



Letter from the President & CEO

"It is a curious situation that the sea, from which life first arose, should now be threatened by the activities of one form of that life. But the sea, though changed in a sinister way, will continue to exist: the threat is rather to life itself." Rachel Carson, The Sea Around Us (1961 ed.)

All of humanity is inextricably linked to the ocean. We depend on it to produce 50% of the oxygen we breathe, to absorb excess greenhouse gases and heat from global warming, to moderate our weather and to feed billions around the world.

And what do we provide in exchange? For decades, we have removed more fish than is sustainable; dumped excessive amounts of pollutants; and now we are rapidly increasing ocean temperatures resulting in disrupted food webs, increased acidity, extinction of entire species and more, yet to be understood, devastating consequences.

The time is ripe for a Sea Change - and I can see it emerging on the near horizon with new national leadership committed to fighting climate change by rejoining the Paris Climate Accord; investing in renewable energy; and promoting sustainable communities and green economies.

Companies large and small are adopting sustainable business practices; local community leaders are working to heal the damage we have done to our coasts; and individuals from all walks of life are becoming actively engaged in the campaign to save our oceans.

Here at the Center for Coastal Studies, that means conducting research to help us understand how human activities are impacting the oceans and the life within, then communicating that information not only to colleagues and policy makers, but also to everyone else as our daily decisions, large and small, ultimately impact the oceans.

All of this is hopeful; but this growing Sea Change will only be successful with everyone joining forces. Together, we can save the ocean's health upon which our communities and economy depend.

WHAT YOU CAN DO

The BIG problem is that carbon dioxide from human activities is warming the planet and oceans. The solution is for all of us to immediately reduce our individual carbon footprints - drive less and in electric vehicles or use mass transportation; lower thermostats and insulate our homes; buy locally-produced food; eat less meat; reduce or eliminate plastic.

Help the Center for Coastal Studies carry out its mission to conserve coastal and ocean resources with your membership, donations, and by considering a legacy gift.

Look ahead. Leave a legacy. The Joanna Toole Foundation. The Ruth Hiebert Memorial Foundation. The Wendy Shadwell Foundation. The Don Palladino Fellowship. All funds named for people who looked to the future and wanted to continue to make the world a better place, even when they were no longer living in it. To learn more about leaving a gift for the future, contact Sue Nickerson at snickerson@coastalstudies.org or 508-487-3622 x102.

Spotlight on Wellfleet

Changes are afoot in Wellfleet Harbor, and the Center for Coastal Studies is playing a key role in measuring outcomes. This fall, the US Army Corps of Engineers (USACE) began Phase One of a three-year dredging project in the federal channel in and out of the Harbor. When that wraps up for the winter, the Town will begin a separate dredging operation in the inner harbor. The goal is to remove 20+ years of silt buildup to improve access to and from the Harbor, the launch ramp, the fuel dock and other facilities, all of which are virtually inaccessible at low tide, but are vital to the safety and economy of the Town's fishing, shellfishing and recreational boating fleets.

Plans are also underway to restore tidal flow to the Herring River Estuary, which flows into Wellfleet Harbor at Chequessett Neck.

In recent years, the Center has conducted several short- and long-term studies in Wellfleet Harbor, including aquaculture productivity, water quality monitoring, sea floor mapping and benthic ecology (including an analysis of the infamous Black Mayo, which you will read about later in this publication), all of which help establish a baseline by which to measure the impacts of dredging, the restoration project, and other natural and anthropogenic stressors on the Wellfleet Harbor habitat. The latest of these projects is led by CCS Marine Fisheries Research director, Owen Nichols.

MARINE FISHERIES









It's been more than 50 years since the Massachusetts Division of Marine Fisheries conducted the last comprehensive inventory of Wellfleet Harbor's marine resources. Now, with funding from a Donald Palladino Fellowship from the Friends of Herring River, Owen Nichols has taken the first step in establishing an updated baseline. This June, Nichols and his team began a year-long study of finfish in the intertidal zone of the Harbor. They are conducting seine surveys - catching, identifying, counting, measuring and releasing fish - at the same sites sampled in the 1960s.

