Brandyn M. Lucca

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Research Interests

Theoretical acoustic scattering models representing typically observed taxa in the water column. Using various remote sensing, statistical, and machine learning methods to automate the classification of habitats and biological community composition in the water column.

Education

Stony Brook University, Stony Brook, NY **Ph.D.**, Marine and Atmospheric Science, GPA 3.96	**2017-2023**
Stony Brook University, Stony Brook, NY **M.Sc.**, Marine and Atmospheric Science, GPA 4.00	**2014-2016**
University of Rhode Island, Kingston, RI **B.Sc.**, Marine Biology, GPA 3.72	**2009-2012**

Academic Experience

Postdoctoral Scholar Applied Physics Laboratory, University of Washington	**2023-present**
Research/Graduate Assistant School of Marine and Atmospheric Sciences, Stony Brook University	**2014 - 2023**
Coastal Fellow College of the Environment and Life Sciences, University of Rhode Island	**2010**

Publications

Lee W., Staneva, V., Setiawan, L., Mayorga, E., Tuguinay, C., Butala, S., **Lucca, B.M.**, and Lei, D. 2024. Echostack: A flexible and scalable open-source software toolbox for echosounder data processing. Proc Python Sci Conf, 386-397. https://doi.org/10.25080/WXRH8633

Lucca B.M. and Warren J.D. 2024. Experimental target strength measurements of pteropods and shrimp emphasize the importance of scattering model inputs. ICES J Mar Sci, 81: 1345-1361. https://doi.org/10.1093/icesjms/fsad211

Lucca B.M., Ressler P.H., and Warren J.D. 2023. Individual sub-Arctic target strength measurements have frequency-dependent differences relative to scattering model predictions. J Acoust Soc Am, 154: 3374-3387. https://doi.org/10.1121/10.0022459

Besnard L., **LuccaB.M.**, Shipley O.N., Croizier G.L., Octavio Rincon R.O.M., Sonke J., Point, D., Galván-Magaña F., Kraffe, E., Kown S.Y., and Schaal, G. 2023. Mercury isotope clocks predict coastal residency and migration timing of hammerhead sharks. J Anim Ecol, 60: 803-813. https://doi.org/10.1111/1365-2664.14384

Lucca B.M., Ressler P.H., Harvey H.R., and Warren J.D. 2021. Variations in sub-Arctic krill material properties, lipid composition, and other scattering model inputs affect acoustic estimates of their population. ICES J Mar Sci, 78: 1470-1484. https://doi.org/10.1093/icesjms/fsab045

Lucca B.M. and Warren J.D. (2019). Fishery-independent estimates of Atlantic menhaden (*Brevoortia tyrannus*) in the coastal waters south of New York. Fish Res, 218: 229-236. https://doi.org/10.1016/j.fishres.2019.05.016

Lucca B.M. and Warren J.D. (2018). Acoustically-measured distribution and abundance of Atlantic menhaden (*Brevoortia tyrannus*) in a shallow estuary in Long Island, N.Y. Estuaries Coast, 41: 1436-1447. https://doi.org/10.1007/s12237-018-0367-x

Papers in Preparation	**Lucca B.M.**, Ressler, P.H., and Warren J.D. *Target strength models for North Atlantic and Pacific pelagic fish and squid demonstrate strong agreement with validation experiments*. **Lucca B.M.**, Warren J.D., *et al. Scattering properties and validated target strength models specific for mesopelagic fish from the Northwest Atlantic*. **Lucca B.M.**, Warren J.D., Keiling, T.D., *et al. Quantifying spatiotemporal distributions of fish and zooplankton in the New York Bight using active acoustics*. Warren J.D. and **Lucca B.M.** *Species-specific material property and experimental broadband backscatter measurements can improve target strength models of California Current euphausiids*.

