

Speeding Toward Extinction:

**VESSEL STRIKES  
THREATEN NORTH  
ATLANTIC RIGHT WHALES**

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**JULY 2021**

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# IN MEMORIAM

North Atlantic right whales are swimming on the edge of extinction. They are prone to being hit by vessels because they tend to swim slowly, near the water's surface, are dark in color, and lack a dorsal fin, making them very difficult to spot and susceptible to vessel strikes.



Photo Credit: FWC

## JANUARY 2020

Derecha, a roughly 27-year-old North Atlantic right whale, was spotted off the coast of Georgia on January 8 with her fourth calf. The newborn had two parallel gashes on its head and face, consistent with injuries from the propeller of a vessel. Experts believed one of the cuts to the newborn's mouth would impede its ability to feed. Scientists and veterinarians from across the country launched an attempt to locate the mother-and-calf pair again and deliver antibiotics to Derecha's calf, which was in poor condition. They succeeded in administering antibiotics on January 15 off the coast of Fernandina Beach, Florida. Tragically the calf has not been seen again, and is presumed dead.<sup>1</sup>

## JUNE 2020

On June 25, the National Oceanic and Atmospheric Administration (NOAA) received a report about a dead whale floating off the coast of Elberon, New Jersey, which turned out to be the first reported North Atlantic right whale calf of the 2019/2020 calving season. The calf was first spotted in December 2019 off the coast of Georgia with his mom, North Atlantic right whale #3560. This was #3560's first calf, but their time together did not last long. The calf was struck by vessels twice within the first few months of his life. The first strike left him with lacerations across his head and chest and a likely rudder injury to his back. The second vessel collision led to similar lacerations across the base of his tail, which ended up being fatal.<sup>2</sup>



Photo Credit: Center for Coastal Studies



Photo Credit: FWC

## FEBRUARY 2021

On January 17, researchers spotted 19-year-old Infinity with her first known calf, swimming together off of Amelia Island, Florida.<sup>3</sup> Less than a month later, on February 13, the calf was reported dead off the coast of Anastasia State Park in Florida. Investigators found that a 54-foot recreational fishing boat had struck the calf at 21 knots, about 25 miles per hour, an impact so hard that the boat began to sink.<sup>4</sup> While the boaters' actions were not illegal, the strike left the month-old calf with propeller wounds, broken ribs and a fractured skull.<sup>5</sup> About 50 miles north of where her calf was struck, Infinity was found several days later with two cuts to her left side, suggesting a recent vessel strike, leaving her vulnerable to infection and other complications.<sup>6</sup>

# Executive Summary

The North Atlantic right whale is one of the most endangered whales on the planet. Only around 360 remain.<sup>7</sup> The two greatest threats to this species are vessel strikes and entanglements in fishing gear. To reduce the risk from these threats, the United States government must: 1) require vessels to avoid areas where North Atlantic right whales are present or if avoidance is not possible, slow down to minimize the risk of serious injury or death; and 2) reduce the number of vertical lines from fishing gear in the water, particularly in times and places where North Atlantic right whales are present.

**For this analysis, Oceana examined vessel speeds in areas where U.S. regulations direct them to slow down to protect whales and found that most vessels were not slowing down when they should be.**



To address the vessel strike threat to North Atlantic right whales, the U.S. National Marine Fisheries Service (NMFS) issued regulations in 2008 known as the Vessel Speed Rule that created two types of right whale conservation areas:<sup>8</sup>

**1. Seasonal Management Areas (SMAs):** Ten distinct areas ranging from Massachusetts to Florida where all vessels 65 feet and longer are required to reduce speeds to 10 knots (11.5 mph) or less, with certain exemptions for safety reasons and for federal vessels. SMA locations were chosen because they represented important feeding, breeding, calving, and migratory habitats for the whales in 2008.

**2. Dynamic Management Areas (DMAs):** Voluntary slow zones where vessels 65 feet and longer are asked to avoid the area or slow down to 10 knots or less. DMAs are reactive speed zones that are triggered based on visual sightings of three or more North Atlantic right whales within an area and are temporary, lasting 15 days from the sighting, but are extended if the whales remain in the vicinity. DMAs are rectangular, extend 15 nautical miles around the core area of the whale detection, and were intended to account for the variability of whale locations outside of SMAs.

Since the implementation of these regulations, researchers estimated that limiting vessel speeds to 10 knots reduces a North Atlantic right whale's risk of death from vessel strikes by between 80% and 90%.<sup>9</sup> Additionally, based on the government's own assessment, the regulations have had a minimal economic burden on the shipping industry.<sup>10</sup>

Despite these promising findings, North Atlantic right whales continue to die from vessel strikes. Oceana conducted an analysis of vessel compliance with speed restrictions in both SMAs and DMAs between 2017 and 2020 using data from Global Fishing Watch (GFW), an international nonprofit organization founded by Oceana in partnership with Google and SkyTruth. Oceana analyzed self-reported vessel speed and location data from 2017 to 2020 to track vessel speeds and positions in North Atlantic right whale conservation areas. For this analysis, **non-compliance in SMAs** refers to vessels exceeding the mandatory speed limits, and **non-cooperation in DMAs** refers to vessels that fail to cooperate with the voluntary speed limits. DMAs were broken up into four regions: Gulf of Maine, Southern New England, Mid-Atlantic, and the Southern States.

## What We Found in Seasonal Management Areas

### BEST CASE

The highest level of compliance with mandatory 10-knot speed restrictions was only around two-thirds of vessels in the Off Race Point SMA, near Cape Cod, Massachusetts.

### WORST CASE

Almost 90% of vessels violated the mandatory 10-knot speed limit in the Wilmington, North Carolina, to Brunswick, Georgia, SMA.



### The SMAs with the worst compliance were:

1. Wilmington, North Carolina, to Brunswick, Georgia (average of 87.5% non-compliance)
2. Ports of New York/New Jersey (average of 79.3% non-compliance)
3. Calving and nursery grounds from Georgia to Florida (average of 72.1% non-compliance)
4. The entrance to the Chesapeake Bay (average of 64.2% non-compliance)
5. The entrance to the Delaware Bay (average of 56.4% non-compliance)



**Cargo vessels** were the least compliant vessel type in both DMAs and SMAs. Cargo vessels represented about 42% of non-cooperation in DMAs and around 50% of non-compliance in SMAs.



**Two-thirds** of the vessels that exceeded the 10-knot speed limits in both DMAs and SMAs operated under foreign flags. **The least compliant vessels by flag state** in both SMAs and DMAs included vessels flagged to the United States, Panama, Marshall Islands, Liberia, Singapore, and Germany.\*

## Current Regulations Are Not Enough

The current protections are analogous to imposing speed limits on semi-trucks to protect pedestrians, while allowing cars and SUVs to go as fast as they want, leaving pedestrians still vulnerable to these just-as-deadly vehicles. We should expand the coverage of the Vessel Speed Rule to all vessels, regardless of size, and improve its enforcement.



**The federal government must take the following actions** to reduce deadly vessel strikes in order to save North Atlantic right whales from extinction:

- + Expand and establish new SMAs
- + Make compliance with DMAs mandatory or require mandatory compliance in all reactive speed zones that may replace DMAs
- + Expand the Vessel Speed Rule to include vessels under 65 feet in length
- + Expand AIS requirement to include vessels under 65 feet in length and require continuous use of AIS
- + Improve compliance and enforcement of the mandatory speed limit
- + Narrow the federal agencies' exemption from the Vessel Speed Rule

\*Panama, Marshall Islands, and Liberia are known "flags of convenience" – when vessels fly flags that do not belong to their country of ownership in exchange for fewer regulations and more lax enforcement.

## What We Found in Dynamic Management Areas

### BEST CASE

Only around half of vessels cooperated with voluntary 10-knot speed limits in DMAs.

### WORST CASE

Almost 85% of vessels did not cooperate with voluntary 10-knot speed limits in DMAs.



Because of the sheer volume of traffic in the Southern New England DMAs, this region poses the greatest threat despite having a lower percentage of non-cooperation than others. **Over 2,600 vessel transits exceeded the speed restrictions over the four-year period.**

**>80%**

With **more than 80%** of the vessels violating the speed limit between Cape May, New Jersey to Florida, the Southern States' DMAs had the highest rate of non-cooperation.

