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VM241

Cetaceans 4th Grade Curriculum—Lesson 16: North Atlantic Right Whales and Ship Strikes[1]

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Description

Students will learn why ship strikes are a threat to North Atlantic right whale survival, and what conservation measures are in place to reduce this threat.

Objectives

By the conclusion of the activity, students will:

- Be able to explain why ships are dangerous to right whales
- Understand why right whales are so hard for ship captains to see
- Be able to explain what a shipping lane is and why right whales that wander into them are in greater danger
- Be able to explain how aerial surveys help inform ship captains about right whales in the area

What You Will Need

- Ability to project PowerPoint presentation
- Copy of *Slow Down… Whale Crossing!* PowerPoint presentation (this can be downloaded from https://sfyl.ifas.ufl.edu/flagler/marine-and-coastal/environmental-education/4th-grade-cetacean-curriculum/)
- Speakers
- For the activity:
  - An area (such as a hallway or outside lawn) that is around 10 feet wide and 30 feet long: this is the designated "shipping lane"
  - Optional: flagging tape or painter's tape to mark off "shipping lane" area
  - Materials to make ID tags or costumes for students playing "right whales" (about ¼ of the students)
  - Materials to make ID tags or costumes for students playing "ships"
  - Baseball cap, hat, or visor for students playing the "ship's captain" (optional)
  - Materials to mark the edges of the "shipping lane," including a starting line and a destination port at the far end of the marked area (e.g., sidewalk chalk, string, cones, colored tape)
  - Writing utensils for "right whale" students
  - Copies of the *Ship Strike Tally Sheet* (one for each "right whale" student)

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Standards

Sunshine State Standards

SCIENCE

- **SC.4.E.6.5** Investigate how technology and tools help to extend the ability of humans to observe very small things and very large things.
- **SC.4.L.17.4** Recognize ways plants and animals, including humans, can impact the environment.

Procedure

There is an instructional PowerPoint presentation and an optional activity that reinforces concepts introduced in the presentation.

PowerPoint Presentation: Slow Down… Whale Crossing!

Teacher Script

Slide 1. This presentation contains background information on North Atlantic right whales and ship strikes and the conservation methods put into place in order to decrease right whale deaths due to ship strikes.

Slide 2. Why do you think there are so few North Atlantic right whales in the ocean today compared to years ago? [*Write student responses on the board. Hunting, entanglement, and ship strikes are all good answers.*]

Slide 3. In this lesson, we are going to focus on the threat of ships and boats (also called vessels) hitting whales.

Slide 4. Vessel strikes are one of the greatest human threats to North Atlantic right whales. The force of the vessel's impact and cuts from propellers can kill whales.

Slide 5. The ocean is very large, and there are not many right whales. So why do so many of these whales get hit by boats?

Slide 6. North Atlantic right whales are vulnerable to being hit by vessels because of where they live and migrate (their habitat), their appearance, and their behavior. We will discuss each of these separately.

Slide 7. As we have learned in other lessons, North Atlantic right whales migrate along the East Coast of the US from their northern feeding and mating ground to the southern calving area. Right whales are often found within 20 miles of shore. Many ships and boats pass through this area as they come into port or move offshore.

Slide 8. Shipping ports are places where ships and boats can dock to load and unload what they are carrying. The southeastern US is home to some of the biggest shipping ports in the world. Many shipping ports, like Boston, Massachusetts and Jacksonville, Florida, are near areas where right whales spend a lot of time.

Slide 9. Even though we do not have roads in the ocean, ships often use specific routes called shipping lanes to travel from one place to another. Ships use shipping lanes because they have water that is deep enough and currents that go in the right direction, among other things. Many shipping lanes are located in the North Atlantic right whale habitat.

Slide 10. Large ships are not the only type of vessel that can hurt right whales. Even a collision with a small recreational boat can kill whales.

