

# QUAHOG BAY CONSERVANCY



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2022 ANNUAL REPORT



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# DIRECTOR'S STATEMENT

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It's that time of year again, when we reflect on all the things we've completed and share the results with you.

QBC is changing and growing to better suit the environmental needs in Harpswell. Plans are in process to convert property into a research facility with intern housing.

This year we are excited to announce two high school scholarship opportunities in addition to the Marine Science Award for college and undergrads. Community Outreach is beneficial in educating the public for a prosperous future and working waterfront.

Welcome aboard to Isabelle Sée who joined us in December 2022. She was raised on the coast of Maine and pursued a Bachelor of Science degree in Marine Biology from University of Maine at Orono. Isabelle is eager to support the research, conservation, and internship programs QBC has established.

Three college interns were selected last summer and brought on to aid with the oyster farms, general lab work to ensure protection of Quahog Bay, and to begin field research in microplastics.

Looking forward, it becomes even more important to support QBC programs to ensure continued growth and success for Maine's working waterfront.

2023 has some exciting concepts and programs to benefit the working waterfront and your assistance is needed to support these programs and to continue protecting Quahog Bay.

Thank you for your support, without you our mission would not be attainable.

**PATRICK  
SCANLAN**

Executive Director



# NONPROFIT STATUS

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The Quahog Bay Conservancy (QBC) is a registered 501(c)(3) non-profit organization. All donations are 100% tax deductible. 100% of every dollar raised goes towards funding our programs and paying the staff who implement them. We are an extremely lean and efficient organization.

QBC is funded in part by generous individual donors, private foundations, and state grants. The balance of our revenue comes from QBC's sustainable oyster farm, which grows hundreds of thousands of oysters each year, selling them to restaurants and wholesale buyers.

The donated funds and 100% of the proceeds from the sale of Snow Island Oysters go to QBC's programs, ensuring that we protect the ecological integrity of the bay.

## OUR BAY. OUR RESPONSIBILITY.

*The mission of Quahog Bay Conservancy is to revitalize the ecosystem of Quahog Bay to a robust and resilient state for all communities that depend on it. Through sustainable aquaculture, ecosystem monitoring, and community education, we aim to conserve natural habitat, protect native wildlife, foster environmental stewards, and support Maine's working waterfront.*



## CONTACT INFORMATION

**QUAHOG BAY  
CONSERVANCY**

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Harperswell, Maine 04079**

**Phone: (207) 522-1105**

**Email: [office@quahogbay.org](mailto:office@quahogbay.org)**



# LEARN WITH QBC

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**Education and outreach.** Engaging and educating the community about the natural environment and marine ecosystem in such a way to promote good stewards of the land and sea.

**Internship Program.** Our summer internship is a comprehensive program for undergraduate students pursuing a career in marine biology, marine science, environmental science, fisheries science, oceanography, aquaculture, or a related field.

**Scholarships.** Hoping to inspire future marine scientists, QBC supports undergraduate students attending a university in Maine with funds to support senior-level research projects.

QBC also works with local high schools to create hands-on opportunities for the next generation.



## NEW IMPLEMENTATION

### Working Waterfront Science Scholarship

We are excited to announce a scholarship for two Harpswell high school seniors pursuing a career in marine biology, marine science, environmental science, marine entrepreneurship, oceanography, aquaculture and aquarium science, fisheries science, ecology, chemistry, marine engineering, civil engineering, and marine systems engineering, etc.

For more information on the scholarship, visit our website ([www.quahogbay.org](http://www.quahogbay.org)) and download the application requirements.



# MICROPLASTICS

This year QBC launched our microplastic analysis program in efforts to examine microplastic levels within our ecosystem.

We were able to take samples from various species including haddock, tuna, various bivalves, and sediment from the bay. We examine microplastics by completely breaking down the organic components of an organism. These solutions of broken-down organic matter are then filtered using a vacuum pump. After filters are dry, the QBC team is able to identify microplastics that are located within the organism sampled.

QBC is excited to have new technology coming this year that will help us identify specific microplastics and their origins. New resources like this are going to strengthen our abilities to positively affect the environment.



# Plastic Pollution



Plastic pollution occurs when plastic objects and particles assemble in an area and begin to adversely impact the natural environment and affect habitats of plants and wildlife, as well as humans.

Plastics pollutants are categorized by size into macro-, meso-, micro-, or nano-, plastics. Another type of debris is microfibers which contain microplastics.



