

GULF OF MAINE RESEARCH INSTITUTE

Annual Report 2016



**Gulf of Maine
Research Institute**

Science. Education. Community.

Teachers, Students Engaging in Citizen Science



Whether in our lab, in the classroom, or out in the field, our Education team is working with students and teachers around the state to support science education. This year, teachers and staff members alike reflected on the impact of Vital Signs — GMRI’s citizen science education program.

Maine Teacher Reflects on Vital Signs Experience

Last year, Messalonskee Middle School teacher Amanda Ripa led an invasive species investigation with her students. Below, she reflects on her experience using Vital Signs with her class.

“Using Vital Signs enhanced this investigation tremendously. This experience allowed my students to make observations and answer an authentic question in their own backyard. Together, we investigated a local population of crayfish to determine whether or not they were invasive. Through Vital Signs, we worked directly with Dr. Karen Wilson, a professor and crayfish expert from the University of Southern Maine. This opportunity to share our research in the scientific community gave our students exposure and confidence as young scientists!



Throughout the project, I watched my students become more engaged as they began to understand the importance of biodiversity to the ecosystem. They also improved their science writing, using new vocabulary to cite evidence supporting their claims. Students with artistic skills put their talents on display by drawing their observations.

This authentic, interdisciplinary learning experience allowed my students to participate as citizen scientists in the Maine learning community!”

— Amanda Ripa, Messalonskee Middle School teacher

Teachers, Students Engaging in Citizen Science (continued)

Staff Stories: Young Citizen Scientists Destined to Lead

Below, Teacher Professional Development Coordinator Molly Auclair shares her story about a special group of students from Massabesic Middle School.

Through GMRI's citizen science education program — Vital Signs — Molly engages Maine students and teachers in hands-on science experiences. These projects contribute meaningful data to research initiatives throughout the state.

“It’s easy to get discouraged in the face of the many challenges we observe in the Gulf of Maine and beyond. Whether it’s a warming Gulf of Maine, or the spread of invasive species throughout our watershed, I’m thinking about these challenges on a daily basis.

But some days provide the inspiration I need to press on, renewing my passion and reminding me why I do what I do. I had one of those days early last month, when I attended the Maine Woods Forever round table meeting at Unity College.

I made the trip to support and celebrate a team of 7th grade students from Massabesic Middle School. That day, they accepted the Teddy Roosevelt Maine Conservation Award, which recognizes young people and youth organizations working to conserve Maine’s forest heritage.

These students are some of the most active young citizen scientists we’ve seen participate in our Vital Signs program. As part of this program, these students chose from a variety of “Field Missions”, answered questions with data, and shared their findings with the science community online. The award recognized their contribution to the scientific community through Vital Signs and other statewide programs.

The event began with a round of introductions. From the start, it was obvious — these students will be conservation leaders in our state. Brenna, one of the students from Massabesic, introduced herself with vigor: “My name is Brenna and I am a citizen scientist from Massabesic Middle School!”

The success of this team starts with their amazing teacher, Pat Parent. Pat is a 7th grade science teacher who has been engaging his students in hands-on investigations with our citizen science education program, Vital Signs, since 2009. These kids are incredible, and so is Pat.

These students are so committed to being knowledgeable, responsible, and active stewards of Maine’s environment. Meeting them and seeing their passion up close brought happy tears to my eyes.

Even in the face of overwhelming environmental challenges, there is inspiration to be found. This day of work reminded me of that, and I left feeling optimistic and proud of the work we all do. I can’t wait to continue our work supporting the many budding citizen scientists in schools across our state.”

— Molly Auclair, Teacher Professional Development Coordinator



Advancing Aquaculture: Our Role in an Emerging Industry

In recent years, GMRI has begun a new aquaculture program, focused on growing this emerging industry in the Gulf of Maine. Below, President & CEO Don Perkins describes our goals, as well as some recent progress:

As global population has grown, demand for premium quality, local seafood has exceeded what we can harvest from the wild. To meet this demand, aquaculture has emerged to provide food for our dinner tables, jobs for our coastal communities, and opportunities for our kids and grandkids to continue working on the water.



In the Gulf of Maine, aquaculture can be a safe, responsible, and sustainable way to grow our marine economy. As wild fisheries change with a warming ocean, we can bolster Maine's coastal communities by supporting a sustainable aquaculture industry that complements traditional fisheries.