Slide 11. Why does the right whale's appearance make it likely to be hit by a ship? Mariners (people in charge of seagoing vessels) have a hard time seeing the whales in the water because the whales are dark and don't have dorsal fins.

Slide 12. How does a right whale's behavior increase the risk of a ship strike? Right whales tend to stay near the surface of the ocean, and they usually only have a very small portion of their head (and sometimes back) sticking out of the water when they breathe.

Slide 13. Like other marine mammals, whales do not know that boats can be dangerous to them. Have any of you ever seen a wild animal crossing a road? These animals often do not realize that cars can hurt them. Even if a whale did know that a ship was dangerous, ships often travel faster than the whales, so it would be difficult for the whale to get out of the way quickly enough.

Slide 14. [*Read slide.*]

Slide 15. There are many conservation efforts to help protect North Atlantic right whales. These include the Early Warning System, laws and regulations such as the Ship Strike Reduction Rule and No Approach Rule, as well as extensive education and outreach for mariners and boaters. We are going to talk more about each of these.

Slide 16. To try to help protect North Atlantic right whales, a program called the Early Warning System was started in 1993. The Early Warning System relies on planes flying over the North Atlantic right whale's critical habitat areas to perform aerial surveys. These surveys are done in the calving area during winter months and in the feeding grounds at other times of year. People in the planes act as "spotters" and use binoculars to look for whales in the water below. If an aerial surveyor spots a right whale, they relay the GPS location of the whale to everyone in the area who should know to look out for a whale. "Everyone in the area" includes commercial mariners, US Navy, harbor pilots, Army Corps of Engineers, US Coast Guard, port authorities, and recreational boaters.

If a ship captain receives a radio notice that there is a whale nearby, they have to assign a crew member to look for the whale. They also need to communicate with other ships in the area in case one of them spots the whale. This helps everyone figure out exactly where the whale is. The ships need to avoid the whale and should not steer in a direction that would put the ship in front of the whale. The closer a ship is to a whale, the more it needs to slow down to minimize injury in case of an accidental collision.

Slide 17. In 2008, the Right Whale Ship Strike Reduction Rule was started. This rule requires ships that are more than 65 feet long (about 10 feet longer than a right whale) to slow down to 10 knots (about 11.5 miles/hour) in certain areas at certain times of the year.

Slide 18. In the next couple of slides, we will see where the Right Whale Ship Strike Reduction Rule is in effect. Off the northeast Florida and Georgia coasts, ships must go slowly during calving season. From November 1 through April 30, ships entering major ports along the East Coast of the US between Georgia and Massachusetts must slow down because there could be migrating right whales present.

Slide 19. Off Boston and Cape Cod, right whales may feed year-round. If whales are present, ships must slow down no matter what time of year it is.

Slide 20. The No Approach Rule helps protect right whales from being disturbed by humans. This is especially important for mother whales that are pregnant or nursing newborn calves. The rule says we must not move towards or remain within 500 yards of a right whale. That's as long as five football fields. If a mother whale is scared by a vessel, kayaker, surfer, paddleboard, Jet Ski, or even a swimmer, she may swim away and leave her calf. The baby right whale cannot survive without its mother. Also, if vessels stay 500 yards away from right whales, they minimize the chance that they will hit a whale.

Slide 21. Many groups try to teach people about right whales so everyone can help protect them. People have created many types of educational brochures, flyers, coloring pages, and videos. We can all do our part to tell other people what we know.

Slide 22. We are going to watch two videos that were created to teach people how to behave around North Atlantic right whales. [*Click on video clip to play it. Video is 60 seconds long and has narration, so you will want to have your sound turned on.*] What is the important message of this video? [*Answer: People need to stay 500 yards away from right whales.*]

Slide 23. Let's watch another video. [*Click on video clip to play it (video is 30 seconds long).*] What is the message of this one? [*Answer: Boats need to slow down when whales are nearby.*]

Slide 24. Why do we have all of these rules in place? We want to try to help the endangered North Atlantic right whale population grow in size. If we keep the existing right whales safe, they can reproduce. This way, the population can continue to increase.

