

Emily N. Meese
Ph.D. Candidate
Department of Marine Biology
Texas A&M University at Galveston, Texas
emily.n.meese@gmail.com

EDUCATION

- 2019 – exp. 06/2024** **Ph.D. Marine Biology, Texas A&M University at Galveston (TAMUG)**
Advisor: Dr. R.J. David Wells, Shark Biology and Fisheries Science Lab
Dissertation: Food web ecology of a subtropical estuary
- 2019** **M.S. Biology, California State University, Long Beach (CSULB)**
Advisor: Dr. Chris Lowe, CSULB Shark Lab
Thesis: Diel, fine-scale spatial movements and activity patterns of California horn sharks, *Heterodontus francisci*
Degree Honors: Biological Sciences Department Honors, Biological Sciences Outstanding Thesis Award
- 2014** **B.S. Marine Biology, California State University, Long Beach (CSULB)**
University Honors Program Thesis:
E.N. Meese, C.G. Lowe (May 2014). Spatial distribution, habitat selection, and effects of temperature on benthic elasmobranchs at Big Fisherman’s Cove, Santa Catalina Island.
Degree Honors: Cum Laude and Biological Sciences Department Honors

PUBLICATIONS

Peer-reviewed journal articles

† indicates authors share first authorship, ^ indicates undergraduate mentee

10. Freedman, R.M., Anderson, J.M., Caldw, C., Stirling, B., Rex, P., Spurgeon, E., McCullough, S., Lyons, K., May, J. III, White, C.F., Logan, R.K., **Meese, E.N.**, Burns, E.S., Clevensine, A.J., O’Sullivan, J., Winkler, C., Duncan, L., Cajandig, M., Lowe, C.G. 2023. Evidence of increasing juvenile White Sharks’ (*Carcharodon carcharias*) habitat use at the Northern Channel Islands. *Journal of Fish Biology*, (1-6). <https://doi.org/10.1111/jfb.15503>
9. †^Anderson, T., †**Meese, E.N.**, Drymon, J.M., Stunz, G.W., Falterman, B., ^Menjivar, E., Wells, R.J.D. 2022. Diel vertical habitat use observations of a scalloped hammerhead and bigeye thresher shark in the northern Gulf of Mexico. *Fishes*, 7(148). († these authors share first authorship)
8. Wells, R.J.D., Rooker, J.R., Addis, P., Arrizabalaga, H., Baptista, M., Bearzi, G., Fraile, I., Lacoue-Labarthe, T, **Meese, E.N.**, Megalofonu, P., Rosa, R., Sobrino, I., Sykes, A., Villanueva, R. 2021. Regional patterns of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ for the European common cuttlefish (*Sepia officinalis*) throughout the Northeast Atlantic Ocean and Mediterranean Sea. *Royal Society Open Science*, 8(9), 210345. <https://doi.org/10.1098/rsos.210345>
7. Anderson, J.M., Clevensine, A.J., Stirling, B.S., Burns, E.S., **Meese, E.N.**, White, C.F., Logan, R.K., O’Sullivan, J., Rex, P.T., May, L. III, Lyons, K., Winkler, C., Garcia-Rodriguez, E., Sosa-Nishizaki, O., Lowe, C.G. 2021. Non-random co-occurrence of juvenile white sharks (*Carcharodon carcharias*) at season aggregation sites in Southern California. *Frontiers in Marine Science, Marine Megafauna, Special Topic: Sociality in the Marine Environment*, (2021):1095. <https://doi.org/10.3389/fmars.2021.688505>

6. Anderson, J.M., Burns, E.S., **Meese, E.N.**, Farrugia, T.F., Stirling, B.S., White, C.F., Logan, R.K., O’Sullivan, J., Winkler, C., Lowe, C.G. 2021. Interannual nearshore habitat use of young of the year white sharks off southern California. *Frontiers in Marine Science, Marine Megafauna, Special Topic: Movement and Connectivity of Large Pelagic Sharks*, 8(645142). <https://doi.org/10.3389/fmars.2021.645142>
5. Yang, Y., Yeh, Y.G., Zhang, W., Lee, C.J., **Meese, E.N.**, Lowe, C.G. 2020. Feature extraction, selection and K-nearest neighbors algorithm for shark behavior classification based on imbalanced dataset. *IEEE Sensors Journal* 21(5): 6429-6439. <https://doi.org/10.1109/JSEN.2020.3038660>
4. **Meese, E.N.**, Lowe, C.G. 2020. Daytime sheltering behaviors of California horn sharks (*Heterodontus francisci*). *Environmental Biology of Fishes*, 103(6):703-717. <https://doi.org/10.1007/s10641-020-00977-6>
3. **Meese, E.N.**, Lowe, C.G. 2020. Active acoustic telemetry tracking and tri-axial accelerometers reveal fine-scale movement strategies of a non-obligate ram ventilator. *Movement Ecology*, 8(1):1-8. <https://doi.org/10.1186/s40462-020-0191-3>
2. **Meese, E.N.**, Lowe, C.G. 2019. Finding a resting place: How environmental conditions influence the habitat selection of resting batoids. *Bulletin of the Southern California Academy of Sciences*, 118(2):87-101. <https://doi.org/10.3160/0038-3872-118.2.87>
1. Adam, T., Griffiths, C.A., Leos-Barajas, V., **Meese, E.N.**, Lowe, C.G., Blackwell, P.G., Righton, D., Langrock, R.. 2019. Joint modeling of multi-scale animal movement data using hierarchical hidden Markov models. *Methods in Ecology and Evolution*, 10(9):1536-1550. <https://doi.org/10.1111/2041-210X.13241>