To date, the team has documented Atlantic menhaden, Atlantic silverside, blueback herring, bluefish, mummichog, and striped killifish.

There have been some notable highlights: in August, a single seine haul at the Town pier site brought in over 1,500 Atlantic menhaden, a small fish known locally as *peanut bunker*. The August survey also surfaced a blue crab, and October brought in lots of ctenophores, commonly known as comb jellies.

This project is the beginning of what is anticipated to be a fully funded study to conduct a shellfish and finfish survey of the whole Harbor and generate a comprehensive species inventory and quantify relationships between the Harbor's species and their habitats, contributing to a framework for long-term monitoring and management of Wellfleet Harbor's marine resources.

Spotlight on Wellfleet (cont.)



BLACK MAYO AN UPDATE

Last year we introduced you to the mystery of Wellfleet Harbor's Black Mayo, the dense, sticky mud that blankets parts of the harbor seafloor. This year, we can report that Wellfleet's Black Mayo is something else altogether!

According to literature, Black Mayo is defined as 'fine-grained, highly contaminated particles that is devoid of all normal aquatic life ... composed of human waste floatables, oily slicks, chips of asbestos, arsenic, copper, lead, and mercury and industrial garbage" (United States Army Corps of Engineers 2001). In short, human-related pollution that is not only toxic for us but also for any aquatic life.

However, the results of the study by CCS benthic ecologist Dr. Agnes Mittermayr show that Wellfleet's black mud is actually incredibly rich in organic matter derived from marine plants such as algae, and sustains 13 species of invertebrates, including worms that are common in silty, low oxygen sediments. So rather than a toxic sludge, this material is more closely akin to good old mud, a lot of it! For lack of a better term, the mud has been renamed *black custard*.

With the help of local artist Steve Swain and his custommade auger, we discovered that the layer of black custard is



predominantly found in and around the town pier, and can occur in layers up to 12 feet deep.

"And the smell?" you might ask? We found no sign of human waste. Instead, the high organic matter content means that bacteria are thriving and causing the smell. Sometimes nature stinks.

COASTAL ACIDIFICATION

Wellfleet is synonymous with oysters. The shellfishing industry upon which this town was built, as in other coastal areas across the globe, has faced many challenges and prevailed. Now the industry, and indeed the entire ocean ecosystem, is under threat from more than just the vagaries of the market.

The oceans are acidifying at rates unprecedented in the Earth's history, significantly impacting seawater chemistry. Although the chemistry of ocean acidification (OA) is well understood, there is still a high degree of uncertainty about the impacts of OA on the marine ecosystem. This is particularly true for shallow coastal waters such as those surrounding Massachusetts. These regions are where we gain the most benefit from oceans in terms of ecosystem services such as the provision of materials, food, recreation, and coastal protection. These coastal areas of New England also have the least amount of data with which to evaluate changes in coastal acidification. To date, no data are regularly collected to monitor levels or rates of change in acidity in the coastal waters of Massachusetts. This is a critical gap in knowledge that is crucial to informing management efforts to help reduce climate change stressors within this ecosystem.

The Center for Coastal Studies Water Quality Monitoring program received funding this spring from the Massachusetts Division of Marine Fisheries (MassDMF) for equipment and start-up costs that will enable us to begin monitoring for alkalinity and pH - two key parameters in understanding coastal acidification. Additional funds were provided by the Massachusetts Bays National Estuary Partnership Healthy Estuaries Grants to measure these parameters at targeted areas within three embayments. These areas encompass a variety of water quality conditions and habitat types and include shellfish beds and/ or aquaculture grants, both of which are highly susceptible to the impacts of OA and are areas that we have been systematically monitoring since 2006 as part of our long-term water quality monitoring program. CCS is applying for additional funding to expand our OA monitoring efforts both in the lab and in the field to increase the knowledge of the impacts of OA on the ecology of Massachusetts' coastal waters, and related economic effects.

Marine Mammal Research and Rescue

The impacts of humans on marine mammals are hard to ignore: entanglement in fishing gear; injury or mortality from ship strikes; disturbance from ocean noise; illness from pollution or diseases; changing and shifting feeding and breeding habitats. Humpback, right and minke whales are all in the midst of ongoing Unusual Mortality Events, episodes in which large numbers of animals die unexpectedly from causes that are at least partially if not primarily human-related.

