Steven M. Lombardo, Ph.D.

Marine Ecologist
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GitHub Research Page • LinkedIn

EDUCATION

2022 Ph.D. Florida Atlantic University
Integrative Biology—Marine Science and Oceanography
Resolving knowledge gaps in bonefish habitat conservation across Florida and The Bahamas

2018 M.S. North Carolina State University
Fisheries, Wildlife, and Conservation Biology; Geospatial Information Sciences (minor)
Phenological characterization & effects of environmental attributes on river herring spawning migrations within the Albemarle Sound watershed

2012 B.S. The University of Akron
Biology

PROFESSIONAL SUMMARY

Marine Ecologist & Spatial Modeler with 10+ years of experience combining field research and ecological/geospatial modeling to support marine resource management, protected area designations, fisheries management plans, and environmental impact assessments across the Atlantic Seaboard and Caribbean. Multi-disciplinary scientist skilled at integrating diverse data and literature syntheses, acoustic telemetry, species distribution and habitat connectivity modeling, and Traditional Ecological Knowledge (TEK/LEK) into decision-support tools for stakeholders including ONMS, BOEM, state agencies, conservation organizations, and fishing guides. Proficient in R, Python, ArcGIS, and SQL for automating workflows, advancing species–environment analyses, and improving efficiency in data quality assurance and processing. Recognized for delivering science-based recommendations that achieve sustainable use while safeguarding ecological integrity.

SKILLS

Marine Spatial Planning
- Data and information inventory and synthesis
- Impact and species-activity interaction assessments
- Siting optimization and impact minimization decision support for Environmental Impact Assessments (i.e., ports, channels, vessel traffic, energy leases)
- Hindcast and projection modeling

Technical Expertise
- GIS automation (Python, ArcPro, R), remote sensing, raster/image processing, deep learning classification
- Statistical & predictive modeling (GAM, Machine Learning, GBM, GLMM, ARIMA)
- Oceanographic & hydrodynamic modeling (Ichthyop, MATLAB)
- Marine operations safety (DOI & NASBLA Motorboat Operator, DAN DEMP, OSHA 10)
- Acoustic telemetry studies (Vemco/Innovasea)
- Hydrographic and benthic surveys

Stakeholder & Regulatory Engagement
- Traditional/local ecological knowledge (TEK/LEK) trust building, co-production, and modeling
- Multi-agency collaboration and research permitting (NOAA, BOEM, state/federal, NGO, academic)
- Science translation, messaging, graphic design, and communication for media and communities

Publications, Communications, & Media
- Peer Reviewed Journal Articles: 14
- Agency & Professional Reports: 4
- Oral Presentations & Posters: 13 & 3
- Media & Magazine Pieces: 6

PROFESSIONAL EXPERIENCE

Quantitative Ecologist / Spatial Modeler **• August 2024–Present**

CSS, Inc contracted to NOAA National Centers for Coastal Ocean Science • Silver Spring, MD

Objective: Use spatial and quantitative modeling to evaluate and address ecological distribution and management questions in marine spatial planning, supporting end-user goals that include spatial conservation, wind energy siting, and resource accessibility.

Duties/Work Performed:

- NCCOS modeling representative for the NOAA Changing Ecosystems & Fisheries Initiative (CEFI) decision support team
- Formed collaborative networks to compile and integrate 25+ biological, fisheries-independent and -dependent data, bathymetric, hydrodynamic, and human dimensions datasets, to develop explanatory models characterizing species communities, distributions, and vulnerabilities for the Hudson Canyon NMS climate-forward assessment and BOEM siting analyses. Collaborators include NEFSC, MAFMC, NEFMC, GARFO, WHOI, UCSB, TNC, and SIO
- Authored sections of biogeographic and marine spatial planning assessments in support of ONMS and BOEM
- Provided expertise in acoustic telemetry tagging and array servicing for Chesapeake Bay climate study
- Serve on review panel for NCCOS Regional Ecosystem Research Program ($4 million granting)
- Public Trust Security Clearance

Data Scientist **•** ***August 2021–Present***

Freelance • Remote

Objective: Provide statistical and geospatial analysis for environmental, maritime, and technical applications

Duties/Work Performed:

- Modeled vessel capsizing event using forensic spatial analysis; produced expert testimony and map products used in legal proceedings (OceanStudies LLC)
- Analyzed long-term water quality time series for EPA wastewater litigation, producing defensible statistical reports relevant to regulatory compliance monitoring (Friends of the Lower Keys)

Post-doctoral Researcher **• May 2022–April 2024**

Bonefish & Tarpon Trust • Remote/Miami, FL

Objective: Develop a benchmark assessment for the spatial decline of the FL Keys tarpon fishery and apply quantitative modeling techniques to identify drivers of decline and develop mitigation strategies to state and federal agencies. Additional spatial planning studies.