Activity: Slow Down… Whale Crossing!

1. Show students the accompanying PowerPoint presentation before starting this activity.

2. Set up:

- Find an area (approximately 10 feet x 30 feet) to use as the "shipping lane." Mark the edges of the shipping lane, the starting line, and a destination port at the end.
- Divide students into groups of "ships" and "right whales." Assign about ¼ of the class to be "right whales." Group the "ship" students to represent different-sized ships (try groups of one, three, and seven). Each ship will have one student to represent the "ship captain." Use ID tags or costumes to represent the whales and ships. Optional: Use a hat to represent the captain of each ship.

3. Instructions for "ship" students:

- Have students line up in their "ship" groups. They should place their hands on the shoulders of the student in front of them and bend their elbow to get closer together. Have the students look at their feet. The "ship captain" should be located at the front of the ship. The "ship captain" should put on a baseball cap, hat, or visor so while looking down at their feet they can only see a few feet in front of them. (Note: to achieve the same result, students can shield their eyes as if wearing a visor.) Explain that by only seeing what is right in front of them, the students are simulating the fact that right whales are hard to see because their dark bodies blend in with the ocean, and normally only a small part of the whales' bodies shows above the surface.
- The "ships" will start at the front edge of the "shipping lane" and try to move in straight lines towards a "destination port." Explain that ships try to move in straight lines to their destinations to save time and fuel.
- The "ships" may deviate from their path in order to avoid hitting a "right whale." In order to avoid hitting a whale, the "ship captain" must spot the whale and give the directions, **"Right whale spotted, turn *left* (or *right*)."** "Ships" should try to steer behind the "right whales" whenever possible. "Ships" may slow down when turning to avoid a "right whale"; however, they may not stop, and they must speed back up to their original pace after their evasive maneuver. Single-student "ships" should act the same as the students at the front of the larger ships, but they will not need to give verbal directions in order to perform an evasive maneuver. (Note: to avoid student injury, tell "right whale" students and "ship" students not to actually collide, but to just simulate the act).

4. Instructions for "right whale" students:

- The "right whale" students will crawl on the ground with the back of their hands pressed against their knees or simulate another way for them to move slowly just like right whales.
- Ask them to space themselves out in the "shipping lane" and move around, stopping to rest.
- Tell the students not to try to avoid being in the path of a "ship," because right whales do not appear to take evasive action to avoid being hit by oncoming vessels. (Note: to avoid student injury, tell "right whale" students and "ship" students not to actually collide, but to just simulate the act).
- Give the "right whale" students the *Ship Strike Tally Sheet* and a writing utensil. Ask them to keep track of:
  - How many times a "ship" hit them and what size the ship was
  - How many times a "ship" narrowly missed them and what size the ship was

Simulation 1: Business as Usual

Have your "ship" students make a run through the "seasonal management area" (the shipping lane) while walking quickly. "Right whale" students should make their tallies in the Simulation 1 tally chart. After all of the "ships" have reached the destination port, bring the students back together and combine the ship encounter tallies from all of the "right whales."

Look at the tallies as a class. Ask:

1. Which "ships" posed the greatest danger to the "right whales" (i.e., which "ships" hit or narrowly missed the "right whales")?

2. Did "ships" of different sizes have different abilities to maneuver around the "right whales"?

3. The "ships" that hit or narrowly missed a "right whale"—Why did they have trouble avoiding the "right whales"?

4. Did the "ships" have enough time to avoid the whales?

5. Would it have been easier to avoid the right whales if they had some kind of warning system?

Simulation 2: Early Warning System

Hand the tally sheets back to the "right whale" students and have them redistribute in the "shipping lane." Tell them to stay still while the other students mark an area with an approximate five-foot radius around each "right whale" student. Leave these markings in place after Simulation 2 because they will be used in Simulation 3 as well. Bring all of the students back together and explain that these marked areas function similarly to the Early Warning System.