With data collected over more than four decades and a visionary approach to research and collaboration, CCS continues to lead the way in understanding and mitigating the effects of human activities on whales, helping answer questions that we didn't even know we would be asking.

HUMPBACK WHALE STUDIES



The 2015 calf of Jabiru was disentangled by the CCS MAER team twice in one year. CCS, NOAA permit 18786-03.

Thanks to new funding received in 2020, CCS continues its long-term research on entanglement injuries and impacts on cetaceans. The Humpback Whale Studies and the Marine Animal Entanglement Response Programs are conducting a major synthesis of such injuries in humpback, fin and minke whales with the support of the U.S. Marine Mammal Commission.

The Massachusetts Environmental Trust is supporting work by our humpback whale researchers to extend their scarbased study of entanglement through recent years and to develop partnerships with other NGOs and whale watching companies to enhance data collection in the Stellwagen Bank National Marine Sanctuary.

An Unusual Mortality Event continued in 2020 for humpback whales and the cause(s) continues to be investigated. CCS is assisting this effort by identifying affected individuals through photo-identification and genetics so that potential risk factors can be identified. This work also assists our work to understand humpback whale survival patterns more generally.

COVID-19 impacts reduced human activity on coastal waters and research is underway to determine if this changed stress levels in humpback whales.

Marine Animal Entanglement Response (MAER)



This summer you may have read about the incredible team effort by CCS and eight other agencies and organizations to disentangle a young humpback whale off New York City. The whale, identified by the CCS Humpback program as the 2016 calf of Nile, was anchored to the sea floor in the busy shipping lane in NY Harbor. The disentanglement operation lasted four days, beginning with a report from boaters to the US Coast Guard and culminating in the removal of more than 4,000 pounds of net, line and steel cable encumbering the whale.

With the highs came the inevitable lows: Right whale #3466 was found south of Nantucket in December 2019 with yards of line through its mouth and trailing behind it. It was spotted again in January 2020, but has not been seen since. The entangled right whale Dragon, spotted south of Nantucket in February 2020, was never relocated and is now presumed dead. A third entangled right whale, #4680 – Dragon's 2016 calf - was last seen in very poor condition off NJ in early October. When the CCS aerial survey team flew in search of #4680 south of Nantucket they located yet another entangled right whale, identified as a nine-year-old male named Cottontail. The CCS MAER team was able to remove about 100 feet of trailing rope from Cottontail and attach a satellite tracking buoy to him before having to return the 90 miles to Provincetown. Cottontail traveled more than 700 miles and crossed into Canadian waters before the buoy detached on October 30 and stopped transmitting shortly thereafter; he has yet to be resighted.

There's no doubt that the coronavirus pandemic affected the MAER program. Commercial and recreational fishing was curtailed, as were commercial whale watches and charter trips. Quite simply, there were fewer eyes on the water this

summer, so fewer opportunities for marine animals to be sighted and reported. In response, MAER partnered with the Humpback Whale Studies Program and Right Whale Aerial Survey team to step up survey efforts to increase the odds of encountering entangled animals. So now more than ever, we urge mariners to report sightings of entangled marine animals to our Hotline: 800-900-3622. It's not only individual lives that you could help us save; it could also be an entire species.



2020 brought the team its first ever mola mola disentanglement, a surprise for all involved as the morphology of the huge fish was thought to make them impervious to entanglement.

Right Whale Ecology

In early 2020, the status of the North Atlantic right whale population was upgraded to Critically Endangered on the IUCN Red List.

In October 2020, researchers at the North Atlantic Right Whale Consortium announced the latest population estimate, based on research conducted during the 2020 season, revising its number down from 400 to just 356 remaining individuals.

CCS continues to work to mitigate human impacts on the right whales, and plans to expand those efforts again in 2021. We will conduct year-round aerial surveys of known critical habitat to alert managers to the presence of right whales, so that we can reduce incidents of boat strikes and keep entangling gear out of the water during times when right whales are feeding in the fishing grounds. We will continue our disentanglement efforts, and work with colleagues in other organizations to assess new sedation techniques, making the operations safer for both human and whale. We will continue to provide the latest, best science to policy makers and resource managers, and to our colleagues who are working with the fishing industry to design ropeless gear.



