oyster Farmer (<http://www.ncrac.org/video/branding-opportunities-oyster-farmers>). This nation-wide webinar featured a 4-person panel that included Rowan Jacobsen. During the course of the webinar, the panelists discussed ~10 oyster brands. Jacobsen highlighted Clammerhead and our Atlantic Emerald™ as a example of turning what was at one time considered a negative characteristic – green gills – into a prime marketing advantage.

Public Television Station Documentary Film about my Sponge Research:

2013 WCTI New Stations – presented news story about the Lindquist et al. oyster reef restoration research in North Carolina tidal creeks.

2008 “Mission to Inner Space” first aired February 3, 2009 as chapter in the WPBT2 (Miami, Florida public television station) “Changing Seas: Submerge, Discover, Engage” series.

Popular Articles about my Sponge Research:

“Among fish”, GEO Magazine (Germany), January 2012

“Sleeping with the fishes”, Schrope, M Nature Reports Climate Change, Published online: 27 Nov 2008, doi: 10.1038/climate.2008.127

“Ocean research: the lab at the bottom of the sea”, Schrope, M Nature **457**:141-143

“Charley and the Aquanauts,” ENDEAVORS Winter 2005, pp. 14-19.

“Meet the Scientist” feature in Science Weekly (Vol. 22, no.1), a periodical targeting elementary school children nationwide.

“Carteret Reels in Research” (The News and Observer, March 14, 2005) featured Lindquist research on the cancer and Alzheimer’s Disease fighting chemicals called the bryostatins.

“Sargasso Sunscreen”, *Discover* March 2002; **23**:51.

“Sunscreens from the Sea”, *Endeavors*, UNC-CH (Winter 1999, Vol. XV, no. 2, 32-34).

"Nature's Take on Sun Block Lives Amid Seaweeds", *News and Observer*, Raleigh, NC (June 1997).

"On the Ocean Floor, a Natural Sunscreen", *Carolina Alumni Review* 86: no. 6, 1997 (June 1997).

"Scientists Turning to the Sea to Produce Sunscreen Secret", *The Daily News*, Jacksonville, NC (April 1998).

Report of Invention Filed with UNC-CH:

- 2014 OTD ROI15-0024, Ephemeral substrates for oyster aquaculture.
- 2012 OTD 12-0106, Instrument for accurate measurement of solid object volume
- 2002 A novel bryostatin acquisition methodology; Niels Lindquist
- 2000 Tridentatols D-H, new UVA/UVB-absorbing metabolites from the marine hydroid *Tridentata marginata*; Niels Lindquist
- 1997 Anti-inflammatory compounds from a marine hydroid; Niels Lindquist (UNC-CH) and Robert Jacobs (UCSB)
- 1996 Marine antioxidants with potential human health benefits; Niels Lindquist (UNC-CH) and George Loo (UNC-Greensboro)
- 1995 Marine compounds as sunscreens; Niels Lindquist and Mark E. Hay
- 1994 Dictyols as antifouling compounds; Niels Lindquist and Mark E. Hay

U.S. Patents:

- 6,900,339 A bryostatin composition and bryostatin acquisition methodologies; Lindquist and Lopanik – inventors; UNC-CH/UDel – co-owners (issued 5/31/05).
- 5,705,146 Sunscreening compositions comprising natural products of a marine hydroid, and derivatives thereof; Niels Lindquist - inventor; Niels Lindquist and Mark E. Hay – co-owners (issued 1/6/98)
- 5,905,158 Sunscreening compositions comprising natural products of a marine hydroid, and derivatives thereof; Niels Lindquist - inventor; Niels Lindquist and Mark E. Hay – co-owners (issued 5/18/99)
- 5,980,920 Antioxidant Compositions; Niels Lindquist and George Loo inventor; Niels Lindquist owner (issued 11/9/99)
- 6,084,118 Sunscreening compositions comprising natural products of a marine hydroid and derivatives thereof; Niels Lindquist – inventor; Niels Lindquist and Mark E. Hay – co-owners (issued 7/4/2000)

Foreign (PCT) Patents Applications:

- WO009719671A1 Sunscreening compositions comprising natural products of a marine hydroid, and derivatives thereof; Niels Lindquist - inventor; Niels Lindquist and Mark E. Hay - co-owners (issued 6/5/1997)
- AU01274397A1 Sunscreening compositions comprising natural products of a marine hydroid, and derivatives thereof; Niels Lindquist - inventor; Niels Lindquist and Mark E. Hay - co-owners (issued 6/19/1997)
- EP00936895A1 Sunscreening compositions comprising natural products of a marine hydroid, and derivatives thereof; Niels Lindquist - inventor; Niels Lindquist and Mark E. Hay - co-owners (issued 8/25/1999)

AU00714924B2 Sunscreening compositions comprising natural products of a marine hydroid, and derivatives thereof; Niels Lindquist - inventor; Niels Lindquist and Mark E. Hay - co-owners (issued 1/13/2000)

Provisional Patent Applications:

Ephemeral substrates for oyster aquaculture (submitted to the USPTO March 6, 2015)
A novel bryostatin acquisition methodology. (submitted to the USPTO April 30, 2002).
Sunscreening compositions comprising natural products of a marine hydroid, tridentatols E and F, and derivative thereof (submitted to the U.S. PTO March 29, 2002).
Sunscreening compositions comprising natural products of a marine hydroid, tridentatols D and G, and derivative thereof (submitted to the U.S. PTO March 29, 2002).