Conference Talks (** indicates speaker*)	**Lucca, B.M.*** and Warren, J.D. *Active acoustic detection of fish and zooplankton along bathymetric features of the New York Bight*. 188th Meeting of the Acoustical Society of America (ASA). New Orleans, LA, May 2025. Lee, W.*, Staneva, V., Tuguinay, C., Butala, S., and **Lucca, B.M.** *Building towards high-throughput information processing in fisheries and plankton acoustics*. 188th Meeting of the Acoustical Society of America (ASA). New Orleans, LA, May 2025. **Lucca, B.M.***, Lee, W., Thomas, R., Billings, A., Phillips, E., and Clemons, J. *Echopop: An open-source software package for acoustics-based population estimates and biological inversion*. Annual Meeting of the ICES Working Group on Fishing Technology Fisheries, Acoustics, Science and Technology (ICES WGFAST). Hafnarfjörður, Iceland, April 2025. Lee, W.*, Staneva, V., Butala, S., Tuguinay, C., **Lucca, B.M.**, Phillips, E., Billings, A., and Clemons, J. *Transforming raw acoustic and trawl data into biological information using an end-to-end, crossplatform data processing pipeline*. Annual Meeting of the ICES Working Group on Fishing Technology Fisheries, Acoustics, Science and Technology (ICES WGFAST). Hafnarfjörður, Iceland, April 2025. Lee, W.*, Staneva, V., Setiawan, L., Mayorga, E., Butala, S., Lei, D., **Lucca, B.M.**, and Tuguinay, C. *Echostack: An open-source Python software toolbox that democratizes water column sonar data and processing*. 23rd Annual SciPy Conference. Tacoma, WA, July 2024. Warren J.D.*, Keiling, T.D., Carlowicz, R.M., Escalante, M., Costante, D., **Lucca, B.M.**, and Blair, H.B. *Trading space for time: What are the opportunities (and challenges) when we replace (or combine) vessel-based sampling with long-duration, fixed-location measurements?* ICES-PICES 7th International Zooplankton Production Symposium. Hobart, Tasmania, Australia, March 2024. Warren J.D.*, **Lucca B.M.**, Escalante M., and Lyons A.P. *A year in the life of zooplankton and fish in the Gulf of Maine: Long (and short) term monitoring of pelagic organisms using bottom-mounted, upward-looking, multifrequency echosounders*. Underwater Acoustics International Conference and Exhibition. Kalamata, Greece, June 2023. Warren, J.D.* and **Lucca B.M.** *Material properties and broadband backscatter measurements* of *individual euphausiids from the California Current coastal ecosystem*. 184th Meeting of the Acoustical Society of America (ASA). Chicago, IL, May 2023. **Lucca B.M.*** and Warren J.D. *One size does not fit all: experimental target strength measurements of pteropods and shrimp emphasize the importance of scattering model inputs*. ICES Fisheries and Plankton Acoustic Symposium (ICES WGFAST). Portland, ME, March 2023. **Lucca B.M.***, Keiling T.D., and Warren J.D. *Active acoustic surveys of fish and zooplankton in the New York Bight*. 57th Annual Meeting of the New York Chapter of the American Fisheries Society (NYCAFS). Stony Brook, NY, February 2023. **Lucca B.M.***, Lyons A.P., and Warren J.D. *Variability in zooplankton and fish abundance in the Wilkinson Basin from Feb 2021 to Jan 2022 as measured by a multi-frequency bottom–mounted*