Our Goals

A wide network of NGOs, trade groups, and others are supporting aquaculture in our state through research, education, and training. At GMRI, our primary role in growing this industry will be to provide system-level business development support — from the farmers to the financiers, and everyone in between.

Our goal is to support aspiring farmers entering the industry, help farmers grow their businesses responsibly, help the business community understand the aquaculture investment opportunity, and help diversify and grow the industry as a whole. A healthy and robust aquaculture industry needs to include a variety of businesses, large and small, supporting each other with diverse knowledge, products, and services.

Over time, we will also support the success of aquaculture with targeted research, particularly related to understanding the impact of climate change, and education initiatives.

Recent Progress

To achieve scalable growth, we needed to first ask how much new production this industry could absorb. Our first step in this endeavor was to understand the current and potential value of Maine's aquaculture industry.

With that in mind, we convened collaborators from throughout the industry to discuss the opportunity at hand. We're working with these active farmers, leading consultants, trade groups and others to better understand the market challenges and opportunities.

In October, we published important findings which resulted from this collaboration. Our Maine Farmed Shellfish Market Analysis confirms a huge opportunity to grow farmed oyster, mussel, and scallop sectors at a scope and scale that fits with Maine's working waterfront culture.

With proof of this opportunity, we can now concentrate on seizing it. This will be our focus in the coming months and years, and I look forward to sharing our progress with you.

Local Fish on a Roll: Gulf of Maine Fishermen Think Sushi

If you're like many Americans, you're probably a big fan of sushi. But did you know that the seafood served in American sushi restaurants is seldom from U.S. waters? Most often, it's imported from Japan. While local fish is available, there are key differences in handling practices between Japanese fishermen and our local fleet.

The term *sashimi-grade* refers to high quality fish that can be consumed raw. Achieving this standard of quality requires specific handling techniques that most fishermen in the U.S. are unfamiliar with. That's why leading sushi chefs pay top dollar for fish imported from Japan.



Building markets for sashimi-grade Gulf of Maine seafood has the potential to help local fishermen earn more for their catch. With New England fishermen facing steep reductions in allowable catch for once high-volume species, it's critical that they make the most of every species and pound that they land.

GMRI is working with fishermen, chefs, restaurateurs, and distributors to support these regional markets and offer training in Japanese handling practices. In December, fishermen from Port Clyde, Maine to Marshfield, Massachusetts participated in training workshops to learn some of these skills.

Each training session featured veteran UK fisherman, Chris Bean, who has built a thriving business supplying several high-end London sushi restaurants. Over the past several years, Chris has developed his fishing business to incorporate quality-handling practices including the *ike jime* method, a Japanese fish killing method that many high-end sushi restaurants require. Other workshop attendees included Chef Seizi Imura, and quality handling expert Mika Higurashi.

Here's what some of these workshop participants had to say about the project:

“As a sushi chef in America, I find it difficult to source local fish that I can use for sushi and sashimi. Working in the Northeast I find it especially disappointing that I cannot use some of the best seafood in the world. As more and more western chefs turn towards crudo preparations, there is becoming an increasing demand for sashimi-grade and if possible “ike jime” fish.

I source herring and sardines from Japan because they are handled in a manner that can be used for sushi and sashimi, but I know that there is a bounty of these fish in our own New England waters. As most people consider these to be bait fish there seems to be less interest in handling these species more carefully simply because they don't feel that they are monetarily worth the effort. I would be willing to pay more if I were able to consistently receive sashimi-grade fish, especially if the *ike jime* technique was performed.”

— Seizi Imura, Chef and owner of Cafe Sushi in Cambridge, MA



Local Fish on a Roll (continued)

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“Catering to sashimi-grade markets has been the door key to open top-end markets throughout the catering trade. ‘Sashimi-grade’ is a buzz word that allows top chefs and fish buyers alike, as well as sashimi restaurants, to be assured of top quality fish. Therefore by setting the bar high enough for our product to reach traditional sushi/sashimi outlets we then found that numerous top-end restaurants were clamoring to buy our fish.



In the case of Maine fishermen, they will gain credibility from the buying sector generally once they show they can produce sashimi-grade fish to a single reputable outlet. The buyers are very competitive when it come to top grade fish!”