Pending Patent Applications:

Ephemeral substrates for oyster aquaculture; submitted to the USPTO March 6, 2016, under the PCT WO 2016144786 A1

License Agreement:

Sunscreening compositions comprising natural products of a marine hydroid, and derivatives thereof (PhycoGen, Inc. 4/97)
Antioxidant Compositions (PhycoGen, Inc., 6/98)
Ephemeral substrates for oyster aquaculture (License UNC to Sandbar Oyster Company, November 2016)

Material Transfer Agreement:

Inhibition of DNA repair enzymes by marine natural products (Cerus Corporation, 10/2002)

Invited Presentations:

- 2016 Evolution of a Novel Oyster Substrate - Inception to Real-World Applications, Carolina Innovation Seminar Series, UNC Chapel Hill, Chapel Hill, NC
- 2016 International Conference on Shellfish Restoration, Development of a Novel Oyster Substrate Inception to Real-World Applications, Charleston, SC
- 2016 Duke University Marine Lab, Stewards of the Future Seminar Series, Restoring the Kings of the Coast
- 2016 UNCW, Department of Biological Sciences, Applying Fundamentals of Oyster Ecology to Habitat Management, Restoration, Aquaculture and Economic Opportunity
- 2016 UNC Chapel Hill, Department of Marine Sciences, Applying Fundamentals of Oyster Ecology to Habitat Management, Restoration, Aquaculture and Economic Opportunity
- 2016 UNC Institute of Marine Sciences, Thursday Think Tank, Using MOM (Miraculous Oyster Material) to Nurture Oysters
- 2012 Duke University Marine Laboratory, "Anything but "boring" sponges - processes and problems of bioerosion in North Carolina oyster habitats"
- 2012 North Carolina Coast Reserve Symposium (Beaufort, NC). Intertidal oyster reef restoration within the Rachel Carson NERR: natural history, distribution, maintenance and restored ecosystem services. N. Lindquist, J. Fodrie, A. Rodriguez, M. Piehler, P. Peterson, J. Grabowski, A. Tyler and D. "Clammerhead" Cessna
- 2007 College of Charleston, "Ecological Impacts of Sponge Metabolism on Benthic Marine Communities"

- 2007 NC Aquaculture Development Conference, “A Sea of Chemistry: Creating Waves of Opportunity”
- 2007 Duke University Marine Laboratory, “Ecological Impacts of Sponge Metabolism on Benthic Marine Communities”
- 2006 Fenical Symposium, Fluxes of Biological Active Chemicals from Marine Sponges (San Diego, CA)
- 2006 Georgia Institute of Technology, Department of Biology. Invited presentation to NSF sponsored IGERT students; “From Nutrients to Natural Products: Sponge Impacts on Coral Reefs” Atlanta, GA
- 2002 Gordon Conference on Marine Natural Products, Symbiont-Derived Chemical Defenses in Marine Invertebrates (Ventura, CA)
- 2002 Georgia Institute of Technology, Department of Biology. Invited presentation to NSF sponsored IGERT students; “Ontogeny of Chemical Defense of Marine Invertebrates” Atlanta, GA
- 2001 University of Papua New Guinea, “Chemical Ecology of Marine Invertebrates” (Port Moresby, Papua New Guinea)
- 2001 International Society of Chemical Ecology, “Consequences of Consuming Chemically Rich Prey” (Lake Tahoe, CA)
- 2001 International Society of Chemical Ecology, “Overview of Frontiers in Marine Chemical Ecology” (Lake Tahoe, CA)
- 2000 UNC-CH Institute of Marine Sciences, 7th Annual Open House Seminar, “A Sea of Chemistry: Creating Waves of Opportunity”
- 2000 Georgia Institute of Technology, Department of Biology, Atlanta, GA
- 1998 American Society of Pharmacognosy, “Consequences of Consuming Chemically Rich Prey” (Orlando, FL)
- 1998 East Carolina University, Department of Biology, Greenville, NC
- 1997 UNC-CH, Curriculum in Marine Sciences, Chapel Hill, NC
- 1997 UNC-CH, Institute of Marine Sciences, Morehead City, NC
- 1997 Woods Hole Oceanographic Institute, Biology Department, Woods Hole, MA
- 1997 UNC at Greensboro, Department of Biology, Greensboro, NC
- 1997 Nova Southeastern University, Oceanographic Center, Dana, FL
- 1997 Flinders University, School of Biological Sciences, Adelaide, Australia
- 1997 Macquarie University, School of Biological Sciences, Sydney, Australia
- 1996 Gordon Conference on Marine Natural Products, "UV Stress on Marine Organisms: Do UVB- and UVA-Absorbing Secondary Metabolites Function as Sunscreens? (Ventura, CA)
- 1996 Advisory Council, North Carolina Marine Resources Commission, "Practical Applications of Natural Compounds from Marine Organisms: Potential Economic Benefits for Coastal North Carolina.”
- 1996 UNC at Greensboro, Department of Food, Nutrition, and Food Science Management
- 1996 Wake Forest University, Winston-Salem, NC, Department of Chemistry
- 1996 Florida Institute of Technology, Melbourne, FL, Department of Chemistry
- 1996 Temple University, Philadelphia, PA, Department of Biology
- 1996 Washington University, St. Louis. MO, Department of Biology (2 talks)
- 1996 Hong Kong University of Science and Technology, Department of Biology
- 1995 7th International Congress on Invertebrate Reproduction, "Palatability and Chemical Defense of Marine Invertebrate Larvae," (Santa Cruz, CA)

