

September 17th, 2019

Dear Senator Collins,

As scientists with expertise on the North Atlantic right whale (*Eubalaena glacialis*) and its conservation, we are concerned over recent efforts by Maine's elected officials (State and Federal), the Maine Department of Marine Resources (DMR), and the Maine Lobstermen's Association (MLA) to undermine proposed conservation measures critical to the North Atlantic right whale's survival. In contrast to claims that Maine lobstermen were "largely forgotten," the proposed right whale conservation measures were developed with, and agreed to by, MLA and ME DMR staff at a National Marine Fisheries Service Atlantic Large Whale Take Reduction Team (TRT) meeting in April 2019, which was convened under the auspices of the U.S. Marine Mammal Protection Act (MMPA).

In recent letters sent to the President of the United States, Maine's elected officials requested delaying or suspending regulations to implement the proposed conservation measures. The MLA has followed this with a letter withdrawing from the conservation agreement that they helped formulate during the TRT process. Both letters contain statements that do not reflect the facts in hand and minimize or ignore the changes needed to prevent the North Atlantic right whale from going extinct. Here we aim to set the record straight.

The North Atlantic right whale lives primarily in the waters of the Exclusive Economic Zone (out to 200 miles from shore) of the United States and Canada. It is listed as Endangered under the both U.S. Endangered Species Act and the Canadian Species at Risk Act, and Critically Endangered on International Union for the Conservation Of Nature's Red List (IUCN 2019). About 400 North Atlantic right whales survive, including fewer than 100 breeding females. Over the last three years, 28 right whales, including at least five reproductive females, and seven additional females, many just coming into reproductive age, were found dead. A recent study indicates that between 2003 and 2018, 88% of all known-cause NA right whale deaths were the result of human activities (38 of 43 animals), and that no adults or juveniles were found to die of natural causes during that time period (Sharp et al. 2019). Over the last ten years, the leading cause of death has been entanglement in fishing gear, primarily in the buoy lines used by lobster, crab, and other trap fisheries. Shipstrikes are the second most common source of mortality. Entanglements and shipstrikes occur in both U.S. and Canadian shelf waters as the whales typically migrate in the spring from winter calving zones off Florida and Georgia up the east coast of North America to feeding and breeding areas in both countries.

**Right Whale Mortality from Entanglements is Higher than Observed** The comprehensive photo-identification and catalog work on this species conducted over four decades has shown that the detected numbers of right whale deaths represent less than half of the actual deaths. Because long-term entanglements lead to weight and fat loss, whales with chronic entanglements sink after death and remain undetected. Other whales caught in heavy offshore gear can drown and remain entangled at depth and therefore are undetected. In contrast, whales killed by shipstrikes usually die instantly so their condition is uncompromised and their carcasses float, which makes them more easily detected and reported.

**Right Whale Entanglement Rates are High** Nearly 85 percent of all surviving North Atlantic right whales carry scars from previous entanglements, and more than half have been entangled multiple times. Although this shows that whales can break free from minor entanglements, an examination of characteristic scars whales acquire when entangled shows that they also are frequently seriously injured while struggling to break free. In addition, entanglement injuries have become more severe in the last ten years, likely due to increases in rope strength which occurred in the mid 1990's (Knowlton et al. 2016). Not all entangled whales die, but right whales observed carrying fishing gear or bearing deep entanglement wounds, typically exhibit poorer health for years afterwards, reducing both survival and reproductive rates critical to species recovery (Robbins et al., 2015; Pettis et al., 2017; van der Hoop, et al., 2017).

**Entanglements Occur Everywhere there is Fishing Gear** Both the MLA and the elected officials' letters claimed that Maine's lobster pots do not contribute to the entanglement problem. The scientific data suggest otherwise. The MLA letter claims that the main gear involved in entanglements was gillnets, yet this is unsupported by the data (Johnson, 2005; NMFS TRT Entanglement reports 2001-2016). A review of 115 right whale entanglement case studies (<https://www.bycatch.org/project/case-studies-north-atlantic-right-whale-fishing-gear-entanglements>) shows that 17 (15%) had evidence of entanglement in gillnet gear from 1984 through 2016. Although gillnet gear should be addressed by NOAA Fisheries and the ALWTRT, the main gear type that occurs in U.S. waters is lobster gear.