— Chris Bean, Veteran UK fisherman

In addition to technical tips, the workshops also included discussions on market demand and supply chain logistics. Local chefs and retailers are eager to try local sashimi-grade products, and it's evident that market demand is high. The quality and consistent availability of product from local fishermen will be key to keeping these new markets open.

In the coming months, fishermen who participated in the workshop will experiment with these new techniques and receive feedback from chef participants. In the meantime, don't forget to ask what's local at your favorite sushi restaurant!

Seafood Team Extends Reach in Boston

In their efforts to build demand for responsibly harvested seafood from the Gulf of Maine, our Seafood team works throughout the bioregion. They work with partners from Massachusetts to Maine, including fishermen, suppliers, restaurants, and institutional dining services.

This year, they were especially active in the Boston market. Stories about two such efforts follow below, and you can read more about their work in the Boston Globe.

Vendor and Buyer Showcase Event Highlights Dogfish in Boston

This past summer, Boston-area seafood vendors and buyers gathered on the campus of UMass Boston for a special dogfish showcase event.

GMRI and Cape Cod Commercial Fishermen's Alliance hosted the tasting event designed to highlight a variety of unique dogfish recipes. Six companies served their dogfish dishes during the luncheon, which capped a two-year effort to build demand for this responsibly harvested Gulf of Maine species.

These vendors — which included High Liner Foods, Ipswich Shellfish, Marder Trawling, Red's Best, SeaTrade International, and Zeus Packing — offered their dogfish products to buyers from local restaurants, institutions, and retail operations. The buyers provided valuable feedback on each dish, helping inform future product development.

“This event was a great opportunity for buyers and vendors to make connections and find ways to get more dogfish in the market,” said Jen Levin, Sustainable Seafood Program Manager at GMRI. “It means a great deal to the people who make their living from the ocean, because dogfish offers potential as an important contributor to the economic and ecologic sustainability of the region's seafood industry.”

Dogfish, also known as cape shark, is an underutilized species in the Gulf of Maine. That means despite being abundant and well-managed, the species isn't harvested to its fullest economic potential. As dogfish gains momentum with regional seafood vendors and buyers, increased demand will be reflected in a better price for fishermen.

Chefs and Fishermen Gather in Boston to Support Local Seafood

In June of last year, fishermen, chefs, school foodservice directors, seafood processors, and researchers gathered at No Name Restaurant on the Boston Fish Pier to explore the journey Gulf of Maine seafood takes on its way from the sea to dinner plates. The event, called *Trawl to Table*, provides a unique forum for industry members to identify and pursue new opportunities in the Gulf of Maine seafood supply chain.

“Despite being connected to each other through the seafood they're buying and selling, members of the foodservice industry don't often have a chance to connect directly with processors and fishermen to learn more about what's happening on the waterfront,” said Kyle Foley, Sustainable Seafood Brand Manager at the Gulf of



Seafood Team Extends Reach in Boston (continued)

Maine Research Institute. “Trawl to Table gives this community a chance to forge new relationships, and we have seen it profoundly change buying practices to include more Gulf of Maine seafood.”

During the all-day forum, the group exchanged information about commercial fishing, with varying perspectives represented from all levels of the supply chain. Together, they learned more about fishing gear and practices, fisheries management, underutilized species, and serving local seafood to consumers.

“I’m lucky to run my family’s fishing business with my son. We work very hard to follow the rules and regulations that govern the fishing industry, and we fish as selectively as possible for the species we target,” said Gloucester fisherman Tom Testaverde, who presented at Trawl to Table. “If more people in the supply chain know how sustainable our industry is, they can help spread the word to consumers about all the healthy, abundant fish we have in our region’s waters.”

As part of their supply-chain discussion, the group focused on improving the market for underutilized species from the Gulf of Maine, such as whiting, pollock, and dogfish. These species represent important income opportunities for fishermen facing highly restrictive quotas to cod and other traditional species.

Cape Cod fisherman Charlie Dodge demonstrated techniques for filleting dogfish, or cape shark, a species which has become a primary fishery for many on the Cape, but still lacks domestic market demand.

Surface to Seafloor: GMRI Researchers Lead Ecosystem Survey

Most of us only get to experience the ocean as it appears to us on the surface. As for what's below, that's always been part of the mystery of the sea. It's inspired songs, paintings, and novels — and it inspires science too.