Duties/Work Performed:

- Co-produced 200+ confidential, spatially explicit fishing activity maps through semi-structured interviews with fishing guides, integrating traditional/local ecological knowledge (TEK/LEK)
- Author and communicate scientific concepts and products to diverse stakeholder groups through speaking engagements, print, social media, television, and peer-reviewed articles
- Developed automated Python scripts in ArcPro/Jupyter Notebooks to georeference stakeholder-drawn maps, convert to classified rasters, and quantify temporal-spatial changes using geostatistical grids
- Synthesized and QA/QC over 100 environmental and infrastructure datasets from diverse sources, creating comprehensive habitat risk assessment GIS layers
- Applied gradient boosted regression models (R) to TEK/LEK timeseries, identifying ecological drivers and guiding spatially targeted management recommendations for vessel navigation aids
- Served as organizational GIS Administrator managing ArcGIS Online systems, database standardization, and stakeholder data dissemination for evidence-based habitat management decisions
- Designed and conducted an acoustic telemetry study in Eleuthera, The Bahamas, confirming no spatial conflict between cruise vessel port siting and a Bonefish spawning aggregation

Doctoral Research Assistant **• June 2018–April 2022**

Florida Atlantic University • Fort Pierce, FL

Objective: Produce novel insights and evaluate spatial conservation strategies for the declining Bonefish population through discoveries describing essential fish habitat—spawning, larval, nursery.

Duties/Work Performed:

- Mapped nearshore and offshore essential fish spawning habitats by executing acoustic telemetry (Vemco/Innovasea) with physical oceanography surveys, supporting spatial protection policies
- Assessed the protection capacity of the Bahamas MPA network by developing and validating ocean circulation and larval transport models (MATLAB, Ichthyop), identifying connectivity gaps and priority protection zones
- Led offshore and remote-location survey operations, overseeing data QA/QC, SOP development, and permitting to ensure compliance with federal, state, and international research regulations
- Modeled juvenile Bonefish nursery habitat distributions in Florida using long-term fisheries-independent monitoring datasets (R, ArcGIS, Python, SQL Server), producing spatial layers to guide protections
- Author and communicate scientific concepts and products to diverse stakeholder groups through speaking engagements, print, social media, television, and peer-reviewed articles

Master Research & Teaching Assistant / Technician **• August 2015–May 2018**

NC State University & NC Division of Marine Fisheries • Morehead City, NC

Objective: Evaluate impacts and provide mitigation advice for climatological, environmental, and anthropogenic impacts on highly-protected North Carolina River Herring populations.

Duties/Work Performed:

- Developed custom ArcGIS Python tools to automate NC Division of Marine Fisheries data analysis and generate standardized reports
- Conducted habitat connectivity and migration analyses using ArcGIS Network Analyst with USGS hydrography data, identifying climate impacts on migration and spawning, no impacts of infrastructure
- Applied statistical modeling in R and Python to assess fish distribution and habitat condition relationships, producing a report that informed state-level management of fishing moratoria
- Coordinated multi-site field sampling using gillnets and water quality instruments, ensuring compliance with federal and state monitoring protocols

Creel Clerk **• October 2014–July 2015**

Ohio Department of Natural Resources Division of Wildlife • Sandusky, OH

- Collected and verified recreational fishing effort, harvest, and resource-use data for incorporation into Lake Erie sport fish stock assessments
- Produced standardized daily data entries and reports that directly informed annual fisheries management decisions
- Served as primary public-facing representative on-site, providing science-based regulatory and management information to anglers and community members

Wet / Radiological Chemist & Field Technician **• October 2012–October 2014**

Summit Environmental Technologies Inc. • Cuyahoga Falls, OH

- Conducted chemical and radiological analyses of water, soils, and industrial byproducts, ensuring compliance with EPA and NELAC regulatory standards
- Coordinated with regulators and clients to maintain accurate sampling schedules, methods, and deliverables
- Developed SOPs and QA/QC protocols that improved analytical accuracy and reduced reporting time.

ASSISTED RESEARCH

- Bonefish & Tarpon Trust / FAU Bonefish Reproduction Study • 2018–2022 • The Bahamas
- FAU HBOI Elasmobranch Survey • 2018–2020 • Florida
- FAU HBOI Artificial Reef Survey • 2018 • Florida
- NOAA NMFS Southeast Fisheries Independent Survey 25 days at sea • 2016 & 2017 • US Atlantic
- Big Rock Blue Marlin Tournament scientific sampling • 2016 & 2017 • North Carolina
- NCSU Effects of Invasive Tilapia on Sportfish Study • 2015 • North Carolina

PUBLICATIONS

Farmer NA, et al. *Accepted 2025*. Long-term random sampling confirms high-use areas and indicates declining abundance of juvenile smalltooth sawfish (*Pristis pectinata*) in Charlotte Harbor. *Scientific Reports*.

Krogman RM, et al. *Awaiting Release*. Role of recreational fisher information in fisheries management. In *Understanding Recreational Fishers*. Pope K, Arlinghaus R, Hunt L, Lynch A, and van Poorten B eds. Wiley, New York, NY

Thurman MA, **Lombardo SM**, et al. *Accepted 2025*. Biofluorescence as a tool to resolve crypsis in two bonefish species, *Albula goreensis* and *Albula vulpes*, with comments on other external morphology. *Journal of Fish Biology*.

