Documenting Whale Migration off Virginia's Coast

Virginia CZM Cooperative Agreement
with the
Virginia Aquarium

October 2012 through March 2014

Virginia Coastal Zone
MANAGEMENT PROGRAM

VIRGINIA
AQUARIUM
& MARINE SCIENCE CENTER

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

PROJECT DESCRIPTION

This project is collecting aerial survey data on the location of large whales off the coast of Virginia in an approximately 10,000 km2 area, the center of which is the Virginia Wind Energy Area. A GIS data layer will be created and uploaded to the MARCO Mapping and Planning Portal in order to facilitate creation of an ecosystem-based marine spatial plan for Virginia that minimizes human use impacts to key biological resources and habitats. This data is critical to Virginia's Ocean Resources Section 309 strategy with its planned outcome of a Virginia Marine Spatial Plan that can be incorporated into a Mid-Atlantic Regional Ocean Plan.

Goals, objectives, outcomes: The goal of this project is to collect important data on the presence, density and seasonality of endangered large whale species, especially critically endangered North Atlantic right whales (Eubalaena glacialis), in the vicinity of the Virginia Wind Energy Area (WEA) designated by the Department of the Interior's Bureau of Ocean Energy Management (BOEM). The outcome of being able to provide this data will ultimately be a Virginia (and Mid-Atlantic) marine spatial plan that minimizes direct and cumulative impacts to large whales.

The Mid-Atlantic serves as an important migratory corridor for right, humpback (Megaptera novaeangliae) and fin (Balaenoptera physalus) whales in nearshore waters. Offshore waters

may be important to sei (Balaenoptera borealis) and minke (Balaenoptera acutorostrata) whales as well. BOEMRE has moved forward with an Environmental Assessment and will eventually need to develop a final EA or Environmental Impact Statement (EIS) along with a National Environmental Policy Act (NEPA) analysis for offshore wind construction and operations in this area. Comments sent to BOEMRE to date on the draft EA mention the lack of scientific data on whale migration corridors.

There are serious gaps in environmental data needed to effectively complete these important analyses. Current inter-agency efforts to collect these data are on-going (primarily by NOAA Fisheries (NMFS) for large whales), but survey effort is insufficient to provide the level of detail needed to develop seasonal density estimates. Furthermore, state endangered species managers and ocean planners need to be able to assess the potential impacts of offshore development of the WEA, including the impacts of changes in other human uses of the area such as shipping and fishing activities, both of which are known to impact large whale species. This data is critical to the development of a sound marine spatial plan that addresses the nation's new national ocean policy.

This project is innovative in its multi-partner approach. No longer is whale data being viewed as the sole responsibility of the National Marine Fisheries Service at NOAA – it is now a priority for Virginia state government including its CZM Program, the Virginia and Mid-Atlantic offshore wind industry, the Port Authority of Hampton Roads, the Mid-Atlantic Regional Council on the Ocean (MARCO), the Navy, the Bureau of Ocean Energy Management (BOEM) and the Department of Energy. Never before have so many entities joined together to create an

ecosystem-based marine spatial plan and never before have they been in such agreement on the need for a particular type of data to be collected. Whale migration data is the #1 top priority data gap (of 16 data gaps identified) needing to be filled according to MARCO's Coastal and Marine Spatial Planning Action Team, which includes most of the aforementioned entities.

Project activities: For this project, the Virginia Aquarium & Marine Science Center Foundation (VAQF) proposes to conduct aerial surveys for a period of 6 months (November 2012 – April 2013) in an approximately 10,000 km2 area, the center of which is the Virginia WEA. Aerial surveys will be conducted using methodology currently employed for aerial surveys of naval training areas along the mid-and south- Atlantic U.S. coast by a survey team from the University of North Carolina Wilmington (UNCW). Survey data would be made available to Virginia, the Mid-Atlantic Regional Council on the Ocean, the Mid-Atlantic Regional Planning Body, adjacent states, the U.S. Navy, NOAA/NMFS/NOS/OCRM, BOEM and other federal agencies.