Peer-reviewed conference articles

- Karan, S., **Meese, E.N.**, Yang, Y., Yeh, H.G., Lowe, C.G., Zhang, W. Classification of shark behaviors using K-nearest neighbors. In *2019 IEEE Green Energy and Smart Systems Conference (IGESSC)* (pp. 1-6).
- Zhang, W., Martinez, A., **Meese, E.N.**, Lowe, C.G., Yang, Y. Deep convolutional neural networks for shark behavior analysis. In *2019 IEEE Green Energy and Smart Systems Conference (IGESSC)* (pp. 1-6).

Publication Service [Journal (# reviewed)]

Aquatic Conservation (1); Environmental Biology of Fishes (1); Fisheries Research (1); Marine and Freshwater Research (1); NOAA Internal Technical Review (1)

HONORS AND AWARDS

Fellowships

2023 – 2024

TAMUG Graduate Student “Boost” Funding

Description: Merit-based award for full support including salary, tuition, and fees, for final year of Ph.D.

2019 – 2021

TAMUG 2-Year Competitive Graduate Student Fellowship

Description: Merit-based award for tuition, fees, benefits and Graduate Teaching Assistantship position.

2016 and 2017

USC Wrigley Graduate Fellowship

Description: Merit-based award for research facility housing at the USC Wrigley Institute for Environmental Studies. Participated in education and outreach events and presentations for the facility.

Grants

2023	\$600	Erma Lee and Luke Mooney Graduate Student Travel Grant
2023	\$500	Galveston Graduate Student Association (GGSA) Mini Grant
2020	\$2,500	Texas Sea Grant Grants-in-Aid of Graduate Research Program
2017	\$1,000	American Elasmobranch Society Donald R. Nelson Behavior Research Award
2017	\$500	Richard B. Loomis (CSULB) Graduate Research Grant
2016	\$1,500	Southern California Tuna Club Graduate Grant
2016	\$2,000	Southern California Academy of Sciences Research Grant
2016	\$1,000	Graduate Dr. Donald J Reish (CSULB) Grant
2013	\$500	Undergraduate Dr. Donald J Reish (CSULB) Grant

Scholarships

2020	\$1,500	Texas Chapter of the American Fisheries Society Scholarship
2018	\$1,500	International Women’s Fishing Association Scholarship
2017	\$1,500	Southern California Tuna Club Marine Biology Scholarship
2017	\$2,000	International Women’s Fishing Association Scholarship
2016	\$2,000	International Women’s Fishing Association Scholarship
2015	\$5,000	CSULB Project Hogar Graduate Student Recruitment Scholarship
2013	\$2,000	Southern California Tuna Club Marine Biology Scholarship
2013	\$1,000	Los Angeles Rod and Reel Scholarship

Awards and Recognition

2023	\$500	Gulf Estuarine Research Society (GERS) Student Travel Award
2023	\$150	Coastal Estuarine Research Federation (CERF) Student Travel Award
2023	\$300	American Elasmobranch Society (AES) Samuel H. Gruber Award
2023	\$250	Latin America and Caribbean Fisheries Congress Student Travel Award
2023	\$500	American Elasmobranch Society (AES) Student Travel Award
2023	\$500	Texas Chapter American Fisheries Society Best Student Oral Presentation
2023	\$150	Texas Chapter American Fisheries Society Student Travel Award
2021	\$1,000	American Elasmobranch Society (AES) Student Research Award
2021	–	TAMUG Research Symposium Graduate Project Award, 3 rd Place Overall
2021	–	TAMUG Research Symposium Graduate Project Award, Life Sciences, 3 rd Place
2020	–	CSULB Biological Sciences Outstanding Thesis Award (<i>Nominated</i>)
2019	–	CSULB Biological Sciences Outstanding Graduate Researcher (<i>Nominated</i>)
2018	\$1,000	American Elasmobranch Society (AES) Travel Award
2018	–	CSULB Graduate Biological Sciences Departmental Honors (<i>Nominated</i>)
2017	\$500	CSU Coast Student Travel Award
2017	\$500	American Elasmobranch Society (AES) Travel Award
2017	\$50	Western Society of Naturalists (WSN) Travel Award
2017	\$500	Southern California Academy of Sciences (SCAS) Best Presentation
2015	\$250	Southern California Academy of Sciences Best Presentation Honorable Mention
2015	–	CSULB Undergraduate Biological Sciences Departmental Honors (<i>Nominated</i>)