For the last three years, researchers from GMRI and elsewhere have conducted an ecosystem survey that explores the connections between what we see at the surface and what's happening below.

The Gulf of Maine Coastal Ecosystem Survey (GOMCES) is an integrated project that brings together researchers and managers from multiple organizations, universities, and agencies to map the biodiversity in the Gulf of Maine coastal region.

Most scientists recognize that species don't exist alone in a vacuum. Still, few studies in the region have translated this prior understanding into a truly integrated research project. GOMCES attempts to meet this challenge. This survey takes a surface-to-seafloor approach — assembling experts who study everything from plankton to marine birds.

The group hopes to understand how key species are distributed and how abundant they are. Beyond that, the study also explores how these species relate to their environment and to each other. This ecosystem-level understanding is critical if we hope to understand how environmental disturbances, such as climate change, might affect the ecosystem in the future.

The team of researchers focuses on the nearshore waters, ranging 2-150 meters of depth. Over the years, GMRI has played a key leadership role in the project, from survey design, to data collection and analysis. This year, the team of researchers enjoyed success across all three major research themes within GOMCES. Below, you can learn more about each theme directly from GMRI scientists.

Marine Bird & Mammal Ecology

Whales, terns, seals, petrels, and more are under the purview of this segment of the study. The team monitors changes to the location, population density, and nesting/breeding habits of the birds and mammals that rely on the sea. Currently, GMRI staff member Andrew Allyn and Aly McKnight from the University of Maine have the honor of manning these observations over the course of the survey.

“During a normal species-specific study, we might collect data on the distribution and abundance of birds. Automatically, you start wondering, ‘Why are they here?’ And normally, that's where it ends, because you don't have data on the rest of the ecosystem. With this survey, we can just go to the pilot house and check out what is going on with the fish by looking at the acoustics. We can then check with the biological oceanographer to find out what's going on with the zooplankton activity. Finally, we have the physical oceanographic measures, such as temperature and salinity, to evaluate how those drivers influence the patterns we observe. Ultimately, this allows us to paint a picture of the whole ecosystem — the relationships among species and their physical environment.”

— Andrew Allyn, Research Technician



Surface to Seafloor (continued)

Biological Oceanography

One of the goals of GOMCES is to characterize the physical characteristics of the water column, such as temperature and salinity. Further investigation of the planktonic community will reveal the distribution and abundances of numerous zooplankton species. These minute animals are essential for transferring energy up the food web from phytoplankton to fish. GMRI/UMaine staff Dr. Jeff Runge and Cameron Thompson spearhead this portion of GOMCES.

“Nutrient-rich waters make the nearshore region of the Gulf of Maine incredibly productive, which supports an abundance of phytoplankton. Even so, these surveys show us that these plankton communities aren’t uniform. Each region along the coast is characterized by its unique physical oceanography. Those unique characteristics influence what species thrive in those waters, and this survey helps us understand these relationships.”

— Cameron Thompson, Research Associate



Fisheries Acoustics

Another important measurement of biodiversity is the distribution and abundance of fish. GOMCES uses multiple frequency acoustics — which you can think of as fancy fish finders — to establish these. Given our expertise in using acoustics to track herring and now shrimp in nearshore waters, GMRI is responsible for this portion of the survey. Dr. Graham Sherwood and Julek Chawarski lead this component.

“I get really excited comparing my findings in real time to plankton samples and surface observations. I can only glean so much from my acoustics data, which is why that full picture is so important. On the GOMCES cruise, we can fill in the gaps in each other’s specific area of research, and that helps us imagine new and interesting questions to investigate with science.”

— Julek Chawarski, Research Technician



For a list of all project partners, and more on GOMCES, visit their blog: <https://gomces.wordpress.com/>

Taking LabVenture! Outside the Lab

It's easy to get caught up in the incredible hands-on activities that kids experience when they participate in *LabVenture!*.

Holding a live lobster, examining plankton through a microscope, and working in teams to explore a real science mystery... it's all quite a rush for the roughly 10,000 Maine middle school students who visit our lab each year.

But the excitement doesn't end there. The *LabVenture!* experience extends far beyond the walls of the lab. In fact, 78% of participating teachers incorporate *LabVenture!* as a deeper part of classroom learning.

We like to think of *LabVenture!* as the spark that ignites student interest in science inquiry. The next step is to fan the flames back in the classroom — a process we support in a number of ways.