- 1995 Hopkins Marine Station, Pacific Grove, CA (2 talks)
- 1995 University of Maryland Baltimore County, Dept. of Biology, Baltimore, MD (2 talks)
- 1994 Gordon Conference on Marine Natural Products, "Chemical Defense of Larvae: Seeds of Marine Invertebrates," (Ventura, CA)
- 1994 National Marine Fisheries, Charleston, SC
- 1993 University of Houston, Department of Biology
- 1992 Gordon Conference on the Chemistry of Plant-Herbivore Interactions, "Chemical Ecology of Larvae and Eggs: Seeds of Marine Invertebrates" (Oxnard, CA)
- 1990 Gordon Conference on Marine Natural Products, "Structures of Diazonamides A-D: Cytotoxic Metabolites of the Ascidian *Diazona chinensis*," (Ventura, CA)

Symposia Organized:

- 2008 Chemical Ecology on Coral Reefs, a symposium organized for the 11th International Coral Reef Symposium, Ft. Lauderdale, July 2008
- 2001 Marine Chemical Ecology, a symposium organized for the International Society of Chemical Ecology's annual meeting to be held July 7-12, 2001, at Lake Tahoe

Contributed Presentations:

- 2014 Marine Benthic Ecology Meeting (Jacksonville, FL). Rate of Oyster Shell Bioerosion by *C. celata* and Sponge Impacts on Oyster Recruitment, K. Chellemi and N. Lindquist
- 2014 Marine Benthic Ecology Meeting (Jacksonville, FL). Developing a Comprehensive North Carolina Salinity Database to Improve Ecosystem Management and Habitat Restoration. N. Lindquist and S. Fegley.
- 2013 Albemarle-Pamlico Ecosystem Symposium (New Bern, NC). Tidal creeks and migrating reefs: enhancing oyster reef habitat in coastal tidal creeks. N. Lindquist, J. Fodrie, A. Tyler, D. "Clammerhead" Cessna, A. Pool and A. Poray.
- 2013 Albemarle-Pamlico Ecosystem Symposium (New Bern, NC). Testing a novel restoration method to enhance oyster populations in tidal creeks. D. "Clammerhead" Cessna, A. Tyler and N. Lindquist.
- 2013 Albemarle-Pamlico Ecosystem Symposium (New Bern, NC). Testing salinity-based predictions of oyster shell cultch planting success. A. Tyler, D. "Clammerhead" Cessna and N. Lindquist.
- 2013 Albemarle-Pamlico Ecosystem Symposium (New Bern, NC). Developing a comprehensive North Carolina salinity database to improve ecosystem management, habitat restoration and human health. N. Lindquist, S. Fegley and R. Guajardo.
- 2013 Albemarle-Pamlico Ecosystem Symposium (New Bern, NC). Fate of restored oyster reefs governed by principles learned from rocky shores and saltmarsh wetlands. J. Fodrie, A. Rodriguez, J. T. Ridge, N. Lindquist, E. J. Theuerkauf, S. E., Coleman, J. H. Grabowski, M. C. Brodeur, R. K. Gittman, D. A. Keller and M. D. Kenworthy.
- 2013 Marine Benthic Ecology Meeting (Savannah, GA). How does a bioeroder affect oyster health, defenses, and predator – related mortality? S. Coleman, J. Fodrie, N. Lindquist and J. Ries
- 2013 Marine Benthic Ecology Meeting (Savannah, GA). Classic paradigms in a novel environment: fate of intertidal oyster reefs governed by principals known from rocky shores and saltmarsh wetlands. J. Fodrie, A. Rodriguez and N. Lindquist,

