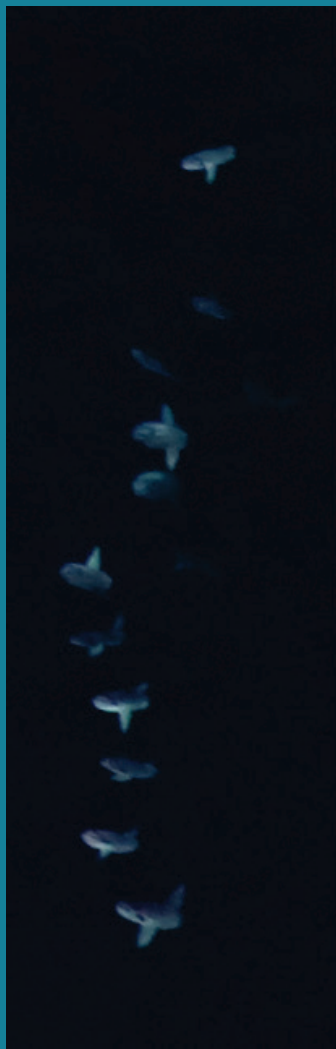


# Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy

Summary of Fall 2016 Digital Survey #2



**NYSERDA**



# Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy

## Summary of Fall 2016 Digital Survey #2

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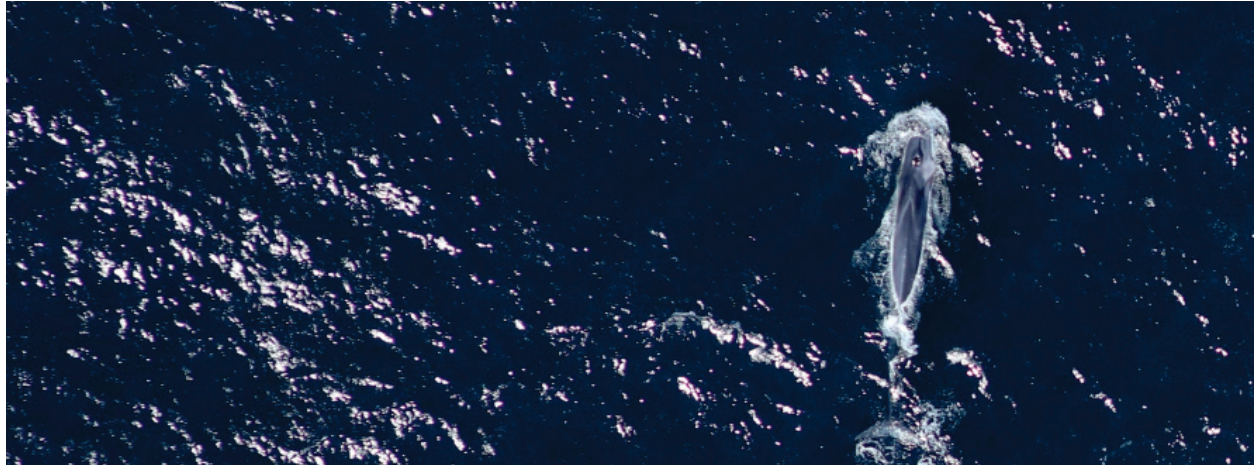


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## Overview

The first fall survey for the NYSERDA Offshore planning area (OPA) and Wind energy area (WEA) was started on the 5<sup>th</sup> of November, 2016. These surveys are designed to characterize the usage of the area by marine fauna to aid in the planning for offshore wind. The survey was undertaken by two APEM camera technicians using the Shearwater 3 camera system, with an image resolution of 1.5cm. The same Piper Aztec twin engine aircraft was used at the planned flight height of 1,360 ft. The survey team was based out of MacArthur Airport in Long Island, NY for the duration of the survey.

## Methods

### Transect Orientation

Following the experience of the first survey, APEM amended the flight plans to replicate survey one as presented in the Fall 2016 Flight plan (confidential document to NYSERDA) in which the nearshore area is surveyed along transects parallel to the shoreline and the offshore area is surveyed along transects perpendicular to the shoreline (Figures 1 and 2). Because there are a number of local airfields on Long Island, FAA imposes varying altitude restrictions that survey aircraft must obey. These are designated according to distance from the airfield. Flights parallel to the shoreline within the restricted zone ensure that the survey aircraft can maintain constant altitude over a complete transect, thus ensuring consistency in image resolution and areal coverage along transect.