2014 \$500 CSU COAST Student Travel Award
2014 \$250 Southern California Academy of Sciences Best Poster Honorable Mention

RESEARCH EXPERIENCE

- 2022 – present** **Flower Garden Banks National Marine Sanctuary Ecosystem-Scale Connectivity**
PIs: Dr. J.R. Rooker and Dr. R.J. David Wells (Texas A&M Univ. at Galveston), Dr. Daniel Lippi (Post Doc), Brett Swezey (PhD Student), Marissa Nuttall (PhD Student, NOAA)
Responsibilities: Assist with offshore (100 mi) field operations of catching, measuring, and tagging (conventional, acoustic, satellite) of Greater Amberjack (*Seriola dumerili*), Silky Sharks (*Carcharhinus falciformis*) and Sandbar Sharks (*Carcharhinus plumbeus*). Assist with underwater (SCUBA) collections and acoustic transmitter surgeries of Lionfish (*Pterois volitans*), Graysby (*Cephalopholis cruentata*), and Gray Snapper (*Lutjanus griseus*) for VPS acoustic arrays. Approx days at sea: 50.
- 2021 – 2023** **Movements and Trophic Ecology of Atlantic Stingrays (*Hypanus sabinus*)**
PI: Dr. R.J. David Wells (Texas A&M Univ. at Galveston)
Responsibilities: Manage field operations to collect, measure, biopsy, and acoustically tag Atlantic Stingrays. Designed external tag attachment for stingrays. Collaborate with Texas A&M Univ. Corpus Christi for acoustic receiver download information. 50 stingrays tagged.
- 2019 – present** **Matagorda Bay Ecosystem Assessment: Trophic Ecology**
PIs: Dr. R. J. David Wells (Texas A&M Univ. at Galveston), Dr. Greg Stunz (Texas A&M Univ. Corpus Christi)
Responsibilities: Quantify spatiotemporal isotopic signatures of estuarine primary producers and consumers (invertebrates, teleosts, elasmobranchs) within Matagorda Bay, Texas using bulk stable isotopes ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{34}\text{S}$) and compound-specific isotope analysis of amino acids ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$). Coordinate field work sampling and process laboratory samples for isotope analysis. Manage field and lab undergraduate assistance.
- 2019 – 2021** **Matagorda Bay Ecosystem Assessment: Fish Recruitment**
PIs: Dr. J.R. Rooker (Texas A&M Univ. at Galveston), Dr. R.J. David Wells (TAMUG), and Dr. Greg Stunz (Texas A&M Univ. Corpus Christi), Liam J. Batchelder (project MS student)
Responsibilities: Facilitate benthic sled field collections of settler and recruit sized fishes within Matagorda Bay, Texas along seagrass and marsh edge habitats. Preserve collected fish for laboratory identification and sorting.
- 2019 – 2021** **Movements of a Predatory Fish Assemblage, Galveston, TX**
PIs: Dr. R.J. David Wells, Dr. Mariah C. Livernois (project PhD student)
Responsibilities: Assist in the catching, measuring, and acoustic tagging of predators within the Galveston Bay, TX acoustic receiver array. Included Alligator Gar (*Atractosteus spatula*), Black Drum (*Pogonias cromis*), Spotted Seatrout (*Cynoscion nebulosus*), and Bull Sharks (*Carcharhinus leucas*).
- 2015 – 2019** **Fine-Scale Movements and Behaviors of California Horn Sharks (*Heterodontus francisci*)**

PI: Dr. Chris Lowe, CSULB Shark Lab

Responsibilities: Quantify fine-scale movements and behaviors using active acoustic telemetry and accelerometer data loggers. Designed custom tag packages, used Ethographer in IgorPro for acceleration analyses, and managed undergraduate volunteers for both field and lab assistance. Twenty continuous active tracks completed, over 150 scientific dives completed.

2015 – 2019

Movements and Habitat Use of Juvenile White Sharks (*Carcharodon carcharias*)

PI: Dr. Chris Lowe, CSULB Shark Lab

Responsibilities: Quantify juvenile white shark (*Carcharodon carcharias*) movements along the southern California coast using passive and active acoustic telemetry, remote underwater video systems (RUVs), and smart tags that included accelerometers, gyrometers, and videologgers. Manage a passive telemetry array of 100 VR2W receivers, tagging operations, data management and analysis.

2013 – 2014

Undergraduate Independent Research, University Honors Program, CSULB

PIs: Dr. Chris Lowe, Terri Iler

Responsibilities: Quantified the spatial distribution of three benthic elasmobranchs, created benthic habitat maps, and designed a temperature data logger array to quantify thermal preferences of elasmobranchs.