Tell the "ship" students that when they see the marked boundary around a recent "right whale" sighting, it is like being notified by the Early Warning System. Tell the "ship captains" that they may look up and/or slow down when they see a marked boundary. When the Early Warning System was first implemented, mariners were requested but not required to take extra precautionary measures when a whale was reported in their area or along their path of travel. These precautionary measures included posting extra lookouts for whales and reducing ship speed. Instruct the "ships" to resume their positions and the "right whales" to return to the middle of their respective marked areas with their tally sheet. This time, they should make their tallies in the Simulation 2 tally chart. Point out to the "right whale" students that if they are hit or narrowly missed, they should indicate on the tally sheet whether the "ship" was traveling quickly or slowly. This differentiation is labeled on the Simulation 2 tally chart for ships of all sizes. Instruct the "right whale" students to move around as they did in Part 1. Let them know that it is their decision whether or not they stay within their marked area.

As in Part 1, have your "ship" students make a run through the shipping lane while walking quickly. After all of the "ships" have reached the destination port, bring the students back together and combine the ship encounter tallies from all of the "right whale" students.

Look at the new tallies as a class and ask:

1. How are the new results different from the results of Part 1?

2. Why might these results have been different?

3. Were there any ships that still posed a danger to the "right whales"?

4. Any "ships" that hit or narrowly missed a "right whale"—Why did they have trouble avoiding the "right whales"?

5. Did the "ships" still not have enough time to avoid a "right whale"? Why or why not?

6. Were they going too fast to slow down or turn in time?

Simulation 3: Right Whale Ship Strike Reduction Rule

Explain to the students that they will simulate the conditions of the Right Whale Ship Strike Reduction Rule. Tell your students that all but the single-student ships are required to reduce their speed and slowly walk through the shipping lane. Single-student "ships" may choose their speed (slow or fast). Point out to the "right whale" students that if they are hit or narrowly missed by a single-student "ship," they should indicate on their tally sheets whether the "ship" was traveling slowly or quickly. This differentiation is labeled on the Simulation 3 tally chart. Instruct the "ships" to resume their positions and tell the "right whale" students to return to the middle of their respective marked areas. Instruct them to move around as they did in Parts 1 and 2.

Have your "ship" students make a run through the shipping lane simulating the Right Whale Ship Strike Reduction Rule. After all of the "ships" have reached the destination port, bring the students back together and combine the ship encounter tallies from all of the "right whale" students.

Look at the new tallies as a class and ask:

1. How are the new results different from the results of Parts 1 and 2? How are they similar?

2. Why might these results have been different?

3. Were there any ships that still posed a danger to the "right whales"?

4. Any "ships" that hit or narrowly missed a "right whale"—Why did they have trouble avoiding the "right whale"?

5. Is there anything else those "ships" could have done to help them to avoid the "right whales"?

Evaluation Suggestions

Use your students' responses to the reflection questions at the end of each activity to evaluate whether or not the students understand how the results of their simulations relate to right whale conservation.

Activity based on *Shipstrike Rule Lesson Plan* by Jessica Hardy, NOAA Fisheries, Marine Mammal Education intern, Summer 2010.

Ship Strike Tally Sheet

Name: _____

"Right whales": Record the number of each type of ship that hits or almost hits you.

Simulation 1: "Business as Usual"	Small Ship	Large Ship	Huge Ship
"Hit"			
"Narrowly Missed"			

Simulation 2: "Early Warning System"	Small Ship		Large Ship		Huge Ship	
	Slow	Fast	Slow	Fast	Slow	Fast
"Hit"						
"Narrowly Missed"						

Simulation 3: "Right Whale Ship Strike Reduction Rule"	Small Ship		Large Ship	Huge Ship
	Slow	Fast		
"Hit"				
"Narrowly Missed"				