## Macroplastics

Large plastic items that are visibly noticeable and can often be found littering shorelines and floating in surface waters (i.e., plastic bottles)

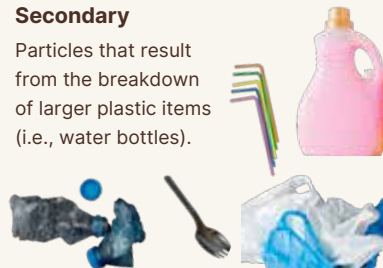
## Primary

Tiny particles designed for commercial use, such as cosmetics (i.e., microbeads found in face washes, body washes and toothpastes). Primary microplastics also include microfibers shed from clothing and other textiles, such as fishing nets.



## Secondary

Particles that result from the breakdown of larger plastic items (i.e., water bottles).



## Mesoplastics

Large plastic particles that are visible, typically defined as 5-10 mm in size.



## Microplastics

Microplastics are much smaller pieces of plastic fragments typically less than <5mm, derived from the breakdown of macroplastics.



## Nanoplastics

Nanoplastics are plastic fragments much smaller than microplastics and are not visible to the naked eye or even under a simple optical microscope.



## Microfibers

Microplastics released from synthetic clothes everytime we wash them.

### UNITS OF MEASURE: MM, UM

- mm: millimeter (mm) is a unit of length = to 0.001 meter.
- um: micrometer or micron (um) is a unit of length equal to 0.001 millimeter. Commonly used to measure the thickness/diameter of microscopic objects.

# INTERNSHIP & SCHOLARSHIP PROGRAM

**Internship.** QBC has established a formal, competitive summer internship program for undergraduate students and recent graduates. Interns support our staff on a portfolio of projects focused on fishery ecosystem research as well as community and education programs. The internship will provide an opportunity to gain valuable work experiences at sea and in our lab.

**Scholarship Program.** To encourage the development of Maine's future marine scientists, QBC supports senior-level research projects in marine science by students attending a university in New England. We allocate \$10,000 from our annual budget to support student marine science related projects.

For more information on internships and the scholarship program, visit our website ([www.quahogbay.org](http://www.quahogbay.org)) and download an application.



**Teagan Cunningham, Bowdoin College;**  
Degree in Earth and Oceanographic Sciences;  
**Summer Intern 2022:**

I am from NJ and have always been passionate about the water! I grew up sailing all year around and compete in college!

I loved working at QBC this past summer! The team is very outgoing, passionate, and knowledgeable. I was exposed to harvesting oysters, micro plastics research, water quality monitoring, clamming, and invasive green crab removal which was all new to me! I loved developing and conducting the research methods to analyze microfiber and micro-plastic concentrations in tuna, cod, clams, oysters, mussels, and sediment. Additionally, we made great contacts at the Gulf of Maine Research Institute. Thank you to everyone at QBC for an amazing summer!





# INTERNSHIP & SCHOLARSHIP PROGRAM

— CONTINUED

**Nash Holley, *Bates College*** Environmental Science Major  
***Summer Intern 2022:***



As an intern at QBC this summer, I was able to develop a proficiency in aquaculture, while also having the opportunity to conduct valuable research on the state of Quahog Bay. As a Maine resident, the well-being of the Gulf of Maine is an environmental concern that resonates with me, and I think that QBC is doing really valuable work in the right direction. I have harbored skills and knowledge that I will continue to use in a marine science setting. Thank you to everyone at QBC for a great summer.



**Mikayla Wallace, *Maine Maritime Academy***  
Oceanography Major  
***Summer Intern 2022:***

I have grown up on the water my entire life, coming from a fishing family, and there's nothing more I love then being on the water, and because of that QBC was a perfect fit for me. Summer here at QBC has really opened my eyes to new opportunities and a great learning experience along with hard work ethic.

I love that QBC is a mixture of being out in the field crabbing, oystering, debris pickup and other hands-on experience, and has some lab time as well in doing microplastic research with several different species, and water quality research. The field trip to Gulf of Maine Research Institute (GRMI) was a great experience, I learned so much. QBC has given me many opportunities for future plans with my Oceanography degree. I'd like to give a big thanks to Pat and the hard-working staff at QBC, for being so welcoming and giving me these amazing opportunities and experiences.