FAA controlled altitude restrictions cease to be an issue several miles offshore. At this point transects were orientated perpendicular to the shoreline and consequently to the bathymetry, providing optimal orientation for expected clines in the distribution of target species (Figure 3).

The WEA was surveyed using the grid pattern depicted in Figure 4.

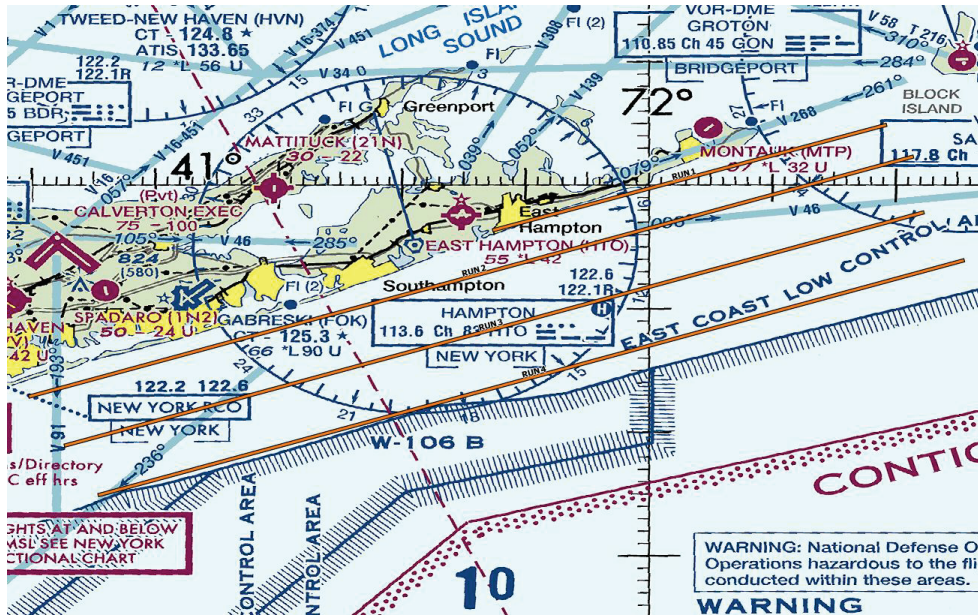


Figure 1. Flight plan used for the nearshore east area.

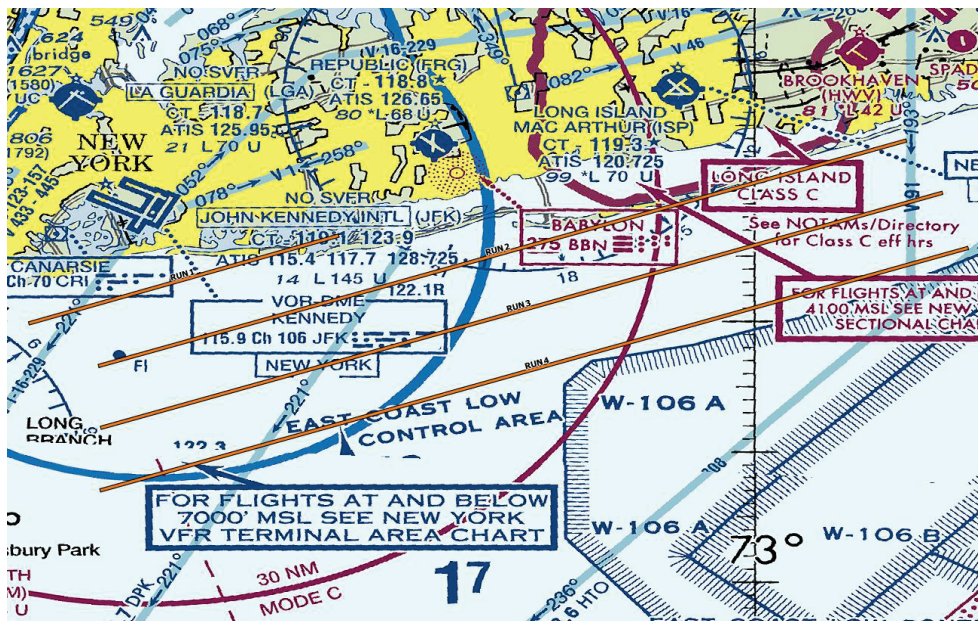


Figure 2. Flight plan used for the nearshore west area.