# Introduction

North Atlantic right whales are swimming along the razor's edge of extinction. They are one of the most endangered large whales on the planet, with only around 360 individuals left.<sup>7</sup> This species was once abundant, with as many as 9,000 to 21,000 individuals before commercial whaling.<sup>11</sup> But their proximity to shore, slow swimming speed, and tendency to float when killed turned out to be a fatal combination for the whales and an incredible boon to the whaling industry, which dubbed them the "right" whale to kill.<sup>12</sup> And kill they did, to the point that fewer than an estimated 100 individuals remained in the Atlantic by the 1920s.<sup>13</sup>



Fortunately, the League of Nations banned the whaling of this species in 1935,<sup>14</sup> and its slow crawl to recovery began, rebounding to as many as 483 individuals in 2010.<sup>15</sup> While whaling has ended, new threats posed by humans have emerged:

- Vessel strikes that leave them with broken bones, blunt force trauma, or lacerations from propellers.<sup>16</sup>
- Entanglements in fishing gear, in which strong ropes wrap around their mouths, fins, tails, and bodies, digging in and causing infections and cuts to the bone. Entanglements can also lead to starvation by preventing whales from feeding, as well as exhaustion and drowning from pulling heavy fishing gear through the water.<sup>17</sup>

These two threats have become such a problem that in 2017, the National Marine Fisheries Service (NMFS) declared an unusual mortality event (UME) for the species. Since then, a total of 34 whales in the United States and Canada have died, and another 15 whales have been documented with serious injuries such as propeller wounds or entanglements in fishing gear.<sup>18</sup> These serious

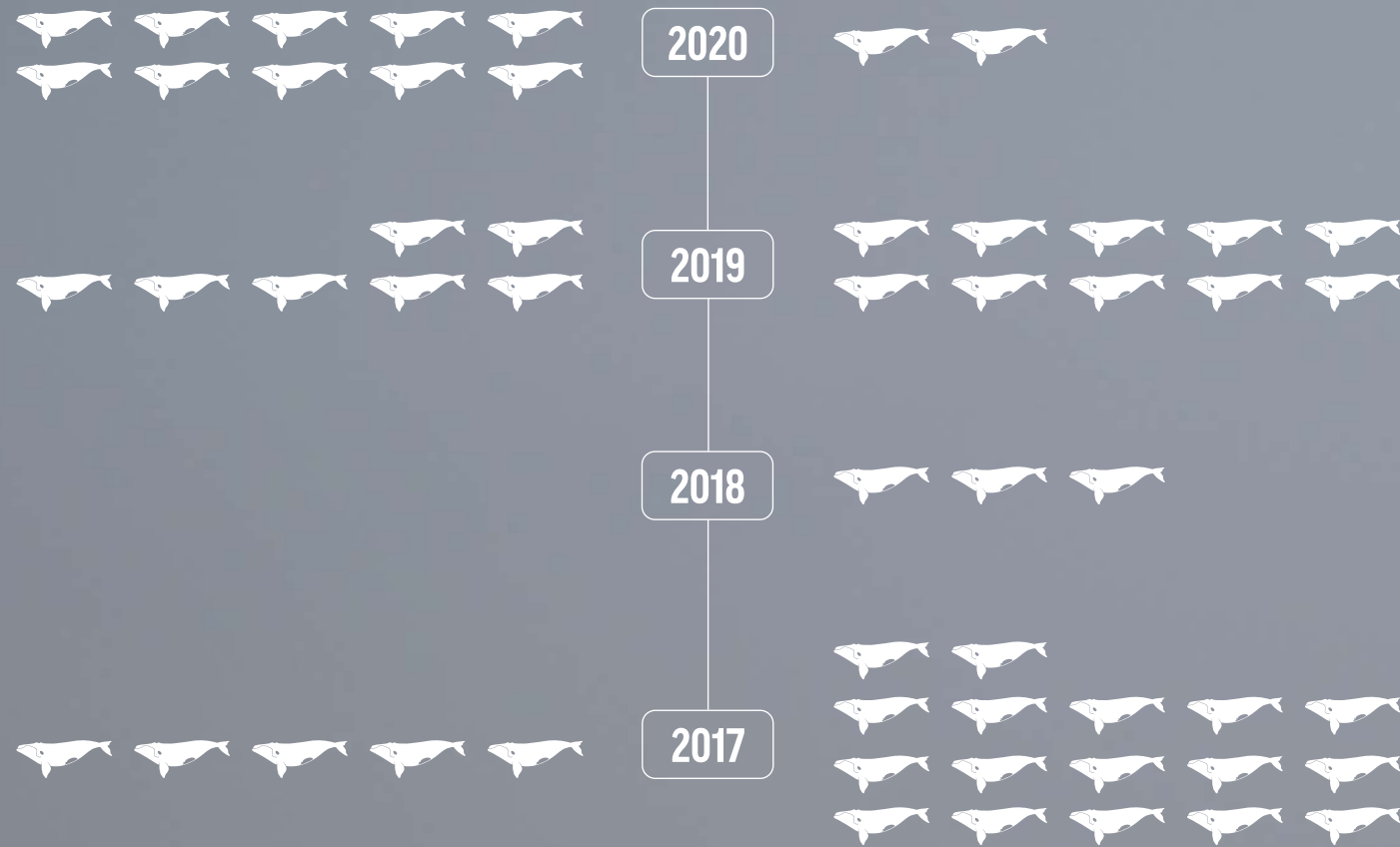
injuries can lead to slow and painful deaths. Consider Cottontail, an 11-year-old North Atlantic right whale who became so badly entangled that he was considered "swimming while dead." Unfortunately, he succumbed to his injuries in early 2021.<sup>19</sup> But these mortalities are only the ones that are found. In fact, scientists only observed 36% of all estimated North Atlantic right whale deaths between 1990 and 2017.<sup>20</sup>

**North Atlantic right whales are one of the most endangered large whales on the planet, with only around 360 individuals left.**

## BIRTHS

VS

## DEATHS



(Birth years defined by calving season)

### Expanding and Enforcing Protections

It is not just where and when the management areas are put into place — how they are enforced is important too. Not only do the existing protections need to be modified to reflect the whales' current geographic range, they also need to be better enforced, and exemptions for smaller and federal vessels need to be narrowed. Otherwise, the regulations will continue to leave these critically endangered whales vulnerable to vessel strikes. The calf found in February 2021 was killed by a 54-foot boat that was exempt from the speed restrictions, which only apply to vessels 65 feet and longer. Federal vessels, like military or law enforcement vessels, are also exempt but just as dangerous.<sup>4,8</sup>

### Shifting Range Means Shifting Protections

North Atlantic right whales are altering their range, likely due to shifting food sources.<sup>21</sup> But with every new location and congregation, the whales are moving into areas where there are no slow zones to protect them. In fact, the current U.S. slow zones were developed prior to 2008 — over a decade ago. Since that time, new regions have become increasingly important to the species but only have temporary, voluntary protections.



Photo Credit: FWC



# Overview of Vessel Speed Regulations

North Atlantic right whales are found up and down the East Coast of the United States and Canada, where vessels, ports, and shipping channels overlap with calving grounds, feeding areas, and migration routes. Of the 34 North Atlantic right whale deaths since the beginning of the unusual mortality event, and where the cause of death could be determined, 11 were caused by vessel strikes.<sup>5,18</sup>



However, vessel strikes were a problem long before 2017. To deal with this, in 2008 NMFS published the Vessel Speed Rule, which set a 10-knot (11.5 mph) speed restriction for vessels 65 feet (19.8 meters) and longer in key areas off the East Coast of the United States during certain times of the year.<sup>8</sup> The 2008 Vessel Speed Rule created two distinct types of protective areas:

**1. Seasonal Management Areas (SMAs):** Ten distinct areas ranging from Massachusetts to Florida where all vessels 65 feet and longer are required to reduce speeds to 10 knots or less, with certain exemptions for safety and for federal vessels. SMA locations were chosen because they represented important feeding, breeding, calving, and migratory habitats for the whales in 2008.

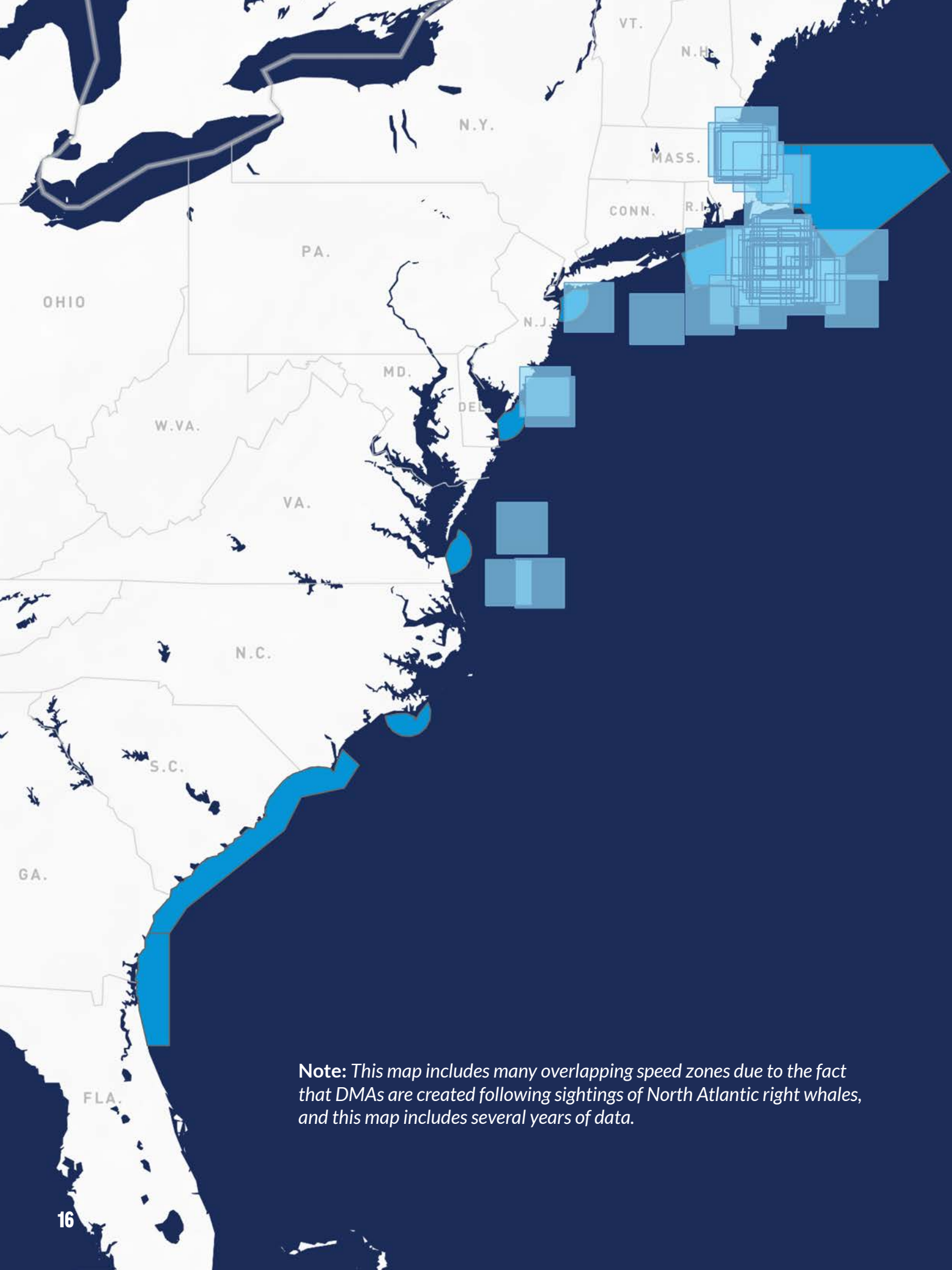
**2. Dynamic Management Areas (DMAs):** Voluntary slow zones where vessels 65 feet and longer are asked to avoid the area or slow down to 10 knots or less. DMAs are triggered based on visual sightings of three or more North Atlantic right whales within an area and are temporary, lasting 15 days from the sighting, but are extended if the whales remain in the vicinity. DMAs are rectangular and extend 15 nautical miles around the core area of the whale detection and were intended to account for the variability in whale locations outside of SMAs.

