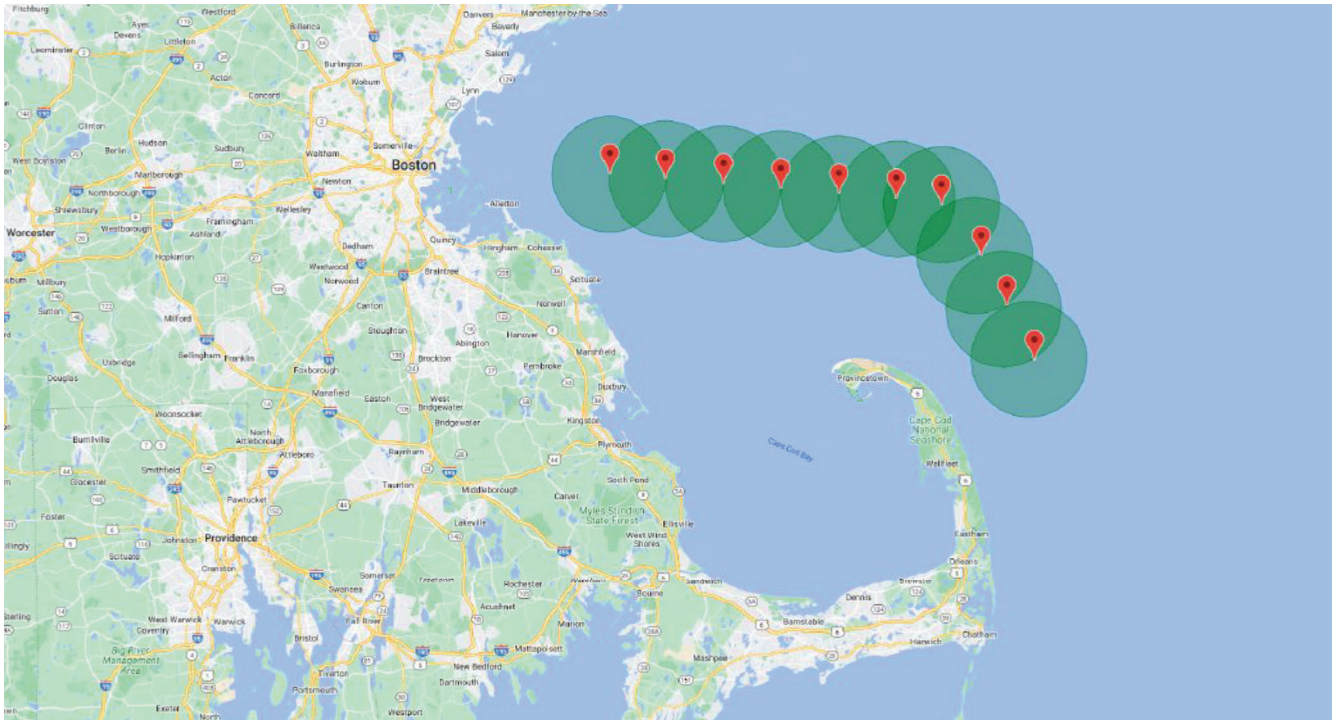


Screenshot from Cornell University's CCB website (https://portal.nrwbuoys.org/ab/dash/1) indicating whale presence at all ten AB PAM systems in Massachusetts Bay on 6 April 2022.

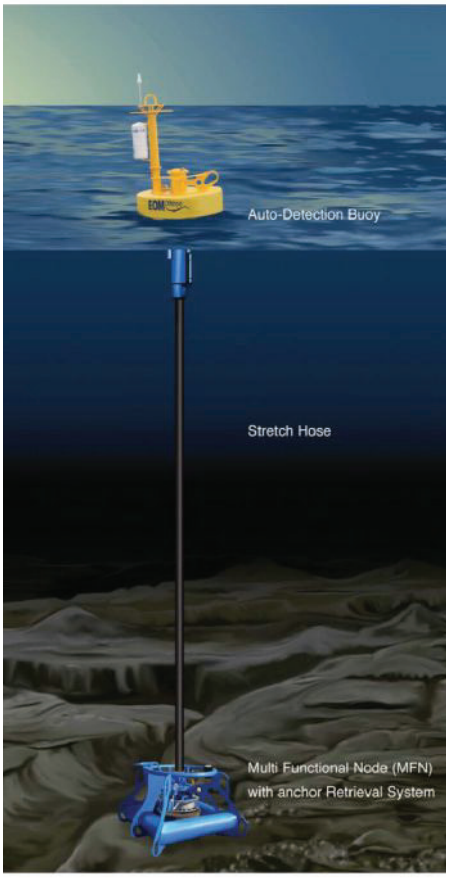
...the North Atlantic right whale (NARW), common to the waters of the U.S. eastern seaboard, is currently in endangered status with a population of fewer than 400 individuals.