- 2013 Marine Benthic Ecology Meeting (Savannah, GA). Bored to death: North Carolina oyster sanctuaries imperiled by carbonate eroding sponges. N. Lindquist, C. Hardy, C. Caroon, P. Holmlund, M. Jordan and G. Lauriat
- 2013 Marine Benthic Ecology Meeting (Savannah, GA). Location, location, location: landscape setting and bathymetry interactively determine intertidal oyster-reef expansion and restoration success. J. Ridge, A. Rodriguez, J. Fodrie, N. Lindquist and J. Grabowski
- 2012 Marine Benthic Ecology Meeting (Williamsburg, VA). Coastal Shellfish Reefs as Carbon Sources and Sinks, Fodrie, Joel; Rodriguez, Antonio; Grabowski, Jonathan; Lindquist, Niels; Peterson, Charles; Piehler, Michael; Rodriguez, Patricia
- 2012 Marine Benthic Ecology Meeting (Williamsburg, VA). Anything But Boring Sponges: A Neglected Factor in North Carolina Oyster Reef Ecology, Lindquist, Niels; Fodrie, Joel; Tyler, Adam; Cessna, David “Clammerhead”; Karam, Amanda; Kuan, Carmen; and Abigail Poray
- 2012 North Carolina Coast Reserve Symposium (Beaufort, NC). Intertidal Oyster Reef Restoration Within The Rachel Carson NERR: Natural History, Distribution Maintenance and Restored Ecosystem Services, Lindquist, Niels; Fodrie, Joel; Rodriguez, Tony; Piehler, Mike; Peterson, Pete; Grabowski, Jon; Tyler, Adam and Cessna, David “Clammerhead”
- 2011 State of the Sounds (New Bern, NC). Anything But Boring Sponges – A Neglected Factor in North Carolina Oyster Reef Ecology
- 2010 Marine Benthic Ecology Meeting (Wilmington, NC). Boring sponge impacts on the oyster *Crassostrea virginica* and oyster reef development. Amanda Karam, Andrea Hale, and Niels Lindquist
- 2010 Marine Benthic Ecology Meeting (Wilmington, NC). Dinitrogen gas production by dominant sponges on Conch Reef, Florida Keys (USA) measured by underwater Membrane Inlet Mass Spectrometry (MIMS). Martens, Christopher S.; Lindquist, Niels; Popp, Brian N.; Mendlovitz, Howard P.; Gibson, Patrick J. ; Camilli, Richard; Hench, James L.; Duryea, Anthony
- 2010 Martens, C.S. et al. “Dinitrogen gas production by dominant sponges on Conch Reef, Florida Keys (USA) measured by underwater Membrane Inlet Mass Spectrometry (MIMS)”. 2010 ASLO/AGU Ocean Sciences Meeting. Portland, OR.
- 2009 Martens et al. “Sponge respiration and N cycling in coral reef systems” 2009 Chemical Oceanography Gordon Research Conference. Tilton, NH.
- 2008 Monismith et al. ASLO-AGU Ocean Sciences Meeting (Orlando, Florida), “Benthic Grazing on a Tropical Reef”
- 2008 Lindquist N, et al. ASLO-AGU Ocean Sciences Meeting (Orlando, Florida), “Detailed Spatial and Temporal Measurements of Sponge Excurrent Plumes Measured in situ Utilizing the Aquarius Reef-Based Observatory”
- 2008 Martens et al. ASLO-AGU Ocean Sciences Meeting (Orlando, Florida), “In Situ Measurements of Diel Variations in Barrel Sponge Respiration from NOAA’s Aquarius Underwater Observatory on Conch Reef, Florida Keys (USA)”
- 2008 Lindquist N, et al. International Coral Reef Symposium (Ft. Lauderdale, Florida), “Toxic Reef Syndrome: the Sponge Seaweed Connection and the Consequence of Allelopathic Impacts of Sponges and Seaweeds on Degraded Caribbean Coral Reefs”
- 2007 Marine Benthic Ecology Meeting (Atlanta, Georgia). Detecting a mutualism between sponges and their associated microbial communities. Weisz, JB., Lindquist, N, Martens, C. S.

- 2007 Marine Benthic Ecology Meeting (Atlanta, Georgia). Sponges: a missing link in Caribbean coral reef management thinking. Lindquist, N, Martens, CS, Weisz, JB, Southwell, MW.
- 2006 Martens, CS, MW Southwell, N Lindquist, JB Weisz, J Hench. Sponge respiration and organic matter recycling on coral reef ecosystems of the Florida Keys. EOS Trans. AGU: 87(36).
- 2006 Southwell, MW, JB Weisz, N Lindquist, B Popp, J Hench, Cs Martens. Sponge control of dissolved inorganic nitrogen fluxes on coral reefs. EOS Trans. AGU. 87(36).
- 2005 C. Martens, N. Lindquist, M. Southwell, H. Mendlovitz, J. Weisz, J. Hench, B. Popp. N Cycling and Respiration by Sponges in Keys Ecosystems. South Florida Program Meeting Dec. 2005 (Marathon, Florida).
- 2005 Marine Benthic Ecology Meeting (Williamsburg, VA) – Urchin Impacts on Hydroids: How Defensive Strategies Affect Hydroid Abundance and Distribution. Jones, RC, JJ Stachowicz, N Lindquist
- 2005 Marine Benthic Ecology Meeting (Williamsburg, VA) – Measuring Sponge Flow Rates to Assess Impacts of Sponge Metabolism on Coral Reefs. Weisz, J., JL Hench, N Lindquist, M Southwell, CS Martens
- 2005 Marine Benthic Ecology Meeting (Williamsburg, VA) – Nutritional Control on the Abundance and Diversity of Sponges on Caribbean Coral Reefs. Lindquist, N, JB Weisz, JL Hench
- 2004 Marine Benthic Ecology Meeting (Mobile, AL) - Investigations of the Potential for Nitrogen Fixation Within Sponges of the Florida Keys. Weisz JB, Southwell M, Martens CS, Lindquist N.
- 2003 EMERGE (Empowering Minority Engineers/ Scientists to Reach for Graduate Education) Conference (Atlanta, GA) - Hydroid defenses against predators: Importance of secondary metabolites vs. nematocysts. Co-authors: Randall Channing Jones (presenter) and John J. Stachowicz – 1st place recipient of the J. Ernest Wilkins, Jr. Award (Oral Research Competition) for Life Sciences.
- 2003 American Association of Underwater Scientists (Greenville, NC) – What do sponges eat: examining variation in sponge nutrition in the FL Keys. N. Lindquist, J. Weisz, M. Southwell and C. S. Martens.
- 2003 Benthic Ecology Meeting (New Haven, CT) – Do sponge associated bacteria influence interspecific and spatial variations in sponge nutrition. N. Lindquist, J. Weisz, M. Southwell and C. Martens.
- 2002 Applications of Stable Isotope Techniques to Ecological Studies (Flagstaff, AZ) – Biogeochemical controls on the stable isotopic composition of marine sponges in the Florida Keys I: nitrogen and the role of nitrogen fixation. N.Lindquist, J. Weisz, M. Southwell and C. Martens.
- 2002 Benthic Ecology Meeting (Orlando, FL) - Chemical and molecular characterization of ontogenetic shifts in the chemical defense in *Bugula neritina* (Bryozoa). Co-authors: Nicole Lopanik and Nancy Targett
- 2002 Benthic Ecology Meeting (Orlando, FL) – Biogeochemical controls on the stable C and N isotopic composition of marine sponges in the Florida Keys. Co-authors: Jeremy B. Weisz, Melissa Southwell, and Christopher S. Martens.
- 2002 Am. Soc. Limnology and Oceanography; Ocean Sciences Meeting (Albuquerque, NM) - Chemical and molecular characterization of ontogenetic shifts in the chemical defense in *Bugula neritina* (Bryozoa). Co-authors Nicole Lopanik and Nancy Targett

