



New England
Aquarium

Protecting the blue planet

Right Whale

RESEARCH NEWS

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Editor

Marilyn Marx

Contributors

Moe Brown

Heather Pettis

Marianna Hagbloom

Kelsey Stone

Philip Hamilton

Brooke Wikgren

Amy Knowlton

Monica Zani

In this newsletter all photographs of right whales in U.S. waters were taken under NMFS/NOAA permit 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 a particular aspect of our project at www.neaq.org.

You may now access past issues of **Right Whale Research News** on our website http://www.neaq.org/conservation_and_research/projects/endangered_species_habitats/right_whale_research/. 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!



Snowball in 2007. Photo: Whale Center of New England, taken under NOAA Permit.

Goodbye Snowball

Whenever a dead or entangled whale is discovered, we put all our effort into identifying the individual quickly. Often these are challenging cases because the identifying features have been obscured by injury or decomposition. Such was the case for an entangled right whale photographed last June by the Northeast Fisheries Science Center (NEFSC). The whale had rope wrapped and embedded across the top of its head. Line lodged in the baleen exited the mouth and trailed behind the animal, having encircled the right flipper along the way. The whale's skin was pale, and the head and body were carpeted with orange cyamids (these thrive on slower moving and/or injured whales). The whale was emaciated, its normally robust body now sunken, with a deep depression on either side of the spine. We spent countless hours trying to identify this whale, but the usual identifying features were so obscured by cyamids and new wounds that we were unable to match it.

Recently, I spent a day looking at photographs of this whale to see if I could find something that had been overlooked. It was an emotionally hard day, staring at lines cutting deep into the whale's head and possibly into bone, thinking about how this poor animal was suffering. Just when I was on the verge of giving up, I recognized a scar peeking through the cyamids. I knew that scar. With a sinking heart, I called up images of **Snowball (Catalog #1131)**, and made the match. We had seen Snowball every year or two since 1979, but he had been missed since 2010, suggesting he may have been entangled for several years.

Snowball has almost certainly died since his June 2014 sighting, having slowly succumbed to infection or starvation, or both. His emaciated body would likely not have floated, sinking to the bottom of the ocean and leaving no chance of someone reporting his carcass. Every right whale death is tragic, but

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Goodbye Snowball

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our long history with this individual and knowing the lengthy, profound suffering he endured makes his plight almost unbearable. The dramatic decrease in mortalities from ship strike means that for right whales, entanglement in fishing gear is now the leading cause of mortality, with some of these whales enduring tremendous suffering before they die. Nearly 83% of the right whale population has been entangled *at least* once, and we humans have found no effective way to mitigate this harm yet. *We must* do better.

Snowball is gone. All that remains is our record of his life, the children whose hearts he touched through our sponsorship program, and our sorrow for what we humans did to him.

—Philip Hamilton



Snowball fatally entangled in 2014.

Photo: Peter Duley/NEFSC, NOAA Permit #17355

Calving Ground Update:

17 calves born!

The right whale winter calving season surveys ended on March 31. Teams from Florida Fish and Wildlife Commission, Georgia Department of Natural Resources, and Sea to Shore Alliance flew aerial surveys on the calving ground with a number of different organizations working on the water and from land. The season had a slow start; only one calf was seen by the end of December, and only six more by the end of January. Luckily the numbers increased more rapidly in February and March to reach a total of 17 known calves. None of the moms are known to have lost any of their calves, so our fingers are crossed that we will see them all up north this spring and summer.

This year there are four first-time mothers, the youngest (**Catalog #3646**) is 9 years old. Some of the older mothers include **Mantis (Catalog #1620)**, **Clover (Catalog #1611)**, and **Aphrodite (Catalog #1701)**. These three are all 28+ years old and have had 13 calves among them! Sponsorship whale **Calvin (Catalog #2223)**, one of our favorites, who is 23 years old, gave birth to her third calf.

One of the moms has an interesting lineage—**Smoke (Catalog #2605)** gave birth to her third calf this year. A life-size model of a model of **Smoke's**

mother, Sponsorship whale **Phoenix (Catalog #1705)**, is hanging in the Smithsonian's Sant Ocean Hall in Washington D.C.—the centerpiece of an excellent educational exhibit in the National Museum of Natural History.

