

Kayelyn Simmons

US Citizen

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Interests

Coral reef fisheries, spatial ecology, ecosystem-based management, Western Atlantic & Caribbean coral reefs

Education

Doctor of Philosophy in Marine, Earth & Atmospheric Sciences
North Carolina State University, Raleigh, NC 08/24/15 – 12/17/22

Graduate Certificate in Geographic Information Systems (GIS)
North Carolina State University, Raleigh NC 08/24/15 – 05/12/18

Master of Science in Marine Biology
Nova Southeastern University, Fort Lauderdale-Davie, FL 08/20/11 – 05/10/14

Bachelor of Science in Marine & Environmental Science
Hampton University, Hampton, VA 08/20/07 – 05/10/11

Employment

Oceanographer, ZP-1360-03 07/18/22 – present
NOAA Atlantic Oceanographic & Metrological Laboratory
Miami, FL, 40hours/week

- Serve as benthic habitat characterization researcher to support AOML's Ocean Chemistry and Ecosystems Division
- Develop a spatial mapping and monitoring program for the Port Everglades Expansion Project to identify thresholds for detrimental impacts via dredging on coral reefs
- Directly support the National Coral Reef Monitoring Program (NCRMP) by participating in field/cruise operations, diver-based surveys and habitat data collection.
- Directly support NCRMP by creating and analyzing 2D and 3D orthomosaics and digital elevation models for assessing spatial and temporal changes in coral reef habitats
- Assist in strategic planning for the US Coral Reef Task Force Coral Disease and Transmission working group
- Strategically identify and build solid rapport with minority serving institutions (MSIs) and Historically Black Colleges and Universities (HBCUs) to better diversify and enhance AOML's recruitment and retention for undergraduate research opportunities

Sea Grant John A. Knauss Marine Policy Fellow 02/01/21 – 01/31/22
NOAA Coral Reef Conservation Program
Supervisor Jennifer Koss, 40hours/week

Research Experience

Serve as co-chair for the US Coral Reef Task Force Steering Committee

- Provide written technical reports/recommendations for congressional inquiries on coral interventions
- Support the implementation of the Coral Program Strategic Plan in partnering states, territories, and US coral reef jurisdictions
- Serve on interagency federal working groups prioritizing coral reef conservation, climate change impacts, ocean acidification, and coastal resilience in the Western Atlantic, Caribbean, Hawaii-Pacific
- Assist in coordination and implementation of science-based strategic plans for watershed coordinators, fisheries liaisons, restoration managers, and coral disease managers
- Provide technical support for National Center for Coastal Ocean Sciences structure-from-motion mapping and place-based restoration efforts
- Communicate and outreach using social media platforms and web stories
- Introductory trainings/workshop: NOAA Financial Workshop (1.0 CLP), ESA Section 7, NEPA

Doctoral Research Assistant

08/24/15 – *12/15/21

**North Carolina State University, Raleigh, NC, Marine Ecology and Conservation Lab,
Major Advisor David Eggleston, Ph.D., 40 hours/week,**

- Doctoral Dissertation: Integrating visual ecological surveys, passive acoustics, and habitat photogrammetry to characterize reef fish assemblages, spawning activity, and resilience among management zones in the Florida Keys National Marine Sanctuary (Zone D)
- Manage, plan, and lead scientific diving plan for coral reef habitat and fish surveys from small vessels (20-25ft)
- Collaborate and communicate scientific information and research results to federal and state agencies (NOAA Coral Reef Conservation Program, Florida Fish & Wildlife Conservation Commission, Florida Keys National Marine Sanctuary) via research proposals, permit applications, manuscripts, grant reports, and partnerships
- Quantify species composition, densities, size/age distribution, habitat associations, and spawning activity of ecologically and economically important reef fish species inside and outside of existing MPAs using eco-acoustic metrics
- Characterize species-specific sounds related to agonistic, feeding, or spawning behavior of sound-producing species
- Develop methods for visual benthic surveys and structure-from-motion photogrammetry
- Create and demonstrate the utility of high-resolution photogrammetric mapping to assess damage and recovery following Hurricane Irma 2017
- Quantify habitat structural metrics and fore-reef composition related to live coral cover, distribution of key foundational reef building coral species
- Provide critical information on changes in reef fish species distribution, habitat associations, ecosystem level responses, and indicators of resiliency following Hurricane Irma 2017

Post Graduate Study Abroad

02/15/14 – 06/01/14

James Cook University, Townsville, Queensland, Australia (unpaid)

- Graduate level courses: Fisheries Science, Conservation Biology, Conserving Marine Wildlife: Sea Mammals, Birds, and Reptiles
- Write monthly blogs for the JCU Connect Study Abroad blog program

Graduate Research Assistant

12/01/11 – 02/01/14

Nova Southeastern University Oceanographic Center, Dania Beach, FL, Fisheries Research Laboratory, Major Advisor David Kerstetter, Ph.D., 40 hours/week, (unpaid)

