

Ashlee Lillis, Ph.D.

Marine Scientist

PO Box 25597, Christiansted, US Virgin Islands 00824
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PROFESSIONAL EXPERIENCE

Lead Scientist Sound Ocean Science	2021-present
National Geographic Explorer	2019-present
Virgin Islands Coral Program Manager The Nature Conservancy, Caribbean Division	2019-2021
Postdoctoral Investigator Woods Hole Oceanographic Institution Biology Department	2015-2019
Postdoctoral Researcher Department of Marine, Earth & Atmospheric Sciences North Carolina State University	2014-2015

EDUCATION

Ph.D., Marine Science <i>Marine, Earth & Atmospheric Sciences, North Carolina State University, USA</i>	2014
M.Sc., Biology <i>Ocean Sciences Centre, Memorial University of Newfoundland, Canada</i>	2009
B.Sc., (Hons) Oceanography and Biology <i>Department of Earth & Ocean Sciences, University of British Columbia, Canada</i>	2005

QUALIFICATIONS AND EXPERIENCE

- High-level analytical, problem-solving, and data synthesis skills
- Expertise in collecting and analyzing large ecological and acoustic datasets
- Management and leadership skills in field and lab/office settings
- Track record of developing relevant research questions, scientific framework, and experimental designs to advance ecological and applied problems
- Experience developing time-series analyses and visualizations using Matlab
- Ability to liaise and collaborate with multi-disciplinary teams and users
- Excellent written and verbal communication skills
- Capacity for identifying key issues, prioritizing workflows, and expediently achieving project goals
- Diverse experience and broad perspective on benthic ecology, monitoring, and restoration across a variety of scales, habitats, and geographies

SELECTED SCIENTIFIC PUBLICATIONS

Suca, J.J.*, **Lillis, A.**, Jones, I.T.*, Kaplan, M.B.* and others (2020) Variable and spatially explicit response of fish larvae to the playback of local, continuous reef soundscapes. *Marine Ecology Progress Series* 653:131-151. <https://doi.org/10.3354/meps13480>

Lillis, A., Apprill, A., Suca, J.J.*, Becker, C.*, Llopiz, J.K. & T. A. Mooney. (2018) Soundscapes influence the settlement of the common Caribbean coral *Porites astreoides* irrespective of light conditions. *Royal Society Open Science*. 5(12). <http://doi.org/10.1098/rsos.181358>

Dinh, J.P.*, Suca, J.J.*, **Lillis, A.**, Apprill, A., Llopiz, J., & T.A. Mooney. (2018) Multiscale spatio-temporal patterns of boat noise on U.S. Virgin Island coral reefs. *Marine Pollution Bulletin* 136: 282-290.

Lillis, A., & T.A. Mooney. (2018) Snapping shrimp sound production patterns on Caribbean coral reefs: relationships with celestial cycles and environmental variables. *Coral Reefs* 37(2): 597-607

Lillis, A., Caruso, F., Mooney, T.A., Llopiz, J.K., Bohnenstiehl, D.R., & D.B. Eggleston. (2018) Drifting hydrophones as an ecologically meaningful approach to underwater soundscape measurement in coastal benthic habitats. *Journal of Ecoacoustics* 2: #STBDH1, <https://doi.org/10.22261/JEA.STBDH1>

Lillis, A., Perelman, J.*, Panyi, A.* & Mooney, T.A. (2017) Sound production patterns of big-clawed snapping shrimp (*Alpheus* spp.) are influenced by time-of-day and social context. *Journal of the Acoustical Society of America* 142(5): 3311-3320.

Lillis, A. & Mooney, T.A. (2016) Loudly heard, little seen, and rarely understood: Spatiotemporal variation and environmental drivers of sound production by snapping shrimp. *Proceedings of Meetings on Acoustics* 27: 010017, <http://dx.doi.org/10.1121/2.0000270>

Lillis, A., Bohnenstiel, D., Peters, J.W.*, & Eggleston, D. (2016) Variation in habitat soundscape characteristics influences settlement of a reef-building coral. *PeerJ* 4:e2557 <https://doi.org/10.7717/peerj.2557>

Ricci, S.W.*, Eggleston, D.B., Bohnenstiehl, D.R., & **Lillis, A.** (2016) Temporal soundscape patterns and processes in an estuarine reserve. *Marine Ecology Progress Series* 550:25-38.