2012 – 2013

Undergraduate Directed Research, CSULB

PI: Dr. Chris Lowe

Responsibilities: Determined the standard metabolic rate of California halibut (*Paralichthys californicus*) by using a Brett-type respirometer to measure oxygen consumption levels.

WORK EXPERIENCE

2023 – present

Graduate Student Ambassador

Texas A&M University at Galveston Research and Graduate Studies Office

Supervisors: Holly Richards and Andrew Reitburger

Responsibilities: Advocate for graduate students, lead programs to increase communication, diversity, and success. Recruit prospective students through personal tours and participate in graduate student panel discussions.

2017 – 2019

Project Scientist, State of California Beach Safety and Shark Research Program

Supervisor: Dr. Chris Lowe

Responsibilities: Organize and maintain a passive acoustic telemetry array of 100 VR2W acoustic receivers, manage education and outreach programs for lifeguards, fishers, and K-12 classrooms.

2016 – 2017

Research Assistant: Multi Robot Systems for Tracking Shark Populations (NSF # 1245813)

Supervisors: Dr. Chris Lowe (CSULB) and Dr. Chris Clark (Harvey Mudd College)

Responsibilities: Assist engineering and computer science students from Harvey Mudd College with in-field operations, learn use, care, and coding of underwater autonomous robots, data analyses of robotics and tracking technology testing.

2015 – 2016

Graduate Assistant, California State University, Long Beach

- Supervisor: Yvette Ralph
Responsibilities: Managed aquarium husbandry, boat care and handling, specimen collecting for marine lab education and miscellaneous research projects.
- 2015** **Research Assistant, California State University, Long Beach Shark Lab**
Supervisor: Dr. Christopher Lowe
Responsibilities: Collaborate and finalize miscellaneous reports, download and initialize passive acoustic receivers, conduct statistical analyses for various projects, create maps in ArcGIS for reports and publications.
- 2015** **Administration & Demonstration Technician Assistant, Southern California Marine Institute (SCMI)**
Supervisors: Adriana Bell, Dr. Daniel Pondella
Responsibilities: Administration duties, otter trawl and vessel safety demonstrations for 75' R/V Yellowfin, assist with miscellaneous research projects.
- 2014** **Communications and Biological Sciences Intern, NOAA Montrose Settlements and Restoration Program (MSRP)**
Supervisor: Gabrielle Dorr
Responsibilities: Maintained fish webcam in wetland, various technical reports, social media posts and updates, logging projects into NOAA database, education and outreach responsibilities at elementary schools and miscellaneous events.

TEACHING AND MENTORING

Teaching Assistant

- 2020 – 2022** **MARB 311 – Ichthyology, Texas A&M University at Galveston**
 Laboratory and field-based instruction on the biology, physiology, ecology, and taxonomy of bony and cartilaginous fishes. Restructured laboratory content for virtual and in person learning. Updated laboratory manual, lab activities, and designed lab practicals to assess students. Taught 3 sections (~60 students) per semester, 3 semesters.
- 2017** **OSI 425 – Marine Ichthyology, California State University Long Beach**
 Field-based instruction on the biology, physiology, and ecology of bony and cartilaginous fishes. Field-based projects included snorkel-based fish identification surveys, artificial reef construction and surveys, and individual species-behavior observation projects. Laboratory-based instruction included the external and internal anatomy of bony fishes, with an emphasis on fish osteology. 16 students. Class held as part of the CSU Catalina Semester at the Wrigley Institute for Environmental Studies, Catalina Island.
- 2017** **OSI 490 – Aquatic Toxicology, California State University Long Beach**
 Laboratory based instruction on introductory aquatic toxicology principles in a saltwater environment. 16 students. Class held as part of the CSU Catalina Semester at the Wrigley Institute for Environmental Studies, Catalina Island.
- 2015 – 2018** **BIOL 153 – Introduction to Marine Biology Laboratory, California State University Long Beach**
 Laboratory and field-based instruction introducing majors and non-majors to introductory marine biology principles including rocky intertidal zonation,

biology of local marine invertebrates and vertebrates, and basic statistics.
Averaged 40 students per semester, 5 semesters.

Guest Lectures

2020 – 2022

MARB 311 – Ichthyology, Texas A&M University at Galveston

Guest lectured when main instructor was unavailable. Lectured on topics of fish respiration and metabolism and gave various research seminars.

2019 – 2021

MARB 312 – Fisheries Techniques, Texas A&M University at Galveston

Guest lectured when main instructor was unavailable. Lectured on topics of fish movement methods including acoustic and satellite telemetry and gave various research seminars.

