Right Whale RESEARCH NEWS Anderson Cabot Center for Ocean Life at the New England Aquarium

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Catalog #5140 seen on July 8, 2023, in the Gulf of St. Lawrence in close proximity to the research vessel, a behavior known as a "curious approach." Photo: Moe Brown/NEAQ/CWI. Taken under SARA permit.

July Fieldwork in the Gulf of St. Lawrence

This summer, our annual research trip to Canada's Gulf of St. Lawrence was a tad different from previous years. Although we still collaborated with familiar organizations such as the Canadian Whale Institute (CWI) and University of New Brunswick (UNB), we participated in additional research focused on right whale tagging efforts using suction cups as well as our typical photo-identification, health monitoring, biopsy darting, and fecal sampling. The suction cup tagging effort was led by Dalhousie University, with researchers from UNB, New England Aquarium's Anderson Cabot Center for Ocean Life, CWI, and NOAA Fisheries Northeast Fisheries Science Center (NEFSC) also participating.

With less than two weeks of time available to conduct this tagging and oceanographic sampling project, we were at the mercy of the offshore weather and, unfortunately, it was not very cooperative. High winds and seas limited the small tagging boat to only four days on the water, but in that time the tagging team was able to place suction cup tags on four different whales: Wishbone (Catalog #4640), Squilla (#3720), Bocce (#3860), and #5015. By placing these tags on whales in areas where they were feeding, researchers hope to gain a better understanding of the whales' activity around prey fields. Their movements are recorded by the tags while the water column is simultaneously sampled for copepods and other plankton. The role of the Aquarium's team member was to collect photos of each whale approached by the tagging boat and determine whether the whale was a good tagging candidate by assessing the physical condition of the whale as well as his or her known health history. During those

four survey days, 15 unique right whales were photographed, including mother of the year **Smoke (<u>#2605</u>)** and her calf.

Our Right Whale Research Program also sent a team member to work alongside colleagues from CWI and a fishing organization called Fédération Régionale Acadienne des Pêcheurs Professionnels (FRAPP) for the entire month of July. Working from a small rigid-hull inflatable, the team focused on right whale photoidentification, biopsy, and fecal sampling primarily in the Shediac Valley region of the Gulf of St. Lawrence. While this research crew had more time in the gulf, we were still limited to twelve survey days due to weather, including five consecutive days of fog-although we did manage to find whales even in dense fog! Altogether, we

Catalog #3993 dead on the beach March 16, 2011, showing entangled right flipper.

July Fieldwork...

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photographed 52 individual right whales including sponsorship whale **Manta** (Catalog #1507) (see *Sponsored Whale Update*)—and collected one poop sample to share with our Anderson Cabot Center's Wildlife and Ocean Health team for analysis.

The importance of boat-based research in the Gulf of St. Lawrence cannot be overemphasized. While planes are often surveying more of this region than boats can cover in a given day and season, they may still miss detecting important information that can only be observed from vessels, such as new injuries, scarring, and health changes. During our limited time in July, several new injuries were detected from our photo-id work, including the first observation of Chiminea (Catalog #4040) with a new severe entanglement injury on her right fluke. As one of the remaining reproductive females, monitoring her health-especially in relation to these human impacts-is essential for understanding the health of the population. The CWI/Aquarium/FRAPP team also documented the last sighting of Martini (#4042) before he was seen by Dalhousie/UNB researchers aboard the Jean-Denis Martin a week later with a new entanglement. The Dalhousie/UNB team were able to collect photographs and drone video of the entangled whale from the vessel, which may otherwise have gone unnoticed as the whale was not seen again for over a month, in which time the gear appeared to have shed (see Mortality and Entanglement Report). Additionally, the CWI/Aguarium/FRAPP team photographed at least two whales that were not seen by any other team (as of the writing of this newsletter).