Lastly, the identity of one of the moms is still tentative because we only have distant images taken by an observer on a dredge in the beginning of February! With so much survey effort in the area, we had expected this mom and her calf to be seen again on the calving ground. The fact that they were not serves as a reminder of what a large area the calving ground encompasses and how, even with regular, dedicated survey efforts, it is likely that not all animals are sighted.

We all look forward to the calving season each year and hope for a large new cohort of young right whales to come into the population. We watch them with protective anticipation to see how they will fare. The first mother/calf pairs are beginning to arrive in northern waters as this newsletter goes to print. We will update you in our next newsletter about how these calves and their diligent mothers managed during their northward migration.

—Philip Hamilton



Catalog #2790 tilts her head up while her calf rests on her back in waters off Georgia.

This is 2790's fourth known calf. Photo: Georgia DNR, NOAA Permit #15488



Catalog #2145 with her new calf, off Cumberland Island, Georgia. Photo: Florida Fish and Wildlife Conservation Commission, NOAA Permit #15488.



Smoke (Catalog #2605) with her third calf, east of Cumberland Island, Georgia. Photo: Georgia DNR, NOAA Permit #15488.

Update on Mortality, Entanglement and Severe Injury

In each newsletter we report on new mortalities, entanglements and severe injuries that the population has suffered in the preceding six months and update the on-going cases. The following is a brief summary of all these known (documented) events.

Mortalities and New Entanglements

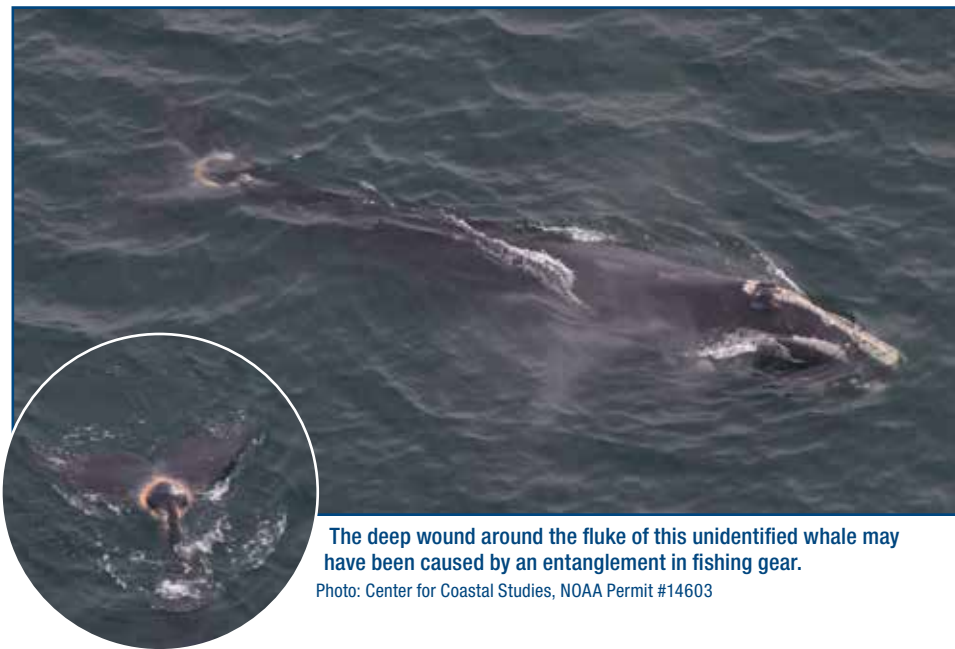
In our last newsletter we reported on a startling number of mortality events that had been documented in the preceding six months: Four right whale carcasses had been sighted but only one was ever identified (**Catalog#3966**). After that dismal stretch we are relieved to report that there have been no right whale mortalities documented since October 2014. Additionally, our last newsletter reviewed three new entanglement cases from the preceding six months. Again, we are happy to report that there have been no new entanglements documented since the last newsletter.