# WATER QUALITY MONITORING

On a weekly basis the QBC team ventures out to nine different locations in Quahog Bay to collect water samples. The surface water at each site is collected and then processed and analyzed in our lab facility. Key measurements reported on include:

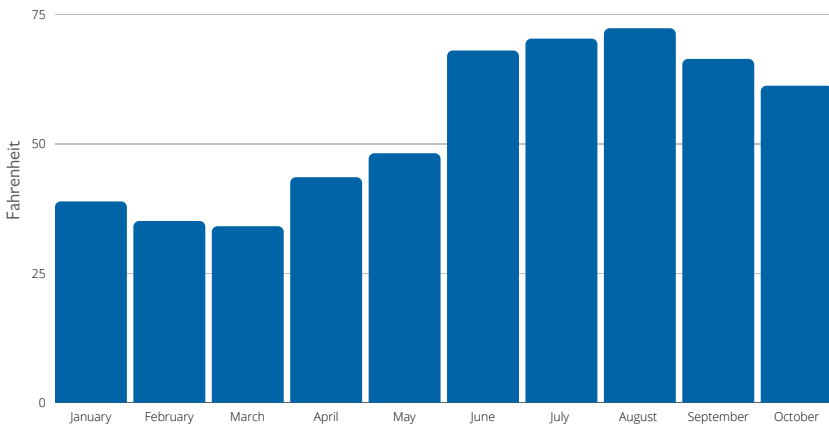
- water temperature
- salinity
- conductivity
- dissolved oxygen
- acidity
- turbidity

Other key components include monitoring the levels of bacteria and various species of phytoplankton to track harmful algal blooms, known as “red tide.” Gulf of Maine red tide is caused by *Alexandrium catenella* algae, which produce a toxin that can accumulate in shellfish.

The combination of these key measurements and components inform us about the water quality and if the presence of disease-causing organisms has caused water contamination.



## 2022 Water Temperature Averages in Quahog Bay



# WATER QUALITY MONITORING

## — CONTINUED

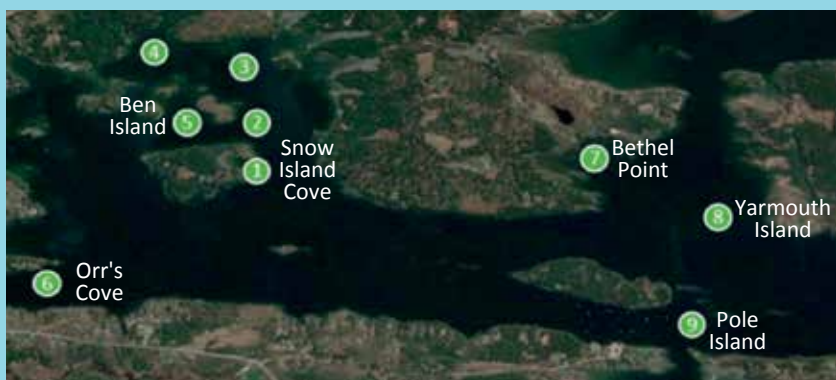
Water quality overview:

- 9 Sites sampled monthly
- 16 hours spent sampling
- 144 samples taken
- 32 hours spent processing data

*For more information on "red tide," please visit our website and refer to the Environmental Monitoring section, Water Quality.*



## Water Quality Testing Sites



# MARINE DEBRIS REMOVAL

Unfortunately, most of the trash in our lives ends up in our marine ecosystems one way or another. Some of the trash that ends up in the ocean are materials like PET, PE, and PVC break down to a micro size; these are what we identify as a "micro-plastic."