In many cases of entanglements, neither gear type nor country of origin has been determined, for the following reason. Only a small portion (115, or 7.8%) of all entanglement events (n = 1469 at the end of 2016) were observed carrying fishing gear (Knowlton et al., 2019), and of those, only 12% were identified to location (Knowlton et al. 2012) due to inadequate gear marking. In other words, less than one percent of all entanglements have ever been identified to original location. The survey and sightings data in recent years demonstrates that right whales can occur in all US Atlantic waters at any time. All fixed gear fisheries in all US and Canadian waters create entanglement risk, and it is unlikely that the origin of most entanglements will ever be identified.

**Evaluating Entanglement Risk** There are three components to entanglement risk: 1) the number of whales in an area, 2) the density of gear in that area, and 3) the strength and weight of the gear, which contributes to the severity of the entanglement as well as to how easily a right whale can self-release if it comes into contact with ropes.

To correct mis-information regarding the three components of risk, here are the facts.

**1) Right Whales are Common in in both Maine and U.S. Waters** Right whales have been observed in Maine lobster management zone waters every month of the year (see monthly maps in Appendix I), sometimes in significant numbers. This year-round occurrence is consistent with recent historical records of right whales in Maine waters (Wikgren et al., 2014). North Atlantic right whales dive for long times, have no dorsal fin, and are difficult to detect at sea. It is entirely believable that most fishermen have never seen a right whale in Maine waters, but that does not mean they are absent. Further, the maps in Appendix I are a significant underestimate of the number of whales that pass through the area because

systematic visual or acoustic surveys (that would detect more right whales) have not been conducted for several years.

Not all right whales have gone to Canada in the summer. Based on quantitative survey estimates, about 130 to 150 right whales have been seen in the Gulf of St Lawrence each summer in recent years (NOAA-NEFSC unpublished data). This indicates that 250 to 270 right whales are occurring elsewhere, many of them in U.S. waters. Further, to get to Canadian waters, right whales have to travel from spring time aggregations in Massachusetts Bay through the Gulf of Maine, both inshore and offshore. Other aggregation areas (e.g. south of Nantucket) have recently been discovered (Leiter et al, 2017). The North Atlantic right whales' primary prey, *Calanus finmarchicus*, occurs at some of its highest abundances in the western Gulf of Maine, and these levels of occurrence may be sustained into the future (Record et al., 2019). As right whales become increasingly food-stressed by climate-driven oceanographic changes, their movements may become more unpredictable, and the western Gulf of Maine may become an increasingly important foraging site for the species (Record et al., 2019).

***Because right whales are difficult to see, are distributed unpredictably, and because Maine waters have high concentrations of the whales' primary prey and have not been subject to systematic surveys in recent years, the numbers of North Atlantic right whales that occur in Maine waters are likely significantly underestimated by fishermen and managers.***

**2) Lobster Trap Density by Location** In both state and federal waters, Maine lobstermen fish about 3 million traps, New Hampshire lobstermen fish around 71,000 traps, and Massachusetts lobstermen fish around 300,000 traps (ASFMC, 2015 Stock Assessment Report). The offshore lobster fishery deploys between 50,000 and 80,000 traps, all in federal waters. The three million licensed traps in Maine's fishery represents an estimated 87% of the U.S. Atlantic lobster fishery (ASFMC, 2015). Only a few entanglements have been definitively tracked to Maine fisheries because it is extremely rare to identify the origin of gear to any fishery. Still, from 1997-2017 at least three right whales were entangled in Maine coastal lobster fisheries, and three more were caught in the offshore lobster fisheries off Maine (<https://www.greateratlantic.fisheries.noaa.gov/protected/whaletrp/reports/index.html>). Further, due to the previous actions of Maine's representatives at the TRT meetings, 70 percent of Maine's waters are exempt from regulations requiring fishing gear to be marked with country and state of origin, with the result that it is not currently possible to determine if right whale entanglements originated in Maine.

Gear marking has been offered by Maine as a "solution", and a better system of gear marking would certainly help us determine more about the geographic origin of gear. However, given the rarity of gear retrieved from entangled whales, it would be many years before any meaningful data are collected. This period could extend well past the estimated time to extinction (20-25 years) if current trends in right whale mortality do not change (Kraus et al, 2016; Pace et al, 2017). Further, given the latest sightings data, better gear marking won't change the fact that right whales go everywhere, and any rope in the water creates a risk of entanglement.

Combined, high trap density and simultaneous whale occurrence will lead to entanglements in any part of the ocean. Right whales are demonstrably occurring in the Maine lobster fishing zones, and 87 percent of

the lobster fishery in the United States is in Maine waters. To claim this is not a Maine problem because of a “disturbing lack of evidence” is misleading at best.

