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New iPad, iPhone app helps mariners avoid endangered right whales

Mariners along the U.S. east coast can now download a new iPad and iPhone application that warns them when they enter areas of high risk of collision with critically endangered North Atlantic right whales. The free Whale Alert app provides one source for information about right whale management measures and the latest data about right whale detections, all overlaid on NOAA digital charts.

“Whale Alert represents an innovative collaboration to protect this critically endangered species,” said David Wiley, NOAA’s Stellwagen Bank National Marine Sanctuary research coordinator and project lead. “Whale conservation is greater than any one organization and this project shows how many organizations can unite for a good cause.”

A key feature of Whale Alert is a display linking near real-time acoustic buoys that listen for right whale calls to an iPad or iPhone on a ship’s bridge showing the whale’s presence to captains transiting the shipping lanes in and around Stellwagen Bank National Marine Sanctuary. “The idea that right whales are directly contributing to conservation through their own calls is pretty exciting,” said Christopher Clark, whose team at the Bioacoustics Research Program at the Cornell Lab of Ornithology helped develop the acoustic detection and warning system.

North Atlantic right whales, which live along North America’s east coast from Nova Scotia to Florida, are one of the world’s rarest large animals and a species on the brink of extinction. Recent estimates put the population of North Atlantic right whales at approximately 350 to 550 animals. Collision with ships is a leading cause of right whale death.

“Massport is proud to be part of this effort. We are working with our cruise and shipping vessel partners to educate mariners about the whales, and the importance of this great new tool,” said Michael Leone, port director for the Massachusetts Port Authority. “The maritime community has always sought ways to increase right whale survival. Whale Alert does this by using science and technology to let mariners know where their vessel is in relation to the whales and conservation measures."

The link to the listening network is only part of what Whale Alert does. The app uses GPS, Automatic Identification System, Internet and digital nautical chart technologies to alert mariners to NOAA’s right whale conservation measures that are active in their immediate vicinity. NOAA, through its NOAA Fisheries Service, is the U.S. agency with responsibility for protecting and recovering this endangered species.

"Endangered right whales are particularly vulnerable to being hit and killed by ships, but we can save them," said Patrick Ramage, global whale director for the International Fund for Animal Welfare and one of the collaborators on Whale Alert. "Right whales need dramatic conservation progress to survive. This new iPad app gives these whales a fighting chance."

“The app also moves whale conservation into the 21st century,” said Brad Winney co-founder of EarthNC, the developer of the Whale Alert mobile application. “Whale Alert highlights the powerful role today's web and mobile based technologies can have in the preservation efforts of endangered species worldwide.”

Whale Alert has been developed by a collaboration of government agencies, academic institutions, non-profit conservation groups and private sector industries, led by scientists at NOAA's Stellwagen Bank National Marine Sanctuary. Collaborating organizations include the sanctuary, Bioacoustics Research Program at Cornell University, Center for Coastal and Ocean Mapping at the University of New Hampshire, EarthNC, Excelerate Energy, EOM Offshore, Gaia GPS, International Fund for Animal Welfare, Massachusetts Port Authority, NOAA Fisheries Service, National Park Service, Cape Cod National Seashore, NYK Lines (North America), United States Coast Guard and the Woods Hole Oceanographic Institution.

Whale Alert can be downloaded free of charge from the App store. More information on Whale Alert and the groups responsible for its development can be found at http://stellwagen.noaa.gov/protect/whalealert.html.

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On the Web:
Whale Alert: http://stellwagen.noaa.gov/protect/whalealert.html
Stellwagen Bank National Marine Sanctuary: http://stellwagen.noaa.gov
NOAA Office of National Marine Sanctuaries: http://sanctuaries.noaa.gov
NOAA: http://www.noaa.gov, Facebook, Twitter and other social media channels
Bioacoustics Research Program at the Cornell Lab or Ornithology: www.listenforwhales.org
EarthNC: http://earthnc.com
International Fund for Animal Welfare: http://www.ifaw.org
Massachusetts Port Authority: http://www.massport.com
Woods Hole Oceanographic Institution: http://www.whoi.edu

WHALE ALERT Backgrounder

What is the *Whale Alert* App?