	echosounder. Regional Association for Research on the Gulf of Maine Annual Science Meeting. Online, December 2022. **Lucca B.M.***, and Warren J.D. *Experimentally validated target strength models for northwest Atlantic mesopelagic fish*. Northeast Regional Environmental Acoustic Symposium. Dover, NH, May 2022. Keiling T.D.*, Blair H.B., **Lucca B.M.**, Heywood E.I., Menz T.C., and Warren J.D. *Active acoustics, net tows, and fish trawls: Monitoring the offshore ecosystem of the New York Bight*. 56th Annual Meeting of the New York Chapter of the American Fisheries Society (NYCAFS). Riverhead, NY/Online, February 2022. Besnard L.*, Shipley O.N., **Lucca B.M.**, Croizier G.L., Sonke J., Galván-Magaña F., Kraffe E., Point D., Rincon R.O.M., Ketchum J., and Schaal G. *Mercury isotope clocks estimate dispersal timing from natal area in hammerhead shark species*. 24th Meeting of the European Elasmobranch Association (EEA). Leiden, Netherlands, November 2021. Miksis-Olds J.*, Warren J.D., Blair H.B., and **Lucca B.M.** *Atlantic deepwater ecosystem observatory network: Patterns of acoustic backscatter and community structure of the U.S. Outer Continental Shelf*. 180th Meeting of the Acoustical Society of America (ASA). Online, June 2021. **Lucca B.M.***, Blair H.B., and Warren J.D. *Seasonal variations in multi-year active acoustic surveys of fish and zooplankton in the New York Bight*. 180th Meeting of the Acoustical Society of America (ASA). Online, June 2021. Warren J.D.*, **Lucca B.M.**, and Blair H.B. *Development of a pelagic zooplankton and nekton acoustic survey in the New York Bight*. Annual Meeting of the ICES Working Group on Fishing Technology Fisheries, Acoustics, Science and Technology (ICES WGFAST). Online, April 2021. Warren J.D.*, Blair H.B., and **Lucca B.M.** *Pelagic fish and zooplankton abundance and distribution in the New York Bight*. State of the Science Workshop on Wildlife and Offshore Wind Energy 2020: Cumulative Impacts. Online, November 2020. Ressler P.H., Warren J.D.*, **Lucca B.M.**, Harvey H.R., and Gibson G.A. *How many krill are there in the eastern Bering Sea and Gulf of Alaska?* Alaska Marine Science Symposium (AMSS), Anchorage, AK, January 2019. Ressler P.H.*, Warren J.D., **Lucca B.M.**, Harvey H.R., and Gibson G.A. *How many krill are there in the eastern Bering Sea and Gulf of Alaska?* Interim Report of the Working Group on Fisheries Acoustics, Science, and Technology (ICES WGFAST). Seattle, WA, March 2018. **Lucca B.M.***, Blair H., and Warren J.D. *Acoustic quantification of abundance, biomass, and size class of Atlantic menhaden (Brevoortia tyrannus) in a shallow estuary in Long Island, New York*. 173rd Meeting of the Acoustical Society of America (ASA). Boston, MA, June 2017. **Lucca B.M.***, Martin S.*, and Gordon W. *The application of planning, design, and other spatial/seascape concepts within spatial management*. University of Rhode Island (URI) Honors Undergraduate Research Conference. Kingston, RI, May 2012.
Conference Posters (** indicates speaker)*	Warren J.D.*, **Lucca B.M.**, Escalante M., and Lyons A.P. *Long- and short-term temporal changes in multiple trophic levels of pelagic organisms (zooplankton, nekton, and maybe more) in the Gulf of Maine as measured by bottom-mounted, upward-looking, multiple-frequency, broadband echosounders*. Ocean Sciences Meeting. New Orleans, LA, February 2024. Warren J.D.* and **Lucca B.M.** *Species specific material property measurements improve the agreement of experimental measurements and scattering model predictions of krill target strength*. ICES Fisheries and Plankton Acoustic Symposium. Portland, ME, March 2023. Keiling T.D.*, Blair H.B., **Lucca B.M.**, Carlowicz R.M., Heywood E.I., Menz T.C., and Warren J.D. *From baby fish to large pelagics: Gathering baseline data for offshore fish and zooplankton in the*