Right whale #3180, Dragon and her 2016 calf. Both whales were entangled and in very poor condition when they were last seen in February and October respectively. CCS, NOAA permit #14603

THE LAST RIGHT WHALES? Charles "Stormy" Mayo, PhD

We've long known that the right whales of the North Atlantic are suffering. A remnant population that once was hunted to the very brink of extinction again clings to life at the edge of a dark future.

The population has been under substantial threat for decades due to low birth rates and high mortality. The work of a collaboration of scientists and conservationists supporting government and private conservation efforts - a collaboration to which studies supported by the Center's Right Whale Emergency Initiative have contributed - continues to tell an increasingly grim story.



Christy Hudak, right whale research associate.

With the rise in human-caused deaths due to entanglement and ship strike, and the decline in births, primarily or secondarily caused by human activities, it was expected that the International Union for Conservation of Nature would list the species in the "most threatened with extinction" category.

The trajectory of the population is downward, and it is not a surprise.

But there's also a glimmer of hope. Though admittedly it's not very bright, still it's shining:

- There is a rising support for efforts to reduce the entanglement deaths by eliminating rope from the water column.
- Support from individuals as well as federal and state government for conservation and research is increasing.
- The right whales have been through periods of low population and have come back as they did in the 1980s and 1990s, and probably still can.

Recovery of the population is possible because we know much of what needs to be done, and though our understanding of the problems so long confronting the right whales is imperfect, it is improving.

But will we, our government, and our industries act in time? On the answer to that question, the same one for all critically endangered species, rests the future of the North Atlantic right whale and of the estimated 356 individuals that remain.

Report right whale sightings to the NOAA hotline at 866-755-NOAA (VA to ME) or 877-WHALE-HELP (FL to NC). In Canadian waters, report using the toll-free hotline 844-800-8568. Sightings may also be reported via the Whale Alert app (whalealert.org).

Microplastics Research



Microplastics are small (< 5 mm) pieces of plastic debris in the environment resulting from the disposal and breakdown of consumer products and industrial waste. They're in the air that we breathe, the food we eat, and the water we drink.

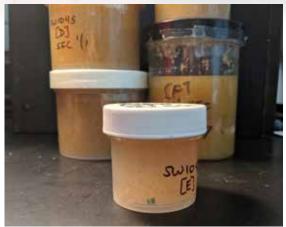
Christy Hudak, a research associate with the Center's Right Whale Ecology program, is leading microplastic research in the CCS Marine Debris and Plastics program. Using an FTIR spectrometer, she is able to identify and quantify the types of plastics recovered from diverse sources including water, sediment, and biological samples. Most recently, she has been analyzing material from the stomachs of great shearwaters, as part of a study by University of Rhode Island PhD candidate Anna Robuck into the plastic ingestion and bycatch demographics of Great Shearwaters from the Gulf of Maine.

The results of this study were grim: over 96% of the microplastics recovered from the birds' stomachs were from recyclable plastics. This indicates that recycling is not the sole solution. We need to not only re-examine our own use of plastics, but also support businesses and policy makers who are actively working to reduce the amount of plastic entering the global market.

Christy (pictured below) is also studying the microplastics in the waters of Cape Cod Bay, specifically those that are found in the zooplankton samples collected during seasonal Right Whale Habitat cruises. The



Center has an archive of samples dating back to the mid-1980s, a treasure trove that may help determine a timeline for the presence, type and distribution of microplastics in Cape Cod Bay.



Microplastic in zooplankton sample collected in Cape Cod Bay by CCS right whale researchers.



Plastic fragments recovered from the stomachs of two juvenile great shearwaters from Massachusetts Bay. (courtesy of M. Salerno/URI STEEP SRP)

Marine Debris Recovery

With all the negative human impacts on our environment it can be difficult to see the positive, but that's where the CCS Marine Debris and Plastics program is certainly front and center.