Whale Alert provides the maritime community and others with up-to-date information concerning the National Oceanic and Atmospheric Administration's (NOAA's) right whale management initiatives and regulations. NOAA is the United States agency with responsibility for protecting and recovering endangered marine species, such as the North Atlantic right whale. The *Whale Alert* app uses Global Positioning System (GPS), Automatic Identification System (AIS) and World-Wide Web technology to alert mariners to right whale conservation measures (regulatory and voluntary) that are active in their immediate vicinity. By doing so, *Whale Alert* will provide notices to commercial shippers, who might otherwise inadvertently fail to recognize active right whale management areas. By understanding and complying with regulations, the shippers reduce the possibilities of legal penalties and maximize the conservation benefits of management measures designed to aid the survival of right whales. *Whale Alert* also uses a state-of-the-art near real-time passive acoustic right whale detection system to warn mariners of the presence of right whales in the Traffic Separation Scheme (shipping lanes) leading through NOAA's Stellwagen Bank National Marine Sanctuary and to and from Boston, Mass.

Why a *Whale Alert* app for right whales?

North Atlantic right whales, which live along North America's East Coast from Newfoundland to Florida, are one of the world's rarest large animals and are a species on the brink of extinction. So few exist -- about 350-550 -- that scientists have identified and named almost all of them. It is believed that right whales have a normal lifespan of 50 to 70 years. But collisions with ships have become a leading cause of premature right whale death. These whales are particularly vulnerable to getting struck by ships because they swim slowly, live in near-shore waters and spend extended periods of time near the surface where the risk of collision with ships is greatest. Given the fragility of the right whale population, the loss of even one whale reduces its chances of long-term survival. *Whale Alert* provides mariners and conservationists with an important tool for reducing the risk of collisions between whales and ships, and the impact of shipping related deaths to the survival of right whales.

What Does *Whale Alert* Provide?

Whale Alert provides a visual display of relevant right whale management initiatives shown on digital nautical charts via an iPad or iPhone. For a mariner, the app indicates:

- Current ship location - An icon depicting the ship's current GPS derived location is displayed on a digital chart;
- Automatic acoustic alerts - Acoustic detection buoys operating in portions of the Boston TSS (Traffic Separation Scheme, aka shipping lanes) through and around NOAA's Stellwagen Bank National Marine Sanctuary will appear on charts as green circles. These buoys use hydrophones, special software and satellite communication to identify right whale calls and automatically relay information to mariners. Yellow circles indicate that a right whale has been detected within the past 24 hrs and NOAA recommends a speed 10 knots or less through the area of the circle (see below for more information);
- Seasonal Management Areas (SMA) – SMAs are parts of the ocean where NOAA seasonally requires vessel 65 feet in length or greater to travel at speeds of less than or equal to 10 knots. SMAs along the eastern seaboard of the US will appear on charts as orange-colored displays. SMAs will only be displayed during the time period in which the SMA is active. If a boat enters an active SMA, a pop-up will appear stating that the ship should be traveling at a regulated speed of less than or equal to 10 knots;
- Mandatory Ship Reporting (MSR) – NOAA requires commercial ships of 300 gross tons and greater to report in when entering designated right whale reporting areas along the U.S. East Coast. When a ship enters a MSR area, a pop-up display will appear reminding the mariner to report to the US Coast Guard and providing information on reporting procedures;
- Areas to be Avoided (ATBA) – Voluntary seasonal Areas to be Avoided (ATBA) in key right whale habitats have been established for ships weighing 300 gross tons or more . ATBAs will appear on charts as red polygons. If a ship enters an ATBA, a pop-up will appear requesting that they not transit the ATBA.
- Recommended Routes (RR) - In key right whale areas that vessels cannot avoid, NOAA-identified RRs will be shown to guide vessels along the path with reduced risk of collision with right whales;
- Dynamic Management Areas (DMAs) – DMAs use sightings of multiple right whales to trigger temporary, voluntary 10 knot speed restrictions. DMAs will appear on charts in designated geographic areas during designated time periods (product in development);
- Right Whale Identification and Photo Gallery – A guide will offer tips on how to identify right whales from other species and provide photographs of right whales engaged in various activities (product in development).

What does the automatic acoustic alert portion of the system provide?

The automatic acoustic alert portion of the app provides near real-time warnings of the presence of North Atlantic right whales in Massachusetts Bay shipping lanes, allowing vessel operators to avoid collision by slowing down and heightening their visual awareness. The automatic acoustic alert portion of the app represents the first time this sophisticated and innovative technology has been used for large scale management and conservation endeavors.