While this is exciting and welcome news, it also should be viewed with caution. In the past several months, areas with dedicated right whale surveys (like the Southeastern U.S. calving ground) faced poor weather conditions, and thus their survey efforts were somewhat limited. Other areas, such as the mid-Atlantic, have minimal survey effort in general. In addition to reduced or restricted effort, there have also been shifts in right whale distribution in the past few years. How these distribution shifts and reduced efforts affect our detection of dead and entangled whales is unknown, but it is likely that these factors could very easily under-represent such events.

Severe Injury

While there were no mortalities or new entanglements reported recently, there were two new severe injuries documented:

- **Catalog #3670** (9-year-old female) was sighted this winter by Sea to Shore Alliance in the Southeastern U.S.



The deep wound around the fluke of this unidentified whale may have been caused by an entanglement in fishing gear.

Photo: Center for Coastal Studies, NOAA Permit #14603

calving grounds in December. During that sighting it was noticed that she had new and extensive entanglement wounds on her head, tail stock and on/in her mouth. She was re-sighted in late March in the waters east of Cape Cod, Mass., during a Center for Coastal Studies aerial survey. From photos taken at the time, she appears to be slightly thinner than she was in December, and there is still some question about how much injury the right side of her mouth has sustained and whether that could be hindering her feeding.

- **Unknown ID:** A right whale sighted on April 6 in Cape Cod Bay has a severe injury around the fluke and tail stock, likely from entanglement. The affected area has evidence of tissue decay and is covered by orange cyamids, which makes understanding the injury difficult. While large clusters of orange cyamids are normal on calves, they tend to be a sign of injury or declining health in adults. We are hopeful that both of these whales will be seen again from a research vessel so that shipboard photographs will allow us to better assess their health and injuries.

Updates on Previously Entangled Whales (since last newsletter)

In our last newsletter we reported on a gruesome entanglement that was photographed in late June on Georges Bank. You might remember that we simply referred to the whale as **field code-WR-2014-08**. This whale was unknown at the time because it's extremely poor body condition obscured some key identification features. It is with a heavy heart that we now report on the identity of this whale (see *Goodbye Snowball*).

Previously Entangled Whales with No Current Update

Entanglements are documented each and every year, and not all cases can be resolved through disentanglement. Often we don't have any updates on previous cases because the whale has not been re-sighted. To our knowledge these entanglements likely still persist or, in some cases, the whale may have died offshore. Currently there are 12 such entanglement cases from only the past five years. If these whales are not sighted for six years we presume they are dead, (See *When Whales Go Missing*).

—Monica Zani

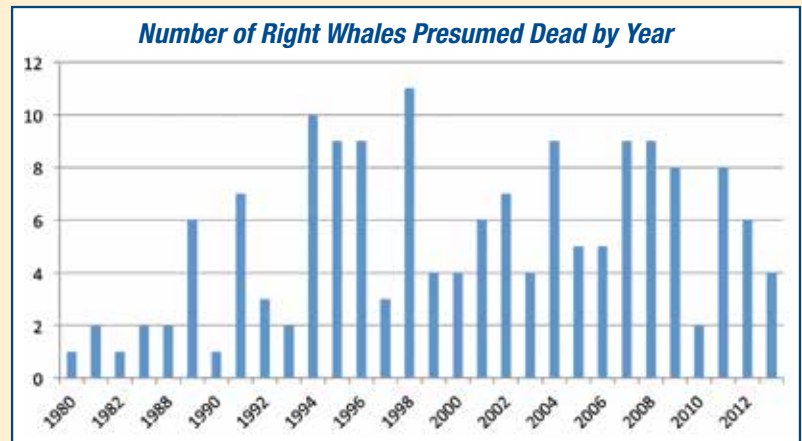
When Whales Go Missing

Keeping track of how many right whales are alive in the North Atlantic population is an important component of the work we do.

This information can tell us how the population is faring and how effective management initiatives are at reducing mortality. It's easy to count a whale as alive when it is seen in a given year, and in some years as many as 80% of North Atlantic right whales have been seen. But what about whales that are not seen in a given year? How do we know if they were simply not seen, or if they have died?

To answer these questions, we examined sighting gaps for individual right whales and discovered that 99% of right whales are seen at least once within a six-year period. In other words, 99% of right whales have sighting gaps of six years or less. Based on these analyses, we consider whales to be alive, even if they are not sighted, until they have not been seen for six years. Once a whale has not been seen for six years, we presume it to be dead. This is a simple tool that helps us keep tabs on the population.