Aerial survey methodology: One team operationally based out of University of North Carolina Wilmington (UNCW) will work with VAQF to carry out the aerial surveys for the duration of the survey effort. UNCW has been conducting offshore aerial surveys for over fifteen years and will follow methodologies currently being used for surveys carried out for the US Navy. UNCW holds NOAA Scientific Permit No. 948-1692-00, which authorizes surveys for endangered species and other cetaceans encountered in the western North Atlantic (expiration date 5/21/2012) and has a 5 year re-application currently in review with NOAA.

Aerial Surveys will be carried out in over-wing, twin-engine aircraft, Cessna 337 airplanes, which are maintained under provisions of 14 Code of Federal Regulations (CFR) Part 135 provided by Orion Aviation. Each plane will be equipped with electronic positioning equipment and safety

gear required for carrying out aerial surveys. Two pilots will be used for each flight. Both pilots meet requirements as specified in 14 CFR Part 135; the pilot-in-command and crew will meet or exceed all NOAA offshore flight safety requirements.

The survey team will include two observers and a coordinator. Surveys will be flown at 1,000 feet altitude at operational airspeeds of 100 mph. Surveys will be flown only in safe operating conditions according to NOAA Aircraft Operations Center (AOC) standards and under visual flight regulations (VFR) flight conditions. Two observers, positioned on each side of the aircraft, will carry out surveys. The plane will be equipped with a Global Navigation System (GPS) to permit precise track-line fidelity. Each observer will use an independent GPS to record precise time and geographic position of all marine mammal and sea turtles sightings. When a sighting occurs, the initial location on the track-line will be recorded and the plane will break from the track-line. Over the actual sighting, the location, species identification and group size will be collected. Observers will also record all large vessel locations. It is expected that survey track-lines, oriented perpendicular to shore, will begin at 36.50o N, and run at 5 nm intervals to 37.50oN, off the Eastern Shore of Virginia (Figure 1). Each track-line will begin at the beach and run to 30-50 nm offshore. All data collected will be uploaded to OBIS SEAMAP and the MARCO Mapping and Planning Portal at the end of the data collection period.

Potential for Budget Optimization: Due to the costs associated with aerial survey efforts, this proposal is limited in its scope and duration. Unfortunately, aerial surveys conducted safely (in accordance with NOAA offshore survey regulations) and in isolation (without other projects to support observers and platforms) are extremely expensive. They are, however, the best means of collecting the data needed to assess large whale presence in mid-Atlantic waters. In addition, funding limitations of this proposal will preclude the opportunity to incorporate directed vessel-based surveys into the project to collect data (whale photo-ID, stock ID biopsy samples, prey availability, oceanographic parameters) unavailable from aerial platforms. Both VAQF and UNCW are actively seeking additional funds to provide further surveys in the region and, should other funding become available, we intend to cost share as much as possible to increase aerial survey effort (additional months and/or additional days per month) and possibly initiate directed vessel-based surveys. This proposal affords an excellent opportunity to align multiple state and federal agency priorities in order to accomplish optimal siting for offshore wind as well as other human uses of state and federal waters off the coast of Virginia.

Likelihood of success: Although we do not expect one season of surveys to provide all the information needed to assess marine mammal movements off Virginia, large whale presence has been identified as one of the most significant data gaps for the region by federal agencies and the #1 data gap by the Mid-Atlantic Regional Council on the Ocean (MARCO). We believe that marine mammal data collected in a manner consistent with current survey methodologies

Figure 1: Large whale survey area (black box) with VA wind energy area (WEA) at the center.

will contribute to baseline data essential for meaningful marine spatial planning efforts in support of offshore wind energy development and in line with MARCO's habitat protection goal. Collaborating with UNC Wilmington and the Navy and complementing those efforts underway with this funding greatly enhances the likelihood of success.

Project evaluation components and activities to communicate project outcomes: This project can be evaluated based on the quality of data collected and its incorporation into a GIS data layer. Because the project will be conducted by experts in the field using tried and true survey techniques, evaluation should be simple and positive. The outcomes of the project will be best disseminated through existing GIS portals such as the MARCO Mapping and Planning portal which has a special data category for "state data" as opposed to region-wide data. Although region-wide data is desired, $200,000 is not enough to cover the entire region, nor is $400,000 – the upper limit for regional projects. It is vital to at least begin collecting this data and hopefully over time it can be collected for the entire region.