Undergraduate and Research Assistant Mentoring

2022

TAMUG Aggies Commit to Excellence Scholar (ACES) Undergraduate Research

Hannah Roby (F 2021 – Sum. 2022): Utilization of stable isotope analysis in estuarine ecology studies.

2021 – 2022

TAMUG LAUNCH Undergraduate Research Scholars (UGR) Program

Anna DeMotte, Texas A&M University at Galveston: Gar species assemblages and abiotic drivers in Galveston Bay and Sabine Lake. LAUNCH Undergraduate Research Scholars (UGR) Thesis Program, Aggies Commit to Excellence (ACES) Scholar, Texas Sea Grant Scholarship.

2021

NSF REU: OCEANUS, Ocean and Coastal Research Experiences for Undergraduate at TAMUG

NSF Award #1959010: Taylor Anderson, University of Nevada Reno and Elias Menjivar, California State University Long Beach. Vertical Habitat Use of a Scalloped Hammerhead and Bigeye Thresher Shark.

2020 – 2023

TAMUG Shark Biology and Fisheries Science Lab Research Volunteers

Instruct, mentor, and manage undergraduate students with laboratory isotope sample processing and field sample collections: A. DeMotte (Spr. 2020 – Sum. 2022), H. Roby (F. 2021 – Sum. 2022), A. Reedholm (F. 2021 – Sum. 2022), E. Ramos (Spr. 2021 – Sum. 2022), B. Chambers (Spr. 2021 – Fall. 2021), N. Whiteford (Spr. 2021 – Fall 2021)

2017

CSU Catalina Semester Undergraduate Directed Research Projects

16 students, each with a unique field or laboratory based project to complete in one semester.

2016 – 2018

CSULB Undergraduate Students

Independent research, Honors Program research: B. Hyla (Spr. 2016 – Fall 2018), L. McWilliams (Spr. 2016 – Fall 2018), S. Corder Lee (Fall 2017 – Fall 2018).

CONTRIBUTED PRESENTATIONS

*Presenter listed first, * indicates presentation award, ^ indicates undergraduate mentee.*

Scientific Oral Presentations

*Meese, E.N., Williams, J., Stunz, G.W., Rooker, J.R., and Wells, R.J.D. Jul 2023. Combining multiple isotope approaches and acoustic telemetry to determine trophic ecology and habitat use of the Atlantic Stingray (*Hypanus sabina*). Ann. Mtg. Joint Meeting of Ichthyologists and Herpetologists, Norfolk, VA. *AES Gruber Award Recipient.

- Meese, E.N.,** Fisher, M., Rooker, J.R., Stunz, G.W., and Wells, R.J.D. (Mar 2023). Long-term trends of fish communities in Matagorda Bay, Texas. 18th Annual TAMUS Pathways Student Research Symposium, Galveston, TX.
- ***Meese, E.N.,** Fisher, M., Rooker, J.R., Stunz, G.W., and Wells, R.J.D. (Feb 2023). Multivariate analyses of fish communities in Matagorda Bay, Texas. Ann. Mtg. Texas Chapter American Fisheries Society, Corpus Christi, TX. *TCAFS Best Student Oral Presentation Award.
- Meese, E.N.,** Wells, R.J.D. (Apr 2022). Stable isotopes of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ reveal preliminary information on estuarine fishes in a subtropical estuary. Texas A&M University at Galveston Research Symposium, Galveston, Texas.
- Meese, E.N.,** Batchelder, L.J., Rooker, J.R., Stunz, G.W., and Wells, R.J.D.. (Apr 2022). Matagorda Bay Ecosystem Assessment: Trophic Ecology. Texas A&M University Corpus Christi, Corpus Christi, TX.
- ***Meese, E.N.,** Wells, R.J.D.. (Apr 2021). Food web structure and spatiotemporal dynamics of a subtropical estuary. Texas A&M University at Galveston Research Symposium, Virtual.
- Lowe, C.G., Burns, E.S., **Meese, E.N.,** Lyons, K, White, C.F., Anderson, J., Stirling, B., O'Sullivan, J., Jorgensen, S., Winkler, C., Garcia Rodriguez, E., Sosa-Nishizaki, O. (Nov 2019). The importance of trans-boundary collaborative research on highly migratory White Sharks. Ann. Mtg. Western Society of Naturalists, Ensenada Mexico.
- Meese, E.N.,** Lowe, C.G. (Jul 2019). Movement strategies and fine-scale activity patterns of the California horn shark (*Heterodontus francisci*). Invited Symposium: Sensory Biology and Behavior of Elasmobranchs. Ann. Mtg. American Elasmobranch Society, Snowbird, UT.
- Meese, E.N.,** Lowe, C.G. (Jun 2018). Diel movements and fine-scale activity patterns of California horn sharks (*Heterodontus francisci*) in response to environmental temperature. Sharks International Conference, João Pessoa, Brazil.
- Lowe, C.G., White, C.W., Logan, R.K., **Meese, E.N.,** Burns, E.S., Clevenstine, A., Winkler, C., Jorgensen, S., O'Sullivan, J. (Jun 2018). Juvenile white shark nursery behavior and habitat use in southern California. Sharks International Conference, João Pessoa, Brazil.
- Burns, E.S., White, C.F., Logan, R.K., **Meese, E.N.,** Lowe, C.G.. (Jun 2018). An all-inclusive Smart Tag combines active tracking, biologging, and animal motion sensors to observe the fine-scale, short-term behavior and habitat use of juvenile white sharks. Sharks International Conference, João Pessoa, Brazil.
- Meese, E.N.,** Lowe, C.G. (Mar 2018). Investigating effects of temperature and depth on the fine-scale movement and activity of the horn shark, *Heterodontus francisci*. Biann. Mtg. North Eastern Pacific Shark Symposium, Seattle, WA.
- Burns, E.S., White, C.F., Logan, R.K., **Meese, E.N.,** Lowe, C.G. (Mar 2018). Smart tags: combining active tracking and biologging to capture the fine-scale, short term behavior and habitat use of juvenile white sharks. Biann. Mtg. North Eastern Pacific Shark Symposium, Seattle, WA.
- Meese, E.N.,** Lowe, C.G. (Nov 2017). Quantifying fine-scale movement and activity of the horn shark, *Heterodontus francisci*, to estimate minimum energetic costs. Ann. Mtg. Western Society of Naturalists, Pasadena, CA.
- Meese, E.N.,** Lowe, C.G. (Jul 2017). Diel movements and fine-scale activity patterns across heterogeneous thermal environments of the CA horn shark, *Heterodontus francisci*. Ann. Mtg. Joint Meeting of Ichthyologists and Herpetologists, Austin, TX.
- Lowe, C.G., **Meese, E.N.,** Luongo, S., Bernal, D. (Jul 2017). New advances in measuring and modeling metabolic costs of elasmobranchs to predict the future. Ann. Mtg. American Elasmobranch Society, Austin, TX.