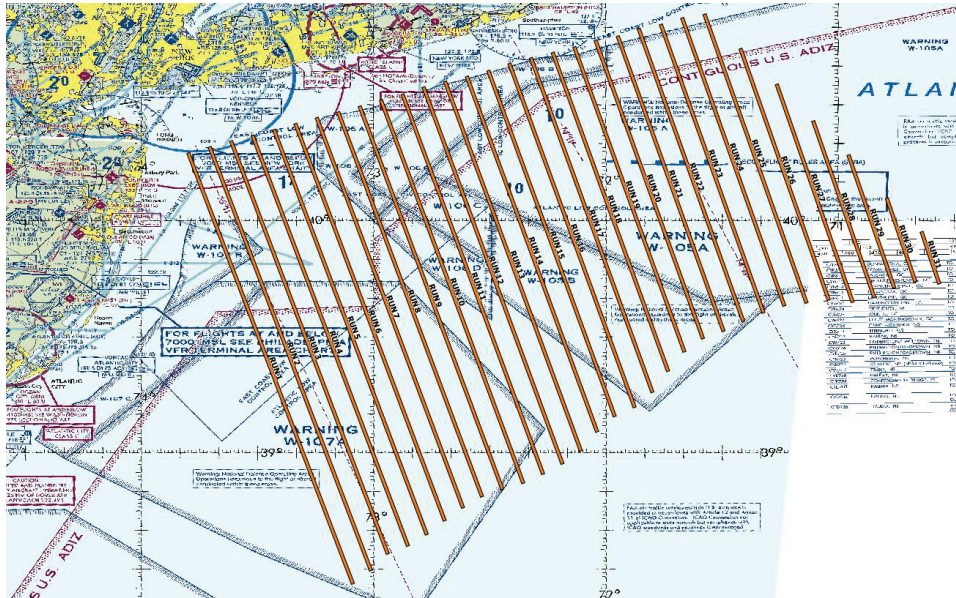


Figure 3. Flight plan used for the OPA offshore.



Figure 4. Flight plan used for the WEA.

## Daily Schedule

The survey was undertaken by one APEM camera technician and pilot each day. Due to the shortening daylight the crew was only able to survey 4-5 hours on task a day. The survey crew generally began surveying around 7 AM. Depending on the weather, the crew would either plan to conduct two short missions or one long mission. Following each daily survey, sample imagery was evaluated to make sure it was of good quality for analysis. If data were deemed not high enough quality, the lines affected were re-flown. Data were backed up daily and prepared to be shipped for analysis.

## Flight Altitude and GSD Resolution

The flight crew was able to gain permission to enter the controlled airspace close to the coast at the proposed flight altitude and therefore the whole survey was completed at a flight altitude of 1,360ft and resolution of 1.5cm GSD. The weather was generally mixed throughout the survey period.

## Timing

The following details the lines completed on each day where surveying took place

Date (2016)	Action
November 5	5 lines of the OPA were flown
November 6	7 lines of the OPA were flown
November 10	4 lines of the nearshore West area, 2 of Montauk Bay and 4 lines of the nearshore East area were flown
November 12	19 lines of the WEA were flown
November 13	9 lines of the WEA were flown
November 16	4 lines of the OPA were flown
November 17	4 lines of the OPA were flown
November 18	2 lines of the OPA were flown
November 23	5 lines of the OPA were flown
November 27	4 lines of the OPA were flown and completed the survey

Other dates not listed above were non-survey days due to weather or aircraft maintenance.

## Results

There were approximately 500,000 images collected during the survey covering both the OPA and WEA areas, from which sufficient images will be extracted to achieve over 7% image capture coverage for the OPA and 20% for the WEA. Details on the footprint size and capture point of each image, along with the final coverage will be provided once data have been fully processed.