OCEAN CLASSROOM

Oceans of Research

Lesson 2: Marine Mammal Science Party

STUDENT GUIDE

THE
UNIVERSITY
OF RHODE ISLAND
GRADUATE SCHOOL
OF OCEANOGRAPHY

Instructions

Part 1: Survey

Make sure your party has copies of the marine mammal background sheet, the marine mammal data sheet, maps of the study area, and a computer.

1. Read your background sheet listing the most common species of whales, dolphins and porpoises found off the southern coast of Rhode Island and Massachusetts, along with the most recent estimated population of the West Atlantic Stock of each species.
2. For the purposes of this study, you will be focusing on one species in particular: the North Atlantic Right Whale. Your science party will be looking at a set of marine mammal survey data collected during the R/V Endeavor research cruise on April 7, 2018, and by the North Atlantic Right Whale Consortium (NARWC) between March 18 and April 20, 2018.
3. Locate your zoomed in map of the study area. Use the map key to identify the Endeavor and NARWC sighting locations. The map also shows where the CTD and Plankton Tow data were collected.
4. Take a look at your data. This is a simplified view of marine mammal survey data. It has the species name, the latitude and longitude the animal was spotted at, and how many individuals were present.
5. Discuss the following questions with your party:
    a. How does the population of North Atlantic Right Whales compare to the other marine mammal population? How does it compare to other whale populations?
    b. How many of the survey observations noted more than one whale at a time? Why do you think that is?
    c. Notice the location of the stations where CTD and plankton tow data were collected. Were any of the marine mammal observations located near these sampling stations?
    d. Why do you think the “presence/absence” data is important?
    e. What are some other observations the science team made besides presence/absence? Why do you think this information is important? What could it be used for?
    f. What other data might be important for scientists to collect during a marine mammal survey?

Instructions *(Continued)*

Part 2: Online Research

1. North Atlantic Right Whale Observations on WhaleMap: This is an interactive map showing the locations of right whales over the past two weeks based on visual or acoustic observations. Spend a few minutes exploring the map before answering the questions below.
   - **a.** Go to: https://whalemap.ocean.dal.ca/
   - **b.** Scroll down and read through the Map Key below the map, then go back to the map.
   - **c.** Zoom in on the area where most right whales are located (gray and red dots). Click on some of the dots and note the information presented. How many of the whales are adults with calves?
   - **d.** Where are most of the whales located? Based on the season, why do you think they are there?
2. Use this website to answer the following questions about the North Atlantic Right Whale (NARW): https://www.fisheries.noaa.gov/species-directory/marine-mammals
   - **a.** What is the size range for NARWs, from calf to adult?
   - **b.** What is the normal lifespan of a NARW?
   - **c.** What do NARW eat and how?
   - **d.** What are some of the threats to NARW?
   - **e.** Where are the two Critical Habitat Areas for NARW located and why are they designated as such?
3. Be prepared to give a brief overview to your classmates about what your science party did and found with your data. You should talk about:
   - **a.** What your data set was
   - **b.** What your analysis task was
   - **c.** What the results are
   - **d.** Discuss any hypotheses you have or any questions
   - **e.** Why you think it's important to collect this type of data

Background

How are marine mammal surveys conducted?

Typically the observer only scans from 5-10 degrees off the cruise heading to perpendicular to the ship on one side. Usually you would have two observers on Big Eyes, and another in the middle with the naked eye or binoculars. The two observers using the Big Eyes scan ahead and to opposite sides of the ship covering ~100 degrees with overlap in front. If the study is focused on a particular species, then when that species is sighted, the ship may break from the track line and at that point the observers would look wherever just to keep track of the animal.

What kinds of data are collected on a survey?

"Presence/absence" data. This is documenting where the animals are located at any given time, and where they are not. Other things that can be documented include variables like number of individuals, species or behavior (for example: feeding).

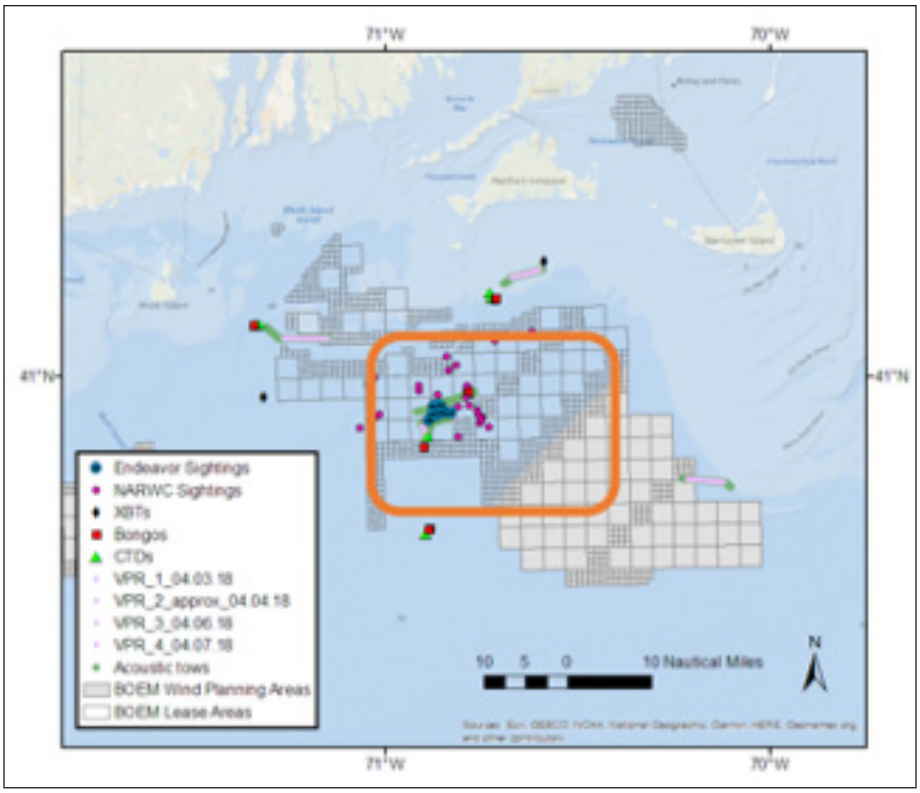
What species are off the coast of southern New England?