Bohnenstiel, D.R., **Lillis, A.** & Eggleston, D.B. (2016) The Curious Acoustic Activity of Estuarine Snapping Shrimp: Temporal Patterns of Snapping Shrimp Sound in Subtidal Oyster Reef Habitat. *PLoS ONE*. 11(1): e0143691. doi:10.1371/journal.pone.0143691

Lillis, A., Eggleston, D.B. & Bohnenstiehl, D.R. (2016) Soundscapes and larval settlement: characterizing the stimulus from a larval perspective. In: Popper, A. & Hawkins, A. (Eds.) *The Effect of Noise on Aquatic Life II*, Springer, New York. p.637

Lillis A., Bohnenstiehl DR, Eggleston DB. (2015) Soundscape manipulation enhances larval recruitment of a reef-building mollusk. *PeerJ* 3:e999

Lillis, A., Eggleston, D.B. & Bohnenstiehl, D.R. (2014) Soundscape variation from a larval perspective: the case for habitat-associated sound as a settlement cue for weakly swimming larvae. *Marine Ecology Progress Series* 509: 57-70. [10.3354/meps10917](https://doi.org/10.3354/meps10917)

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Lillis, A., Eggleston, D.B. & Bohnenstiehl, D.R. (2014) Estuarine soundscapes: distinct acoustic characteristics of oyster reefs compared to soft-bottom habitats. *Marine Ecology Progress Series* 505: 19-28. Feature Article

Lillis, A., Eggleston, D.B. & Bohnenstiehl, D.R. (2013) Oyster larvae settle in response to habitat-associated underwater sounds. *PLoS ONE* 8(10): e79337.

GRANTS & FELLOWSHIPS

NFWF National Coastal Resilience Fund (<i>P.I.</i> , \$2,409,103)	2020-2024
NOAA Coral Reef Conservation Program (<i>P.I.</i> , \$200,000)	2020-2022
National Geographic Explorer Grant (\$15,000)	2019-2022
WHOI Interdisciplinary Award (<i>Co-PI</i> , \$100,000) <i>Unsupervised habitat characterization from ambient soundscapes</i>	2016-2018
Woods Hole Oceanographic Institution Postdoctoral Scholarship (\$118,000)	2015-2017
PADI Foundation Research Grant (\$7000) <i>Racket on the reef: ambient reef sound as a coral settlement cue and the potential impact of anthropogenic noise</i>	2014-2015
NSF Doctoral Dissertation Improvement Grant (\$15,000)	2013-2014
NSF Grant OCE-1234688 (\$456,414) <i>(proposal based on PhD data; primary contributor to design and writing of proposal with P.I.s Eggleston & Bohnenstiehl)</i>	2012-2015
American Academy of Underwater Sciences (\$1500) Kathy Johnston Graduate Student Research Award	2011
PADI Foundation Research Grant (\$5000) <i>Underwater sound as an orientation and settlement cue for estuarine larvae</i>	2011
National Shellfisheries Association Carriker Research Grant (\$1250)	2011
National Science & Engineering Research Council of Canada (NSERC) Postgraduate Scholarship - Doctoral (\$42,000)	2009
North Carolina State University Provost's Fellowship (\$5000)	2009
National Science & Engineering Research Council of Canada (NSERC) Canada Graduate Scholarship – Masters (\$39,000)	2006

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AWARDS & DISTINCTIONS

Caribbean Impact Award, The Nature Conservancy	2021
Travel Award for “Effects of Noise of Aquatic Life” International Meeting	2016
Best Presentation (3 rd), NCSU Graduate Research Symposium	2013
Travel Award for “Effects of Noise of Aquatic Life” International Meeting	2013
Best Poster Award, Southeastern Estuarine Research Society Meeting	2012
Best Poster Award, American Fisheries Society Tidewater Meeting	2012
Graduate Student Travel Award, NCSU Marine Sciences	2012
Best Student Poster, NCSU MEAS Graduate Student Symposium	2012
Outstanding Teaching Assistant Award, NC State University	2012
Best Student Presentation Award, Benthic Ecology Meeting	2011

CONFERENCE PROCEEDINGS & INVITED PRESENTATIONS

Presented at over 25 international scientific meetings, including ecology, coastal research, fisheries, oceanography and acoustics conferences including Ocean Sciences, Benthic Ecology Meeting, and International Coral Reef Symposium, and has given 10 invited seminars as part of university and research institution invited speaker series.