While we always wish for more time on the water, it felt especially applicable this year as we provided a supporting role with new collaborations and dealt with our long-time nemesis-Gulf of St. Lawrence weather patterns. More time on the water may have meant more suction cup tags applied and more whales documented for new injuries, but we are grateful for the time we were able to spend in (relatively) good conditions and the amounts of data that were collected. Perhaps our next visit to the Gulf of St. Lawrence will bring calmer seas and clearer skies. We will keep our fingers crossed! -Kelsey Howe and Kate McPherson



Genetics Lead to Interesting Recent Discoveries

For over three decades, our team at the New England Aquarium's Anderson Cabot Center for Ocean Life has collaborated with the right whale genetics program that started in Canada at Trent University and later moved to St. Mary's University under the direction of Dr. Tim Frasier. We have collected over 700 biopsy samples for the lab to analyze and have also helped integrate the genetic results into the North Atlantic Right Whale Catalog-looking for identification discrepancies, adding sex and paternity information, and linking decomposed dead whales to known individuals. The combination of these two independent identification databases is both powerful and exciting. Two recent cases serve as excellent examples.

The first case is a long, convoluted story that eventually led to solving a 12-year mortality mystery. A very decomposed dead whale was found on the beach in South Carolina on March 16, 2011, with an entangling rope tightly bound and cutting deep into its right flipper. Although originally identified as a humpback whale due to the presence of what looked like ventral pleats, it was later determined to be a right whale. Catalog #3993 had been seen with a similar entanglement configuration 31 days earlier, 125 miles to the south and in very poor condition, so we assumed the dead whale was #3993. However, the genetic analysis of a small bone shard, which yielded low-quality DNA, was not consistent with #3993. Did we have two different entangled whales with nearly the same kind of entanglement configuration?

Luckily, the Smithsonian Institution had collected the flipper bone as a record of damage done by fishing ropes. They were kind enough to drill that bone in 2020, and when the team at St. Mary's used a boosted method of DNA amplification on the bone powder, they were able to get clear and usable results from a small amount of DNA. The results confirmed that it was, in fact, **Catalog #3993** and not a second right whale entanglement a better outcome than initially feared.

The second case concerns Catalog #4810. This whale was first seen on February 15, 2018, as an apparent juvenile and was not seen again for four years. She does not photographically match any known calf, but some calves are only seen on the calving ground before their callosities have developed and can only be identified to later sightings via genetics. The sample collected from her in 2018 does not match any previously sampled calf. What's more interesting is that the mitochondrial haplotype (100 percent of which is passed on from the mother) allowed us to rule out all unidentified and unsampled calves over the past 20 years!

The most likely explanation? The mother of this calf was never seen with her in her calving year—in other words, a calf that went completely undetected. While we know this must happen occasionally, we think it is rare given the extensive survey effort on the calving ground and elsewhere. A study is underway by several research organizations, including the Aquarium, to evaluate how rare this is. The story of **Catalog #4810** is a perfect example of one case; how many more are there? We will be sure to provide updates in future newsletters when this study is completed. —*Philip Hamilton*

Entanglement Monitoring Program

Monitoring the frequency and severity of right whale entanglements has been a major role of the New England Aquarium's Right Whale Catalog team at the Anderson Cabot Center for Ocean Life for the past four decades. Our team scrutinizes every submitted photograph to look for evidence of wrapping scars or attached fishing gear, indicating the whale has been entangled. It is painstaking work since, as curators of the North Atlantic Right Whale Catalog, we receive thousands of photographed sightings each year, which can include dozens or more photographs per sighting that then need to be reviewed. Sometimes, entanglement scars cause minor injuries that are harder to see than more extensive ones, meaning each photo must be carefully inspected for evidence of entanglements.

Through our work, we have shown that nearly all (86.4 percent) of the individuals in this population have experienced at least one entanglement, with some experiencing as many as nine entanglements over their lifetime. Of great concern is the increasing level of moderate and severe injuries resulting from these events, some of which can lead to the whale's death.

In 2017, after an unprecedented level of mortality was documented in North Atlantic right whales, NOAA Fisheries declared an **Unusual Mortality Event** (UME) for the species. Initially, the UME focused on cases of mortality or serious injury (i.e., injuries likely to lead to the whale's death). More recently, because of the increasing frequency of moderate and severe injuries detected through our work, the UME was expanded to consider cases of morbidity—cases that wouldn't necessarily lead to death but could have sublethal effects. As a result of several recent studies looking at the effects of entanglements on right whales, we have learned that these events can impact growth rates (right whales are now smaller than they were two decades ago), delay age of first calving, extend intervals between calvings, and impact health and survival.