	New York Bight. 57th Annual Meeting of the New York Chapter of the American Fisheries Society (NYCAFS). Stony Brook, NY. February 2023. Warren J.D.*, Keiling T.D., Blair H.B., **Lucca B.M.**, Carlowicz R.M., and Leone M. *Monitoring surveys of pelagic fish and zooplankton in the New York Bight*. NYSERDA State of the Science Workshop on Wildlife and Offshore Wind Energy. Tarrytown, NY, July 2022. **Lucca B.M.*** and Warren J.D. *Measuring abundance, biomass, and distribution of fish using active acoustics in the coastal waters of Long Island, New York."* Northeast Regional Environmental Acoustics Symposium, Brown University, Providence, RI. May 2019. **Lucca B.M.***, Warren J.D., Ressler P.H., Harvey H.R., and Gibson G.A. *An improved target strength model for sub-Arctic krill validated by ship-board backscatter and material property measurements from individual animals*. Alaska Marine Science Symposium. Anchorage, AK, January 2019. Harvey H.R.*, Warren J.D., Ressler P.H., Gibson G.A., **Lucca B.M.**, McMahon R., and Pleuthner R. *Target strength calibration through parallel measures of intact lipid classes and acoustic profiles of individual euphausiids*. Alaska Marine Science Symposium. Anchorage, AK, January 2019. Warren J.D.*, **Lucca B.M.**, Ressler P.H., Harvey H.R., and Gibson G.A. *How many krill are there in the Bering Sea and Gulf of Alaska? Field observations and acoustic calibration of krill and their composition in 2016 and 2017*. Alaska Marine Science Symposium. Anchorage, AK, January 2018. Warren J.D.*, Ressler P.H., Harvey H.R., Gibson G.A., and **Lucca B.M.** *How many krill are there in the Bering Sea and Gulf of Alaska? Preliminary field observations from summer 2016 and implications for ecosystem-wide measurements*. Alaska Marine Science Symposium. Anchorage, AK, January 2017. **Lucca B.M.*** and Warren J.D. *Acoustic measurements of the distribution and abundance of Atlantic menhaden (Brevoortia tyrannus) in the Peconic River and Estuary in Long Island, NY*. 50th Annual Meeting of the New York Chapter of the American Fisheries Society (NYCAFS). Cooperstown, NY, February 2016. **Lucca B.M.*** and Rynearson T. *The rate of growth in Thalassiosira rotula and Thalassiosira gravida as a result of phosphorus limitation*. URI Coastal Fellows Presentation. Kingston, RI, December 2010.

Technical Reports & Book Chapters	Baggeroer A.B. and **Lucca B.M.** Sonar Systems. In: *Encyclopedia of Ocean Sciences* (Third Edition), edited by JH Steele, Academic Press, 2019. Urmy S.S., **Lucca B.M.**, Blair H., and Warren J.D. (2017). *Seafloor habitat characterization around Montauk Point*, submitted to Seatuck Environmental Association, pp. 1-57.

Open Source Software	**echopop** A Python library designed to combine active acoustic and biological datasets to estimate spatiotemporal distributions of fish abundance and biomass. https://github.com/OSOceanAcoustics/echopop	**2024-present**
	isoclockR R-package for empirically residence time of animal tissues using stable and bulk isotope samples. When turn-over rates of tissues are known, empirical residence time estimates can be modeled to infer migrations of different organisms. https://github.com/brandynlucca/isoclockR	**2021-present**
	soundshapes Matlab-compiled software for extracting various animal morphometrics from digital photographs important for parameterizing theoretical scattering models. https://githhub.com/brandynlucca/soundshapes	**2020-2021**