- 2001 International Society of Chemical Ecology (Lake Tahoe, CA) – Hydroid defense against predators: importance of secondary metabolites vs. nematocysts. Co-author: Randall Channing Jones.
- 2001 Benthic Ecology Meeting (Durham, NH) - Evolution of a Chemical Defense Among File Clams (Bivalvia: Limidae) - Relationships Between Bivalve Palatability, Shell Morphology, and Shell Strength. Co-author: Lisa Weiss
- 2001 Benthic Ecology Meeting (Durham, NH) – Chemical defense of *Bugula neritina* (Bryozoa) larvae by bryostatins. Co-authors: Nicole Lopanik and Nancy Targett
- 2001 Benthic Ecology Meeting (Durham, NH) – Predation on a *Donax*-hydroid association – protected status or open season? Co-authors, Lisa Manning and Charles Peterson)
- 2000 Benthic Ecology Meeting (Wilmington, NC) – A unique marine isopod microalgal symbiosis: a noxious combination to coral-reef fishes.
- 2000 Benthic Ecology Meeting (Wilmington, NC) – Hydroid defenses against predators: importance of secondary metabolites vs. nematocysts. Co-authors: R. C. Jones and J. J. Stachowicz
- 2000 Benthic Ecology Meeting (Wilmington, NC) – Localization and activation of defensive secondary metabolites of the marine hydroid, *Tridentata marginata*. Co-author: Jeremy Weisz
- 1999 Benthic Ecology Meeting (Baton Rouge, LA) - “Chemical defense of gammarid amphipods”, Co-author: Stephen Norton
- 1995 Larval Biology Meeting (Harbor Branch Oceanographic Institute, Ft. Pierce, FL) - "Larval tolerance to near-surface levels of solar UV light."
- 1993 New Research in the Science of Global Change: A Multidisciplinary View, U.S. Department of Energy, Oakland, CA), "Effects of solar UV on the survivorship of larvae from marine invertebrates."
- 1993 Larval Ecology Meeting (Port Jefferson, NY), "Chemical defense of invertebrate larvae."
- 1993 Benthic Ecology Meeting (Mobile, AL), "Chemical defense of marine larvae: effects of eating toxic babies."
- 1993 International Society of Chemical Ecology (Clearwater, FL), "Chemical defense of invertebrate larvae."
- 1992 Benthic Ecology Meeting (Newport, RI), "Chemical defense of larvae: seeds of marine invertebrates."
- 1991 Ecological Society of America (San Antonio, TX), "Learning to avoid toxic foods."
- 1991 Benthic Ecology Meeting (Williamsburg, VA), "Chemical protection of the ascidian *Trididemnum solidum* and its larvae from predation by coral-reef fishes."

Educational Outreach Activities:

- 2017 Rural Day, Presented by the NC Rural Economic Development Center, speaker, Stories from Rural North Carolina, Raleigh, NC, May 9, 2017
- 2017 Beaufort Wine and Food Festival, speaker - Oyster Ecology and Aquaculture, Vin de Mer Culinary Village event, also donated and shucked oysters for attendees, Beaufort, NC
- 2009-2013 Member of the organizing committee for the Go-Science Coastal Science Café series.
- 2007-2014 Presentation on marine sciences and marine sciences careers to the Sneed Marine Sciences Academy summer program
- 2010 – Invited speaker/field guide for the Saba Sea and Learn Program, Saba, Netherland Antilles.