- *Meese, E.N.,** Lowe, C.G. (Apr 2017). Diel movements and fine-scale activity patterns of the CA horn shark, *Heterodontus francisci*. Ann. Mtg. Southern California Academy of Sciences, Santa Monica, CA. *Best Presentation Award.
- Meese, E.N.,** Lowe, C.G. (Mar 2016). Thermal energetics and activity rates of horn sharks, *Heterodontus francisci*. Biann. Mtg. North Eastern Pacific Shark Symposium, Catalina, CA.
- Meese, E.N.,** Lowe, C.G. (Jul 2015). Finding a resting place: How environmental conditions affect the spatial distribution of benthic elasmobranchs at Big Fisherman’s Cove, Santa Catalina Island. Ann. Mtg. Joint Meeting of Ichthyologists and Herpetologists, Reno, NV.
- *Meese, E.N.,** Lowe, C.G. (May 2015). Spatial distribution, habitat selection, and effects of temperature on resting benthic elasmobranchs at Big Fisherman’s Cove, Santa Catalina Island. Ann. Mtg. Southern California Academy of Sciences, Los Angeles, CA. *Best Presentation Honorable Mention.

Scientific Posters

- [^]Roby, H., **Meese, E.N.,** Wells, R.J.D. (August 2022). Utilization of stable isotope analysis for estuarine ecology studies. Aggies Commit to Excellence Undergraduate Research Symposium. Galveston, TX. Virtual.
- Meese, E.N.,** [^]Anderson, T., Drymon, J.M., Stunz, G.W., Falterman, B., [^]Menjivar, E., Wells, R.J.D. (July 2022). Diel vertical habitat use observations of a scalloped hammerhead and a bigeye thresher in the northern Gulf of Mexico. Ann. Mtg. Joint Meeting of Ichthyologists and Herpetologists, Spokane, WA.
- [^]DeMotte, A., **Meese, E.N.,** Wells, R.J.D. (May 2022). Gar species assemblages and abiotic drivers in Galveston Bay and Sabine Lake. Texas Chapter American Fisheries Society Regional Meeting, Hunt, TX.
- Meese, E.N.,** Stunz, G.W., Rooker, J.R., Wells, R.J.D. (May 2022). Using a bottom-up isotopic approach to establish baseline data on an estuarine food web system in Matagorda Bay. Texas Chapter American Fisheries Society Regional Meeting, Hunt, TX.
- ^{*^}A. DeMotte, **Meese, E.N.,** Wells, R.J.D. (April 2022) Abundance patterns of three gar species in Sabine Lake. Texas A&M University at Galveston Research Symposium, Galveston, TX. *1st Place Life Sciences, *1st Place Overall Undergraduate Posters and Projects.
- Meese, E.N.,** Lowe, C.G.. (Nov 2016). Diel movements and fine-scale activity patterns of the CA horn shark, *Heterodontus francisci*. Ann. Mtg. Western Society of Naturalists, Monterey, CA.
- Meese, E.N.,** Lowe, C.G.. (Aug 2014). Spatial distribution, habitat selection, and effects of temperature on benthic elasmobranchs at Big Fisherman’s Cove, Santa Catalina Island. Ann. Mtg. Joint Meeting of Ichthyologists and Herpetologists, Chattanooga, TN.
- *Meese, E.N.,** Lowe, C.G. (May 2014). Spatial distribution, habitat selection, and effects of temperature on benthic elasmobranchs at Big Fisherman’s Cove, Santa Catalina Island. Ann. Mtg. Southern California Academy of Sciences, Oxnard, CA. *Best Poster Honorable Mention Award.