How does the automatic acoustic alert system work?

Special sound-detecting buoys -- indicated in green on the *Whale Alert* screen -- detect right whale vocalizations within a five-mile radius. Once a buoy picks up a whale call, the signal is passed via satellite to Cornell University's Bioacoustics Research Program, where a technician confirms whether it is indeed a right whale. If confirmed, Cornell triggers a message via the Automatic Identification System (AIS), which is aVHF signal managed by the US Coast Guard (USCG) and transmitted through a collaboration between the USCG and NOAA. The transmitted AIS message is decoded by the *Whale Alert* app, allowing the *Whale Alert* buoy icon to turn yellow on the map. The *Whale Alert* app automatically renders the color-coded buoys in the proper geo-location over NOAA raster charts (utilizing EarthNC's "seamless" national raster chart set). Vessel operators using the *Whale Alert* app offshore can then slow down and post a lookout to avoid collision. If twenty-four hours passes without an additional confirmed detection, the buoy icon returns to green.

Where can more information on *Whale Alert* functions be found?

NOAA is the United States agency with responsibility for protecting and recovering endangered marine species, such as the North Atlantic right whale. Administrative authority is provided by the Endangered Species Act http://www.nmfs.noaa.gov/pr/species/esa/, http://www.nmfs.noaa.gov/pr/recovery/ and the Marine Mammal Protection Act http://www.nmfs.noaa.gov/pr/laws/mmpa/.

Acoustic Detection Buoys – *Whale Alert* also uses a state-of-the-art near real-time passive acoustic right whale detection system to warn mariners of the presence of right whales in the Traffic Separation Scheme (shipping lanes) leading through NOAA's Stellwagen Bank National Marine Sanctuary and to and from Boston Harbor. For more information see: http://www.listenforwhales.org and http://www.whoi.edu/oceanus/viewArticle.do?id=57146.

Seasonal Management Areas – Seasonal Management Areas are parts of the ocean where NOAA requires vessel equal or greater than 65 feet in length to travel at speeds of less than or equal to 10 knots at particular times of the year. For more information see: http://www.nero.noaa.gov/shipstrike/doc/compliance_guide.pdf

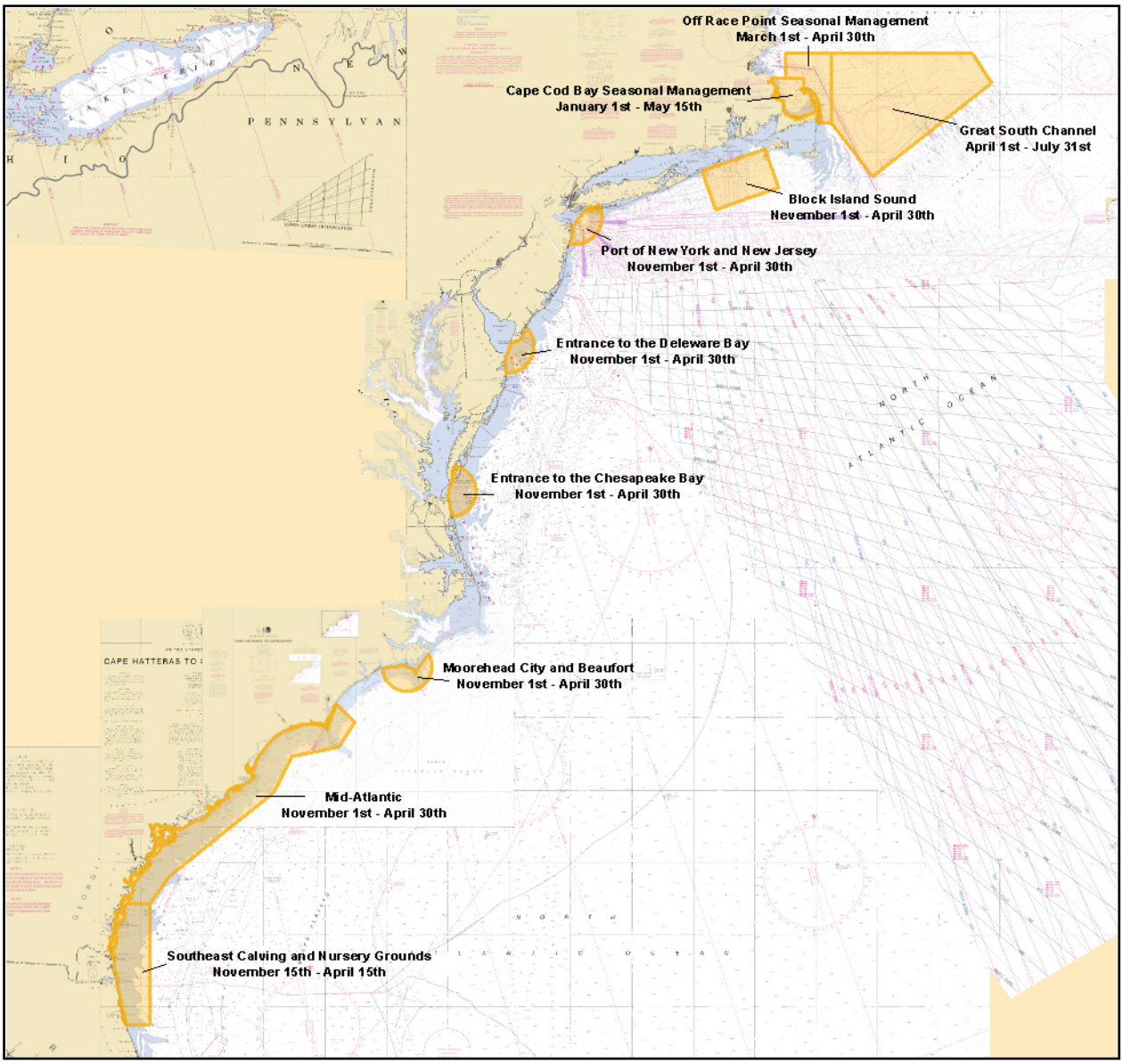
Mandatory Ship Reporting – Commercial ships of 300 gross tons and greater **must report** in when entering designated right whale reporting areas along the U.S. East Coast. For more information see: http://www.nmfs.noaa.gov/pr/pdfs/shipstrike/msr_placard.pdf.