- 2008 – Public television documentary film produced about ocean acidification and coral reefs focused on Martens-Lindquist research conducted during an Aquarius saturation mission.
- 2007 – 10 day joint NOAA-UNC Aquarius outreach mission - “If Reefs Could Talk”
- 2006 – Hosted a Presentation and question/answer session with a Boy Scout Troop from Raleigh, NC at IMS for a presentation and questions/answer session as they worked toward a merit badge in oceanography
- 2005 – Aquarius outreach
- 2004 - Career Day Speaker – Morehead Elementary School at Camp Glenn
- 2004 – Volunteer for 10-week Science Enrichment Program at Morehead Elementary School
- 2004 – Talks (2) given to biology and aquaculture groups from Carteret Community College
- 2002-2003 – Member Morehead Elementary School at Camp Glenn Advisory Board
- 2003 – Volunteer for 10-week Science Enrichment Program at Morehead Elementary School
- 2003 – Career Day Speaker – Morehead Elementary School at Camp Glenn
- 2002-2003 – Development of 2 high school science lesson plans on marine symbioses and chemical defenses for nation-wide distribution as part of a package developed by NOAA/NURC/UNCW related to undersea research through the underwater laboratory, AQUARIUS
- 2002 Initiated a program to bring area high school students interested to the UNC-CH’s Institute of Marine Sciences to hear research, thesis defense and dissertation defense seminars given by UNC graduate students
- 2002 Career Day Speaker - Morehead Elementary School at Camp Glenn
- 2002 Coordinated four IMS graduate student’s participation as ecologist for a 6th grade team’s (~80 students) field trip to the Rachael Carson Estuarine Reserve (5-28-02)
- 2002 Hosted two separate 5th grade science classes at the Institute of Marine Sciences (6-4 02)
- 2002 Conducted a plankton ecology lab for 6th grade science classes at Morehead City Middle School (5-20-02)
- 2001 Workshop participant (NURC, Key Largo, FL 11/30-12/2) for developing lesson plans for high school sciences classes focused on research projects conducted through NURP’s underwater, saturation laboratory AQUARIUS
- 2001 Two 5th grade field trip groups from Morehead Elementary School at Camp Glen to IMS
- 2001 2nd grade field trip group from Morehead City Primary School to IMS
- 2001 Career Day speaker – Morehead Elementary School at Camp Glenn
- 1999 Career Day speaker, Morehead City Elementary School at Camp Glenn

Public Service:

- 2017 Sound Economic Development: Creating a Rising Economic Tide for the N.C. Coast (2017 NC Oyster Summit), Panelist, Eliminating the Barriers to Entry and Building a Shellfish Aquaculture Industry, Raleigh, NC March 22-23, 2017
- 2017 UNC Clean Tech Summit, Panelist, Oyster Restoration as an Economic Development Tool, Chapel Hill, NC, March 2-3, 2017
- 2015 – present Member, North Carolina Oyster Steering Committee
- 2015-2016 Member, NC Division of Marine Fisheries Hard Clam and Oyster Fisheries Management Plan Advisory Committee
- 2014-present, Member, Northeast Oyster Working Group, organized by the North Carolina Coastal Federation

- 2006-2011 Member Carteret County Community College Applied Marine Biology and Aquaculture Advisory Board
- 2001 Davis, Bodega Bay Marine Lab. Open House participant (7/14/2001)
- 1999 to 2008 Consultant and supplier of tropical fish for the Morehead Elementary School at Camp Glen 150 gal. coral reef display aquarium and for aquariums of an 8th-grade science teacher
- 1999 Presentation to the Morehead City – Soundview Rotary Chapter
- 1997 Presentation to a Morehead City Rotary Chapter
- 1997 Isaac Walton Conservation League, White Oak River Chapter, "Practical Applications of Natural Compounds from Marine Organisms: Potential Economic Benefits for Coastal North Carolina."
- 1996 Science Fair judge, Carteret County School District
- 1994 Science Fair judge, Carteret County School District

Workshops:

- 2001 "Marine Biotechnology: Biomedical Applications of Marine Natural Products" (National Academy of Sciences, Ocean Studies Board, Washington, D.C., 11/5-11/6)
- 1997 "Aquatic Biotechnology and Sciences Consortium Forum IV," (Wrightsville Beach, NC, April 1997 - invited to give a presentation on the commercialization of marine natural products"
- 1996 "Marine and Coastal Technology Transfer: A North Carolina Emphasis," (North Carolina State University, December 1996)
- 1996 "Applying Molecular Techniques to Aquaculture," sponsored by the North Carolina Aquatic Sciences and Biotechnology Consortium (Durham, NC, July 1996)
- 1995 "Aquatic Biotechnology and Sciences Consortium Forum III," (Wrightsville Beach, NC October 1995)

Research Experience:

- 1999-present Institute of Marine Sciences, University of North Carolina at Chapel Hill, Professor, marine natural products chemistry, chemical ecology, coral reef ecology; oyster reef ecology
- 1998-present Institute of Marine Sciences, University of North Carolina at Chapel Hill, Associate Professor, marine natural products, chemical ecology, marine ecology
- 1997 Institute of Marine Sciences, University of North Carolina at Chapel Hill, Visiting Associate Professor, marine natural products, chemical ecology, marine ecology
- 1993-1997 Institute of Marine Sciences, University of North Carolina at Chapel Hill, Research Assistant Professor, marine natural products, chemical ecology, marine ecology
- 1992-1993 Institute of Marine Sciences, University of North Carolina at Chapel Hill, DOE Global Change Distinguished Postdoctoral Fellow
- 1989-1991 Institute of Marine Sciences, University of North Carolina at Chapel Hill, NSF Marine Biotechnology Postdoctoral Fellow
- 1983-1989 University of California, San Diego, Scripps Institution of Oceanography - Ph.D. Candidate, Research Assistant, marine natural products chemistry
- 1983 University of Florida - Characterization and synthesis of fragrance components from Central and South American orchids (with Prof. Norris Williams)