Working closely with NOAA and a team of right whale and veterinary experts, we provided images of right whales with these types of sublethal injuries. These external reviewers determined whether the injuries were extensive enough to place them in the morbidity category. This expansion of the UME was important as it recognizes the full extent of the situation facing right whales. From 2017 to July 2023, a total of 121 right whales were included in the UME, and 79 of these cases are entanglement-related (see graphic).

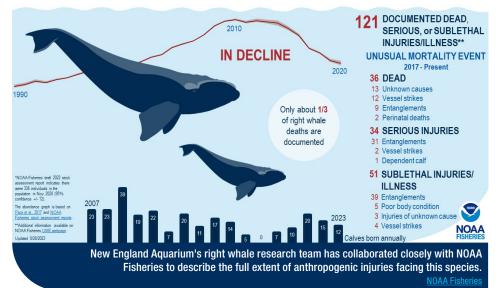
As we witness this increasing degree of injury and death of right whales due to entanglement, the fate of this species is now uncertain. To prevent right whales' extinction, there must be major changes in how fisheries operate so that gear can be made safer for all large whales. The shift towards using on-demand or ropeless gear in offshore waters that overlap with right whales' habitat is critical and holds tremendous promise.

We also are advocating for the use of weaker ropes in nearshore waters, which would allow a whale to part from the heavy bottom gear if an entanglement occurs. Ideally, as the on-demand technology improves, the costs go down, and other hurdles are addressed, on-demand gear can become the norm instead of the exception in fixed-gear fisheries. Persistence, persuasion, and financial support are now needed to help this new technology become a reality which will ultimately make whales and, in turn, our ocean healthier. —*Amy Knowlton*

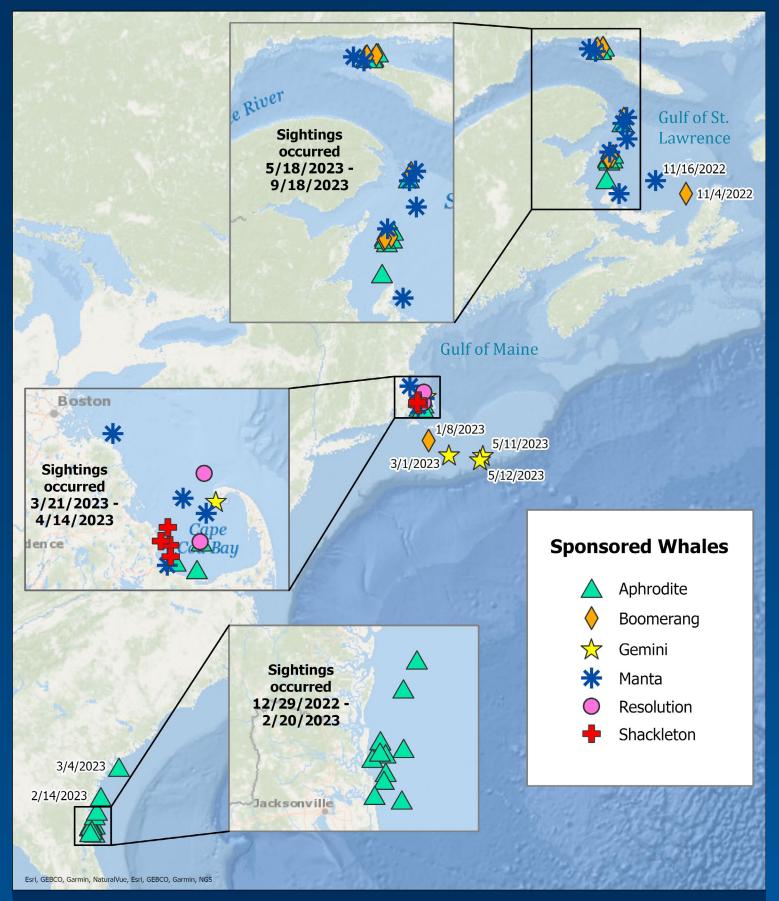
Update on Mom-Calf Pairs in Cape Cod Bay and Gulf of St. Lawrence: 2023