To date, 159 right whales have been classified as presumed dead and the number of whales who become presumed dead varies by year (Figure 1). Only 46 whales in the population have been re-sighted after a six-year gap and 36 of them are considered to be still alive.



Whale-Saving App Goes International

Large whales are vulnerable to collisions with vessels throughout the world's oceans. Whale Alert, launched in April of 2012, is a free iPhone and iPad mobile application developed by many stakeholders with the common goal of reducing lethal collisions of vessels with endangered North Atlantic right whales. The application was designed to provide a "one-stop shop" for mariners to access all U.S. vessel strike reduction regulations as well as dynamic conservation measures implemented from recent whale sightings. Whale Alert was downloaded by 15,000 users its first week and reached a larger and more diverse audience than anticipated.

Due to the interest in the application, developers recognized a need for a more advanced version. Whale Alert 2.0 was released in October of 2014 and transformed the application from an information hub developed for the shipping industry to an international, interactive two-way user interface. In addition to providing the original

vital new features and a platform for citizen science! The app has expanded geographic coverage to include the eastern and western U.S. and Canadian coastal waters and also provides users an interface for reporting sightings of live and distressed whales. Professional mariners and the public can now contribute to international efforts to reduce vessel

strikes by contributing sighting data for multiple whale species through the in-app whale sighting report feature. The geographically smart app provides users a platform to accurately identify and report live whale sightings, but more importantly, allows for reporting sightings of dead, entangled, or stranded whales and will direct the user to the appropriate government agency or response group, expediting response to whales in distress. This allows for users to play a direct role in marine conservation science and could potentially save the lives of endangered whales along international coastlines!

Whale Alert 2.0 is an entirely new and improved application. New users and those still operating the original version are urged to go to the iTunes store and download the new version in order to benefit from all the enhanced features! Whale Alert for Android phones is coming this spring.

You can learn more at www.whalealert.org.

—Kelsey Stone and Moira Brown

Whale Alert App
Reducing Ship Strikes to Large Whales

A new enhanced version of Whale Alert is now available for download from the Apple app store!
<https://itunes.apple.com/us/app/whale-alert/id881181092?mt=8>

All Original Features Still Included

- Current ship location
- Seamless NOAA vessel alerts
- GPS position tracking and alerts when entering right whale management areas
- Automatic live right whale sighting system in Massachusetts Bay
- Seasonal Management Areas
- Dynamic Management Areas
- Mandatory Ship Reporting Areas
- Recommended Routes
- Areas to be Avoided

"NEW" Additions to the App

- Submit live whale sightings to mariners using our users ID guide to contribute to understanding of whale habitat use and right whale alerts
- Report dead, stranded, entangled or stranded whales - time is critical to successful response!
- Capture time/date/location stamped photos to submit with sightings
- Use NOAA PORTS® (Physical Oceanographic Real Time System) weather and tide data for safe navigation
- Check out the whale watching guidelines for operational guidance when in sight of whales
- Enjoy greater geographic coverage

Download the App and help save whales!