- 1982 University of Florida - Search for the aggregation pheromone of the monarch butterfly (with Prof. Lincoln Brower)
- 1982 University of Florida - Overwintering strategy of a seasonal colony of monarch butterflies (with Prof. Lincoln Brower)
- 1982 Woods Hole Oceanographic Institute, Physiology of sexual reproduction in *Gonyaulax tamerensis* (with Prof. Donald Anderson)
- 1981 Cornell University, Synthesis of deodactol (with Prof. Jerrold Meinwald)

Teaching:

- 2010 University of North Carolina at Chapel Hill, ENST 698, Capstone Course for the UNC Institute for the Environment Field Site (co-taught with Johanna Rosman)
- 2003-2016 University of North Carolina at Chapel Hill, Coastal and Estuarine Ecology (ENST 135) for the UNC Institute for the Environment Field Site (co-taught with Charles Peterson and others)
- 2000 University of North Carolina at Chapel Hill, "Biological Oceanography" (co-taught with Sean Powers and Charles Peterson)
- 1999 University of North Carolina at Chapel Hill, "Biological Oceanography" (co-taught with Charles Peterson)
- 1998 University of North Carolina at Chapel Hill, "Biological Oceanography"
- 1995 Hopkins Marine Station, Stanford University, "Methods in Marine Chemical Ecology" (a 1-day short course presented to a marine ecology class)
- 1991 Institute of Marine Sciences, University of North Carolina at Chapel Hill, "Marine Chemical Ecology – An Experimental Approach" (co-taught with Mark E. Hay)

Development of Human Resources:

Students I have advised on chemical and ecological aspects of their graduate research and independent study projects.

High School Students:

Trey Creech, Kaya Lindquist, Kirk McIntosh, Michelle Moritz, Chip Peterson, Charlie Waters, Crystal Williams

Undergraduates:

UNC Chapel Hill: Kelly Barr, Lien Beamon (Vietnamese-American female), Brian Chanas, Trey Creech, Parker Ellis, Andrea Hale, Sheri Hart, Ryan Hill, Alex Hodges, Amanda Hollebone, Delia Johnson, Sara Johnson, Quaker Kappel (Morehead Scholar), Amanda Karam, Mike Klompas (Morehead Scholar), Carman Kuan, Katherine Lane, Sarah Lester, Matt McGee, Lance Miller, Joe Morton, Rogerio Prata (Latino), Alesia Read, Hannah Slep, Alexia Snedeker, Charles Waters, Patrick Winner

UNC Pembroke: Randall Channing Jones (Native American)

Duke University: Buffy Turner (African-American female)

Hampton College: Mike Duncan (African-American), Greg Smith (African American),

University of Maryland, Eastern Shores: Walton Cephas (African American male)

University of Miami: Patrick Nichols

University of North Florida: Katelin Chellemi

University of North Wales: Emma Cole

Graduate Students:

UNC Chapel Hill: Andrea Anton*, Robin Bolser* (M.S. 1996), Stephan Bullard* (Ph.D. 2000), Giancarlo Certulo* (M.S. 1998), Sara Coleman*, Reagan Converse[†], Cynthia Kicklighter (transferred to Georgia Tech); Greg Cronin* (Ph.D. 1994), Edwin Cruz Rivera* (Puerto Rican male, Ph.D. 1998), Mike Deal* (Ph.D. 1997), Nate Gerald[†], Patrick Gibson* (Ph.D. 2010), John Grabowski (Ph.D. 2002), Jason Gregory* (M.S. 2005), Charlie Hileman* (M.S. 2000), Dan Hoer*, Galen Johnson*, Randall Channing Jones[†] (Ph.D. candidate), Lisa Manning, Sarah Lee*, Tim Schmitt (M.S. 1991), Nyssa Silbiger[†] (M.S. 2009), Greg Sorg[†] (M.S. 2016); Eric Sotka (Ph.D. 2001), Melissa Southwell* (Ph.D. 2007), Jay Stachowicz* (Ph.D. 1998), Stephanie Ware* (Ph.D. 1997), Lisa Weiss[†] (M.S. 2001), Jeremy Weisz[†] (Ph.D. 2006) Margaret Wohlenberg* (Ph.D. 1994)

North Carolina State University: Robert Dunn* (Marine Sciences)

UNC Wilmington: Brian Chanas* (Marine Sciences), Johnathan Cowart* (Marine Sciences)

University of Delaware: Nicole Lopanik* (Marine Sciences)

Wake Forest University: Matt Melvin* (Chemistry)

[†]Student's thesis or dissertation advisor

*Member of the student's thesis or dissertation committee

Present and Past Lindquist Graduate Students:

Randall Channing Jones (Native American) – Channing is the graduate student supported by the NSF hydroid grant to work on different defensive strategies of marine hydroids and their ecological implications.

Reagan Converse (recipient of a 5-year UNC Graduate School Pogue Fellowship) – Reagan's research is focused on the ecology and evolution of host-symbiont interactions of a unique set of associations between a group of marine isopods and an epibiotic microbial community of cyanobacteria and bacteria. After her MS-bypass project Reagan moved to Rachel Noble's group to work on human pathogens in the coastal environment.