Earlier this year we reported that six of the 11 mother-calf pairs had been seen in Cape Cod Bay by the end of March, although surveys were still underway (see Report from Cape Cod Bay in RWRN May 2023). Since then, four additional mother-calf pairs were seen in this feeding habitat. Aphrodite (Catalog #1701), Smoke (#2605), Viola (#2029), and War (#1812) were all seen with their respective calves later in the spring, which means the only pair not observed in Cape Cod Bay this year was Archipelago (#3370) and calf. When Archipelago's last calf was born in 2019, the pair were seen frequently on the calving grounds, and then they were not sighted again until November of that year offshore on George's Bank, so we don't know where she and her 2023 calf may be spending their time for sure, but it seems she may have an alternate feeding ground she prefers!

After the mother-calf pairs departed from the Cape Cod Bay feeding ground, four were sighted in Gulf of St. Lawrence during the summer in their continued migration. **Aphrodite, Smoke, War**, and **Pilgrim** (Catalog #4340) and each of their calves have made an extensive journey of 2,000 plus miles from the southeast US to the Gulf of St. Lawrence with stops along the way. The distribution of the other seven mother-calf pairs during the summer and fall is unknown but they are likely broadly distributed in northern areas where surveys aren't happening. —Kate McPherson and Kelsey Howe



ENDANGERED NORTH ATLANTIC RIGHT WHALE Fewer than 350* Individuals



Sponsored Whale Sightings November 2022 to September 2023. Map: Kelsey Howe/ACCOL/NEAQ

Sponsored Whale Update

Thank you very much for sponsoring a right whale and supporting our program! Spring and summer can often be productive seasons for new sightings, and it seems this year was no exception. We are happy to report that many sponsored whales have updated sightings to share!

Gemini (Catalog #1150) was

sighted in the Great South Channel off the coast of Cape Cod on May 11 and 12, 2023, both times by vesselbased teams from the Northeast Fisheries Science Center (NEFSC).

Manta (Catalog #1507) was observed in Cape Cod Bay on March 21, 2023, by the Center for Coastal Studies (CCS) aerial survey team. He was seen feeding in the area during the following weeks, though he was also documented in Massachusetts Bay on April 13, as part of a surfaceactive group! A little over a month later, on May 18, he was spotted in the Gulf of St. Lawrence by the Canadian Department of Fisheries and Oceans (DFO) aerial survey team. He was sighted in the area again periodically during the rest of May, June, and July by teams from NEFSC, DFO, and the Canadian Whale Institute (CWI). Manta was last seen in the Gulf of St. Lawrence on September 14 and 18 by Mingan Island Cetacean Study (MICS).

Aphrodite (Catalog <u>#1701</u>) and her calf were sighted in Cape Cod Bay by the CCS aerial team on April 9, 2023, having

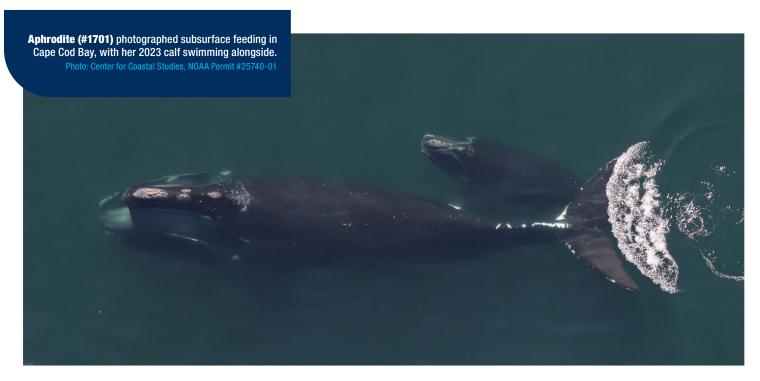
successfully made their migration from the southeast! Every calf is a sign of hope for this species, so it is always heartwarming to see them arrive up north. The pair were documented in the bay a few more times through April 14, with mom mainly feeding, while the calf was periodically observed nursing. Almost two months later, on June 11, they were observed further north in the Gulf of St. Lawrence, seen by aerial observers from NEFSC and DFO. It seems that the dynamic duo became a recurring sight in the area for the duration of the summer, being spotted by several organizations, including Campobello Whale Rescue Team (CWRT), from June through early September. Both Aphrodite and her calf were last seen in the Gulf of St. Lawrence on September 6 by MICS.