During the rulemaking process that led to the final Vessel Speed Rule, more than 60 shipping interests — including

trade associations, port associations, pilot associations, passenger services, private commercial services, whale-watching and deep-sea fishing charters, shipbuilding entities, technological entities, and government agencies — submitted comments in opposition to the proposed Vessel Speed Rule.<sup>22</sup> Some of these comments claimed there was a lack of scientific evidence to support speed restrictions, suggested the rule would lead to a substantial economic burden on the shipping industry, and expressed concerns that slower speeds could result in a loss of vessel maneuverability.<sup>23</sup> The agency caved to this pressure and weakened the final rule substantially, increasing the risk to whales. To accommodate the industry opposition, the final Vessel Speed Rule made compliance with DMAs voluntary rather than mandatory, created exemptions to speed limits for maintaining navigational safety, reduced the size and boundaries of the SMAs in the mid-Atlantic, and set the rule to expire in 2013 pending an analysis of the effectiveness of the regulations.<sup>23</sup>

However, in 2013, NMFS extended these protections indefinitely since its own analysis had revealed that the Vessel Speed Rule reduced the risk of vessel strikes within SMAs, and showed that death and injury from vessel strikes were still primary threats to the recovery of the species.<sup>24</sup>





# Mandatory (SMAs) and Voluntary (DMAs) Speed Zones to Protect North Atlantic right whales

-  Seasonal Management Areas (SMAs)
-  Dynamic Management Areas (DMAs)

*Note: This map includes many overlapping speed zones due to the fact that DMAs are created following sightings of North Atlantic right whales, and this map includes several years of data.*



Photo Credit: Monica Zani/ New England Aquarium

A separate 2013 analysis estimated that the vessel speed reductions reduced the North Atlantic right whale's risk of death from vessel strikes by between 80% and 90%.<sup>9</sup> Additionally, contrary to the shipping industry's claims that the rules would pose an economic burden,<sup>25</sup> a 2012 economic analysis found the direct economic impact of speed restrictions only represented 0.006% of the value of traded merchandise and 0.2% of freight costs for the marine East Coast trade in 2009. The 10-knot speed limit had minimal impact on the revenues and financial performance of shipping vessels.<sup>26</sup> The reality was that the costs of speed restrictions were substantially lower than initially projected by NMFS in 2008.<sup>23</sup>

The 2013 extension of the regulations also included a requirement that, by January 1, 2019, NMFS would

publish a report evaluating the conservation benefits and the economic and navigational safety impacts of the Vessel Speed Rule.<sup>27</sup> However, this report was not released until January 2021, after two years of unexplained delay.<sup>10</sup> The 2021 report found that the speed restrictions are working to protect North Atlantic right whales, but that compliance, particularly in DMAs, is inadequate. The report also followed up on the previous economic analyses and found that the annual direct cost to commercial shipping ranges between \$24.8 million and \$29.2 million,<sup>28</sup> which represents only about 0.005% of the trade value at relevant East Coast ports.<sup>10</sup>

## NMFS concluded in January 2021 that in order to best protect the North Atlantic right whale, the Vessel Speed Rule should be changed in the following ways:



Modifying the location, timing, and duration of some SMAs to make them more effective



Enhancing enforcement and outreach



Addressing vessel strike risk from smaller vessels that are currently exempt from the Vessel Speed Rule



Modifying or terminating the DMA program



Conducting additional research into vessel strikes and North Atlantic right whales<sup>10</sup>



While Oceana's report uses slightly different methodology for analyzing compliance (see methodology section), Oceana's findings and policy recommendations are consistent with those of NMFS. The data clearly show the need for mandatory speed restrictions in previously defined DMAs and effective enforcement with penalties that deter violations. Both NMFS and Oceana's findings underscore the immediate need for the Vessel Speed Rule to be updated and improved to reflect current analyses of the danger of high vessel speeds to North Atlantic right whales.

# Compliance in Seasonal Management Areas

There are 10 SMAs along the East Coast of the United States that require all vessels 65 feet or longer to slow down to 10 knots or less in order to reduce the risk of death or serious injury to North Atlantic right whales from vessel strikes.



The SMAs are each active for a distinct part of the year when North Atlantic right whales are likely to be present. From north to south, the SMAs are:

- **Cape Cod Bay** (from January 1 to May 15)
- **Off Race Point** (from March 1 to April 30)
- **Great South Channel** (from April 1 to July 31)
- **Block Island Sound** (from November 1 to April 30)
- **Ports of New York/New Jersey** (from November 1 to April 30)
- **Entrance to the Delaware Bay** (from November 1 to April 30)
- **Entrance to the Chesapeake Bay** (from November 1 to April 30)
- **Ports of Morehead City and Beaufort** (from November 1 to April 30)
- **Wilmington, North Carolina, to Brunswick, Georgia** (from November 1 to April 30)
- **Calving and nursery grounds (Georgia to Florida)** (from November 15 to April 15)<sup>29</sup>

Oceana analyzed non-compliance (the proportion of vessels that transited through each SMA that exceeded the 10-knot mandatory speed limit at any given point) over three seasons: November 1, 2017, to July 31, 2018; November 1, 2018, to July 31, 2019; and November 1, 2019, to July 31, 2020. We chose to organize SMAs into seasons rather than calendar years because several SMAs span the January 1 calendar year start point, and seasons allow for a continuous analysis of the area's entire active period.

We defined the percentage of non-compliant vessels as those that exceeded the 10-knot speed limit relative to all vessels that transited the area. Oceana found that:

- In our analysis, 8,714 vessels made a total of 26,608 vessel transits over these three SMA seasons;
- Over all three SMA seasons, non-compliance ranged from 32.7% to 89.6%;
- Overall, the North Carolina to Georgia SMA exhibited the worst non-compliance: More than 85% of vessels violated the speed limit during each individual SMA season.

Thousands of vessels are speeding. Rates in the southeast are close to 90%.

Vessel Non-Compliance In Mandatory Speed Zones			
SMA	Nov 2017/July 2018	Nov 2018/July 2019	Nov 2019/July 2020
Cape Cod Bay	46.5% (101)	42.6% (100)	45.1% (92)
Off Race Point	51.0% (80)	32.7% (54)	33.1% (43)
Great South Channel	37.1% (181)	36.5% (161)	39.2% (138)
Block Island Sound	40.2% (227)	37.0% (223)	38.1% (223)
Ports of New York/New Jersey	79.4% (1,164)	79.3% (1,185)	79.1% (1,091)
Entrance to the Delaware Bay	60.6% (804)	56.4% (692)	52.3% (553)
Entrance to the Chesapeake Bay	68.4% (1,207)	62.2% (1,065)	62.0% (981)
Ports of Morehead City and Beaufort	58.9% (305)	37.8% (195)	38.0% (199)
Wilmington, North Carolina, to Brunswick, Georgia	89.6% (1,501)	87.3% (1,499)	85.7% (1,448)
Calving and Nursery Grounds (Georgia to Florida)	72.2% (665)	74.8% (711)	69.2% (650)

Percent of non-compliant vessels in SMAs. Number of non-compliant vessels in SMAs in parenthesis.