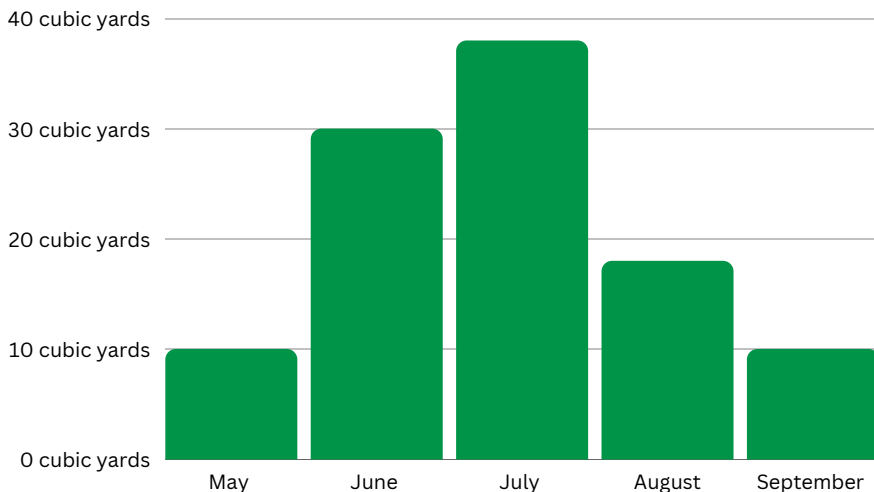
Due to the oceans current, Quahog bay tends to trap a large portion of floating garbage. Our goal is to pickup debris before it breaks down to the microscopic level and becomes difficult to remove. We patrol every shore, grab debris found, and transfer to a recycling facility.

## Types of debris eliminated from the bay:

- fishing gear
- rope
- rubber gloves
- tires
- car batteries
- cigarette butts
- bottles & cans
- derelict docks & parts
- plastics
- styrofoam
- party balloons
- dock debris



## Cubic Yards of Trash Collected 2022





# MARINE DEBRIS REMOVAL

## — CONTINUED

This past summer has been no different than previous years. Our annual Yarmouth Island Cleanup removed an estimated 20 cubic yards of marine debris in this one effort.

QBC is always on patrol for trash, whether we are crabbing, on the oyster farm, or testing water quality. If we see trash floating, or on the bank we pick it up. QBC follows the theory of "leave no trace," the goal is to leave it better than we found it.

Educating the community about the impact of trash in the bay and the health of the marine life is also a priority for QBC.



# OVERBOARD DISCHARGE

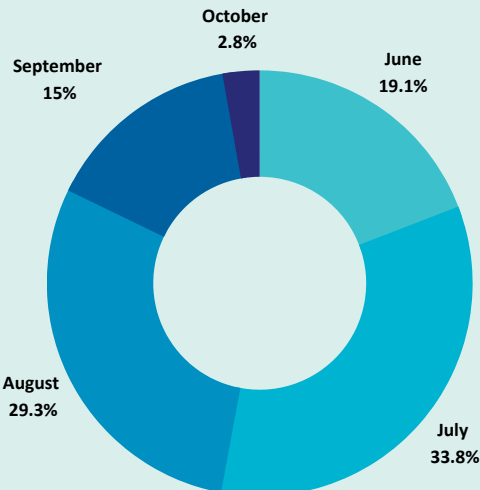
Quahog bay is a popular boating destination due to the geography with its warm waters and unique islands along the coast. Unfortunately, there is limited options for dumping boat waste and Maine law prohibits discharge of raw sewage within three (3) miles of the coast.

Pumping sewage directly into the water creates problems for fish and aquatic life by lowering oxygen levels in the water. An excess of nutrients in the ecosystem causes sudden growth of algae and depletes oxygen that organisms desperately need.

QBC's free pump-out service, for any boats anchored in Quahog Bay, helps prevent unneeded waste in our ecosystem that can have harmful effects. We pump it and then transport the waste to a licensed local facility, thereby potentially preventing thousands of gallons of brown and gray wastewater from being discharged into the bay every year.



## Percentage of Waste Pumped Per Month 2022



# OVERBOARD DISCHARGE

## — CONTINUED

Just like it did for everyone else, covid had a large impact on our normal way of life. We are seeing the effects through our pump-out service.

During covid and directly after we pumped record numbers due to increase number of boaters. As of recent, we have seen a slight decline in overall traffic as the world seems to rebalance itself.

QBC also created an education program to make sure boaters know about our free service and to encourage them to take advantage of it.

### Non Discharge Areas:

A "No Discharge Area" or "NDA" is a federally designated body of water where the discharge of both treated and untreated boat sewage is prohibited.