Shackleton (Catalog <u>#2440</u>) was documented traveling in Cape Cod Bay on March 22, 2023, by the CCS aerial team. He was seen in the area three more times in the following weeks, sometimes feeding cooperatively with other right whales. **Shackleton** was last sighted in Cape Cod Bay on April 14 by CCS. **Boomerang (Catalog <u>#2503</u>)** was observed subsurface feeding on June 13, 2023, in the Gulf of St. Lawrence by the NEFSC aerial survey team. She was seen in the gulf at least once a month by multiple aerial and vessel-based teams throughout the summer, with her most recent sighting taking place on September 6 by MICS.

Resolution (Catalog <u>#3532</u>) was spotted twice in Cape Cod Bay this past spring by the CCS aerial team. He was observed subsurface and skim feeding on April 9, then traveling on April 14, 2023.

We do not have new sightings of Calvin **(Catalog <u>#2223)</u>** to report on at this time. However, data processing is always ongoing and field teams are keeping an eye out for her, so if a new sighting occurs or a previous one is discovered, we will be sure to include it in our next issue!

To keep up with where all the sponsored whales have been sighted in the past year, we encourage you to check out the map! —*David Lockwood*



Mortality and Entanglement Report

In each newsletter, we report on new entanglements and mortalities that we have observed in North Atlantic right whales since the last issue. Although this number is always concerning, we know that it drastically under-represents what the species is actually enduring. A recent study determined that for every carcass observed, there may be three times that number of undocumented deaths. This species is in decline, and until entanglements and vessel strikes are dramatically reduced, North Atlantic right whales will continue to inch closer to extinction due to these human impacts. By sharing these stories, we are keeping you, our readers, apprised of these life-threatening injuries.

Mortalities

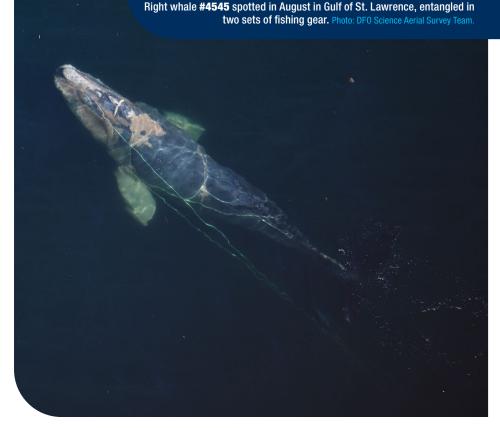
There have been no new documented mortality events since the last newsletter in May.

Update on Previous Entanglements

Below, we report on three ongoing and two new entanglements observed since our May newsletter (see *Mortality and Entanglement Report* in *RWRN May 2023*).

Catalog #4501 (eight-year-old male): In the summer of 2022, #4501 was seen by a Canadian Department of Fisheries and Oceans (DFO) aerial survey team in the Gulf of St. Lawrence with rope across his body and acting agitated. The nature of the entanglement was unknown as the rope was not seen consistently in the footage, and it was unknown how long the entangling gear remained attached. Nearly a year later, #4501 was resighted by the Northeast Fisheries Science Center (NEFSC) aerial team at the end of March 2023. He appeared to be gear-free in a large feeding aggregation in southern New England.

Catalog #5120 (two-year-old female previously known as the 2021 calf of Squilla, #3720): #5120 was initially observed entangled in August 2022 in the Gulf of St. Lawrence with subsequent disentanglement attempts and sightings in January and February of 2023 off Cape Cod. #5120 was resighted still entangled in June by the NEFSC aerial team in the Gulf of St. Lawrence. Her overall body condition has declined and it appears the constricting rope around her tail stock became more deeply embedded. The buoys that were originally part of the entanglement have been shed, but the lack of trailing line makes future disentanglement attempts more challenging. Response teams were unable to respond to the June sighting, and she has not been seen since.