Personalized Websites

After completing a *LabVenture!* visit, each student receives a Science Passport to access his or her own webpage. On these personalized web pages, students can review their findings and research from the lab. That includes everything from the videos they created with their teammates to the microscope images they captured. Many students share these webpages with their families back home, or use the data they collected to inform continuing projects in the classroom.

Activities & Resources

Every participating teacher receives a packet of activity cards, which can be used for a number of learning games or projects. These activities relate to the concepts students investigated at GMRI. Teachers also receive a take-home card detailing the many resources we've created or curated for their use. These resources include online games, our kid-friendly blog, science writing prompts, and more.

Professional Development

We also provide professional development for teachers who want to dive deeper into *LabVenture!*. These teachers learn about best practices in STEM teaching, explore cross-curricular opportunities, discover how *LabVenture!* is aligned with national learning standards, and network with other passionate educators. They become part of a larger community of teachers working with GMRI to inspire our next generation.



Riley's Research

The Gulf of Maine is one of the world's most productive ecosystems with thousands of species and countless numbers of organisms. At GMRI, you explored how cod, lobster, herring, and people are connected in the complex Gulf of Maine ecosystem. You explored how people have become part of the Gulf of Maine ecosystem over the centuries. You modeled relationships between copepods and climate change, studied effects of herring bait on lobsters, researched cod and lobster behavior, and steamed out on a trawler on a virtual fishing trip!

TEAM ZOEA

Climate Connections
How might climate change affect the Gulf of Maine ecosystem?

Trawl to Table
How are scientists and fishermen working together?

You Are What You Eat
Are we farming lobsters?

Predator!
How are cod and lobster populations connected?



Exploring the Impacts of El Niño

Early last year, everybody wanted to know about El Niño. What is it? How does it affect ocean temperatures? With these questions swirling, Chief Scientific Officer Andy Pershing jumped on the opportunity to explain El Niño and how it affects us in the Gulf of Maine.

Greetings from February 18, 2016! This week, we went from the coldest temperatures of the year on Valentine's Day to windy, wet, and (relatively) warm conditions a few days later. After experiencing these extremes, wacky even by New England standards, it requires a bit of courage to predict that water temperatures will be warm this spring — yet, that's exactly what we and other climate scientists anticipate.



So far, this has been one of the mildest winters ever in New England. December was 11.4°F above normal, making it the warmest December in Maine by almost 5°. January was 6.1°F above normal — warm, but not quite record-setting. NOAA's Climate Prediction Center is forecasting that mild conditions will prevail into the spring.

You can blame these unusually mild conditions on the Pacific Ocean. Normally, the trade winds that blow from east-to-west along the equator create a blob of very warm water in the western Pacific, near Indonesia. These same winds pull cold water to the surface in the east, leading to cold conditions off of Ecuador. If the trade winds get weaker, the warm water sloshes to the east.

The appearance of warmer-than-normal water off of Ecuador is the hallmark of the phenomenon known as *El Niño*. Under such conditions, global weather patterns go haywire.

The impacts of El Niño are dramatic, but they aren't random. Conditions in an El Niño year are incredibly predictable, and El Niño effects reach far beyond the warm waters of the Pacific. The warm water sloshing across the Pacific during El Niño changes the flow of heat and moisture across the globe. For us, it means that we get warm, moist air from the south — almost the exact opposite of the conditions we experienced last February. You can learn more about El Niño and what it means for the Northeast at <http://www.nrcc.cornell.edu/services/special/special.html>.

It is important to note that El Niño is not the only part of the story. Each year, the Earth gets a little bit warmer as our temperature adjusts to the extra carbon dioxide we've put in the atmosphere. This means that the conditions this winter are warm, even when compared to other El Niño years.

Right now, the water temperatures at the three NERACOOS buoys along the coast of Maine are running about 2°F above average at both the surface and 165 feet below. This is quite warm, but it's down from the record temperatures we were at before the Valentine's Day cold snap.

Although we're not quite at record levels, the warm temperatures and mild weather are reminiscent of 2012. That year, the Gulf of Maine was at the epicenter of a large scale "ocean heatwave."

We know warming waters affect commercially and economically important species in the Gulf of Maine. For example, the warm water caused the lobster fishery to shift into its summer, high-landings mode 3–4 weeks early in 2012. That experience caused us to launch our lobster forecasting effort, which attempts to predict the annual landings spike based on water temperatures.