Penalties – To date, NOAA has issued penalty assessments ranging from $11,500 to $92,000 to ships violating speed restrictions in designated Seasonal Management Areas. For more information see: http://www.noaanews.noaa.gov/stories2012/20120110_rightwhalepenalties.html and http://www.noaanews.noaa.gov/stories2010/20101116_rightwhale.html)

Voluntary seasonal Areas to be Avoided (ATBA) – ATBAs have been established for ships weighing 300 gross tons or more in the Great South Channel of the US. For more information see: http://www.nmfs.noaa.gov/pr/pdfs/shipstrike/atba_chart.pdf and Roseway Basin, Canada http://www.rightwhale.ca/rosewayatba_e.php.

Voluntary Dynamic Management Areas (DMA) – Mariners are requested to route around DMAs or transit through them at 10 knots or less. For more information see: http://www.nmfs.noaa.gov/pr/shipstrike/.

Where are the right whale Seasonal Management Areas (SMAs)?



What have been the roles of the partner organizations?

- Bioacoustics Research Program, Cornell Laboratory of Ornithology, Cornell University:
  Development and operation of acoustic detection system for right whales
- Center for Coastal and Ocean Mapping, University of New Hampshire:
  Development of AIS transmission capability for alert messaging
- EarthNC:
  Development of application for iPhone and iPad
- EOM Offshore:
  Maintenance of real-time buoys
- Excellerate Energy:
  Funding of acoustic detection system
- Gaia GPS:
  Development of application for iPhone and iPad
- International Fund for Animal Welfare:
  Project funding, research and liaison with maritime and environmental communities
- Massachusetts Port Authority:
  Liaison with maritime community
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service:
  Development and implementation of right whale conservation measures
  Project funding
- National Oceanic and Atmospheric Administration, Stellwagen Bank National Marine Sanctuary:
  Project initiation, management and coordination
  Development of AIS messaging capability
  Operation of AIS messaging site
  Project funding
- National Park Service, Cape Cod National Seashore:
  Host location for AIS transmission site
- NYK Lines (North America):
  Field testing of app
- United States Coast Guard:
  Development of AIS program in the US
  Research and development of AIS messaging capability
  Operation of AIS messaging site
- Woods Hole Oceanographic Institution:
  Development of buoy system for acoustic detection system