	acousticTS R-package consisting of physics-based and analytical models, approximation methods, and exact solutions used for calculating the theoretical target strength (TS) of different scatterers (e.g. fish with gas-filled swimbladders). https://github.com/brandynlucca/acousticTS	**2018-present**
Teaching	**Instructor, University of Washington eScience Institute** Software Carpentry Workshop: Building Programs with R	**2024-present**
	Teaching Assistant, University of Washington eScience Institute Software Carpentry Workshop: Version Control with Git, Building Programs with R	**2024-present**
	Guest Lecturer, Stony Brook University Bioacoustics (MAR 395) Long Island Marine Habitats (MAR 303)	**2014-2023**
	Teaching Assistant, Stony Brook University Supervised boat-based field labs aboard the *R/V Shinnecock*, *R/V Paumanok*, and *R/V Peconic*, and additional land-based activities; led computer labs; A/V troubleshooting; grading homework assignments, essays, quizzes, and exams (ENS 301, MAR 303, MAR 352).	**2015-2020**
	Professional Water Safety and Lifeguard Instructor American Red Cross certified instructor (LGI, WSI).	**2009-2014**
Reviewer	***Peer-reviewed Journals*** Marine Pollution Bulletin, Journal of Fish Biology, Deep-Sea Research Part I: Oceanographic Research Papers, Marine Biology, Fisheries Research, Journal of the Acoustical Society of America, Polar Biology, Fisheries Oceanography, Fisheries Research, Fishes ***Fundings Grants & Proposals*** NOAA-NMFS	
Honors & Awards	AAAS/*Science* Program for Excellence in Science	**2024**
	SEED Postdoctoral Fellowship (APL-UW)	**2023-2025**
	ICES Fisheries & Plankton Acoustics Symposium Early Career Scientist Travel Award	**2023**
	Jerry R. Schubel Graduate Fellowship (SBU)	**2022**
	Maze-Landeau Travel Award (SBU)	**2017**
	School of Marine and Atmospheric Sciences Travel Award (SBU)	**2016**
	South Windsor Town Council Commendation & Citation	**2014**
	SWRPD “Above the Call of Duty” Award	**2013**
	Omicron Delta Kappa National Leadership Honor Society	**2012**
	Phi Eta Sigma National Honors Society Fraternity	**2010**
	National Society of Collegiate Scholars	**2010**
	URI Coastal Fellowship	**2010**
	URI Dean’s List	**2009-2012**
	Robbins Barstow Marine Science Book Award	**2009-2012**
	Pleasant Valley School PTO Orville C. Rowley Scholarship	**2009**
Outreach	**Underwater Plains and Valleys: Using Sound to Map Where Marine Life Gathers** Lay-language article associated with research presented at the 188th Meeting of the Acoustical Society of America (ASA). https://acoustics.org/underwater-plains-and-valleys-using-sound-to-map-where-marine-life-gathers/	**2025**
	Montauk Historical Society Summer Talk Series A lecture part of the summer talk series at the Montauk Point Lighthouse. https://montaukhistoricalsociety.org/event/the-secret-life-of-offshore-scientists/	**2022**

	Letters to a Pre-Scientist Volunteer for a 501(c)3 organization; engage in a pen pal program that connects STEM professionals with K-12 students across the country. https://www.prescientist.org	**2020-present**
	Skype A Scientist Volunteer for a 501(c)3 organization; engage in Q&A sessions with classrooms (K-12, College) around the United States (40+ classrooms around North America). https://www.skypeascientist.com	**2017-present**
	North Country Middle School Science Fair Outreach event coordinated by the Stony Brook University Geosciences Department at the North Country Middle School.	**2019**
	WAC Lighting Foundation Invitational Science Fair High school science fair judge at Manhasset High School. https://www.researchassociation.org	**2018-2019**
	Biotweeps Curated a Twitter account presenting research to a broad and diverse audience (15,000+ followers) discussing acoustics, life at sea and during fieldwork, inclusivity in STEM fields, and graduate student mental health. https://www.biotweep.wordpress.com/2018/08/090718-brandynlucca/	**2018**
	The MVP of Long Island Fish (Atlantic menhaden) Public talk series presented at Moustache Brewing (Riverhead, NY), Long Island Paddlers Inc. (Bay Shore, NY), and Smithtown Public Library (Nesconset, NY).	**2017-2018**
	Media Quotes Photograph quoted in: "Shinnecock Canal Fish Kill Wipes Out Thousands of Bunker", by Clyde Hughes, 15 November 2016, https://www.newsmax.com/ Quoted in: "Bunker Die in Droves Monday at Shinnecock Locks", by Beth Young, 14 November 2016, https://www.eastendbeacon.com/	**2016**

Professional Skills & Training	Total of **225 sea days** aboard oceanographic vessels (2014-present) Jupyter Notebook Bootcamp (AMSS, 2019, Axiom Data Sciences) Metadata 411 (AMSS, 2019, Axiom Data Sciences) PADI Open-water, Advanced, Rescue, and Nitrox (83 hours diving experience) AAUS Scientific Diving (2011-2014)
References	**Dr. Wu-Jung Lee** *Principal Oceanographer, Applied Physics Laboratory, University of Washington* *Affiliate Assistant Professor, University of Washington* leewj@uw.edu **Dr. Joseph D. Warren** *Associate Professor, Stony Brook University* joe.warren@stonybrook.edu **Dr. Oliver N. Shipley** *Assistant Professor, Stony Brook University* oliver.shipley@stonybrook.edu

	Dr. Jennifer L. Miksis-Olds *Research Professor, University of New Hampshire* jmiksisolds@ccom.unh.edu