Sponsored Whale Update

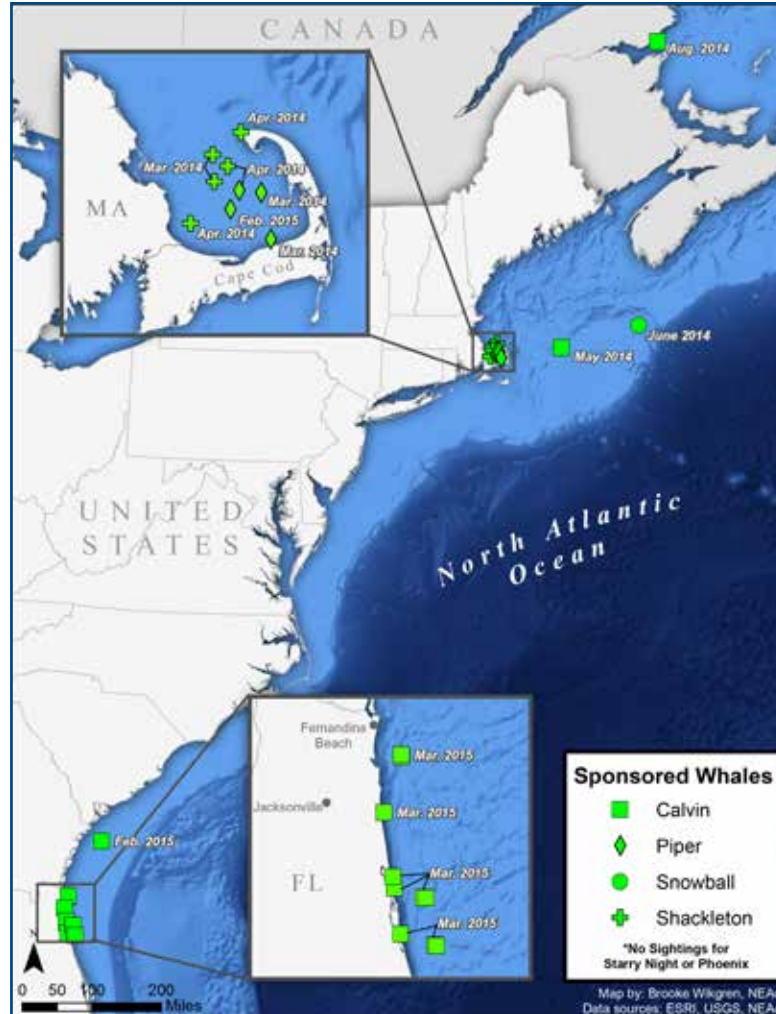
As curators of the *North Atlantic Right Whale Catalog* we are constantly processing the photographs and data that are submitted by our right whale research colleagues along the East Coast. In some cases we are not able to identify or confirm individuals until several months or more after a field season is completed. It's for that reason that we have some older, but recently discovered sightings of two of our Sponsorship whales, *Shackleton* and *Calvin*

Back in April 2014 *Shackleton* (Catalog #2440) was photographed in Cape Cod Bay by the Center for Coastal Studies (CCS) aerial survey team. The next day the Northeast Fisheries Science Center (NEFSC) aerial survey team documented him skim feeding off Race Point, the northernmost point of Cape Cod.

A May 2014 sighting of *Calvin* (Catalog #2223) has also been recently confirmed: She was seen in the Great South Channel by NEFSC. More recently, on February 21, 2015, *Calvin* was photographed by the Sea to Shore Alliance with a calf—her third—off the coast of Georgia! She and her calf stuck around the Florida coast for a few weeks, with several sightings in March by Florida Fish & Wildlife. Although we don't know where this calf was born, *Calvin's* previous calves were both first seen as newborns off North Carolina, further north than we typically first see mother/calf pairs. Considering *Calvin* and her 2015 calf were not seen on the calving ground until late February, it's possible that this year's calf was also born further north but just not detected there.

Piper (Catalog #2320) was photographed by CCS when she made a brief appearance in Cape Cod Bay on February 24, 2015. She'll likely be there again soon to feast on copepods!

There are no new sightings of *Phoenix* (Catalog #1705) to report at this time, but hopefully we'll have an update on her



Sponsored whale sightings March 2014 through March 2015. Map: Brooke Wikgren/NEAQ



Calvin and calf off Nassau Sound, Florida in March.

Photo: Florida Fish and Wildlife Conservation Commission, NOAA Permit #15488.

in our next issue, so stay tuned! Sadly, because *Snowball* has likely died [see *Goodbye Snowball*] and *Starry Night* has not been seen in recent years, we have removed both of them from the sponsorship program. However, we will soon be adding a few new favorite individuals to the program, so please

be sure to visit our website over the next couple of months to learn their stories.

And as always, thank you so much for choosing to sponsor a whale. Your generous contributions help to support our research!

You can learn more at <http://www.neaq.org/rwsponsor>



—Marianna Hagbloom

Photographs + DNA = Discovery!

