



IMPACT REPORT



Beacons

Strategic Plan
2018–2028

BEACON

1

World-class place-based, experiential and immersive science education

BEACON

2

Scientific discovery and application to today's environmental challenges for the coasts and ocean

BEACON

3

Interdisciplinary and problem-based collaboration

BEACON

4

An engaged and supportive SML community

BEACON

5

Sustainability leadership

This is Your Report

Dear SML Supporters and Friends,

Every page in this report is evidence of what you have created with each donation and every volunteer hour. I hope you enjoy reading highlights and stories from the 2019 Shoals Marine Laboratory season, which will go down as an exciting and busy one for all. Together, we achieved **SML's mission to provide outstanding experiential, place-based education and to support innovative research programs focused on understanding and sustaining the marine environment.**

We have three take-home messages in this report:

First, we are realizing the SML Strategic Plan that many of you helped create to guide our growth from 2018 to 2028 (available on our website, shoalsmarinelaboratory.org). A few highlights: You, our supporters, have expanded scholarship resources for students from all over the world. We have significantly increased the rigor of our undergraduate student research program (renamed: SURG – Shoals Undergraduate Research Group) through adding more professional development opportunities. We have developed architectural plans for a new faculty house and are working towards a plan for replacing the R/V *Kingsbury*. We hired our first ever Director of Community Relations to help lay groundwork that will strengthen SML as a leader in the study and conservation of sustainable, healthy oceans.

Second, SML students are at the core of our mission. SML is the largest and oldest undergraduate-focused marine laboratory in the United States. Experiential, immersive education in both course offerings and in research programs are our hallmark. In 2019, we continued to enroll a record number of students. We attracted more student interest than ever before in our history. Our 2019 students came to SML from around the world and left as well-educated, passionate scientists. This winter, they have been publishing papers in peer-reviewed scientific journals, speaking at professional conferences, applying to graduate school, and some are even planning their return to the Lab in 2020.

Third, we are a model for sustainability. Through creative partnerships and the dedication of our donors, interns, and staff, we continue to enhance SML's sustainable operations to demonstrate outstanding environmental stewardship to our community and the world. In 2019, we increased efficient use of energy in the kitchen, developed a sustainability data dashboard (coming soon to our website), devised an ingenious new way to make 100% green power freshwater, and increased our green energy generation to 85% of our power needs.

As we begin the 2020 season, we are excited for more progress toward the “beacons” of our strategic plan. We are grateful to have you in our community and we look forward to working with you to further understand and protect the ocean.

With gratitude,



Jennifer Seavey, Ph.D.
Kingsbury Executive Director



Cornell University



University of
New Hampshire

Education

life-changing

Shoals Semester Student Embarks on International Research

Avni Sukhdai Bhalla, a sophomore at Cornell University, participated in the “Shoals Semester” program (4-5 full-time courses) during Summer 2019. *Field Ornithology* was Avni’s first introduction to island life, where she became acquainted with the island natives — the gulls. During this class, she developed research skills by investigating their habitat and nesting behavior. Avni continued her education at SML with *Marine Mammal Biology, Evolution and Marine Diversity, Integrated Ecosystem Research and Management*, and *Shark Biology and Conservation*. By the end of the summer, Avni had become a true islander and a devoted scientist.

Before coming to SML, Avni was an animal science major on the pre-veterinary track at Cornell. Her experience on Appledore led her to not only change her major to Ecology, but also to work with Dr. David Bonter at the Cornell Lab of Ornithology. With Dr. Bonter’s mentorship, Avni is embarking on research in her home country of India. Avni is applying the skills and techniques she learned in *Field Ornithology* to evaluate the long-term ecosystem effects of environmental challenges facing the Kaliveli wetlands of Tamil Nadu, an area that serves as a nesting site for a diverse group of bird species. Avni hopes to evaluate environmental impacts and help inform management strategies for the area. Avni’s work represents a brilliant and engaged student using the skills she learned at Shoals to make a positive impact on the world.

“I love teaching at SML because I get to be a part of inspiring the next generation of scientists! The island learning environment is hands-on and immersive; students learn the benefits of group dynamics and how to apply scientific learning to real-world questions.”