- Master's Thesis: Evidence for the Enemy Release Hypothesis: Parasites of the Lionfish complex (*Pterois volitans*) in the North Atlantic, Gulf of Mexico and Caribbean Sea (http://nsuworks.nova.edu/occ_stuetd/2/)
- Collected lionfish and ecologically related reef fish species in the snapper-grouper complex via scuba diving
- Collaborated with state, federal, and non-profit agencies to identify removal strategies and collected lionfish specimen donations
- Conducted traditional fish sampling methods (e.g., otolith removal, gonad removal) for reef fish and pelagic species
- Identified and compared lionfish endoparasite fauna to commercially important reef associated fishes via parasitology, histology
- Compared lionfish endoparasite fauna to bioregions in Bermuda, Southeastern United States, Central America, and the Greater Caribbean to assess ecological role of lionfish
- Participated in local billfish tournaments for life history biological sampling of recreationally important pelagic species and science outreach communication
- Participated in outreach and demonstrations of lionfish dissections at local Reef Environmental Education Foundation (REEF) lionfish derbies

Title V Fellowship – US Department of Education

02/01/12 – 02/15/14

Nova Southeastern University Oceanographic Center, Dania Beach, FL, 30hours/week,

- Sorted and identified planktonic invertebrates (Penaeid shrimp) from Gulf of Mexico-Deepwater Horizon Spill
- Co-coordinated and co-lead Graduate Peer Mentorship Program by supporting student recruitment, hosting peer mentorship meetings, developing program reports, and certification workshops (e.g., REEF reef fish identification course, BOEM protected species observer program)

Research Lab Assistant **10/15/10 – 04/20/11**
Virginia Institute of Marine Science, Gloucester, VA, Planktonic and Microbial Process Laboratory,
Major Advisor Kam Tang, Ph.D., 15hours/week,

- Assist Ph.D. candidate in research of bacteria associated zooplankton in the Chesapeake Bay
- Created and maintained media for phytoplankton and zooplankton culturing
- Quantified bacteria associated with copepods using DAPI/Sybr-gold staining
- Aided in microplate reading of phytoplankton and zooplankton cultures

Research Assistant Internship **06/01/10 – 07/31/10**
Rosenstiel School of Marine & Atmospheric Science (RSMAS-UM), Miami, FL, Reef Fish Ecology
Laboratory, Major Advisor Su Sponaugle, Ph.D., 40hours/week (average)

- Project: Spatial and temporal variations in the life history of a coral reef bicolor damselfish (*Stegastes partitus*)
- Otolith removal of juvenile stage bicolor damselfish
- Measured and compared larval and juvenile growth, size-at-age, and pelagic larval duration for bicolor damselfish collected monthly in the Upper and Middle Florida Keys
- Boat tender for diver collection fieldwork surveys

Research Assistant Internship **06/01/09 – 08/05/09**
Monterey Bay Aquarium Research Institute (MBARI), Monterey Bay, CA, Video Lab, Major
Advisor Susan Von Thun, M.S., 40hours/week (average)

- Project: Observations of the egg cases from the holopelagic polychaete family: Tomopteridae
- Identify Tomopteris sp. egg cases from AUV/ROV video footage using MBARI's Video Annotation Reference System
- Vessel time at sea on the R/V Point Lobos during Monterey Canyon deep-sea exploration trips

Research/Lab Assistant **01/05/08 – 04/30/11**
Hampton University, Hampton VA, Funded by Living Marine Resources Cooperative Science
Center (LMRCSC-NOAA), 20hours/week,

- Collected juvenile migratory fish and invertebrate species native to Chesapeake Bay using seine net tows and traps
- Developed and managed husbandry techniques for saltwater fish tanks and turtle terrarium

Publications

Simmons, K.R., Bohnenstiehl, D.R., Eggleston, D.B. 2022. "Spatiotemporal variation in coral assemblages and reef habitat complexity among shallow fore-reef sites in the Florida Keys National Marine Sanctuary." *Diversity*, 14:153. [Doi:10.3390/d14030153](https://doi.org/10.3390/d14030153)

Simmons, K.R., Eggleston, D.B., Bohnenstiehl, D.R. 2021. "Hurricane impacts on a coral reef soundscape." *PLoS ONE*, 16:e0244599. [Doi:10.1371/journal.pone.0244599](https://doi.org/10.1371/journal.pone.0244599)

Carr H, Abas M, Boutahar L, Caretti ON, Chan WY, Chapman A, Mendonca, Engleman A, **Simmons K.R.,** Verdura J, Zivian A & Ferrario F. 2020. "The Aichi Biodiversity Targets: Achievements for marine conservation & priorities beyond 2020". *PeerJ*, 8:e9743. [Doi:10.7717/peerj.9743](https://doi.org/10.7717/peerj.9743)

Selected Presentations

Simmons, K.R. Oral presentation. Hurricane impacts on a coral reef soundscape. Southeast Climate Adaptation Science Center – Global Change Seminar Lightning Talk. Raleigh NC. Sept 2019

Simmons, K .R., Bohnenstiehl D., Eggleston, D. Oral presentation. How did Hurricane Irma affect the underwater soundscape in the Florida Keys? Association for the Sciences of Limnology & Oceanography (ASLO) Conference San Juan, Puerto Rico. Feb 2019

Simmons, K.R., Bohnenstiehl, D., Eggleston, D. Oral presentation. Evaluating the Efficacy of Management Zones in the FKNMS: Integrating Visual Surveys, Habitat Data, and Passive Acoustics to Monitor Reef Fish Assemblages and Spawning Activity. World Conference for Marine Biodiversity (WCMB), Montreal, Quebec Canada, May 2018.