Forecasting and other climate adaptation efforts continue to be an important piece of our work here in the lab. As waters warm, we'll learn more about the associated impacts on species such as lobster, cod, shrimp, and herring. We hope the lessons learned from this research will give fishing communities throughout the bioregion the information they need to sustain their way of life.

Scientists, Anglers Partner to Research Striped Bass

Recreational anglers will tell you, pound-for-pound, few fish fight like a striped bass.

A premier target of Maine sport fishermen, stripers have long been a cornerstone of Maine's recreational saltwater fishery.

But catches have declined dramatically in recent years — with landings down by 90%, according to some estimates — leaving both scientists and fishermen searching for answers. To that end, GMRI has partnered with the Maine chapter of The Coastal Conservation Association to launch a citizen science initiative called Snap-a-Striper.

This year, our Research team recruited anglers, fishing guides, and captains to participate in this study. In 2016, 44 of these citizen scientists helped compile 486 photos, making it the most successful year to date.



The project also earned attention from local media, and was featured on an episode of Bill Green's Maine.

The program is a data collection effort that aims to compile photos of live-released and legally kept striped bass caught in Maine waters. In addition to the photos, anglers saved and froze the heads of legally harvested fish for further analysis in the lab.

Here's how the process works:

- When an angler catches a striped bass of any size, he quickly fills out a data card provided by GMRI and CCA. The card provides simple information — the angler's name, the date, the generic location of the fish, etc.
- The angler then places this 3x5 inch card next to the fish, snaps the photo, and then either releases or harvests the fish (if of legal size).
- In addition to emailing the photo to GMRI, anglers are also asked to remove the head of any legally harvested fish, freeze the head in a plastic bag with the original card, and email stripers@gmri.org for pickup or delivery instructions.
- From there, GMRI scientists, Lisa Kerr and Graham Sherwood, will use the photos and samples to explore the origin of each fish.

Understanding where these fish came from is crucial to understanding where they have gone. Together, scientists and recreational anglers aim to find answers through the Snap-a-Striper initiative.

CONTINUES ON NEXT PAGE

Striped Bass (continued)

Below, GMRI Research Associate Zachary Whitener, a dedicated striper-fisherman and registered saltwater guide himself, shares his experience working on the project.

Here's what Zach has to say about Snap-a-Striper:

Snap-a-Striper is a truly unique research project, and I feel lucky to be a part of it for a number of reasons. Here are just a few...

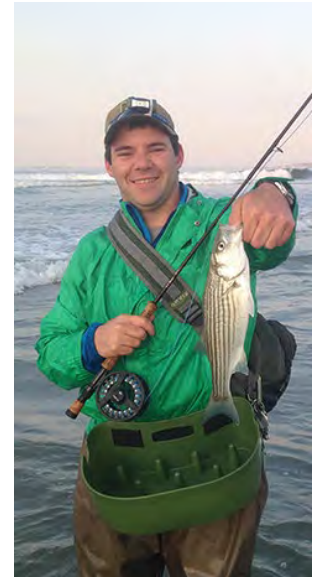
Catch and Release: As an angler, I'm a big fan of catch and release. As a scientist, I currently have to harvest and dissect the fish I study. The end goal of this project is that we'll know where a striper comes from just by the shape of its body. All the data we'll need will be in the fishermen's photos. That means more fish in the ocean, and less in my lab.

Dealing with Climate Change: It's so important for us scientists to know the effects of warming oceans on fish. This project will show us the status of Maine stripers now, so in the future we can compare changes in temperature to changes in the fish population.

Recreational anglers get a say: One of the coolest parts of the project is that local sportfishermen can engage in real science to protect a species we all love.

Local Jobs: I grew up making my living on the water, and I know how tough it can be. While stripers aren't harvested commercially here in Maine, the recreational fishery supports jobs in tourism along our coast, from charter boats, to tackle shops, to bed and breakfasts.

Stripers are important in so many ways and the more we can learn about them, the better. I love this program, and can't wait to take it to the next level. Oh, and if you haven't had a chance to try striper fishing yourself – get out and try it this summer. And don't forget to snap a photo for us!



Do you know someone who fishes for stripers? Do you fish for stripers yourself? Contact us by sending an email to stripers@gmri.org or visit <http://cca-maine.org> to get involved!