According to NOAA Fisheries there are about 35 species of whales, porpoises/dolphins, and seals/sea lions in the New England/Mid-Atlantic region. Of these, about 15 species may be found in the waters off the coast of Rhode Island and Massachusetts (southern New England):

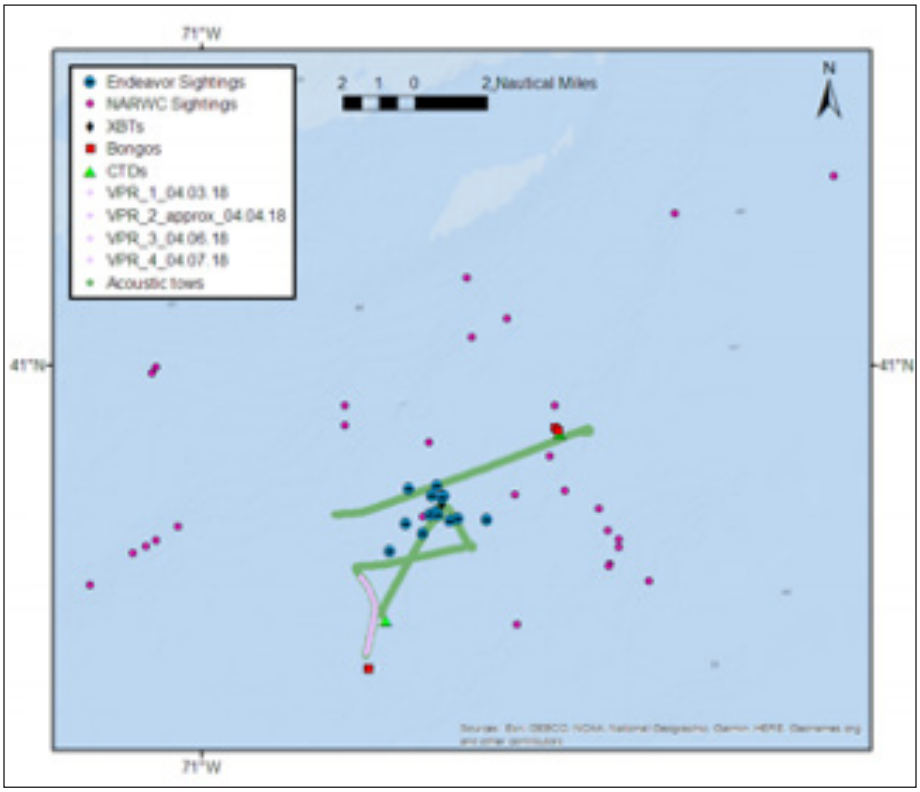
Animal	Recent Estimated Population (Western North Atlantic Stocks only)
ATLANTIC WHITE-SIDED DOLPHIN, *Lagenorhynchus acutus*	93,233
BLUE WHALE, *Balaenoptera musculus*	402
BOTTLE NOSE DOLPHIN, *Tursiops truncatus*	(Offshore stock) 62,851
FIN WHALE, *Balaenoptera physalus*	7,418
GRAY SEAL, *Halichoerus grypus atlantica*	27,131
HARBOR PORPOISE, *Phocoena phocoena*	95,543
HUMPBACK WHALE, *Megaptera novaeangliae*	1,396
LONG-FINNED PILOT WHALE, *Globicephala melas*	39,215
MINKE WHALE, *Balaenoptera acutorostrata*	24,202
NORTH ATLANTIC RIGHT WHALE, *Eubalaena glacialis*	336
SEI WHALE, *Balaenoptera borealis*	6,292
SHORT-BEAKED COMMON DOLPHIN, *Delphinus delphis*	70,184
SHORT-FINNED PILOT WHALE, *Globicephala macrorhynchus*	28,924
SPERM WHALE, *Physeter catodon*	4,349
WHITE-BEAKED DOLPHIN, *Lagenorhynchus albirostris*	536,016

Maps

General Study Area



Zoomed-in Map of Focus Area
(Area within orange rectangle on general study area map)



Data

R/V *Endeavor* Observations

Data collected on April 7, 2018 by URI researchers and students on the R/V *Endeavor.* **Note:** These are two right whales that were resighted multiple times, not 11 individual whales.