PROGRESS REPORT (October 2012 through March 2013)

During this reporting period, we identified and trained aerial observers, purchased supplies and conducted both aerial and vessel-based surveys. The aerial observers flew five days in three months completing 30 track lines. Due to weather and plane maintenance, observers did not fly in Dec. or Jan. and flew one day in February. The PI, granting agency and aerial survey contractor are currently discussing when to fly the days that were missed this winter. Aerial surveys resulted in 22 sightings of 216 (estimated) individual animals. Sightings included five cetacean species: bottlenose dolphin (Tursiops truncatus), common dolphin (Delphinus delphis), fin whale (Baleanoptera physalus), humpback whale (Megaptera novaeangliea) and minke whale (Baleanoptera acutorostrata). Common dolphins were the most commonly sighted species with 11 sightings of an estimated 173 individuals. Most of the large whale sightings were east of the Wind Energy Area (WEA).

In addition to the flights, the Virginia Aquarium conducted four vessel surveys, three in January and one in March. Humpback and/or fin whales were sighted on three of the four surveys. Aquarium observers sighted and approached 23 humpback whales in groups of one or two, seven fin whales in groups of one, two and three and one large group of approximately 100 bottlenose dolphins. Observers collected images of all of the whales and collected biopsy samples from one fin and six humpback whales. Images are still being processed and compared with images taken from the whale watch vessels, but at least 34 different humpbacks have been sighted thus far this year. Ten of those are known animals from the Gulf of Maine feeding stock, several of breeding age.

On Jan 9th, a humpback whale was sighted entangled in gear that appeared to be pot gear. The whale was free swimming, not anchored and appeared to be in fairly good body condition. The entanglement involved the peduncle and flukes and may have involved the flipper and/or mouth. The first sighting was too late in the day to attempt disentanglement, so we documented the interaction and prepared to respond if the whale was re-sighted. The whale was re-sighted twice by the whale watch vessel, but we were unable to respond for disentanglement either time. The gear moved significantly between sightings and the whale was not sighted again after late-January. We are hoping that the gear was shed from the animal, but have not seen it without gear.

On Jan 11th, the boat crew documented two pairs of whales bubble net feeding. This may be the first documented bubble net feeding in the mid-Atlantic in winter months and Aquarium research staff are preparing a note on the observation for publication.