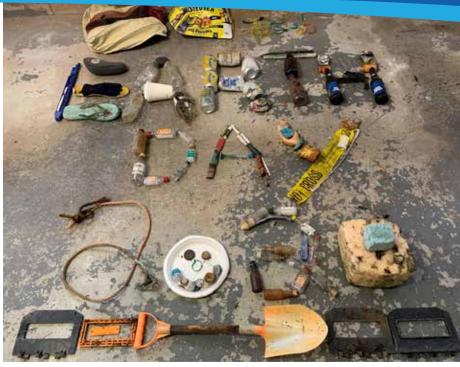
This year, the Center's ongoing ghost gear recovery project collaborated with commercial fishermen to remove 9 tons of debris from Cape Cod Bay, in spite of constraints imposed by the pandemic. The MDP program benefitted from two amazing interns this summer/fall: Amy Green, formerly an intern with the right whale program, and Jenna Schwerzmann, the first recipient of the Joanna Toole Fellowship. They both assisted with cleanup logistics, data collection and analysis, and outreach materials.

Despite COVID, more than 100 volunteers participated in a dozen community beach cleanups in 2020. They turned out, masked and gloved, individually and in small, socially distant groups on Earth Day and World Ocean Day, for the International Coastal Cleanup and the Outer Cape Cleanup, and began a monitoring project at three Provincetown beaches.

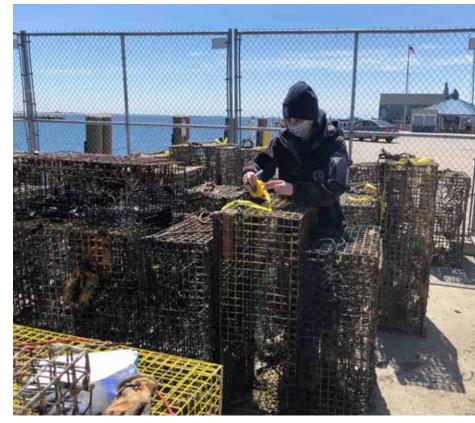
MDP program staff and volunteers also conducted two shellfish flats cleanups, in Provincetown and Wellfleet, to remove "legacy" gear and other plastic debris from sensitive habitats. Together they removed a total of 2.5 tons of debris from the intertidal zone.



We are pleased to announce that Willie's Superbrew is our official 2021 Coastal Cleanups Partner. Willie's fights plastic pollution along our shores through community programs and beach cleanups. Learn more about their work at superbrew.com/cleanup.



Volunteer Marcia Bissell celebrated Earth Day by spelling it out in debris she collected from Gray's Beach in Yarmouth Port as part of the first CCS Virtual Actual Beach Cleanup.



CCS Americorps Service Member Corrine Losch assists with tagging recovered lobster traps at MacMillan Pier.

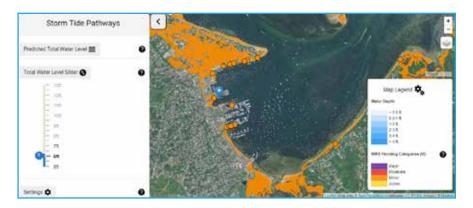
Marine Geology

Among the most visible effects of climate change on the ocean are sea level rise and increasingly frequent and intense weather events. In combination, these forces are causing ever increasing coastal flooding events around the globe.

Until recently, it was difficult to predict precisely when and where that flooding might occur, but CCS researchers have developed methods to identify Storm Tide Pathways and create maps of the streets and low-lying areas most likely to flood, giving municipalities the information needed to prepare for and adapt to flooding events.

Now, that information will be available to individuals at the touch of a button. CCS has created a web app that shows the precise path and extent of flooding on a street-by-street level, under varying storm conditions.

Currently the application is limited to Nantucket, but it will soon expand to include all the towns along the Cape Cod Bay shoreline from the Canal to Provincetown. In 2022 it will include the towns from Chatham to Barnstable on Nantucket Sound and all of Martha's Vineyard. Perhaps most exciting is the potential for the project — and the associated public safety and economic benefits — to be replicated in coastal communities across the globe.