Marine Resource Education Program Goes West

In August of 2016, the Marine Resource Education Program (MREP) team hosted their first fisheries science workshop on the West Coast.

The workshop, hosted in Santa Cruz, CA, was specifically designed for the region through collaboration with local fishermen, scientists, and regulators.

Marine fisheries management is a delicate balance of providing jobs, providing fishing opportunities, and providing for the long-term availability of both.

Management of such a delicately balanced system could easily lead to the exclusion of the very people who depend on it for their livelihoods. Fortunately, federal fisheries management in the US considers the needs of fishermen and others with a stake in marine fisheries by requiring their participation in regulatory decisions. Key to effective participation, however, is a comprehensive understanding of the science and policy which underlies the management system. MREP aims to provide fishermen with the comprehensive understanding, which empowers them to effectively participate in marine fisheries management.

MREP West is a workshop series designed for west coast fishermen interested in building their understanding and involvement in fisheries science and management decisions. It was developed to equip fishermen with the tools to confidently engage with the tough issues facing their region today. It specifically runs through the fisheries science and management processes, demystifies the acronyms and vocabulary, and exposes fishermen to the 'how' of the whole fisheries management process. Additionally, the program provides a neutral setting in which fishermen can meet the people behind agency jobs, ask personally relevant questions, and share important feedback from the fishing community.

The program is offered as a series of two, three-day workshops. These workshops build upon each other: a three-day Fishery Science Workshop followed by a three-day Fishery Management Workshop. Presenters are drawn from NMFS Regional Offices and Science Centers, the Fishery Management Councils, research institutions, and the fishing community. Workshops are designed and held as a collaborative effort, with industry moderators keeping the discussion relevant to the fishing community.

MREP was created by fishermen, for fishermen. It was founded by local New England fishermen in 2001 to provide members of their community with the tools and information to actively and effectively participate in fisheries science and management. Over the next 15 years the program slowly expanded into other regions as other fishermen have expressed a need for that information. Participants leave the workshops prepared to engage confidently in fishery management and to critically evaluate the science affecting their fishery.

“Whether we’re working in New England, the Southeast, the Caribbean, or now the West Coast, our goal remains the same,” said Alexa Dayton, MREP program manager. “We want to foster industry leadership by exposing fishermen to the tools and information they need to effectively participate in fisheries science and management.”

The MREP team also received a significant amount of media attention from industry publications this year, including an in-depth profile in Seafood Source.

This work is generously sponsored by the David and Lucile Packard Foundation and Gordon and Betty Moore Foundation.



Financials

Gulf of Maine Research Institute (GMRI) had a successful year, with continued delivery of core programs and 20% growth in new and expanded work. Operations broke even, and the \$2,000,000 surplus of total revenue over expense reflects the growth in endowments, reserves, and restricted gifts for future program expenses.

Science, Education, and Community programs are funded primarily by federal grants and charitable contributions. Federal income increased in 2016, based on new activity in large multi-year program awards received in 2015 from the NASA and the National Oceanic and Atmospheric Administration (NOAA) for marine research, science literacy, and education. The major increases in charitable contributions were from foundations and individuals.

Fundraising and community relations activities are funded by unrestricted contributions and investment income. Most administrative costs are allocated as overhead to the programs in compliance with federal cost guidelines, and the balance are funded by property management income.