Near Real-time and Archival Passive Acoustic Monitoring

By David G. Aubrey, Ph.D., EOM Offshore LLC

Recent increased concern about marine mammals in the offshore waters of the United States and elsewhere has focused attention on the excessive and unsustainable mortalities of these animals. In particular, the North Atlantic right whale (NARW), common to the waters of the U.S. eastern seaboard, is currently in endangered status with a population of fewer than 400 individuals. In response to these concerns, EOM Offshore has teamed with various partners to monitor marine mammal presence in nearshore waters along the U.S. east coast and elsewhere.

The longest continuous ongoing measurement of NARW presence is probably the Northeast Gateway Energy Bridge project (NEG), with continuous observation from April 2008 to present. EOM Offshore has been involved in this project since EOM formed in 2009 in Pocasset, MA. Working closely with Cornell University's Center for Conservation Bioacoustics -- CCB (formerly the Bioacoustic Research Program) and the Woods Hole Oceanographic Institution (WHOI), EOM Offshore has been responsible for the deployment, recovery and maintenance of an array of ten passive acoustic monitoring buoys (AB or auto-detection buoys) in Massachusetts Bay east of Boston Harbor. This near real-time array within the Traffic Separation Scheme (TSS) between the Boston Shipping Lanes provides six-hourly updates on the detection of North Atlantic right whales in the vicinity of Stellwagen Bank. The system is used for operational guidance to the Northeast Gateway Energy Bridge, a fully permitted, operational LNG terminal that, with long-term planning, can be utilized each year to help New England meet peak winter demand without having to expand infrastructure. Twice a year, EOM Offshore retrieves the ten operational buoys, and replaces them with ten refurbished buoys, that will stand guard for the following six months.



| PAM II Concept

Focused on the North Atlantic right whale, each buoy reports routinely and provides in near real-time the presence, if any, of NARW near each buoy. Presence of NARW near a buoy within the previous 24-hour period will trigger voluntary speed reductions around sensitive areas, employ emissions-reduction systems and drastically reduce seawater intake and discharge. The frequency of reporting for these buoys depends on whether LNG tankers are present or not. Reports are issued on a six-hourly basis when tankers are absent.

Identified whales are reported to a public web site operated by CCB and available for general viewing (https://portal.nrwbuoys.org/ab/dash/1). This web site depicts the ten PAM monitoring buoys that form the NEG array. The circles depict the approximate detection limit for NARW from each buoy. The color on the marker at each buoy indicates presence or absence of NARW detections within the previous 24 hours: RED indicates presence, and GREEN indicates absence of detections within that period. The example shows presence at all ten buoys in this time period, which is typically an active one in Massachusetts Bay.

Focused on the North Atlantic right whale, each buoy reports routinely and provides in near real-time the presence, if any, of NARW near each buoy.

In addition to the NEG project, EOM Offshore has been involved in other near real-time monitoring projects for marine mammals in the northeast U.S. region and elsewhere, and has teamed with JASCO to provide both near real-time and archival measurements of marine mammals in the world.

A significant ongoing and potential client for this unique monitoring capability is the offshore wind industry, which is increasing its presence throughout U.S. coastal waters. Because of their construction activities and long-term operational footprints in waters critical to the survival of marine mammals, the offshore wind industry is commonly mandated to provide ongoing construction and operational monitoring of marine mammals. EOM's participation in marine mammal monitoring for offshore wind developments to date has largely been through its subsidiary, Ocean Tech Services, with facilities both in Massachusetts and New Jersey, and has primarily been collecting data for archival purposes, as opposed to real-time.

In anticipation of the increased demand for marine mammal monitoring, EOM Offshore is continually updating our approach to making these demanding measurements, through updated design, improved operations, and teaming with experts in marine mammal detection, classification, and localization to better serve the offshore wind industry and other sectors such as governmental entities.