Here at the Aquarium we curate the North Atlantic Right Whale Photo-Identification Catalog; we use photographs of unique marks to identify and track the lives of individual whales. Scientists at Trent University in Canada use DNA from skin samples to do the same thing with the same individuals. It is important to link and compare these databases in order to sort out any potential errors. During this process we also make some interesting discoveries. With funding from the Institute of Museum and Library Services (IMLS), we have been undergoing a very detailed comparison of the two databases. We did this once before and found very low error rates of about 3% in both databases. Since that time, hundreds of DNA samples and newly identified whales have been added to each database and additional information has been uncovered to rectify particularly challenging discrepancies from the past. My colleagues in this endeavor are Dr. Brenna MacLeod Frasier (St. Mary's University) and Dr. Brad White (Trent University), with assistance

from Nguyen Thi Xuan Nguyen and Matt Harnden. Below are just three of the many interesting stories that have unfolded through this painstaking, yet always interesting, work.

We saw **Morse (Catalog #1608)** and her calf in the Bay of Fundy and collected a sample from the calf. But, once analyzed, the genetics from that sample were not consistent with it being from Morse's calf. The answer: There were actually two calves with the mother that day, but they were surfacing at different times and they looked similar (it is not uncommon for calves to associate with other whales while their moms are feeding at depth). We had actually detected the second calf (**#3310**, the calf of **#2301**) when processing the photos, but had assigned the genetic sample to the wrong calf.

A mother of the year, **Catalog #1814**, was seen four times in a row in August through December without her calf, so we assumed that her calf had died. But lo and behold, a whale that we had believed to be a 1-year-old that

same year based on its size and head shape was genetically consistent with being **#1814's** calf. However, it was seen in a completely different habitat than where its mother had been seen, indicating the calf had been weaned earlier than most calves—a happy and unexpected discovery. We know a calf can be weaned early and survive (such as Sponsorship whale **Calvin**), but it is rare.

Along a similar vein, a carcass that we thought was a calf based on its length was found in the Bay of Fundy, but we couldn't figure out which mother it belonged to. Years later, we found that it genetically matched the uncataloged calf of **Catalog #1604**, born the year before; and once we knew who it was genetically, we confirmed that match photographically. It was in fact, not a calf at all but a very small 1-year-old.

We are only part way through our work, so I am sure there will be many more interesting stories to share!

—*Philip Hamilton*

Photo Identification Catalog Fact:

Did you know that the earliest identified whale sighting in the Catalog is from 1935?

The photograph is of **Catalog #1045** and her calf off the coast of Florida; sadly the photos were from a newspaper article about sport fisherman killing a whale (**#1045's** calf). This turned out to be the last right whale legally hunted and killed in U.S. waters!

Do YOU have pictures of a right whale?

If so, please contact rwdata@neaq.org to submit any photos you may have obtained and help right whale researchers learn more about the species!

If you sight a right whale

Always contact the Coast Guard by radio or call the NMFS hotline at 866-755-6622 to report your sighting (or, if in Canadian waters, the DFO hotline at 506-529-5838).

Remember

It is illegal to approach within 500 yards of a right whale in U.S. waters.



This grainy photo from a 1935 newspaper shows a man about to shoot and kill a right whale calf. Many decades later the adult female whale in the background was matched to **Catalog #1045**. In 1995 she was sighted with a deep propeller wound to her head; she has not been seen again.

Photo: *New York Herald Tribune*



New England Aquarium

Central Wharf
Boston, MA 02110-3399



350/5-15/Alpha

Celebrating right whales!

As this newsletter goes to print, the Aquarium is preparing to host the second annual New England Right Whale Festival on Sunday, May 3, from 11 a.m. to 3 p.m.. The idea of a festival was originated by the Calvineers, a group of middle school students from the Adams School in Castine, Maine, who have been researching, advocating for, and teaching others about North Atlantic right whales under the direction of their teacher, Bill McWeeny. The festival brings together organizations that are involved with right whale research and education to share knowledge and increase

awareness about this small population. With hands-on activities, games, videos, and the opportunity to talk to right whale scientists, it is a fun way to celebrate right whales. Last year, more than 1,200 people attended the festival, and we are looking forward to another successful day to honor our whale friends! Details of this year's celebration will be in our next newsletter, so stay tuned!

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 before, and we truly appreciate your generosity. Sponsorship funds are used by the New England Aquarium Right Whale Program to support activities that directly contribute to the conservation of North Atlantic right whales.