Elizabeth (Ebett) Siddon, Ph.D.,
Former SML student, staff, and current faculty

“Every day was an opportunity to pick up new skills — from identifying whales, to designing conservation plans, to experiencing science through fieldwork and direct application. For instance, you don’t just learn about bird banding through a PowerPoint — you go down to the island’s banding station and help do it.”

Avni Sukhdai Bhalla, '22,
Cornell University



“I was surrounded by a unique community that readily included me and pushed me to improve not only in my skills as a scientist but also as an artist, a productive community member, and a team player.”

Noah Abasciano, '20,
University of New Hampshire

Biology Students Discovers a Passion for Fieldwork

Noah Abasciano, a University of New Hampshire Biology major, ventured to SML to expand his science experience and begin a research project that would define his final year in college.

Noah’s Shoals adventure took him into the terrestrial ecosystems of Appledore and the surrounding islands through *Coastal Habitat Field Research Methods*. Noah’s fieldwork allowed him to explore the islands, collecting data and assessing the plant communities. Noah hacked his way through poison ivy to investigate the apple trees on Appledore. He mapped the origin of the trees using historical records and other data. Noah continued his research after leaving SML and developed the project into his senior capstone. Noah’s work allowed him to examine diverse ecosystems and begin a unique research project that has excelled his passion for biology. Noah’s SML experiences awakened his desire to pursue a career in outdoor research and exploration. As a senior, Noah is planning for his future after college and hopes to pursue a Ph.D. in plant biology.

Shoals Artist-in-Residence Program

Artists have been inspired by Appledore Island’s remote and beautiful landscape since the nineteenth century. Students, researchers, and artists come together at SML to study this natural landscape through the donor-supported **Artist-in-Residence Program**. A shared passion for keen observation and interpretation of nature creates a unique collaboration between artists and students, resulting in a more impactful educational experience. In 2019, six Artists-in-Residence collaborated with SML students and blended the worlds of art and science, enhancing learning outcomes and enriching the student experience. Below, **Robert DuGrenier**, a handblown glass artist, works with students to create glass structures that mimic marine life and habitats.



An Appledore hermit crab explores a handblown glass shell, as scientists and artists collaborate to discover the natural world.

2019 Education Highlights

- + 20 credit courses offered, including two new courses, *Integrated Ecosystem Research and Management* and *Applied Science Communication*
- + Over 200 course enrollments (keeping pace with 2018)
- + Students came from 33 undergraduate institutions and 59 high schools
- + 63% of students who applied for financial aid received support
- + SML awarded over \$335,000 in donor-funded scholarships
- + Six Artists-in-Residence collaborated with SML students, blending the worlds of art and science and improving education outcomes
- + Over 20 guest researchers spoke to students on a broad range of current marine science topics

Research

transformative



Shoals Undergraduate Research Group Program

The Shoals Undergraduate Research Group (SURG) Program provides undergraduate students with an opportunity to conduct independent field research under the guidance of a team of SML scientists and mentors. Research projects also contribute to ongoing, long-term monitoring efforts at the lab. The SURG program provides invaluable hands-on research experience and helps students develop skills that will help them pursue graduate school and/or career aspirations.

As a SURG member, **Yulibeth Velásquez Mendoza** conducted research on the prevalence of nemertean worms that parasitize eggs of gravid American lobsters. The nemertean parasite, *Pseudocarcinonemertes homari*, was first documented in the northern Gulf of Maine in the early to mid-1980s. Yulibeth's research in the waters adjacent to the Isles of Shoals provides the first documented occurrence of this parasite and its impact on lobster eggs anywhere in the southern portion of the Gulf of Maine. Yulibeth was able to spend her summer at SML through a collaboration with the U.S. State Department's *100,000 Strong in the Americas* program, Dr. Timothy DeVoogd of Cornell University, and SML. Since finishing the SURG program, Yulibeth has graduated with honors from the Universidad de Magdalena in Colombia, South America, and has presented the results of her research at two international research symposia.

Science-in-Residence Fellowship Program

The Scientist-in-Residence Fellowship (SIRF) Program supports postdoctoral and early career scientists who conduct research at Shoals Marine Laboratory during the summer. Through donor support, this program provides a stipend as well as funds to support research efforts. In addition to research, fellows assist with mentoring undergraduate researchers participating in SML's SURG Program (see above).