Screenshots from the new web app, stormtides.org, illustrate the depth and extent of flooding in the Town of Nantucket if Total Water Level rises to 6 feet (top) and 8 feet (middle) at Mean Lower Low Water (MLLW). The colored dots on all three images indicate the location of Storm Tide Pathways.

TAKING THE NEXT STEP

In December 2020, the CCS Marine Geology Department is announcing the launch of the new **Coastal Geographic Research** and **Applied Sciences (CGRASs) Program**. CGRASs will distill the scientific and coastal resource mapping data produced by CCS and others into a single resource that will help local municipalities, managers, and the public understand and confront emerging public safety and economic impacts associated with the changing climatic conditions that threaten coastal communities.

Seal & Shark Research

Sometimes, what biologists and ecologists view as a success story is perceived differently by others. That paradox is certainly true for the resurgence of seal and shark populations in the waters off Cape Cod.

Seals and sharks are native to the marine environment around Cape Cod. However, by the 1970s their populations were all but destroyed by hunting and overfishing. Following the introduction of the Marine Mammal Protection Act in 1972 and the designation of white sharks as a protected species in federal (1997) and state (2005) waters, both populations began to recover.

Both sharks and seals are critical to maintaining a healthy, biodiverse, balanced ecosystem, but their increasing presence in our waters, and the impact that has on our own use of Cape Cod's coastal waters, has initiated some lively debate in our community.

CCS has long recognized that good science provides the means for humans to co-exist with the marine environment. For our seal and shark researchers, that means determining how human activities in seal and shark habitat overlap in time and space.

In summer 2020, the CCS seal program and Stephanie Wood from UMass Boston started a pilot study looking at how seals and white sharks transit the outer shores of Cape Cod. The majority of seal sightings in summer and fall are gray seals; in fall the team also observed harbor seals traveling in the near shore waters. Researchers perform weekly surveys to collect spatial, behavioral and group size data for seals and white sharks, as well as information on other activity in the area such as swimming, boating, commercial and recreational fishing, schooling fish and more. Preliminary data are being analyzed as part of a UMass Boston student's Senior Capstone Project. The team hopes to secure funding for 2021 to expand this study.

This year CCS shark researcher Bryan Legare continued his study of fine-scale shark movements in the shallow waters off North Truro, and added a second location off Nauset Beach in Orleans, where there are a greater number of reports of shark activity and predations on seals. The goal of the study is to understand how sharks behave in those areas – when, where and how they travel through and within the area – and pass that information on to town, state and federal officials so that they can determine how best to manage potential shark/human interactions and communicate that information to the public.



Gray seals (top) and white shark (bottom) transiting the outer shores of Cape Cod, photographed as part of a new research project underway at CCS.

Education and Outreach

The COVID-19 pandemic affected all the programs at CCS to a degree, but none more so than our education program.

Within just a few days of widespread closures, education director Jesse Mechling had readjusted his entire program of in-school and on-site education to continue to provide quality marine science education to students of all ages. With assistance from events and marketing staff, CCS began broadcasting online educational programming every day via our Facebook page. From March through June, viewers from across the world tuned in live to learn about intriguing marine animals and coastal and ocean habitats. Hundreds more watched recordings of the presentations. In addition to the new daily programming, CCS also began producing videos for the public: fun experiments for kids, weekly beach reports, virtual whale walks and salt marsh explorations, and more. We also created a new series of live and pre-recorded webinars and presentations by CCS staff and colleagues, called Dockside Chats, opening up our traditional live lectures to audiences across the globe.

In addition to the online programming, the education program, with strict COVID-19 protocols in place, provided quality in-person programming over the summer at SEA Space Marine Discovery Center, on field walks, and at the Center's new informational tent at several beaches in the Cape Cod National Seashore.

A number of major conferences pivoted to an online format, including the annual Whale Watch Naturalist Workshop, the North Atlantic Right Whale Consortium and the American Geophysical Union. The move to virtual meetings also gave our staff opportunities to present and participate in conferences that they might not otherwise have been able to attend, offering new opportunities to both teach and learn.