Certificates & Skills

Certifications: NOAA Financial Assistance, Remote sensing & mapping for coral reef conservation, AAUS Scientific Diver (depth rating 100ft), DAN Diving First Aid for Professional Divers (DFA Pro) course, PADI Advanced Open Water, PADI Nitrox, First Aid/Emergency O₂, PADI Rescue, Protected Species Observer Geo-Marine Inc. (License BOEM/BSEE NTL), Florida Boater Safety course, North Carolina Boater Safety course

Technical Skills: grant/permit writing, Captain/trailer small vessels (30ft), scuba diving (100ft), reef visual census survey (South Florida/Caribbean species), characterize biological acoustics, 3D reef mapping, underwater photography, biological sampling and otolith removal of reef & pelagic fish species, age & growth of reef & pelagic fish species (staining), biological sampling of stranded cetaceans, sorting & identifying planktonic vertebrates & invertebrates, plankton culturing, DAPI/Sybr-gold staining, microplate reading stock assessment, benthic video annotation, PCR preparation, stable isotope preparation, fisheries husbandry, seine netting, hook and line, conversational spoken language in Spanish and Portuguese

Computer Skills: Metashape Agisoft Photoscan, ArcGIS, MATLAB, SPSS, R, Primer-E, Marxan Spatial Planning, Adobe Illustrator & Premiere, MS Office (Word, PowerPoint, Excel)

Grants, Fellowships, Awards

Sea Grant John A Knauss Marine Policy Fellowship (\$45/year)	2021
NCSU Dissertation Completion Grant (\$10k/6-months)	2020
NOAA Coral Reef Conservation Program Grant (\$72k)	2018-2019
NCSU Augustus M. Witherspoon Graduate Scholarship (\$1k/year)	2017-2020
NCSU GSA Travel Assistance Award (\$500)	2018
NCSU Ebony Harlem Award Graduate Student Outstanding Research Award	2018
NC Diversity Enhancement Grant (\$1k)	2017
NCSU Teaching Assistant Fellowship (\$25k /year)	2015-2019
Presidents Faculty R&D Grant (NSU)	2012-2014
Title V Grant Fellowship US Dept Education (\$23k/year)	2012-2014

Leadership Experience

Graduate Representative, NCSU Multicultural Student Affairs	2016-2020
Lead Marine Counselor, Exploring the Earth Science Summer Camp (10 th -12 th grade)	2017-2019
Vice President, NCSU Black Graduate Student Association	2017-2018
Social Media Ambassador, NCSU College of Sciences	2017-2018
Secretary, NCSU Student Fisheries Society	2016-2017

Teaching Experience

MEA 210 Introduction to Oceanography Lab	2017-2019
MEA 200 Introduction to Oceanography Lecture (online)	2016
MEA 100 Introduction to Earth Science Systems Lab	2015-2016

Community Outreach & Science Communication

Coral Restoration Volunteer, Capítulo Estudiantil de la Sociedad Ambiente Marino (CESAM), San Juan, Puerto Rico	2019
○ Recover and restore fragmented corals <i>Acropora palmata</i> and <i>A. prolifera</i>	
Coordinator/Presenter, “Coral Reef Soundscape Block Party”, Divers Direct, Key West, FL	2018
○ Collaborative public outreach event with Divers Direct, NOAA-CRCP, NOAA-FKNMS, The Nature Conservancy, a local DJ, and local Key West dive shops	
“Chasing Coral” Panelist, UNC Chapel Hill	2018
○ Participated in review panel hosted by the Citizens Climate Lobby-Triangle NC Chapter	
Fish Dissection Volunteer, Shad in the Classroom (k-6 th grade), Raleigh NC	2017-2018
○ Led and supervised fish dissections	
○ Presented on the importance of life history traits in fish reproduction	
Necropsy Volunteer, Marine Mammal Stranding NC Central Coast Network	2016
○ Assisted with bottlenose dolphin <i>Tursiops truncatus</i> necropsy and biological tissue sampling	

Necropsy Volunteer, South Florida Marine Animal Rescue Society

2012-2014

- Assisted with marine mammal stranding events, necropsies, and biological tissue sampling for pygmy sperm whale *Kogia breviceps* and pilot whales *Globicephala sp.*
- Mediated and educated public bystanders on general marine mammal knowledge and conservation