Dr. Carrie Keogh, a lecturer in ecology at Emory University, first came to SML as an undergraduate researcher in 2007. Her work in 2007 focused on quantifying differences in the parasite community of two invasive species of shore crabs that inhabit the intertidal zone of Appledore. Since her time as an undergraduate researcher at SML, Dr. Keogh has gone on to conduct research on the parasite ecology of a variety of intertidal organisms. She returned to SML in summer 2019 as a SIRF and expanded her research on adaptations of periwinkle snails to evolutionary selection pressure from trematode parasites.



Sustainable Engineering Internship Program

The Sustainable Engineering Internship (SEI) Program invites four engineering students each summer to Appledore Island as part of the Shoals Sustainability Program sponsored by SML's corporate partner, Unitil. Over the course of a month, interns work on multiple projects involving the performance and planning of the electrical, drinking water, wastewater management, and salt water systems.

During the summer of 2019, the interns focused on running the newly purchased reverse osmosis machine on solar power to help reduce the amount of diesel used on the island. After measuring SML's 2019 diesel fuel consumption for energy production, interns calculated that SML used 88% less diesel than when our first green energy grid was installed in 2007.

One of the newest facility improvements was the replacement of SML's decades-old, walk-in refrigeration equipment in 2019. Past sustainability interns had helped to compile and analyze energy use data of the old equipment to make recommendations on its replacement. By renovating the system, SML aims to improve overall energy efficiency, as refrigeration is one the largest energy loads on the island. This is one example of how these interns provide and analyze data to assist SML in making critical infrastructure decisions toward our sustainability goals.



"This was a once-in-a-lifetime opportunity to gain hands-on experience with a variety of current environmental engineering topics. Compared to other classic 9 to 5 engineering internships, I benefited greatly from the community aspect and superb mentorship in a unique setting."

Marguerite Lorenzo, '21, Cornell University
2019 Sustainable Engineering Intern



2019 Research Highlights

- + 18 students came from 11 institutions around the world to conduct research in a wide range of subjects, from parasites to marine mammal biology to sustainable engineering
- + 20 student researchers presented at two symposia: the 3rd annual *Undergraduate Research Symposium* and the 14th annual *Sustainable Engineering Internship Symposium*
- + Two Scientist-in-Residence Fellows conducted research and mentored students
- + Seven undergraduate researchers presented at the *Gulf of Maine 2050 International Symposium*
- + Dozens of researchers visited from Cornell University, the University of New Hampshire, Dartmouth College, Canisius College, UMass Boston, Tufts University, Northern Essex Community College, and more



Outreach

community

2019 Outreach Highlights

- + The Appledore Walking Tour brought 286 guests to the island, while Celia Thaxter’s Garden Tour attracted 301 garden enthusiasts
- + 85 guests participated in six overnight Adult and Family Programs
- + SML hosted two conferences: the NSF’s *Evolution and Changing Seas Conference* and the *New England Humanities Consortium’s Digital Humanities Retreat*
- + SML hosted hundreds of visitors from academic programs at UNH, St. Paul’s School, Phillips Exeter Academy, and more

Alumni and Friends Weekend 2019

During Labor Day weekend 2019, SML hosted the annual **Alumni and Friends Weekend** offering activities, networking, and reconnection for the SML Community. As with SML’s academic programs, the weekend featured hands-on activities and learning opportunities focused on marine science. Participants also enjoyed hiking, snorkeling, boating, and fishing on and around Appledore — and of course taking in the sunsets and sharing past island experiences with other “Shoalers.”

In 2019, SML launched our **Alumni and Friends Association (AFA)**. The mission of the AFA is to engage and enhance the Shoals Marine Laboratory community (alumni, families, friends, donors, and staff) in a manner filled with pride, tradition, life long-learning, and excitement that stretches across time and space. As our Alumni and Friends community grows, we hope that you will engage in new opportunities for networking, learning, and fun.