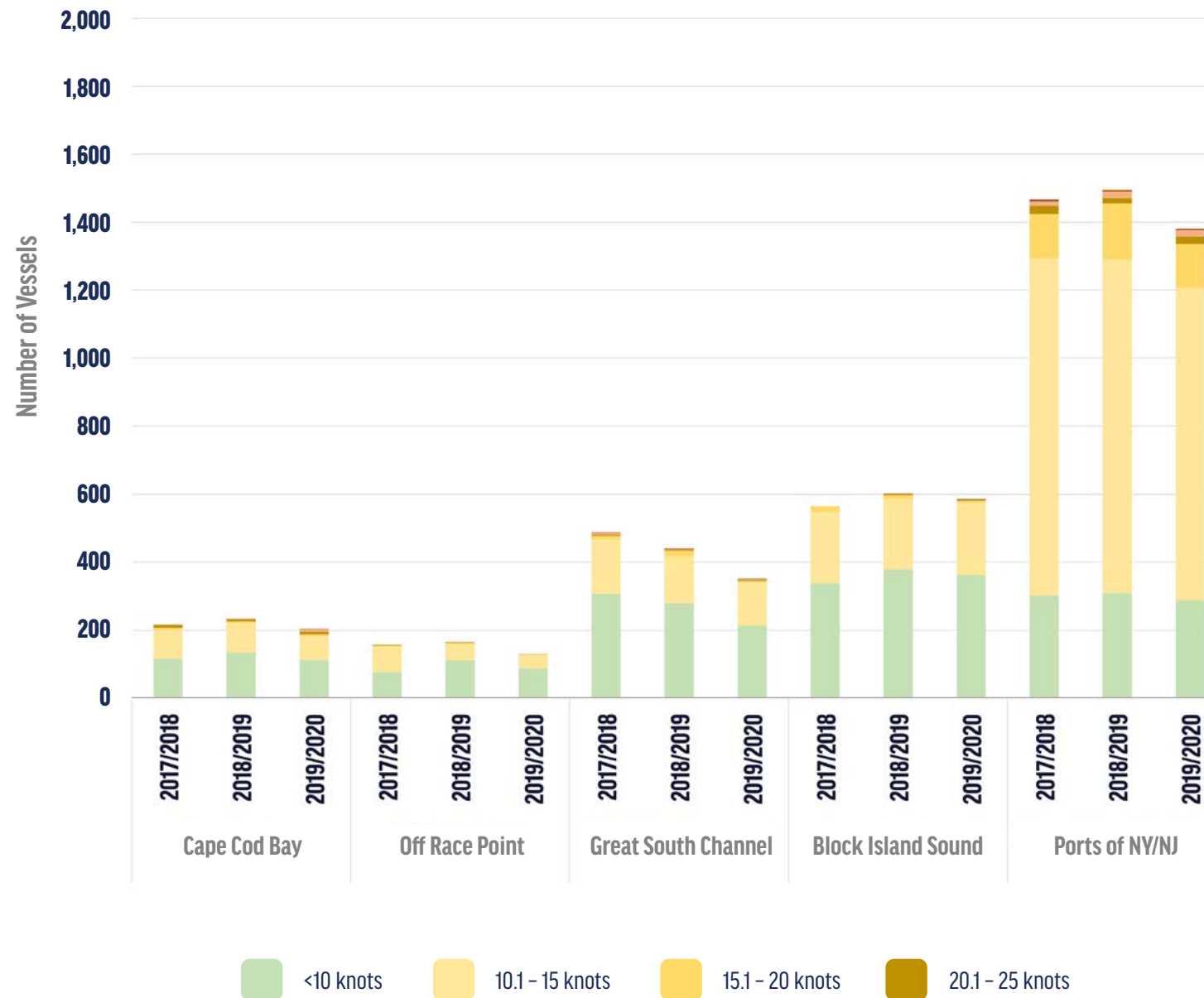


Photo Credit: Shutterstock

# From New England to Florida,

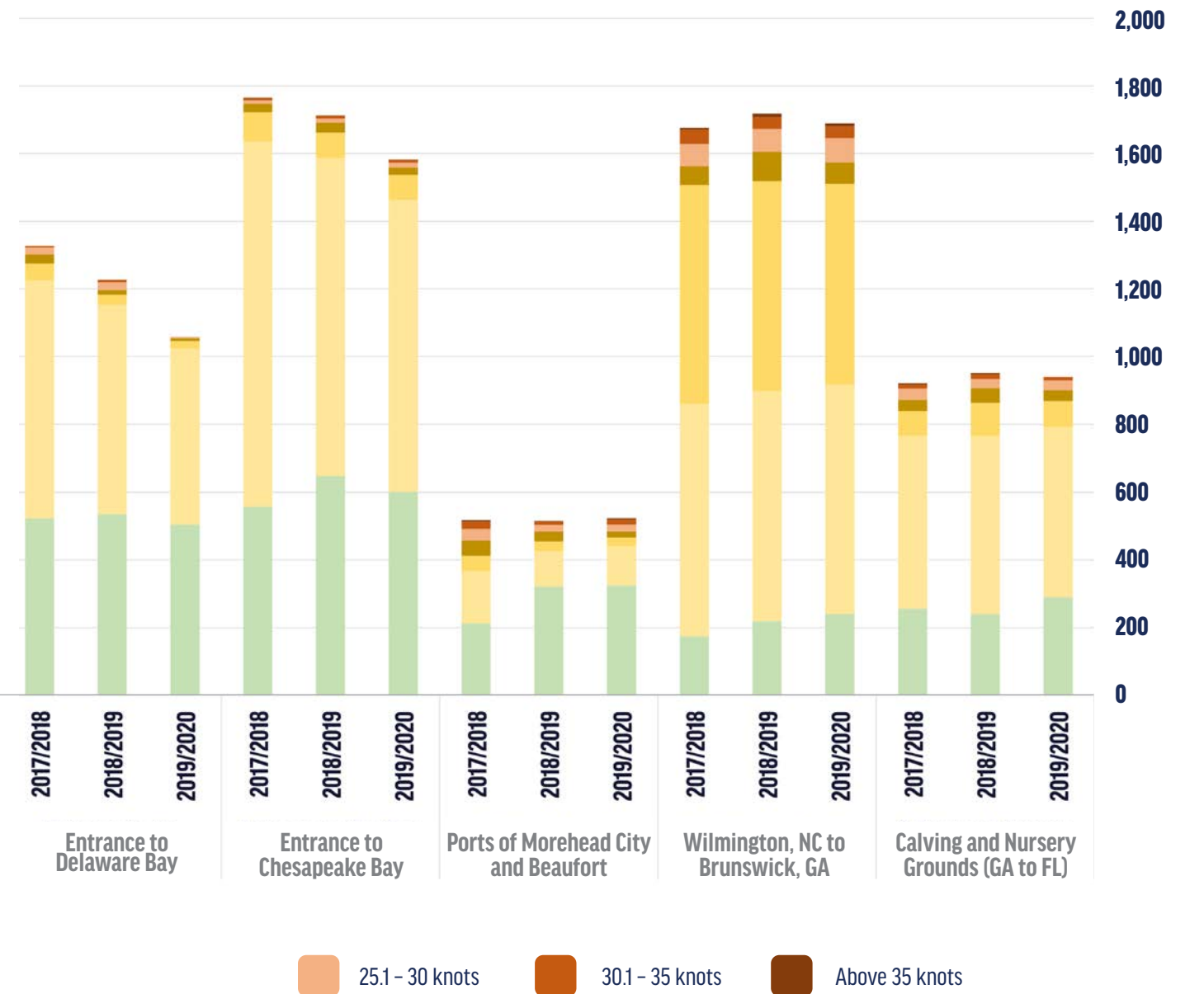
# thousands of vessels speed every year.

### SMA Non-Compliance Rates



Maximum speeds detected for vessels within active SMAs during the 2017/2018 SMA season.

### SMA Non-Compliance Rates (Continued)



Stacked bars represent the total number of vessels traveling through the DMA while it was active. Green indicates vessels that never exceeded the 10-knot speed limit, while darker orange represents vessels in increasingly higher speed classes.

**In half of the mandatory speed zones, vessels recklessly approached up to four times the speed limit set to protect endangered whales.**

Top Recorded Vessel Speeds in Mandatory 10-Knot Speed Zones (in Knots)			
SMA	Nov 2017/July 2018	Nov 2018/July 2019	Nov 2019/July 2020
Cape Cod Bay	26.9	28.1	37.6
Off Race Point	23.1	31.3	23.6
Great South Channel	33.9	32.2	36.6
Block Island Sound	19.6	34.1	37.9
Ports of New York/New Jersey	38.8	35.0	36.3
Entrance to the Delaware Bay	34.9	35.3	29.4
Entrance to the Chesapeake Bay	40.0	38.4	36.2
Ports of Morehead City and Beaufort	39.9	37.6	37.5
Wilmington, North Carolina, to Brunswick, Georgia	39.7	39.3	39.3
Calving and Nursery Grounds (Georgia to Florida)	39.0	39.7	34.3

*Top speeds reached in each SMA reported in knots. Note: Analysis was limited to vessels traveling 40 knots or less.*



Of the non-compliant vessels, the top five vessel classes were cargo vessels, tankers, passenger vessels, tugboats, and non-fishing vessels. Nearly 50% of the speeding vessels each SMA season were cargo vessels.