Federal Law prohibits the discharge of untreated sewage from vessels within all navigable waters of the United States, which includes waters within three miles of shore. For more information on Maine's NDA's please visit: <https://www.maine.gov/dep/water/wd/vessel/nda/index.html>



## *In need of a boat pumpout?*

Give us a call  
**(207) 522-1105**  
or reach us by email  
**Office@quahogbay.org**



Available for service mid-May to October

# INVASIVE SPECIES

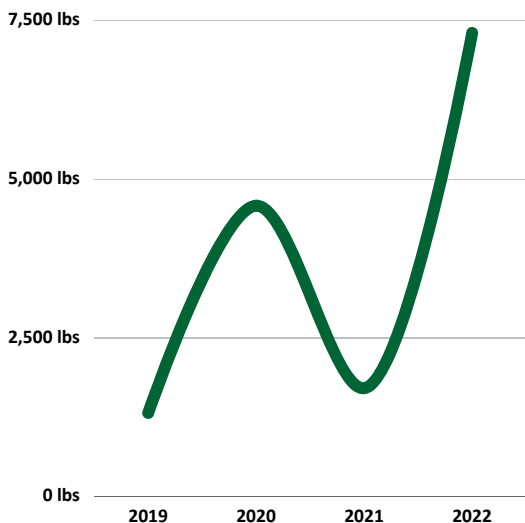
An aggressive and invasive predator, the European green crab (*Carcinus maenas*) is the most ecologically and economically damaging predator. With the rise of water temperature in the Gulf of Maine, green crab populations are rapidly expanding.

Green crabs devastate and consume nearly everything in their paths including mussel beds, clam flats, and scallop stocks. In addition, green crabs slice through eelgrass habitat and burrow in salt marshes, causing increased erosion in bays and estuaries.

New strategies are needed to mitigate the ecological and socioeconomic impacts of green crabs. QBC developed a localized management plan that investigates and collects data on green crab population dynamics to learn more about the species. Since the beginning of our efforts, we have observed an increase in soft shell clams throughout many parts of the bay.



**Total Green Crab Weight Per Year**







**Tom Prohl, Wolfe's Neck Farm;**  
*Farm Operations & Systems Manager*

At Wolfe's Neck Center we simply love utilizing the thousands of pounds of invasive European Crab harvested by QBC. We put them to use right away within our compost operations, the crabs are nutrient rich and really feed our compost. Our finished product is laden with shells & claws and helps us tell this inspiring story of invasive species removal; repurposed to fertilize our fields and grow organic food for our community.



# SNOW ISLAND OYSTERS



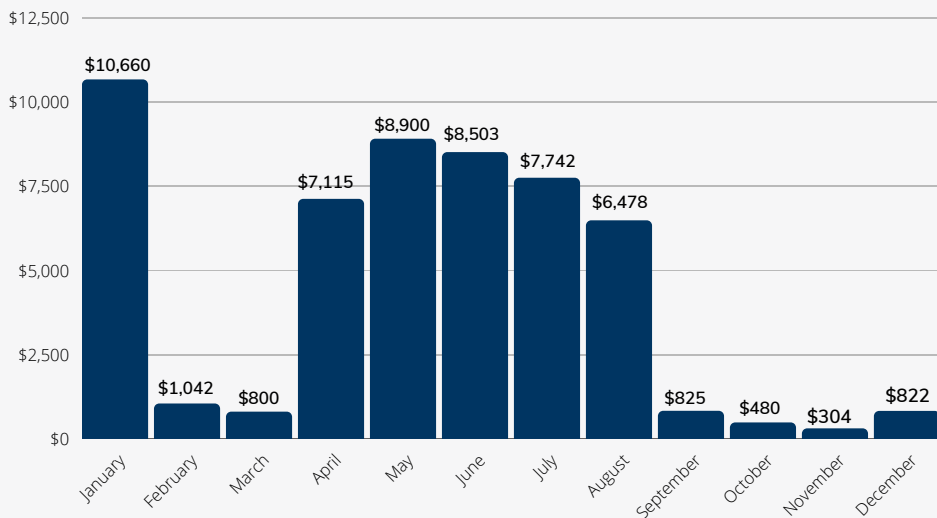
Originally, when Quahog Bay started in 2015 the state of the ecosystem was deteriorating. The bay was closed to shellfish harvesting due to the harmful levels of e.coli and other bacteria that prohibited any harvesting.

After years of cleanup projects, addressing harmful waste disposal practices, and working with Maine Department of Marine Resources we were able to lift the ban on shellfish harvesting. Quahog Bay was able to reopen to the harvest of shellfish.

In 2021 we had record sales, producing the most oysters, which in turn depleted our stocks. This allowed QBC to focus on our other conservation initiatives for the bay.



## 2022 Oyster Income Breakdown



# SNOW ISLAND OYSTERS

—CONTINUED



We have changed the way we package oysters for consumers to utilize biodegradable netting. This material has the ability to decompose within 3 months without leaving harmful residue.