Catalog #4545 (eight-year-old female): #4545 was first seen entangled in February 2023 south of Nantucket. During disentanglement efforts in March of this year, a telemetry buoy was attached to #4545's trailing gear. Response teams tracked her location, poised and ready to respond when the weather and whale's location were conducive to disentanglement attempts. In early April, with the help of the NEFSC aerial team, the Center for Coastal Studies' Marine Animal Emergency Response team was able to relocate #4545, 15 miles east of Cape Cod. The response team worked all day, trying multiple methods of removing the tight body wraps. A combination of the whale's behavior, and a complex entanglement configuration prevented the team's progress. In the end, most of the trailing line was removed but the dangerous body wraps remained. #4545 was later sighted by a DFO aerial survey team in the Gulf of St. Lawrence in early July, her condition further deteriorating. By the end of the month, she was seen with additional gear, indicating a subsequent entanglement (see below).

Unfortunately, we have no additional updates on the following ongoing cases mentioned in our May newsletter: **Catalog** <u>#4904</u>, **Sundog** (<u>#3823</u>), **Meridian** (#1403), and **Snow Cone** (#3560).

New Entanglements

Catalog <u>#4545</u> (eight-year-old female; see above): In addition to her entanglement updates, **#4545** was seen in the Gulf of St. Lawrence by a Canadian surveillance aircraft on July 30 with a new entanglement involving weighted gear on top of her previous entanglement. She was resighted by DFO at the end of August, but vessel teams were not able to relocate her, and she has not been seen since. Given the continued presence of two entanglements and her rapidly deteriorating condition, her survival is unlikely.

Martini (Catalog #4042, 13-yearold male): In mid-July, during a research cruise in the Gulf of St. Lawrence aboard the Jean-Denis Martin, crew members from Dalhousie University came across Martini with rope through his mouth and trailing behind his body. Due to the time of day and distance from shore, rescue teams were unable to respond. Martini had been seen roughly one week prior with no entanglement. Thankfully, just a few weeks later in early September, a research team from Mingan Island Cetacean Study documented Martini gear-free near Anticosti Island in the Gulf of St. Lawrence. - Amy Warren

Aerial Survey Recap 2023

The New England Aquarium's aerial survey team at the Anderson Cabot Center for Ocean Life flies surveys in the southern New England shelf waters year-round, but the winter to spring season is the peak time for right whale sightings. Between January and April, our team documented at least 102 individual right whales—which is almost 1/3 of the entire population!

We noticed a significant turnover of individual right whales within the groups of whales we saw throughout the season, which we found interesting. While we typically see one or more groups of whales on every flight in our survey area during these several months, each group may be made up of almost entirely different individuals each time we fly.

In fact, 77 of the 102 individuals we documented last spring were only sighted on one of our surveys, and we didn't resight any whale more than three times during our 11 survey days. Of the whales resighted more than once, only one individual appeared to stay in the area for three months (adult male **Catalog #2770**), while others stayed one to two months. This rapid turnover of individuals implies consistent movement into and out of the area.

Among the 102 whales we photographed, some standouts were: an old favorite, **Musketeer (Catalog #4360)**; reproductive female **Bocce** (**#3860)** photographed in a surface active group; the **2021 calf of Flounder** (**#2420)** (whom we first saw as a three-month-old calf on a survey in 2021); and **Wolf (<u>#1703</u>)**, a 36-year-old reproductive female who has not been documented in our survey area before!

Want to read more about the right whales we saw on our aerial surveys? Check out our blog! – Orla O'Brien

> A surface active group seen by the New England Aquarium's aerial survey team in southern New England. Photo: Katherine McKenna/ACCOL/NEAQ, NOAA Permit #25739

Team Member Transitions

It has been a dynamic few years for the staff at the New England Aquarium's Anderson Cabot Center for Ocean Life Kraus Marine Mammal Conservation Program with a few recent changes to report. We are sad to announce the retirement of Associate Research Scientist Marilyn Marx, however we are excited to welcome David Lockwood and Hansen Johnson to the team.