### Most Common Speeders Are Massive Cargo Vessels

Percent of All Vessels Exceeding 10 Knots			
VESSEL CLASS	2017/2018	2018/2019	2019/2020
Cargo	49.8%	49.4%	47.4%
Tanker	14.0%	14.5%	15.3%
Passenger	13.3%	14.0%	14.0%
Tug	7.7%	7.1%	6.8%
Non-Fishing	4.2%	4.4%	4.8%

All vessels 65 feet or longer must comply with SMA speed restrictions; however, vessels longer than three football fields (1,080 feet) were recorded exceeding mandatory speed limits.

Percent of All Vessels Exceeding 10 Knots			
VESSEL LENGTH IN METERS (FEET)	2017/2018	2018/2019	2019/2020
19.8 – 50 (65 – 164)	27.7%	27.4%	28.1%
50.1 – 100 (164.1 – 328.1)	4.5%	4.7%	5.3%
100.1 – 150 (328.2 – 492.1)	11.0%	10.2%	10.6%
150.1 – 200 (492.2 – 656.2)	34.2%	34.4%	33.1%
200.1 – 250 (656.3 – 820.2)	15.9%	16.3%	16.0%
250.1 – 300 (820.3 – 984.3)	5.2%	5.8%	5.9%
300.1+ (984.4)	1.0%	0.8%	0.9%
NA	0.6%	0.4%	0.2%

Vessels ranged in length from 19.8 meters (65 feet) to over 300 meters (984 feet).

### Flags of Convenience



All vessels are required to be registered to a country, and that country is responsible for regulating the activities of the vessels that fly its flag.<sup>30</sup> However, vessels do not have to be flagged to the country in which the owners or operators reside. Some countries profit off the use of their flag in return for fewer regulations and more lax enforcement.<sup>31</sup> When vessels fly flags that do not belong to their country of ownership, it is known as a “flag of convenience.” For example, a vessel owned by a U.S. company can be flagged to Panama to reduce regulations. The International Transport Workers’ Federation has identified flag states that are commonly used as flags of convenience, including Panama, Marshall Islands, and Liberia.<sup>32</sup>

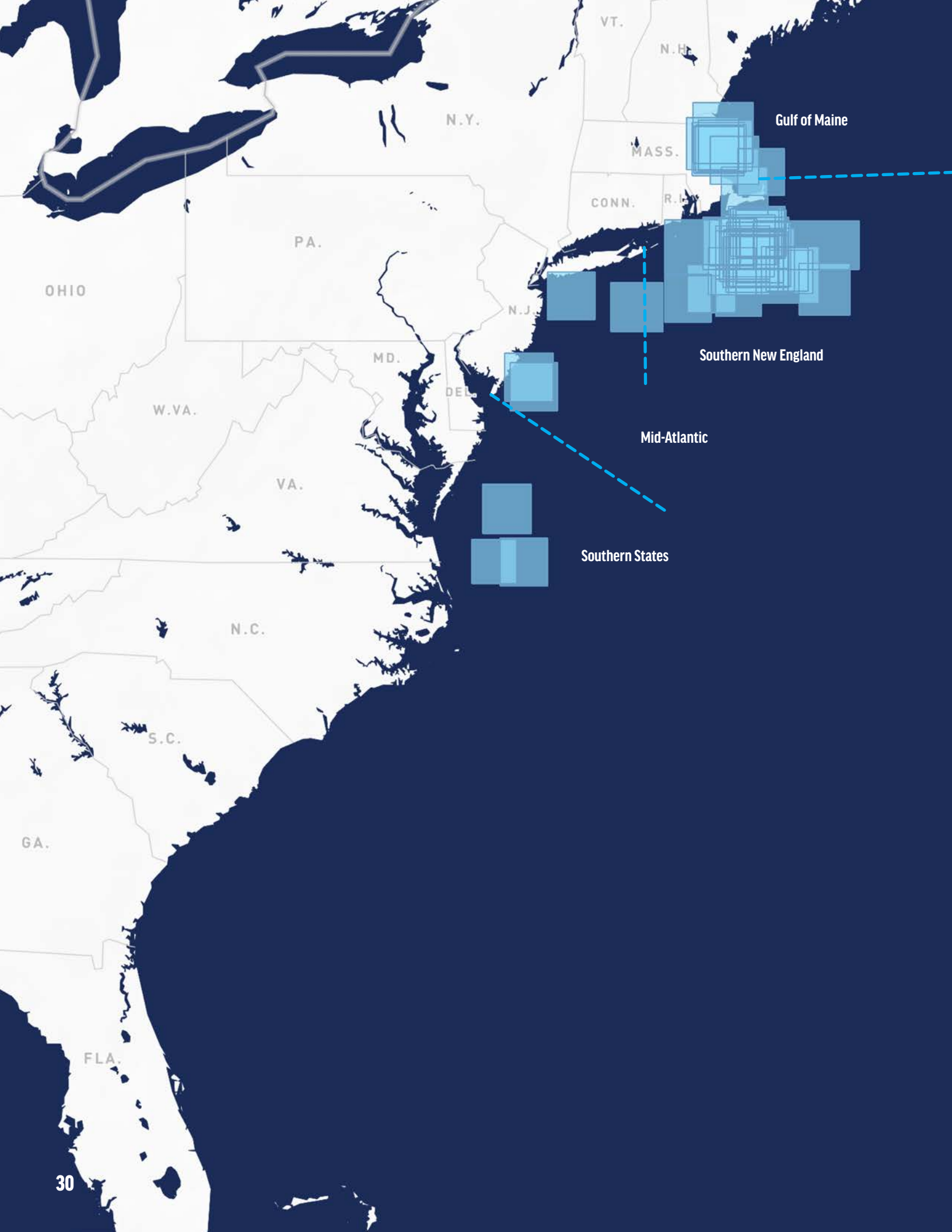
Two-thirds of speeding vessels were foreign-flagged, while U.S.-flagged vessels accounted for the rest. The top five flag states for vessels violating the SMA rules were the United States, Panama, Marshall Islands, Liberia, and Germany, with Singapore tying with Germany in the 2018/2019 SMA season.

### 1/3 of Speeding Vessels were U.S.-Flagged

Percent of Vessels Exceeding 10 Knots			
FLAG STATE	2017/2018	2018/2019	2019/2020
United States	34.2%	33.8%	34.4%
Panama	10.8%	10.2%	10.1%
Marshall Islands	8.6%	9.5%	8.1%
Liberia	6.8%	6.5%	7.3%
Germany	6.1%	5.3%	5.0%
Singapore	N/A	5.3%	N/A

# Cooperation in Dynamic Management Areas

DMAs are voluntary slow zones where vessels 65 feet and longer are asked to slow down to 10 knots or less.<sup>29</sup> These areas are triggered by visual sightings of three or more North Atlantic right whales within an area and are temporary – lasting 15 days from the sighting.



DMAs are intended to account for the whales' variable range outside of static SMAs.<sup>29</sup> NMFS alerts mariners to DMA activations using radio, websites, email, and fax distribution lists.<sup>33</sup> Additionally, NMFS allows anyone to sign up for email or text notifications to receive information on North Atlantic right whale slow zones and DMAs.<sup>34</sup>

Oceana analyzed non-cooperation (the number of vessels that exceeded the suggested 10-knot speed limit) in each DMA that occurred between 2017 and 2020. In our analysis, 3,776 vessels made a total of 6,264 vessel transits through DMAs during these years. A total of 75 DMAs were triggered over this period, which were grouped by region for ease of analysis. However, because DMAs are triggered by the presence of whales, not every region had DMAs in certain years. The four regions are:

- **Gulf of Maine**  
(Maine through the tip of Cape Cod, Massachusetts)
- **Southern New England**  
(the tip of Cape Cod, Massachusetts, to Montauk, New York)
- **Mid-Atlantic**  
(Montauk, New York, to Cape May, New Jersey)
- **Southern States**  
(Cape May, New Jersey, through Florida)