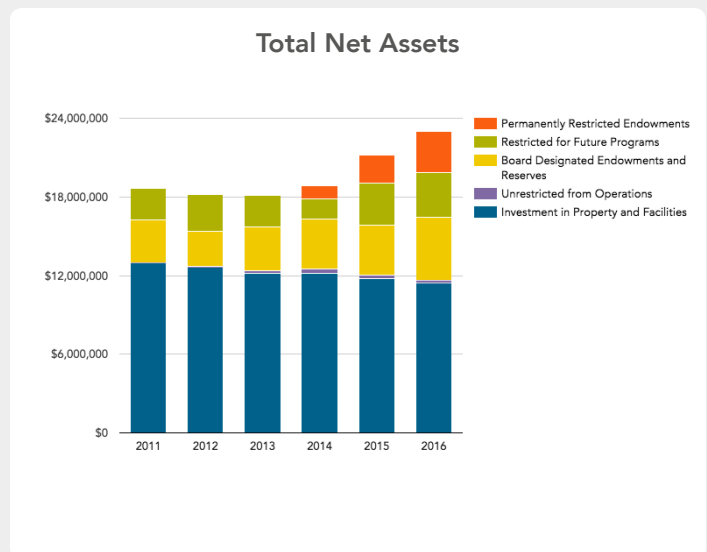
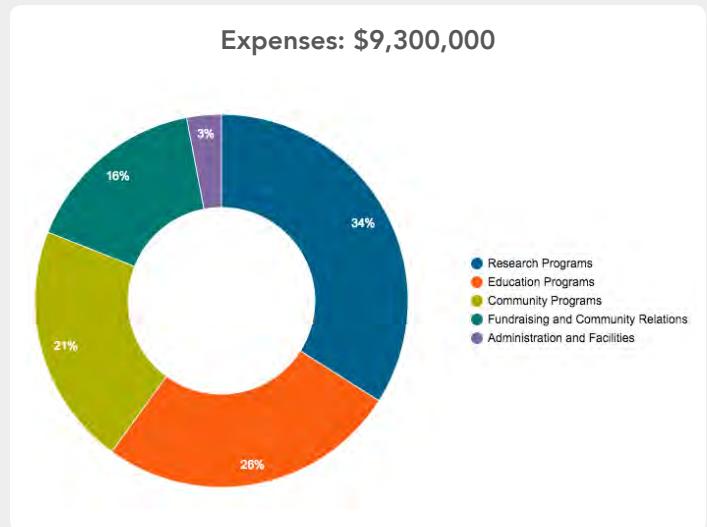
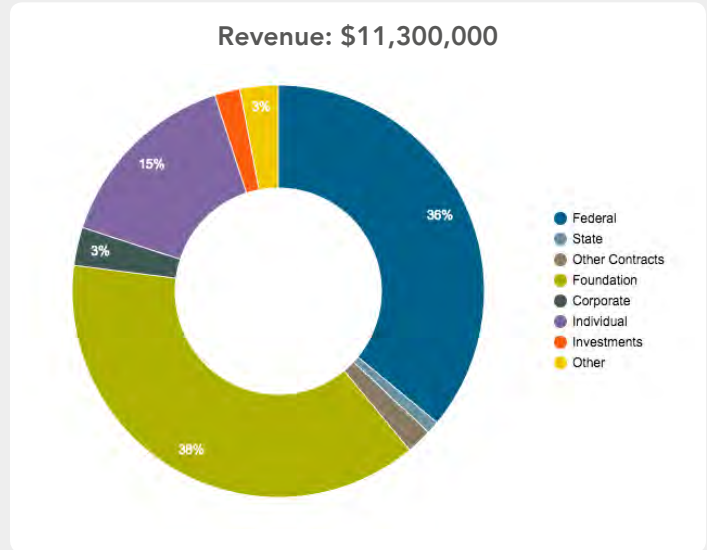
GMRI has a wholly-owned subsidiary, Gulf of Maine Properties Inc. (GMPinc), which owns and operates GMRI's facilities. GMRI rents 75% of the total space in the current facility and shares the rest of the building with a mix of tenant partners, establishing a growing cluster of economic activity centered on marine science, technology, and education innovation.

GMRI has always received unqualified opinions in our financial and federal compliance audits from external auditors. We also have a 10-year history of not receiving Management Letter comments on financial weaknesses. Our 2016 external audit is underway and will be added to the website when available.

Our net assets continue to grow in the area of endowments and reserves. We maintain our 2005 laboratory facilities in top shape, but have not made any major investment in capital expansion in the last 11 years. Starting in 2013, the Science Literacy Fund for Maine and other GMRI-held endowment funds reflect a new phase of asset growth.

GMRI and GMPinc audited financial statements are reported on a consolidated basis.

Complete financial statements can be downloaded at: www.gmri.org/about-us/annual-reports



We deeply appreciate your support and enthusiasm for GMRI's mission. Your donations fuel our efforts to catalyze solutions to the complex challenges of ocean stewardship and economic growth in the Gulf of Maine bioregion.

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We are grateful to the following members of the Wind Rose Society for their gifts in 2016. Wind Rose Society members lead the way in helping GMRI protect our ocean, sustain vibrant coastal communities, and prepare the next generation for active citizenship.

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