Outreach Presentations

- 2022 “Totally Jawesome Sharks”
Rosenberg Library ‘Oceans of Possibilities’ Shark Program, Galveston, TX.
- 2019 “So, you want to study shark behavior?”
Ocean Institute Girls in Ocean Science Day, Dana Pt, CA.
- 2018 “Juvenile White Sharks in Southern California”
Pt. Fermin Elementary School Ocean Day, San Pedro, CA.

- 2018 “What we use to track sharks (and other fish)”
Vista Magnet Middle School, Oceanside, CA.
- 2018 “White shark nurseries of the Northeast Pacific”
Belmont Shore Garden Club, Long Beach, CA.
- 2017 “Movements and behaviors of an important kelp forest predator, the California horn shark”
Wrigley Marine Science Center’s Saturday at the Lab, Catalina Island, CA.
- 2017 “Developing technology to study shark behavior: using robots and drones to track sharks”
Vista Magnet Middle School, Oceanside, CA.
- 2016 “Determining the importance of horn sharks at Catalina Island”
Aquarium of the Pacific’s Teachers Retreat, Wrigley Marine Science Center, Catalina Island, CA
- 2016 “Thermal energetics and activity rates of horn sharks”
Wrigley Marine Science Center’s Saturday at the Lab, Catalina Island, CA.
- 2015 “Taking a bite out of shark myths and the El Niño”
Aquarium of the Pacific’s Night Dive, Long Beach, CA.

Selected Media Engagements

California State University Student Spotlight, “Save the Sharks”: [https://www2.calstate.edu/csulb-system/news/Pages/Save-The-Sharks.aspx](https://www2.calstate.edu/csulb/system/news/Pages/Save-The-Sharks.aspx)

Quartz, In the Deep, “Catching sharks by hand”:

<https://www.facebook.com/watch/?ref=external&v=166574177270248>

CSULB News Hub, “Horn sharks, sea urchins and kelp forests”:

<https://www.youtube.com/watch?v=wtrJM92rE-M>

EDUCATION AND OUTREACH

- 2023** **NOAA Virtual Watershed Education and Training (VWET): Coastal Fisheries in Galveston Bay**
Supervisor: Mariah Waters, Education Coordinator, Galveston Bay Foundation; Dr. Jamie Steichen, Instructional Assistant, Professor, Texas A&M University at Galveston, Dr. RJ David Wells, Texas A&M University at Galveston.
Responsibilities: Write scripts and provide curriculum materials (e.g., data, figures, images, video) for Teaching Guide for the Coastal Fisheries in Galveston Bay Curriculum, and participate in the teacher training day.
Curriculum: Fits standards for NGSS and Texas Essential Knowledge and Skills.
<https://galvbay.org/work/education/>
- 2017 – 2019** **CSULB Shark Lab White Shark Education and Outreach Program**
Supervisor: Dr. Chris Lowe
Responsibilities: Manage and design off-campus education and outreach program for juvenile white shark research to be used for lifeguard agencies, commercial and recreational fishermen, K-12 classrooms, and the public. Produce education curriculum and products (e.g., comic books). Implement Shark Lab tour curriculum for students and coordinate Shark Lab tours (approx. 1,000 visitors annually).
- 2018** **M.V. Horizon Isla Guadalupe White Shark Education Program**
Supervisors: Dr. Chris Lowe (CSULB) and Capt. Spencer Salmon (Horizon Charters)
Responsibilities: Collaborate and advise computer scientist on creation of custom shark recognition software program for the M.V. Horizon. Provide educational content for software. Manage On-Board Shark Biologist program; create presentation and provide

2017 scientific content for biologists to educate tourists. Participated as the on-board Shark Biologist educating tourists about shark biology and research at Isla Guadalupe, Mexico.
Understanding White Sharks 8th Grade Next Generation Science Standard (NGSS) Learning Sequence

Supervisors: Dr. Chris Lowe (CSULB) and Jill Grace (K-12 Alliance at WestEd)

Responsibilities: Contributed to 8th grade science curriculum for new NGSS standards. Curriculum includes physics and biology lessons from juvenile white shark work using acoustic and satellite telemetry. Instructed teachers how to use curriculum in classrooms.