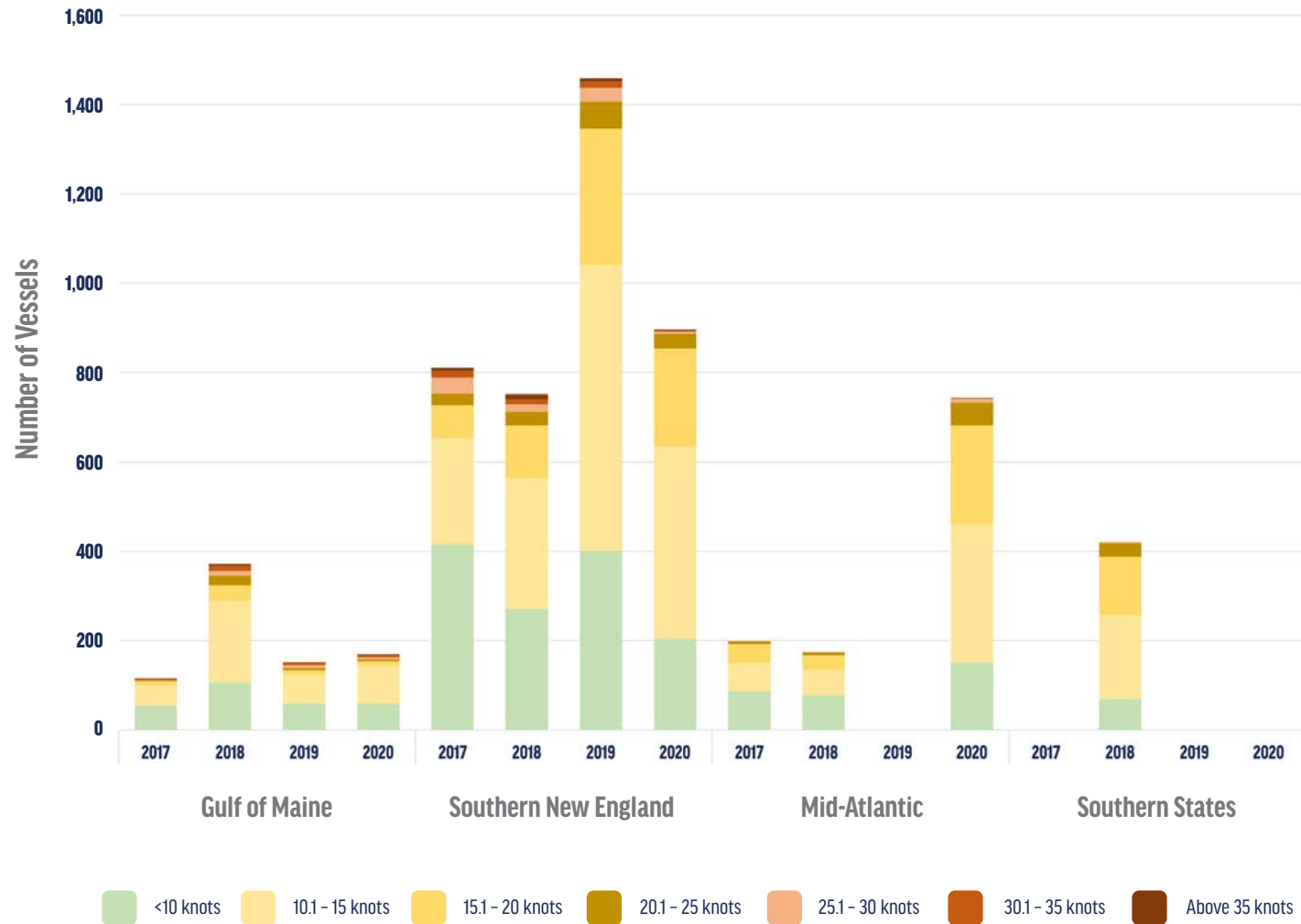
**North Atlantic right whales are found up and down the East Coast of the United States and Canada, where vessels, ports, and shipping channels overlap with calving grounds, feeding areas, and migration routes.**



Vessel Non-Cooperation in Voluntary Speed Zones				
ZONE	2017	2018	2019	2020
Gulf of Maine	53.5% (62)	71.5% (266)	61.2% (93)	65.3% (111)
Southern New England	48.5% (393)	63.9% (480)	72.5% (1,057)	77.2% (692)
Mid-Atlantic	56.3% (112)	55.2% (96)	N/A	79.7% (593)
Southern States	N/A	83.6% (352)	N/A	N/A

Percentage of non-cooperating vessels in DMAs. Number of non-cooperating vessels in DMAs in parentheses.

### DMA Non-Cooperation



Maximum speeds detected for vessels within active DMAs in the four regions from 2017 to 2020. Stacked bars represent the total number of vessels traveling through the DMA while it was active. Green indicates vessels that never exceeded the 10-knot suggested speed limit, while darker orange represents vessels in increasingly higher speed classes.

Our analysis also revealed the top speeds of vessels transiting through DMAs during this time. Top speeds ranged from 22 knots (25.3 mph) to 40 knots (46 mph), although our analysis was limited to vessels transiting at less than or equal to 40 knots.

Top Recorded Vessel Speeds in Voluntary Speed Zones (in Knots)				
ZONE	2017	2018	2019	2020
Gulf of Maine	35.6	39.0	36.0	37.3
Southern New England	39.6	39.9	40.0	37.3
Mid-Atlantic	28.7	22.0	N/A	38.5
Southern States	N/A	26.1	N/A	N/A

Top speeds reached in each DMA region reported in knots. Note: Analysis was limited to vessels traveling 40 knots or less.

The top five vessel types that were most likely to exceed the suggested 10-knot speed limit over all four years were cargo vessels, tankers, passenger vessels, trawlers, and tugboats.






### Most Common Speeders Are Massive Cargo Vessels

VESSEL CLASS	PERCENT OF ALL VESSELS EXCEEDING 10 KNOTS
Cargo	41.7%
Tanker	20.0%
Passenger	17.5%
Trawler	4.8%
Tug	4.6%

Vessels from 19.8 meters (65 feet) to over 300.1 meters (985 feet) exceeded the suggested 10-knot speed limit over all four years.

Percent of Vessels Exceeding 10 Knots	
VESSEL LENGTH IN METERS (FEET)	% of Vessels Exceeding 10 Knots
19.8 - 50 (65 - 164)	29.8%
50.1 - 100 (164.1 - 328.1)	4.1%
100.1 - 150 (328.2 - 492.1)	6.7%
150.1 - 200 (492.2 - 656.2)	30.1%
200.1 - 250 (656.3 - 820.2)	20.8%
250.1 - 300 (820.3 - 984.3)	7.5%
300.1+ (984.4)	1.1%

Two-thirds of the vessels that exceeded the suggested 10-knot speed limit over all four years of data were flagged to foreign countries. The remaining third flew U.S. flags. The five flag states that most often violated the 10-knot speed limit were the United States, Marshall Islands, Panama, Liberia, and Germany.

FLAG STATE	Percent of Vessels Exceeding 10 Knots
 United States	33.26%
 Marshall Islands	9.45%
 Panama	8.89%
 Liberia	7.79%
 Germany	4.46%

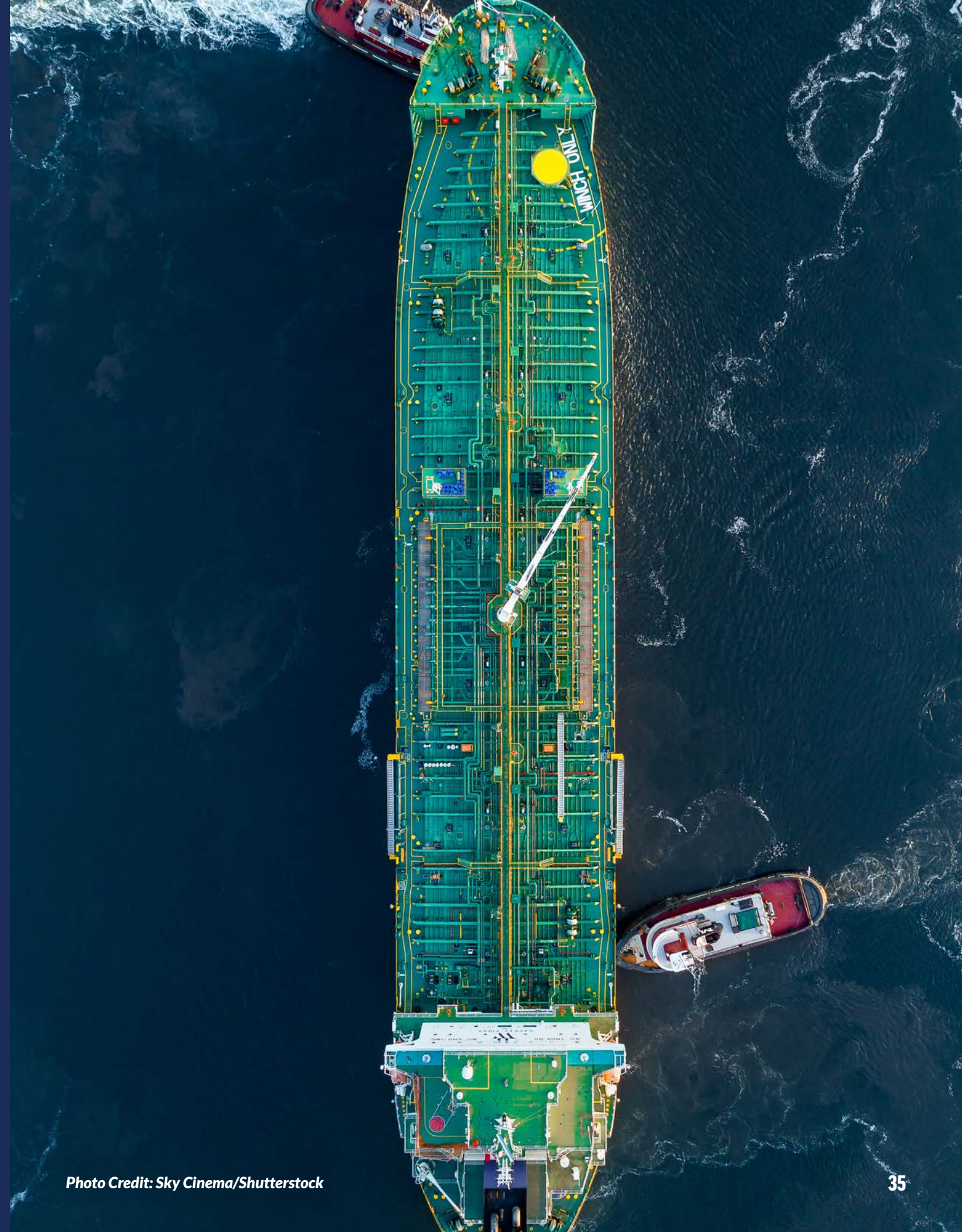


Photo Credit: Sky Cinema/Shutterstock

# Summary of Findings

## Seasonal Management Areas

SMA non-compliance ranged from **32.7%** to **89.6%** over all three seasons.