Lombardo SM, et al. 2025. Evaluation of juvenile bonefish (*Albula* spp.) habitat preferences in tropical and subtropical Florida. *Marine and Coastal Fisheries*. doi: 10.1093/mcfafs/vtaf003

Adams AJ, et al 2024. Stakeholder engagement as a core component of marine fisheries knowledge, research, conservation, education, and advocacy. doi: 10.1002/fsh.11166

Lombardo SM, et al. 2024. Assessing historical shifts in the Lower Keys Tarpon fishery. A report for Bonefish & Tarpon Trust. Link

Rudershausen PJ, **Lombardo SM**, et al. 2023. *MEPS*. Relating absolute abundance of an estuarine fish to habitat area in an urbanizing environment. doi: 10.3354/meps14387

Cahill BV, et al. 2023. Visitation patterns of two ray mesopredators at shellfish aquaculture leases in the Indian River Lagoon, Florida. *PLOS ONE*. doi: 10.1371/journal.pone.0285390

Lombardo SM, et al. 2022. Biophysical larval dispersal models of observed bonefish (*Albula vulpes*) spawning events in Abaco, The Bahamas: An assessment of population connectivity and ocean dynamics. PLOS ONE. doi: 10.1371/journal.pone.0276528

Boucek R, et al. 2022. Using recreational tournament records to construct a 52-year time-series of the Florida Keys recreational Bonefish fishery. *Env Biol Fish*. doi: 10.1007/s10641-022-01299-5.

Lombardo SM. 2021. Assessment of trends in Marathon coastal water nutrient concentrations and EPA target compliance within the Florida Keys National Marine Sanctuary. A report for Friends of the Lower Keys (FOLKS). Link

Rudershausen PJ, **Lombardo SM**, et al. 2021. Linking historical changes in salt marsh coverage to lost production of a nektonic bioindicator. *Mar Coast Fish* 13:131–139. doi: 10.1002/mcf2.10147.

Lombardo SM, et al. 2019. Evidence for temperature-dependent shifts in spawning times of anadromous alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*). *Can J Fish Aqaut Sci*. doi: 10.1139/cjfas-2019-0140.

Rudershausen PJ, et al. 2019. Survival and habitat of yellow-phase American eels *Anguilla rostrata* in North Carolina tidal creeks. *Trans Am Fish Soc*. 148(5): 978-990. doi: 10.1002/tafs.10190.

Marks C, **Lombardo SM**, et al. 2012. The influence of ontogenetic dietary fluctuations on zebrafish size and swimming performance. *Front Physio.* 3:310. doi: 10.3389/fphys.2012.00310.

PRESENTATIONS & POSTERS

Gulf and Caribbean Fisheries Institute Conference • 2023
The Society for Integrative and Comparative Biology • 2022
Bonefish and Tarpon Trust International Science Symposium & Flats Expo • 2022
Florida Atlantic University Symposia • 2021, 2020, 2019, 2018
American Fisheries Society National Meeting • 2020, 2019, 2018, 2017
Virginia Alosa Task Force Meeting • 2017
American Fisheries Society Tidewater Chapter • 2017
American Fisheries Society North Carolina Chapter • 2017

MENTORSHIP

Mason Thurman • Sophomore–Senior • Florida Institute of Technology • 2019–2021
Project: Determining juvenile bonefish benthic habitat preference using mesocosms
Current Position: Ph.D. student Clemson University

AWARDS & SCHOLARSHIPS

- Guy Harvey Fellowship • 2021 • Marine science innovation and conservation leadership
- FAU Hardship & Cares Scholarships • 2021 • Academic achievement under challenging conditions
- FAU Three Minute Thesis & Symposia • 2021 • Excellence in science communication to broad audiences
- American Fisheries Society Best Student Paper • 2020 • Research quality and presentation skills
- American Fisheries Society Travel Awards • 2016, 2017, 2018 • Contributions of impactful research

MEDIA, PRINT, INTERVIEWS, & CONTRIBUTED PIECES (SELECTED)

Featured in national and international outlets for applied marine science, stakeholder engagement, and conservation communication, translating technical research for diverse audiences and public engagement.

- National Geographic, Hatch Magazine, 10 outlets via FAU — Coverage of bonefish spawning and conservation research
- Bonefish & Tarpon Trust Journal — Multiple authored and edited articles on habitat research and fisheries conservation (2019–2023; example writer/editor "Tracking the Next Generation")
- Television — Featured on Silver Kings (Conservation Minute segment)
- Public Outreach — Live Q&A sessions and blog posts on fisheries science, conservation policy, and stakeholder-driven research

JOURNAL REVIEWER

Canadian Journal of Fisheries and Aquatic Sciences, Environmental Biology of Fishes, Fisheries Bulletin, Marine Ecology Progress Series, Transactions of the American Fisheries Society, Scientific Reports