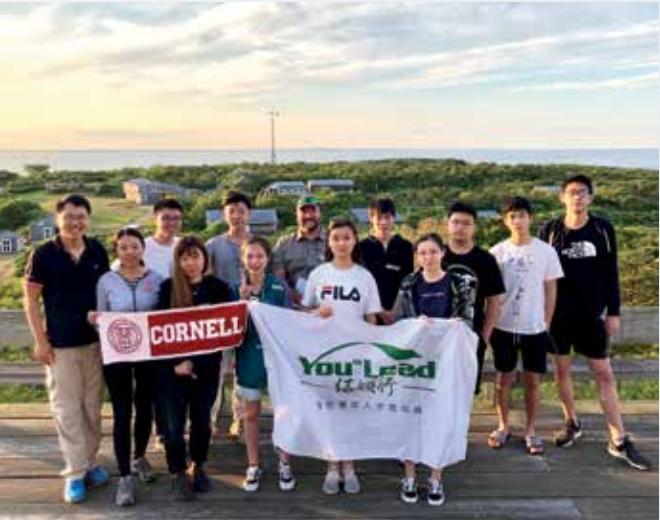
“At this year’s SML Alumni Weekend I observed the phenomenal progress at the Lab — in its programming, facilities and outreach efforts. As an alumnus of the Introduction to Marine Science course (from 1977!) I was so positively impressed by the high-quality, immersive education that SML provides its students. I donate to Shoals Marine Lab to increase the availability of these invaluable experiences to students from across the country and the globe.”

Michael Coburn, MD
Alumni and Friends Association Council Chair

Visiting Groups

SML is an educational destination for a diverse array of visiting groups. We have long-standing relationships with many external groups, and we welcome them year after year so they may collaborate with our students and researchers, as well as benefit from our unique island classroom and facilities. Hosting these groups allows SML to offer the Appledore experience to individuals who might otherwise not have the chance.

The photo below shows the 2019 group from **Youth Lead**, a social enterprise platform affiliated with Cornell that aims to promote global understanding, leadership, and entrepreneurship among Chinese students in the fields of environment, green growth, climate change, and sustainability.



Thank You 2019 Partners

Shoals Marine Laboratory was fortunate to work with dozens of partners and collaborators to deliver on our mission in 2019. We are grateful for their support and collaboration, which allows SML to advance innovative marine education and research programs.

100,000 Strong in the Americas	National Marine Educators Association	St. Paul’s Advanced Studies Program
Appledore Island Migration Station	National Oceanic and Atmospheric Administration	Star Island Corporation
Atlantic White Shark Conservancy	National Science Foundation	State of Maine Department of Health and Human Services
Biology Institute at Exeter	New England Fishmongers	The Music Hall
Blue Ocean Society	New England Humanities Consortium	Three River Farmers Alliance
Calypso Communications	New Hampshire Audubon	Tufts University Department of Civil and Environmental Engineering
Canisius College	New Hampshire Charitable Foundation	U.S. Fish & Wildlife Service
Coast Encounters	New Hampshire Department of Natural and Cultural Resources	UNH Advancement and Alumni Relations
Cornell Alumni Affairs and Development	New Hampshire Fish and Game Department	UNH College of Engineering and Physical Science
Cornell College of Agriculture and Life Sciences	New Hampshire Sea Grant	UNH College of Life Sciences and Agriculture
Cornell Cooperative Extension, Master Gardener Program	New Visions Charter Network	UNH Cooperative Extension, Master Gardener Program
Cornell Lab of Ornithology	Northeastern Coastal Stations Alliance	UNH Facilities
Cornell School of Continuing Education and Summer Sessions	Northeastern University	UNH Institute for the Study of Earth, Oceans, and Space
Dartmouth College	Northern Essex Community College	UNH Marine Docent Program
Environmental Septic Solutions	PEASE Development Authority	UNH School of Marine Science and Ocean Engineering
Girl Scouts of the Green and White Mountains	Peter Paul Wines	United States Coast Guard
Harvard Institute for Learning in Retirement	Piscataqua Sailing Association	Unitil Corporation
Johns Hopkins University Applied Physics Laboratory	Rolling Green Nursery	University of Central Oklahoma Forensic Science Institute
Kittery Land Trust	Rosamond Thaxter Foundation	University of Massachusetts Boston
Kittery Point Yacht Yard	Sea Education Association	University of New Haven
Knox College	Seacoast Consulting Engineers	Wright-Pierce Engineering
Lewis Family Foundation	Seacoast Science Center	Youth Lead Program
Maine Department of Marine Resources	SML Volunteer Weekend Participants	
Maine Entomological Society	Society for the Preservation of NH Forests	
Marine Mammals of Maine		