### The SMAs with the worst compliance were:

1. Wilmington, North Carolina, to Brunswick, Georgia (**average of 87.5% non-compliance**)
2. Ports of New York/New Jersey (**average of 79.3% non-compliance**)
3. Calving and nursery grounds from Georgia to Florida (**average of 72.1% non-compliance**)
4. The entrance to the Chesapeake Bay (**average of 64.2% non-compliance**)
5. The entrance to the Delaware Bay (**average of 56.4% non-compliance**)

These five SMA zones all had non-compliance **over 50%** every season, with the SMA for Wilmington, North Carolina, to Brunswick, Georgia, always **over 85%** non-compliant.



Cargo vessels were consistently the least compliant vessel class with percentages between 46% and 50%, followed by tankers, passenger vessels, tugboats, and non-fishing vessels.



Vessels flagged to the United States constituted around 34% of non-compliant vessels, while the remaining two-thirds were foreign-flagged. Vessels flagged to the United States, Panama, Marshall Islands, Liberia, Singapore, and Germany were the worst offenders.

## Dynamic Management Areas



DMA non-cooperation ranged from **48.5%** to **83.6%** over the four-year period of analysis, meaning that nearly 50% or more of the vessels traveling through DMAs exceeded the requested speed limit.

**More than 80%** of the vessels traveling through DMAs in the Southern States region violated the speed restrictions. However, because of the sheer volume of traffic in the Southern New England DMAs, this region poses the greatest threat despite having a lower percentage of non-cooperation than others. **Over 2,600** vessel transits exceeded the speed restrictions over the four-year period.



Similar to results in SMAs, cargo vessels were the worst offenders, violating the voluntary speed zones 41.7% of the time, followed by tankers, passenger vessels, trawlers, and tugboats.



In DMAs, the flag states for vessels with the highest rates of non-cooperation after the United States were the Marshall Islands, Panama, Liberia, and Germany.



Photo Credit: FWC



# Discussion

Our analysis clearly shows that speeding vessels continue to threaten the North Atlantic right whale. Vessels are not slowing down in the mandatory or voluntary slow zones established to protect these whales. Non-compliance/cooperation rates (32.7% to 89.6% in SMAs and 48.5% to 83.6% in DMAs) are consistently high. But non-compliance/cooperation are not the only problems...



**T**he current SMAs do not reflect some new locations where North Atlantic right whales are regularly observed. Additionally, the exemptions for smaller vessels less than 65 feet, and for federal vessels, like Coast Guard and Navy ships, continue to leave these critically endangered whales vulnerable to deadly strikes. We know that slow speeds help protect whales. To effectively protect this species, the federal government must expand existing slow zones in time and size, reduce loopholes and exemptions to the speed limit, and enhance compliance and enforcement across the board.

## Mandating Speed Limits in DMAs

Both Oceana and NMFS found that an alarmingly high number of vessels violate the voluntary speed restrictions in DMAs.<sup>10</sup> In fact, Oceana's analysis found only one DMA in Southern New England in 2017 where more than 50% of the vessels traveled less than 10 knots. This lack of compliance is likely due to the voluntary nature of the DMAs compared to the mandatory requirements of SMAs. It may also be that vessels underway and headed toward a DMA when it's activated may not be notified of the activation, or if they are, may be more incentivized to ignore it due to strict shipping schedules. The reactive nature of DMAs, while necessary, can be an impediment to planning voyages. The maritime industry is rigidly scheduled, with companies possibly facing costs for

missed deadlines at port, which provides little incentive to abide by voluntary measures. Making slowdown zones mandatory, rather than voluntary, could allow shipping companies to build slow zones into their schedules, removing the incentive for speeding in these areas.

During the 2008 rulemaking for the Vessel Speed Rule, NMFS stated that if DMAs were not successful at getting vessels to slow down, they would "consider making them mandatory, through a subsequent rulemaking."<sup>35</sup> With only around 360 whales left and more than 50% of vessels exceeding the voluntary speed limit, it is time to take that action: NMFS should require that all vessels slow down to 10 knots or less in areas where North Atlantic right whales are found.

## Expanded Protections

North Atlantic right whales are altering their range, likely due to shifting food sources.<sup>21</sup> The government has a legal mandate to expand and create new protections for this critically endangered species to reflect where the whales are presently congregating. The current SMAs were developed by NMFS before the release of the 2008 Vessel Speed Rule — over a decade ago. Since that time, new regions have become increasingly important to the species, such as the area south of Nantucket where around 100 whales — more than a quarter of the existing



population — gathered in January 2019.<sup>36</sup> In 2018 alone, 15 DMAs were established near similar locations south of Nantucket.<sup>37</sup> Likewise, North Atlantic right whales consistently show up in areas off the coasts of Massachusetts and Rhode Island. Since 2010, nearly 200 North Atlantic right whales, including 34 calving females, were spotted in the area.<sup>38</sup> NMFS needs to expand SMAs to areas where the whales are regularly observed, especially in areas where DMAs continue to be extended due to the presence of whales.

### Length Requirements

Current SMA and DMA speed limits only apply to vessels 65 feet and over, even though vessels of all sizes can seriously injure or kill right whales.<sup>39</sup> This was sadly demonstrated in February 2021 when a 54-foot vessel traveling at 21 knots struck Infinity’s month-old calf, leaving it with propeller cuts, broken ribs, and a fractured skull — injuries that ultimately proved fatal.<sup>45</sup> Between 1999 and 2012, experts evaluated 18 cases of injuries in which vessels struck North Atlantic right whales. Of those 18 cases, 11 (61%) involved vessels less than 65 feet long.<sup>40</sup>

Precedent for changing length requirements exists. Canada’s most recent protections for the North Atlantic right whale included expanding their 10-knot speed zones to include vessels as small as 43 feet long.<sup>41</sup> Additionally,

to protect the whales in Cape Cod Bay, the state of Massachusetts imposed seasonal speed limits on all vessels, including those smaller than 65 feet.<sup>42</sup>

The current protections are analogous to imposing speed limits for semi-trucks to protect pedestrians, while allowing cars and SUVs to go as fast as they want, leaving pedestrians still vulnerable to these just-as-deadly vehicles. Expanding the coverage of the Vessel Speed Rule to vessels less than 65 feet long will further protect the roughly 360 whales that remain.

### Federal Exemptions

All federal vessels — regardless of agency, type of vessel, or vessel activity — are exempt from the Vessel Speed Rule, purportedly to prevent some agencies from compromising navigation, human safety, or even national security.<sup>43</sup> While an exemption along these lines is certainly warranted, this one is overly broad. For instance, police cars and ambulances are generally expected to comply with the speed limit and traffic laws, unless responding to an emergency. The federal vessel exemption could easily be narrowed to cover only those government activities that involve national security or safety concerns. In fact, Canada has already implemented this kind of narrow exemption for federal vessels and, in 2019, the government fined two Canadian Coast Guard vessels for speeding in a mandatory slow zone.<sup>41,44</sup>

Additionally, NMFS exempts state law enforcement vessels only if they are engaged in law enforcement or search-and-rescue duties.<sup>45</sup> A 2004 review of the Large Whale Ship Strike Database revealed that U.S. Navy and Coast Guard vessels were responsible for 17.1% and 6.7% of strikes, respectively, in cases where the type of vessel was known. It should be noted that it is standard Navy and Coast Guard practice to report vessel strikes, whereas other types of vessels may be underreporting, which may create a bias.<sup>46</sup> Nonetheless, requiring these vessels to slow down when national security and human safety are not at risk would reduce the threat they pose to North Atlantic right whales.



### Enforcement

Compliance with the Vessel Speed Rule is alarmingly low in both SMAs and DMAs. The federal government is responsible for investigating, enforcing, and issuing penalties for violations of the Vessel Speed Rule. If a vessel exceeds a 10-knot speed limit within an SMA for reasons beyond the scope of navigational safety exemptions, a range of enforcement measures can be issued, including written warnings, educational letters, and/or monetary fines and penalties. Between 2017 and 2019, the government contacted 178 vessels related to enforcement of the Vessel Speed Rule — a stark contrast to the thousands of vessels found speeding in our analysis over a similar time frame.<sup>10</sup> This is a solvable problem.

We can see which vessels are speeding and where, and so can the government. To save this species, NMFS needs to not only expand mandatory protections, but also ensure that the ones we already have are well-enforced. There are several ways to improve compliance and enforcement, including:

- Performing ongoing evaluations of vessel speeds using AIS to identify vessels that are not obeying mandatory speed limits;
- Ensuring that all relevant navigational charts are up to date during Port State Control inspections, verifying that they reflect current SMAs and speed restrictions;
- Ensuring that the exemptions to the Vessel Speed Rule are not abused, by requiring periodic reporting of when and why speed overages occur;
- Inspecting vessel logs, electronic chart displays, and voyage data recorders as part of regular U.S. Coast Guard boardings to check for abuse of the exemption;
- Seeking sufficiently high penalties on the same scale as port penalties for late arrivals, to deter multimillion-dollar corporations from ignoring speed limits and passing the fines on to the consumer; and
- Increase funding and support to agencies such as NOAA and the U.S. Coast Guard to ensure they have the necessary resources to promptly enforce the Vessel Speed Rule.