FIELD EXPERIENCE & RESEARCH SKILLS

Extensive coastal small vessel and scientific diving experience (400+ scientific dives):

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|--------------|--|
| 2019-present | St. Croix, US Virgin Islands |
| | <ul style="list-style-type: none">- field-based coral nursery construction and maintenance- coral outplanting and restoration site preparation- reef photomosaic surveys- coral spawning and larval propagation |
| 2020-present | Bazaruto Archipelago, Mozambique |
| | <ul style="list-style-type: none">- reef/hardbottom benthic surveys- instrument deployment and recovery |
| 2015-2018 | St. John, US Virgin Islands |
| | <ul style="list-style-type: none">- coral reef benthic cover and fish surveys- acoustic recorder deployment and recovery- surface drifter deployments |
| 2017 | Cuba, Gardens of the Queen reefs |
| | <ul style="list-style-type: none">- acoustic recorder deployment and recovery- hydrophone vertical array measurements |
| 2014-2015 | Curaçao, Carmabi Research Station |
| | <ul style="list-style-type: none">- <i>in situ</i> larval settlement experiments- monitoring instrument deployment and recovery |

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- 2009-2014 Pamlico Sound, North Carolina
- excavation and demographic sampling of oyster reefs
 - hydrophone deployment and recovery
 - fish and benthic sampling, trawls & gillnets

Oceanographic research cruise experience:

- 2018 *R/V Walton Smith*, Coral Chorus: reef soundscapes and recruitment
St. John, USVI, 23 days
- 2017 *R/V Walton Smith*, Rapid response to Hurricane Irma
St. John, USVI, 14 days
- 2017 *M/V Alucia*, Exploring protected Cuban coral reefs
Southern Cuba, 26 days
- 2013 *R/V Hatteras*, Deep-sea mooring deployment cruise
Blake Ridge, Western Atlantic, 6 days
- 2013 *R/V Atlantis*, Deep-sea methane seep collection cruise, ROV Jason
Caribbean Sea (Barbados), 21 days
- 2012 *R/V Savannah*, NOAA Fisheries Survey Cruise
Southeastern US (NC to FL), 14 days

Certifications:

AAUS Scientific Diver, DAN Diver Emergency Medical Provider (CPR & First Aid),
NAUI Rescue Diver, NAUI Nitrox Diver

Laboratory expertise:

- 2019-2021 - coral collections, husbandry, and propagation
- 2015-2018 - microbial ecology seawater sampling
- long-term experimental mesocosms
 - temperature manipulations and monitoring experiments
- 2009-2014 - larval invertebrate (coral) rearing
- small tank acoustic replays
 - particle motion measurements
 - larval settlement tile microscope processing
- 2007-2009 - laboratory flume experiments
- hydrodynamic measurements (acoustic Doppler velocimetry)
 - larval crustacean behavioural observation
 - aquatic animal husbandry

Certifications:

AAUS Scientific Diver, DAN Diver Emergency Medical Provider (CPR & First Aid),
NAUI Rescue Diver, NAUI Nitrox Diver, NC Boater Safety Certification, PADI
Advanced Open Water Diver

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TEACHING & MENTORING EXPERIENCE

Mentoring:

- 2020-2021 Emily Nixon, TNC intern (now at Scripps Institution of Oceanography)
Sophie Cook, TNC intern (now at Scripps Institution of Oceanography)
Kristina Black, UT-Austin PhD candidate (TNC NatureNet Fellow)
Lindsay Dade, University of the Virgin Islands Masters student
Makayla Carino, University of the Virgin Islands undergrad intern
Amanda Boussiere, University of the Virgin Islands undergrad intern
- 2019-2020 Mikayla Barnwell, TNC intern (now University of Hawaii M.S. student)
- 2016-2018 Alexis Earl, guest student, University of Texas
Jason Dinh, summer research fellow, Duke University
Apryle Panyi, guest investigator/graduate student, WHOI
Jessica Perelman, guest investigator/graduate student, WHOI
Martha Clark, high school student, WHOI
Karen Ji, high school student, WHOI
- 2014-2015 Shannon Ricci, M.S. student, North Carolina State University
Jason Peters, M.S. student, North Carolina State University

Teaching:

- 2019 Guest Lecture, SEA Semester Program, St. Croix
- 2017 Guest Lecture, SEA Semester Program, Woods Hole, MA
- 2016 Guest Lecture, WHOI/MIT Joint Program, Woods Hole Oceanographic Institution, Effects of Noise on Aquatic Life
- 2012-2014 Guest Lecturer, North Carolina State University
Biological Oceanography (MEA 449/549)
Marine Biology (MEA 200)
Estuarine and Coastal Ecology (MEA 469)
- 2011-2012 Head Teaching Assistant, North Carolina State University
Biological Oceanography (MEA 449/549)
Department of Marine, Earth & Atmospheric Sciences
* Awarded NCSU Outstanding Teaching Assistant 2011
- 2009-2012 Teaching Assistant/ Lab Instructor, North Carolina State University
Biological Oceanography (MEA 449/549)
Department of Marine, Earth & Atmospheric Sciences