We could devote an entire newsletter to all the ways Marilyn helped right whales and our team before retiring after more than 35 years of researching and caring deeply about this species. Marilyn was involved in all facets of the team's work including various field studies, catalog work, documentation of human impacts, and editor of this newsletter. Marilyn's attention to detail was exceptional and incredibly valuable to our program. We will miss her passion for protecting this species and her playful sense of humor.

David Lockwood joined us as a research technician in May, fresh off his third field season flying right whale aerial surveys over the calving grounds off the southeast US. David brings a passion for photo-identification and quality control to the team and is already trained and skilled in identifying right whales and assessing their behaviors. David is also an accomplished artist.

Dr. Hansen Johnson joined us in late September to spearhead our field research efforts. Hansen comes to us with a broad and deep knowledge base, ranging from passive acoustics detections of large whales (by gliders, sonobuoys, and moored acoustic buoys) to plankton ecology in the Gulf of St. Lawrence, to programming in R and Shiny. He created WhaleMap, which has been an instrumental tool helping both government managers and scientists in their efforts to protect right whales (see WhaleMap sidebar). Hansen will help refine our fieldwork strategy as our team adjusts where and how we conduct our research in a time of rapid change.

With Marilyn's departure, Shelby Vance has taken over as editor of this newsletter. Thank you, Shelby, for spearheading the production of this platform, allowing our team to communicate with a broad audience.

Welcome, David and Hansen; may you wield the red pen wisely, Shelby; and Marilyn, may the wind be always at your back! —Philip Hamilton

WhaleMap

The North Atlantic Right Whale Consortium (NARWC), of which the New England Aquarium is a founding member, is now host and curator for the WhaleMap platform. WhaleMap is a tool used to collate and display near-real-time whale detections and survey efforts along the eastern coast of North America by combining visual sighting information from aerial and vessel surveys, as well as opportunistic sightings reported via Whale Alert (an app for anyone to report whale sightings, which are verified for accuracy before being posted to the map in near-real-time to alert mariners of nearby whales, in hopes of preventing vessel strikes).

Acoustic detections, both from fixed buoys and gliders, are also integrated. The WhaleMap platform is designed to provide easily accessible information to scientific, regulatory, and industrial sectors to help inform research and conservation activities. This is a very collaborative effort, and the New England Aquarium is proud to be a partner. Check out the latest sightings information at <u>whalemap.org</u>! —Kate McPherson





Give the Gift of Endangered Species Conservation

Today, there are an estimated 356 individual North Atlantic right whales remaining. And, while no longer commercially hunted, the long-term survival of this critically endangered species is still under intense threat from fatal vessel strikes and fishing gear entanglements.

Established in 1980, the Aquarium's Right Whale Research Program is one of the longest continuously-running whale research and conservation programs in the world. Working with government, conservation, industry, and commercial interests, the Right Whale Research Program seeks to find ways to ensure the survival of these majestic animals.

North Atlantic right whale-themed gifts and <u>tax-deductible sponsorships</u> are available with proceeds directly supporting our research and conservation work to save this critically endangered species.

Visit **rightwhaleresearch.bigcartel.com** to learn more!



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In this newsletter, all photographs of right whales in U.S. waters were taken under NOAA research permits under the authority of the Marine Mammal Protection Act and the U.S. Endangered Species Act. *Right Whale Research News* is produced and published by the New England Aquarium. We welcome your comments and suggestions.

Read more about our project at accol.org.

You may access past issues of *Right Whale Research News* on our website at <u>www.neaq.org/news-and-stories/right-</u> <u>whale-research-news-sponsorship</u>. The archive goes back to 2005, and all but the two most recent issues of RWRN are available. Now when one of the articles in the current issue refers to an earlier piece on the same subject, it's easy to check it out!

Thank you!

We would like to thank all the individuals, organizations, and schools that continue to support our research with annual sponsorships and donations. In these difficult economic times, with federal research budgets shrinking, your support is more critical than ever, and we truly appreciate your generosity. Sponsorship funds are used by our Right Whale Program to support activities that directly contribute to the conservation of North Atlantic right whales.