Graduated Students and Their Present Positions:

Lisa Weiss (MS, 12/2001); Thesis title – “Coming out of the shell: noxious tentacles release bivalve shells from predation selection”; Current position – Watershed Coordinator for the Jacques Cousteau National Estuarine Reserve near Tuckerton, NJ (1/2002 to present). Lisa's thesis research examined relationships between the palatability of diverse bivalves (including a group known as file clams that have large, distasteful sensory tentacles) and their shell morphology, shell strength, and habitats. Lisa demonstrated that file clams, despite living in habitats where the threat of predation is high, have evolved diminutive, non-protective shells because of the protection afforded by their distasteful tentacles, similar to the acquisition of a diet derived chemical defense and subsequent loss of shells by nudibranch and sea hares.

Dr. Jeremy Weisz (NSF Predoctoral Fellow, UNC-CH Dissertation Completion Fellowship, Ph.D. 5/2006) – Dissertation Title – “Measuring impacts of associated microbial communities on Caribbean reef sponges: Searching for symbiosis”; Present Position, Assistant Professor, Department of Biology, Linfield College, Minnville, Oregon. Jeremy's dissertation research focuses on host vs. symbiont contributions to nutrition and

the production of ecoactive secondary metabolites among marine sponges. Jeremy is testing his hypotheses using a combination of chemical, stable isotope, and molecular techniques, in addition to manipulative field experimentation.

Nyssa Silbiger (MS, 8/2009); Thesis title – “Impacts of sponge produced dissolved inorganic nitrogen on Caribbean coral reef seaweed communities”. Current position – Ph.D. candidate at the University of Hawaii

Gregory Sorg (MS, 5/2017); Thesis title – “Identifying sustainable substrates for subtidal oyster reef construction”. Current position: technician with Sandbar Oyster Company, Morehead City, North Carolina

Professional Organizations:

American Association of Underwater Scientists

Other Professional Service:

2010 Member of the Aquarius Underwater Laboratory Technical Review Panel, Washington, DC

2006 – 2011 Member of the Marine Biotechnology Center of Innovation (NC Biotechnology Center) Development Committee

Manuscripts Reviewed For:

Aquatic Botany

Biological Bulletin

Journal of Chemical Ecology

Ecological Applications

Ecology

European Journal of Biochemistry

Journal of Experimental Marine Biology and Ecology

Journal of Natural Products

Marine Biology

Marine Ecology

Marine Ecology Progress Series

Oecologia

Proceedings of the National Academy of Sciences

Tetrahedron

Proposal Review Panel Member:

NSF Biological Oceanography Program

California Sea Grant Marine Biotechnology Program

NIEHS (NIH/NSF) Centers for Oceans and Human Health

Grant Proposals Reviewed For:

NIEHS (NIH/NSF) Centers for Oceans and Human Health

National Science Foundation - Biological Oceanography

National Science Foundation – Chemical Oceanography

National Science Foundation – Ecological and Evolutionary Physiology

National Science Foundation – Environmental and Structural Systems Cluster

National Science Foundation – Polar Programs
 National Science Foundation – International Programs
 National Science Foundation – Organisms-Environment Interactions
 Natural Environment Research Council (U.K.)
 NOAA - National Undersea Research Center, Wilmington, NC
 NOAA - National Undersea Research Program, Caribbean Marine Research Center
 NOAA - National Marine Fisheries Service
 Center for Field Studies
 California Sea Grant Program
 Delaware Sea Grant Program
 Florida Sea Grant Program
 Lizard Island Research Foundation
 U.S.-Israel Binational Science Foundation

University Committees:

2015 Full Professor Promotion Review Committee for Dr. Joel Fodrie
 2015 Search Committee – IMS outboard motor and shop technician
 2012 NC Sea Grant–Water Resources Research Institute Director Search Committee
 2011 Full Professor Promotion Review Committee Chair for Dr. Rachel Noble
 1999-present UNC-CH Marine Sciences Diving Control Board
 1998-present Marine Sciences Graduate Admissions Committee
 2009-2010 IMS faculty search Committee Chair
 2008 House Cleaning Head Search
 2007-2011 Member Multi-university Marine Biotechnology Center of Innovation Project
 Management Team sponsored by NC Biotechnology Center
 2007 IMS Research Faculty Search Committee
 2005 Chair, Sediment Dynamics Search Committee for IMS
 2004 Co-Chair, Geological Oceanography Search Committee for MASC and IMS
 2003 Member of the mid-appointment review committee for John Bruno
 2002 Maintenance Mechanic III Search Committee
 2001 Research Vessel Captain I Search Committee
 2001 Laboratory Mechanic I Job Search Committee
 2000 Chairman, Facilities Maintenance Supervisor Search Committee
 2000 Laboratory Mechanic II Job Search Committee
 1999-2000 Molecular Ecologist Search Committee Member
 1999-2009 IMS representative to the UNC-CH Institutional Animal Care and Use
 Committee
 1996 Research Vessel Captain I Search Committee

Diving Experience:

Thirty three yrs. of scientific diving experience; NOAA certified, working NITROX diver;
 TRIMIX certified, certified decompression diver; saturation diving from the Aquarius
 Reef Base Observatory – “aquanaut” for 8 missions, surface support team member for 2
 missions.