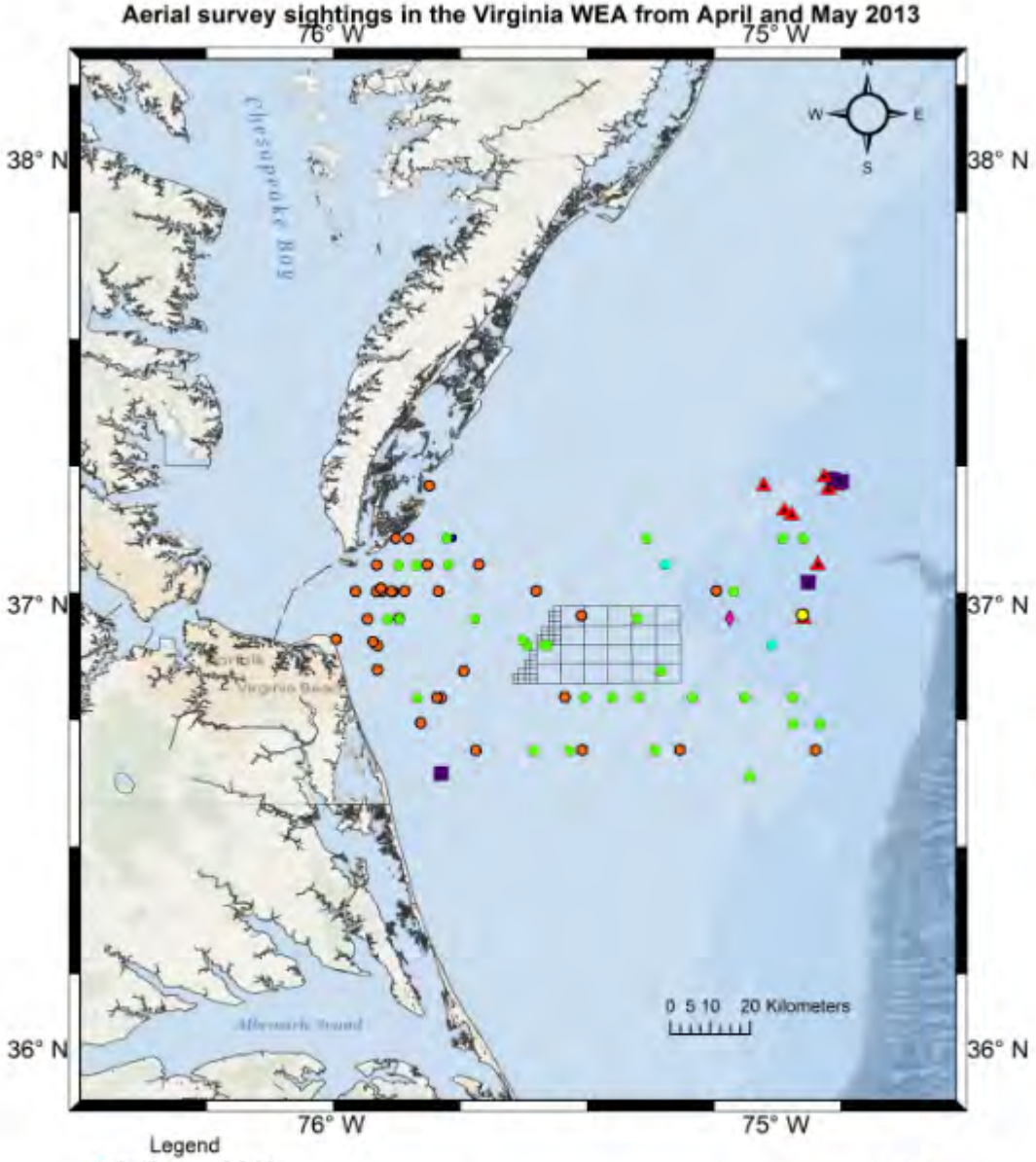
PROGRESS REPORT (April 2013 through September 2013)

During this reporting period, aerial observers flew four days in two months completing 24 track lines in April and May. Aerial surveys resulted in 33 sightings of an estimated 88 individual animals in April and 76 sightings of an estimated 195 individual animals in May (see attached map). Sightings included four cetacean species: bottlenose dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), fin whale (*Baleanoptera physalus*) and humpback whale (*Megaptera novaeangliea*). VAMSCF also sighted two species of sea turtle, loggerhead (*Caretta caretta*) and leatherback (*Dermochyles coriacea*). Bottlenose dolphins were the most commonly sighted cetacean species with 45 sightings of an estimated 196 individuals, and loggerheads were the most commonly sighted sea turtle with 49 sightings of an estimated 58 individuals.

VAMSCF only sighted large whales in April with eight sightings of 12 fin whales and four sightings of five humpbacks. Observers also sighted a dead floating humpback whale in April. Most of the whales, common dolphins and leatherbacks were sighted north and/or east of the WEA while most of the bottlenose dolphins were sighted to the west of the WEA. Loggerheads were sighted throughout the survey area. Both bottlenose dolphins and loggerhead sea turtles were sighted within the WEA.

Since VAMSCF did not see any large whales in May, VAMSCF postponed the surveys until the fall and requested an extension through March 2014.

Aerial survey sightings in the Virginia WEA from April and May 2013



Legend
- bottlenose dolphin
- common dolphin
- dead humpback
- fin whale
- humpback
- leatherback
- loggerhead
- unidentified cetacean

Map created with data collected by the
Virginia Aquarium & Marine Science Center
17 October 2013
Projection WGS 1984

VIRGINIA AQUARIUM FOUNDATION