The pandemic also resulted in CCS's first foray into film. In November, CCS premiered *Sea Change Film Shorts 2020*, a virtual film festival hosted by WBUR's Barbara Moran featuring the documentary *Spinnaker* and two short pieces on the effects of microplastics on the ocean, as well as interviews with CCS researchers. To accompany the production CCS staff curated *Sea Chest 2020*, a collection of short documentaries on a diverse range of topics hosted on our website.

2020 was a challenge in so many ways, but it also opened up a host of avenues that provided CCS with the time and means to reach whole new audiences of potential ocean stewards.

NEW PUBLICATIONS

CCS completed a dedicated special issue in the peer-reviewed literature based on our multi-year, interdisciplinary ecosystem assessment for Pleasant Bay. The massive coordination effort, typical for an issue like this, was led by Dr. Agnes Mittermayr (Geology) and Pat Hughes (Marine Policy). Owen Nichols and Lisa Sette (Marine Fisheries and Seal Research) were also lead authors of papers in the issue, as were Agnes, Bryan Legare, and Dr. Mark Borrelli (Geology).

The lead author of the first paper in the issue, at 89 years old, is one of the founders of the Center, Dr. Graham Giese (Geology). Graham continues to make significant contributions to the peer-reviewed literature and remains a strong presence at the Center, even as we all work remotely.

Please visit our website for a list of peer-reviewed publications and selected technical reports by our staff, ordered by year. Copies of papers are available upon request.



Dawson Farber (left) and Stormy Mayo at the 2019 Homeport Gala.

The cancellation of our annual Homeport Gala gave rise to an incredible \$50,000 match challenge from the Farber Family of Orleans, to which many of you responded very generously. This inspired alternative effort raised over \$200,000 for the Center! We are extremely grateful to the Farber Family and to our incredible members and supporters for continuing to donate to CCS during this difficult year. Thank you!

Follow our Instagram, Facebook and Twitter feeds to keep up with program updates, events, whale sightings and a whole lot more.







Volunteers

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Rosie Puffer

Thank you for all that you do for the Center!

Staff Updates

A warm welcome to Michelle Silva (rescue assistant, MAER); Laura Stinson (administrative assistant, Development Department); Emily Kelly (research assistant, Humpback Whale Studies program); Sam McFarland (Marine Geology Department); and Steve Mague (Marine Geology Department).

Thank you and farewell to Robert Ware (outreach coordinator); Terri Smith (Marine Geology Department); and Alison Ogilvie (Right Whale Ecology program).

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IN MEMORIAM

The CCS family lost some great friends this year:

Napi Van Dereck, whose vision for and support of the Center from its earliest days helped shape what it is today.

Margaret Hotz, the longest-tenured and quite possibly the most dedicated volunteer we ever had the pleasure of working with.

Mary Sexton, a dear friend to so many, who lived life to the fullest and who was an inspiration to all who knew her.

John Shea, long-time business manager at CCS whose sense of humor, booming laugh and love for his family were legendary.

CCS STAFF, 2020

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Bryan McCormack, CaPE Lab Manager

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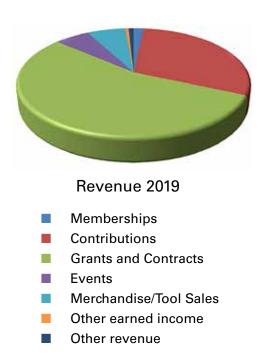
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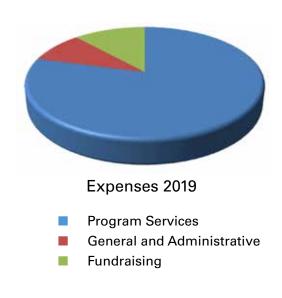
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FY2019 Source and Use of Funds Summary*





REVENUE (restricted and unr	estricted) <u>2019</u>	EXPENSES	<u>2019</u>
Memberships	\$73,211	Program Services	\$3,262,146
Contributions	1,309,441	General and Administrative	376,403
Grants and contracts	2,385,992	Fundraising	484,147
Events	253,745	Total	\$4,122,696
Merchandise/tool sales	278,235		
Other earned income	26,598	Net	\$240,303
Other revenue	35,777		
Total	\$4,362,999		

^{*}A copy of our audited Financial Statements is available on our website.

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