SELECTED MEDIA COVERAGE & PUBLIC OUTREACH

Featured "Nature Changemaker", Change Starts Here: An Earth Day Celebration
<https://www.youtube.com/watch?v=ulzTI861k7A>

Scientific Contributor & Interviewee, New York Times Magazine
<https://www.nytimes.com/interactive/2018/09/21/magazine/voyages-travel-sounds-from-the-world.html>

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Featured Scientist, Fusion Univision documentary “Coral Reefs Last Stand: Cuba”
<https://fusion.tv/video/589477/coral-reefs-last-stand-cuba/>

Scientific Contributor, Music of Reality, “Reef Music” www.musicofreality.com

Contributor, Black Inscription: a multimedia song cycle about our ocean, debuted Jan 2018 (<http://prototypefestival.org/archive/show/black-inscription/>)

“Eavesdropping on Snapping Shrimp Communication”
Oceanus Magazine, January 30, 2017
<http://www.who.edu/oceanus/feature/snap-chat--eavesdropping-on-snapping-shrimp-communication>

“Oh, snap! What snapping shrimp sound patterns may tell us about reef ecosystems”
Science Daily, Jan 14, 2016
<https://www.sciencedaily.com/releases/2016/01/160114163041.htm>

Scientific Contributor, Squidtoons Science Illustrations
<http://www.squidtoons.com/how-oyster-larvae-hear-their-way-home.html>

“NC researcher finds baby oysters drawn to places with reef sounds”
Raleigh News & Observer March 16, 2014
http://www.newsobserver.com/2014/03/16/3696613_what-do-baby-oysters-listen-for.html?rh=1

“Oyster Sounds” California Academy of Sciences Science News Nov. 16, 2013
<http://www.calacademy.org/explore-science/oyster-sounds>

“NC State Researchers Say Oysters Let Sounds Carry Them Home”
North Carolina Public Radio Interview Nov. 6, 2013
<http://wunc.org/post/nc-state-researchers-say-oysters-let-sounds-carry-them-home>

“The reefs are alive with the sound of oysters”
ScienceNews Scicurious Blog Nov. 5, 2013
<https://www.sciencenews.org/blog/scicurious/reefs-are-alive-sound-oysters>

“Oysters Don’t Have Ears But Still Use Sound to Choose Their Homes”
Smithsonian.com Nov. 1, 2013
<http://www.smithsonianmag.com/smart-news/oysters-dont-have-ears-but-still-use-sound-to-choose-their-homes-8117006/?no-ist>

“Oysters Use Sound to Select Their Home, Study Suggests”
Nature World News Oct. 31, 2013
<http://www.natureworldnews.com/articles/4710/20131031/oysters-use-sound-to-select-their-home-study-suggests.htm>

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ACADEMIC SERVICE

Reviewer for the journals:

Science, Scientific Reports, Marine Ecology Progress Series, Journal of Experimental Marine Biology and Ecology, Biofouling, PLOSone, PeerJ, Canadian Journal of Fisheries and Aquatic Sciences, Tropical Conservation Research, Coral Reefs, Marine and Coastal Fisheries, Remote Sensing for Ecology

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|-----------|---|
| 2015-2016 | Postdoctoral Association Representative
Woods Hole Oceanographic Institution |
| 2011 | Chairperson & Founder, Graduate Student Symposium Committee
Marine, Earth & Atmospheric Sciences, North Carolina State
University |
| 2010-2011 | Graduate Student Representative, Faculty Search Committee
Marine Microbial Ecology Assistant Professor, North Carolina State
University |
| 2010-2011 | President, MEAS Graduate Student Association 2010-2011
Marine, Earth & Atmospheric Sciences, North Carolina State
University |
| 2009-2010 | Vice-President, MEAS Graduate Student Association
Marine, Earth & Atmospheric Sciences, North Carolina State
University |
| 2007-2008 | Vice-Chairperson & Treasurer, Biology Graduate Student
Association, Memorial University of Newfoundland |
| 2007-2008 | Graduate Student Representative to Faculty
Biology Department, Memorial University of Newfoundland |
| 2007-2008 | Graduate Student Representative to Academic Council
School of Graduate Studies, Memorial University of Newfoundland |