Curriculum: Fits standards for NGSS.

<https://www.nextgenscience.org/resources/middle-school-understanding-white-sharks>

SOCIETIES AND ORGANIZATIONS

2023 – present	Gulf and Caribbean Fisheries Institute (GCFI) Student Member
2022 – present	Gulf Estuarine Research Society (GERS) Student Member
2022 – present	Coastal and Estuarine Research Federation (CERF) Student Member
2021 – present	American Fisheries Society (AFS) Student Member
2020 – present	Texas Chapter American Fisheries Society (TCAFS) Student Member
2019 – present	TAMUG Galveston Graduate Student Association Member
2015 – 2020	American Institute of Fisheries Research Biologists (AIFRB) Student Member
2014 – present	American Elasmobranch Society (AES) Student Member
2014 – 2019	American Society of Ichthyologists and Herpetologists (ASIH) Student Member
2014 – 2019	Southern California Academy of Sciences (SCAS) Member
2013 – 2019	Western Society of Naturalists (WSN) Student Member
2010 – 2014	Marine Biology Student Association (MBSA) Member
2010 – 2014	University Honors Program Student Association (UHPSA)
2010 – 2014	Alpha Omicron Pi (AOII) Sorority Member

LEADERSHIP POSITIONS AND SOCIETY SERVICE

2023 – present	American Elasmobranch Society (AES) Nominating Committee, Member
2022 – 2023	American Elasmobranch Society (AES) Student Affairs Committee, Chair
2022 – 2023	American Elasmobranch Society (AES) Equity and Diversity Committee, Member
2022 – 2023	American Elasmobranch Society (AES) Grant Fund Committee, Member
2020 – 2021	Galveston Graduate Student Association Social Media Officer
2020 – 2022	American Elasmobranch Society (AES) Student Affairs Committee, T-shirt committee
2017 – 2020	American Elasmobranch Society (AES) Student Affairs Committee, Member at Large
2016	Northeastern Pacific Shark Symposium (NEPSS) Meeting Organizer
2014	CSULB Marine Biology Student Association (MBSA) Treasurer
2013	CSULB Marine Biology Student Association (MBSA) President
2012 – 2013	Alpha Omicron Pi (AOII) Vice President of Academic Development

CERTIFICATIONS

AAUS Scientific Diver (100 ft depth rating, > 400 scientific dives), Scientific Boating Safety Association (SBSA) Motorboat Operator Training Certification (MOTC), US Sailing Safe Powerboating Certification, CSULB Public Media Training Certification, First Aid/CPR, O2 Administration, AED Administration, NAUI Training Assistant, PADI Master Diver, PADI Rescue Diver, PADI Nitrox, US Coast Guard Boating Safety Certification (CA and TX), State of CA Defensive Driving Certification

BOATING EXPERIENCE

Boat Operating

Boston Whalers (< 19'): Experience since 2013. Over 200 operating hours.

22' Twin Vee Catamaran: Experience since 2015. Over 50 operating hours.

26' V-hull Parker: Experience since 2015. Over 25 operating hours.

22' Jones Brothers Bateau: Experience since 2019. Over 100 operating hours.

24' Carolina Skiff: Experience since 2021. Over 100 operating hours.

RELEVANT SKILLS

Lab Techniques:

- Stable Isotope Laboratory Preparation: Bulk $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{34}\text{S}$ and Compound Specific Isotope Analysis of Amino Acids (CSIA-AA): $\delta^{13}\text{C}$, $\delta^{15}\text{N}$. GF/F filters and solids (phyto- and zooplankton, vegetation, consumer tissues)
- Fish otolith removal, processing, and reading
- Operating Brett-type flume respirometer to quantify metabolic rates of fishes
- Water chemical analysis
- Marine animal husbandry

Field Methods:

- Active acoustic telemetry tracking via VEMCO VR100 receiver and VH110 directional hydrophone
- Passive acoustic telemetry: designing and managing acoustic arrays (VR2W, VR2T), telemetry data, VPS and VEMCO VRAP system, etc.
- Animal tracking technology: acoustic transmitters (VEMCO InnovaSea), accelerometers (Cefas, Technosmart), miniPat tags (Wildlife computers)
- External tag package development for fishes
- Boat maintenance: outboard engines, general maintenance
- Animal capture techniques: Bag seines, gill nets, entanglement nets, hook and line, cast nets
- Animal handling and euthanasia techniques
- Field specimen live collection and transportation

Computing:

- Arc-GIS Programming
- R studio
- IgorPro and Ethographer
- VEMCO VUE
- Geospatial Modeling Environment Program
- PRIMER

RELEVANT LINKS

ORCID: <https://orcid.org/0000-0003-4928-4297>

Google Scholar: <https://scholar.google.com/citations?user=BDsr6mAAAAAJ&hl=en>