Financials

2019
snapshot

2019 SML Staff

Isabel Aley
Director of Community Relations

David Buck, Ph.D.
Associate Director

Samantha Claussen
Program Support Assistant

Elizabeth Craig, Ph.D.
Academic Coordinator and SML
Tern Conservation Program Manager

Ross Hansen
Director of Facilities and Planning

Gregg Moore, Ph.D.
Academic Coordinator –
University of New Hampshire

Michael Rosen
Director of Operations

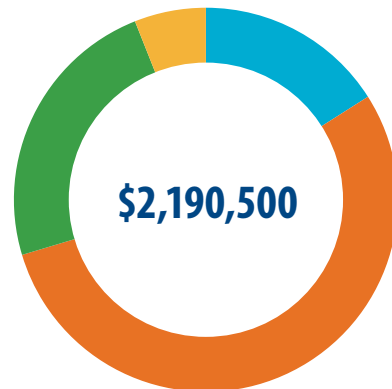
Jennifer Seavey, Ph.D.
Kingsbury Executive Director

Becca Toppin
Diving Safety Officer (DSO)

Eugene Won, Ph.D.
Academic Coordinator –
Cornell University

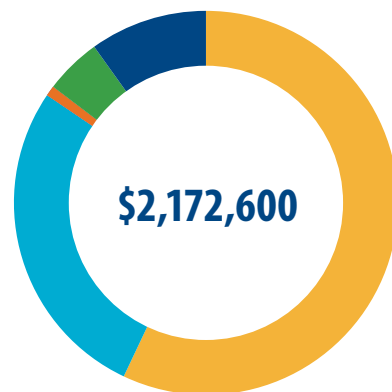
List includes 2019 year-round staff
only. SML hires dozens of seasonal
staff every year.

Expenses



- Programs / 54%
- Operations & Facilities / 23.4%
- Student Scholarships / 15.3%
- University Support / 7.3%

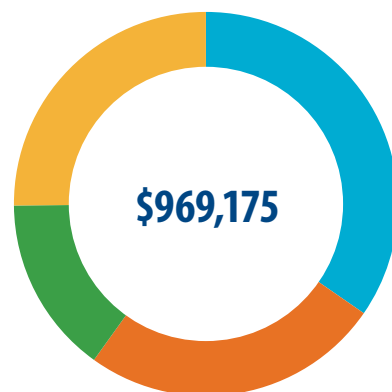
Revenue



- Course Fees* / 57.2%
- Non-scholarship Gifts & Grants / 27.3%
- Store / 0.9%
- Public Programs / 4.7%
- Visitor Fees / 9.9%

*27% of course fees are supported by
scholarship donations

Gift & Endowment Allocation



- Scholarships / 34.6%
- Programs / 25.3%
- Staff / 15%
- Facilities & Operations / 25.1%

In 2019, over 400 alumni and friends supported SML through donations, allowing SML to grow as a world leader in the study and conservation of healthy oceans.

Dive In!

get involved

Come to Appledore

Visit our website shoalsmarinelaboratory.org to learn about our overnight Adult & Family Programs, Celia Thaxter's Garden Tours, Appledore Island Walking Tours, Alumni & Friends Weekend, and other opportunities to visit and learn.

Donate

SML relies on donor generosity to provide world-class, immersive education and research opportunities to students. Every dollar you invest in a SML student makes a difference in their education and future. Visit shoalsmarinelaboratory.org/give to make your tax-deductible donation through Cornell University or the University of New Hampshire. If you are interested in discussing the benefits of gift planning, please contact Executive Director Jennifer Seavey at jennifer.seavey@unh.edu.

Follow Us

Keep up to date with SML happenings by subscribing to our monthly newsletter at shoalsmarinelaboratory.org/newsletters. If you frequent social media, like our Facebook page and follow us on Twitter and Instagram.

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Reach Out Anytime

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Ecophotography, LLC





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Shoals Marine Laboratory is operated jointly by
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Cornell University



University of
New Hampshire