The North Atlantic right whale's range extends from the United States into Canada. Here is how the two countries' protective measures for the species compare:

HOW PROTECTIONS COMPARE		
CONSERVATION MEASURE	 UNITED STATES	 CANADA
Mandatory dynamic shipping zones/areas	NO	YES
Mandatory static speed reduction zones/seasonal management areas	YES	YES for Gulf of St. Lawrence NO for Cabot Straight
Year-round or seasonal protections	Seasonal	Seasonal
Vessel size affected by speed limits	65 feet and longer	43 feet and longer
Federal vessel speed requirements	Exempt under all circumstances	Only exempt under limited circumstances
Speed limits in slow zones	10 knots	10 knots
Depth exemptions	None	Speed restrictions not required for vessels in <20 fathoms (<120 feet of water) unless a whale is sighted
Restricted areas/areas to be avoided	Mandatory and voluntary based on location	Mandatory or a reduced speed of 8 knots (exemptions for science and rescue) voluntary area to be avoided in the Roseway Basin
Modified shipping lanes/traffic separation schemes	Mandatory and voluntary based on location	Mandatory

# Conclusion and Recommendations

## Current regulations fall short.

We can see the problem, and we know how to fix it. To protect this species, Oceana recommends that NMFS and the U.S. Coast Guard update the Vessel Speed Rule or initiate new rulemaking that would:

1

Expand and establish new SMAs

2

Make compliance with DMAs mandatory or require mandatory compliance in all reactive speed zones

3

Expand the Vessel Speed Rule to include vessels under 65 feet in length

4

Expand AIS requirement to include vessels under 65 feet in length and require continuous use of AIS

5

Improve compliance and enforcement of the mandatory speed limit

6

Narrow the federal agencies' exemption from the Vessel Speed Rule



The North Atlantic right whale is one of the most endangered whales on the planet. **Only around 360 remain.**

## Acknowledgments

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*Note: All photos of North Atlantic right whales were taken under permits from NOAA or Fisheries and Oceans Canada where required.*

# Methodology

This analysis was conducted using the Global Fishing Watch (GFW) mapping platform, which provides a powerful tool for ocean governance, empowering anyone to view or download data and investigate global fishing activity in near real-time for free. Oceana used the GFW mapping platform to analyze vessel speeds in North Atlantic right whale conservation areas. The GFW database compiles data from Automatic Identification System (AIS) transmissions and vessel registries, including the vessel's unique Maritime Mobile Service Identity (MMSI), location, speed, class, length, flag state, timestamp, and date. AIS data is pulled from both terrestrial and satellite sources.

GFW uses machine learning to classify vessel behavior and combine databases with identifying information. The flag state of a vessel is first determined by what is listed in government vessel registries. If this is not known, GFW uses the first three digits of the vessel's MMSI, which serves as an identifier of the country responsible for the vessel.<sup>47</sup> If the flag is missing from the registry and the vessel's MMSI does not have a valid three-digit country code, the vessel's flag is designated as "unknown." Similarly, vessel length is first assigned based on registry information. If a vessel's length is not available from a registry, GFW uses machine learning to infer its length based on its movement patterns.<sup>48</sup> Vessel class is assigned by GFW's neural net, which uses behavioral and registry data to determine the class to which each vessel belongs. If the neural net cannot give any class a probability of greater than 50%, the vessel is assigned a more general class, such as "fishing" or "non-fishing." The coordinates for the speed restriction zones and the time periods when they were active were obtained from the U.S. National Oceanic and Atmospheric Administration (NOAA).<sup>29</sup> Seasonal management areas

span calendar years. For this report, compliance was calculated across seasons to allow for a continuous analysis of the entire open period of the SMA. SMA seasons for this report are:

- November 1, 2017, to July 31, 2018;
- November 1, 2018, to July 31, 2019; and
- November 1, 2019, to July 31, 2020.

As DMAs are triggered by the presence of whales, compliance was calculated by region rather than season. The DMAs were divided into four regions:

- Gulf of Maine (Maine through the tip of Cape Cod, Massachusetts);
- Southern New England (The tip of Cape Cod, Massachusetts, to Montauk, New York);
- Mid-Atlantic (Montauk, New York, to Cape May, New Jersey); and
- Southern States (Cape May, New Jersey, through Florida).

Oceana calculated the percentage of non-compliant vessels in a particular area as the number of MMSIs with at least one AIS signal exceeding 10 knots divided by the total number of MMSIs detected in the area over the relevant time span. The data were filtered to only include vessels that recorded at least two AIS signals during transit through a speed restriction zone. Furthermore, the data were analyzed for erroneously high speeds, which were also removed. For example, if a vessel's AIS recorded the following consecutive speeds: 11, 12, 11, 11, 38, 12, then the outlier would be removed from the data as an error. All vessel speeds greater than 40 knots (46 mph) were filtered out of the dataset as vessels included in this study were not capable of reaching 40 knots, and these speeds were likely errors made either by the transponder or by the

# Methodology

receiver. However, the points over 40 knots made up about 0.002% of the total data.

In its January 2021 report, NMFS conducted its own analysis of vessel speed compliance using distance-weighted average speed. Distance-weighted average speed totals the distance a vessel travels and records the speed during each segment of its transit. Each speed segment is then multiplied by the fraction of the total distance traveled and summed to produce an average speed weighted by each segment's contribution.<sup>10</sup>

This method of reporting compliance is notably different from the method used here, in which a vessel was determined to be non-compliant if at least one position message exceeded 10 knots. For example, the NOAA report method smooths out short bursts of fast speeds, while this report uses a binary system of compliance — a vessel either has or has not exceeded the 10-knot speed limit.

GFW, a provider of open data for use in this report, is an international nonprofit organization dedicated to advancing ocean governance through increased transparency of human activities at sea. The views and opinions expressed in this report are those of the authors, which are not connected with or sponsored, endorsed, or granted official status by GFW. By creating and publicly sharing map visualizations, data, and analysis tools, GFW aims to enable scientific research and transform the way our ocean is managed.

Oceana's online tool called Ship Speed Watch allows anyone to track vessel speeds in speed zones designed to protect North Atlantic right whales along the East Coast of the U.S. and Canada. Ship Speed Watch uses vessel information from the GFW database.

This information is transmitted from a vessel's AIS device, which is collected via satellites and terrestrial receivers. Faulty AIS devices, user error, intentional manipulation, crowded areas, poor satellite reception, and transmission flaws are factors that contribute to noise and errors in AIS data, and sometimes those inaccuracies can be reflected in the speed and location of a vessel. Vessel operators can accidentally or purposefully enter false information into their ship's AIS, thus concealing their identity or location. In crowded areas, such as ports, the massive number of radio transmissions can crowd the bandwidth of satellite and terrestrial receivers, leading to inaccuracies as well. For these reasons, Ship Speed Watch information must be relied upon solely at your own risk.

Our analysis cannot determine which vessels fall under exemptions to the Vessel Speed Rule (e.g., for U.S. federal government vessels, foreign-flagged vessels engaging in joint exercises with the U.S. Navy, and vessels deviating to maintain safe maneuvering speed due to inclement wind and current conditions), so some speeding vessels counted in this analysis may have legal exemptions. See 50 C.F.R. § 224.105(a) (providing an exemption for U.S. vessels owned or operated by, or under contract to, the Federal Government and for foreign sovereign vessels when engaging in joint exercises with the U.S. Navy); 50 C.F.R. § 224.105(c) (allowing for deviations from the 10-knot speed limit to maintain safe maneuvering speed and the requirement to enter the deviation into the vessel's logbook).



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**Global Fishing Watch, a provider of open data for use in this article, is an international nonprofit organization dedicated to advancing ocean governance through increased transparency of human activity at sea. The views and opinions expressed in this article are those of the authors, which are not connected with or sponsored, endorsed or granted official status by Global Fishing Watch. By creating and publicly sharing map visualizations, data, and analysis tools, Global Fishing Watch aims to enable scientific research and transform the way our ocean is managed.**

A large whale carcass lies on a sandy beach. Several workers in yellow and green protective gear are gathered around the whale, some kneeling and examining it. A yellow excavator is positioned to the left of the whale. The background shows a grassy field and rolling hills under a blue sky with scattered clouds.

#RightWhaleToSave

[usa.oceana.org/SpeedingTowardExtinction](https://usa.oceana.org/SpeedingTowardExtinction)

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**OCEANA** Protecting the  
World's Oceans

*Oceana is the largest international advocacy organization dedicated solely to ocean conservation. Oceana is rebuilding abundant and biodiverse oceans by winning science-based policies in countries that control one-third of the world's wild fish catch. With more than 225 victories that stop overfishing, habitat destruction, pollution, and the killing of threatened species like turtles and sharks, Oceana's campaigns are delivering results. A restored ocean means that 1 billion people can enjoy a healthy seafood meal, every day, forever. Together, we can save the oceans and help feed the world. Visit [usa.oceana.org](https://usa.oceana.org) to learn more.*