Date	Sighting	Latitude	Longitude	Species	CueTyp	Behavior
4/7/2018	1	40.8378483	-70.88829407	Gray seal	body	swimming
4/7/2018	2	40.8897183	-70.88621908	Right whale	blow	diving
4/7/2018	3	40.9252366	-70.86701577	Right whale	blow	swimming
4/7/2018	3	40.9274099	-70.86523243	Right whale	blow	swimming
4/7/2018	4	40.9269699	-70.86340077	Right whale	blow	fluking
4/7/2018	5	40.9252866	-70.86006411	Right whale	body	swimming
4/7/2018	5	40.9252866	-70.86006411	Right whale	blow	fluking
4/7/2018	6	40.9260066	-70.85639244	Right whale	body	swimming
4/7/2018	6	40.9260066	-70.85639244	Right whale	body	swimming
4/7/2018	7	40.9306599	-70.84873745	Right whale	body	swimming
4/7/2018	8	40.9240799	-70.84399246	Right whale	body	swimming
4/7/2018	9	40.9148632	-70.84542246	Right whale	blow	swimming
4/7/2018	9	40.9148632	-70.84542246	Right whale	blow	swimming
4/7/2018	9	40.9148632	-70.84542246	Right whale	blow	swimming
4/7/2018	10	40.9121333	-70.86228077	Right whale	blow	swimming
4/7/2018	10	40.9121333	-70.86228077	Right whale	blow	swimming
4/7/2018	11	40.9089283	-70.88121408	Right whale	body	swimming
4/7/2018	12	40.9030883	-70.90490572	Right whale	blow	swimming

Data *(Continued)*

North Atlantic Right Whale Consortium (NARWC) Observations:

Data obtained from online map spanning 3/18/18-4/20/18.
(Endeavor sightings are included, highlighted in yellow.)

Date	Group Size	Latitude	Longitude	Reliability	ID	Mom & Calf	Source	Source2
18/March/2018	4	40.9578	-70.7900	Probable	30461	No	RWSAS	NK
18/March/2018	2	41.0695	-70.7143	Probable	30462	No	RWSAS	NK
23/March/2018	1	40.8800	-70.8100	Definite	30538	No	RWSAS	NK
23/March/2018	6	40.9080	-70.7535	Definite	30543	No	RWSAS	NK
23/March/2018	1	40.9398	-70.8113	Definite	30545	No	RWSAS	NK
23/March/2018	5	40.9300	-70.8667	Definite	30546	No	RWSAS	NK
23/March/2018	2	40.9070	-70.7545	Definite	30547	No	RWSAS	NK
24/March/2018	1	40.9000	-70.7300	Definite	30544	No	RWSAS	NK
24/March/2018	1	40.9193	-70.7485	Definite	30548	No	RWSAS	NK
24/March/2018	1	40.9335	-70.7603	Definite	30549	No	RWSAS	NK
24/March/2018	1	40.9417	-70.7808	Definite	30550	No	RWSAS	NK
24/March/2018	1	40.9233	-70.7552	Definite	30551	No	RWSAS	NK
24/March/2018	2	40.9158	-70.7480	Definite	30552	No	RWSAS	NK
28/March/2018	1	41.0400	-70.8400	Definite	30615	No	RWSAS	NK
28/March/2018	1	40.9962	-71.0303	Definite	30623	No	RWSAS	NK
31/March/2018	1	40.9719	-70.9134	Definite	30660	No	RWSAS	NK
31/March/2018	1	40.9810	-70.9135	Definite	30662	No	RWSAS	NK
2/April/2018	2	40.9160	-71.0337	Definite	30666	No	RWSAS	NK
2/April/2018	1	40.9987	-71.0273	Definite	30667	No	RWSAS	NK
2/April/2018	3	40.9127	-71.0417	Definite	30668	No	RWSAS	NK
2/April/2018	2	40.8982	-71.0673	Definite	30669	No	RWSAS	NK
2/April/2018	1	40.9253	-71.0145	Definite	30670	No	RWSAS	NK
2/April/2018	1	40.9190	-71.0277	Definite	30671	No	RWSAS	NK
3/April/2018	1	40.9640	-70.8628	Definite	30708	No	RWSAS	NK
3/April/2018	1	41.0125	-70.8367	Definite	30709	No	RWSAS	NK
6/April/2018	1	40.9810	-70.7868	Definite	30823	No	RWSAS	NK
7/April/2018	1	40.9222	-70.8664	Definite	30744	No	RWSAS	Endeavor
7/April/2018	1	40.9140	-70.8867	Definite	30745	No	RWSAS	Endeavor
11/April/2018	1	41.0870	-70.6187	Definite	30812	No	RWSAS	NK
11/April/2018	1	41.0214	-70.8161	Definite	30813	No	RWSAS	NK