The spool of netting can be cut to the desired length to best match the quantity to contain and the ends are tied off or sealed with hog rings or zip ties. This containment method has the same strength and durability as the previously used plastic net bags, without the negative effects on the environment. It's a way for QBC to take action with a long-term solution.



## QBC Yearly Oyster Income

**2016**

\$6,460 & 9,900 oysters sold

**2017**

\$40,693 & 61,650 oysters sold

**2018**

\$45,203 & 55,705 oysters sold

**2019**

\$74,393 & 100,255 oysters sold

**2020**

\$9,483 & 12,286 oysters sold

**2021**

\$234,062 & 375,918 oysters sold

**2022**

\$53,231 & 64,775 oysters sold





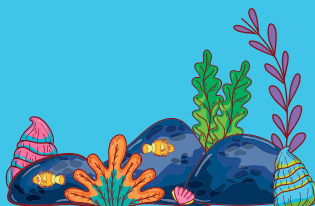
# AMERICAN OYSTER

*Crassostrea virginica*



## KEYSTONE SPECIES

The American Oyster is a Engineer Keystone species; this is an organism that creates, manipulate, or destroy a habitat. Oyster beds create essential habitat for juvenile fish and other organisms. Additionally, the filtration system of oysters helps maintain the bays water quality.



## WATER FILTRATION

A single adult American Oyster can filter up to 50 gallons of water a day. A overload of nitrogen and other nutrients can cause imbalances that effect the ecosystem as a whole. Oysters help maintain nutrient levels to prevent eutrophication.

## QUAHOG BAY

This year our farm has between 250,000 and 400,000 oysters in our lease. With this amount of oysters our lease is currently filtering around 20 million gallons of water every single day.



## SUSTAINABLE AQUACULTURE

Oysters are not just a delicious source of protein; oysters are a big component of a healthy marine ecosystem. Growing oysters allows us to filter the bay. It also allows us to use profits to fund our various cleanup projects that contribute to the health of the ecosystem.



# FINANCIAL OVERVIEW

Quahog Bay Conservancy's income is obtained from three primary sources: contributions/grants, fundraising, and oyster sales.

Without generous contributions and grants, QBC could not exist. Additional financial support is done with yearly mailing, local events, and social media campaigns. Oyster sales also generate a substantial amount of capital acquired to assist our conservation efforts.

Trust plays a key role in building our relationship with those who share our passion for this work. As a 501(c)(3) nonprofit, QBC is deeply committed to accountability and transparency. Our IRS Form 990s for the last several years are available on our website. We do this to ensure that our donors, partners, and the public can learn more about how we bring in revenue, how we invest it in the bay, and the overall efficiency of our operations.

*For more financial information please visit [www.quahogbay.org](http://www.quahogbay.org)*





## Quahog Bay Conservancy Revenue and Expense Summary 2022 January – December

**Revenue Total**  
**\$467,738**

Contributions — \$398,398

Oysters — \$53,231

Grants — \$16,109

**Expense Total**  
**\$293,518**

**Support Services Total**  
**\$64,276**

Overhead — \$45,518

Fundraising — \$18,758

**Programs Total**  
**\$229,242**

Conservation — \$99,549

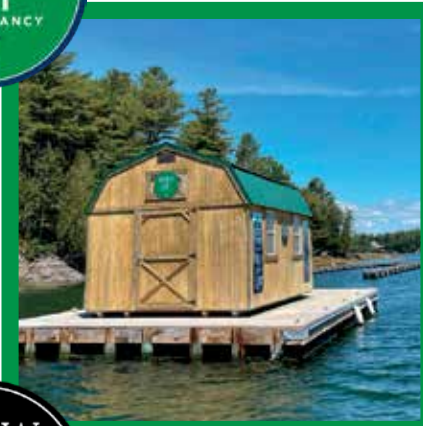
Oysters — \$91,577

Research and Development  
— \$24,754

Education and Outreach —  
\$13,361

### NO EXECUTIVE COMPENSATION:

We are an extremely lean and efficient organization. Not a single penny goes to executive compensation because we don't have any executives to compensate. 100% of every dollar raised goes towards funding our programs and paying the staff who implement them.





**OUR BAY. OUR RESPONSIBILITY.**

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**GIVE A SHUCK.**