***The high trap counts, the current gear marking scheme, and the challenges in both recovering and identifying fishing gear of any kind, combine to significantly underestimate numbers of entanglement events in Maine waters.***

### **3) Severity of Entanglements affects Right Whale Health, Reproduction, and Survival**

Both MLA and the Maine elected officials characterized the “decision support tool” used by NMFS to evaluate risk as being under-developed and not peer-reviewed. This shortcoming is largely irrelevant, as any area where there are either high numbers of whales or a high density of fishing gear (or both) creates a high risk of entanglement. The legitimate criticism of the decision support tool was focused upon the TRT member’s subjective evaluation of the effects that various rope and gear configurations would have on the severity of an entanglement. However, the severity index was actually diluted by the contribution of many TRT members who had no background to assess entanglement severity, indicating that part of the decision support tool was significantly underestimated. There is published information that addresses the gear characteristics related to the severity of entanglement question. A detailed study of the risk of death from entanglements has shown that the heavier and stronger the rope, the greater chance whales will die (Knowlton et al, 2016; Robbins et al, 2015). Critical support provided by Arthur et al. (2015), showed that whale size and strength are correlated with the ability of a whale to break free from an entanglement. These studies show that many current fishing rope strengths exceed the ability of whales to break free.

One feature of entanglements that has not yet been incorporated into the formal TRT deliberations is that most entanglements have negative effects on whales, even if they don’t kill them (Rolland et al., 2017; Pettis et al. 2017; van der Hoop et al., 2017). Studies underway at the New England Aquarium and Duke University have shown that non-lethal entanglements reduce health, delay reproduction, and contribute to lower survival. By not including the sub-lethal effects of entanglement on right whales, the decision support tool significantly underestimated the risk of severity from different gear types. The corollary to this is that the risk reduction due to gear modifications was probably underestimated as well. A sensitivity analysis of the severity component in the risk equation (i.e. the subjective part) showed that risk reduction is most sensitive to this factor, and the TRT likely underestimated the risk reduction resulting from gear modifications. This suggests that the gear modifications agreed to at the TRT meeting in April would be successful at lowering entanglement risk at least 60%.

***To summarize, the number of North Atlantic right whales in Maine waters, the number of entanglements that are occurring in Maine waters, and the severity of all entanglements and their effects upon the right whale population are all significantly underestimated.***

**NOAA’s Legal Requirements** As required by U.S. Federal law, NOAA is developing new regulations to reduce entanglements in consultation with fishermen, scientists, environmental groups, and state and federal agencies that form the TRT, as well as with input from the general public. Contrary to the MLA’s claim that NMFS assumed the lobster fishery was the most significant cause of serious injury and mortality, it is clear from their regulatory actions that NMFS recognizes other threats to North Atlantic

right whales (<https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-ship-strikes-north-atlantic-right-whales>). However, the TRT process is the federally mandated legal approach under MMPA for solving the fishery component of serious injury and mortality. The proposed measures were developed with the Maine Department of Marine Resources, the Maine Lobstermen's Association, and individual Maine lobstermen to reduce the risk of deadly entanglements of North Atlantic right whales in New England by 60 percent.

**The 60% Entanglement Risk Reduction Goal is Biologically and Legally Defensible** The MLA letter claims that “the 60% reduction target is inconsistent with (NMFS) own data analyses and was imposed without consultation with the TRT”. Actually, the requested risk reduction is consistent with both the data and the law. The MMPA allowed “Potential Biological Removal” (PBR) level for North Atlantic right whales is one animal per year (the U.S. federally mandated level at which mortality from human activities won't cause the population to decline). Ship strike mortalities in the U.S. have declined since NOAA implemented a ship speed reduction rule in U.S. North Atlantic right whale habitats in 2008 (Conn and Silber, 2013; van der Hoop, et al, 2015).

In contrast, mortalities from entanglements, continue to rise (see Figure 1). Entanglement mortalities have averaged over 4 per year for the last decade, and since less than half of all mortalities are detected, it is likely that more than 8 right whales per year are dying from entanglements. If half of all the 8 entanglement deaths are due to Canadian fisheries, then 4 animals are dying annually in US fisheries. NMFS requested that the TRT consider 60% to 80% risk reduction. The 60% reduction goal could reduce deaths to less than 2 right whales per year, which does not meet PBR, but approaches it. The 80% reduction could have reduced entanglement deaths to 1 right whale per year, the legal limit of PBR (ignoring the right whale mortality attributable to ship strikes). The PBR rate is not set by the TRT, it is calculated by NOAA's NEFSC scientists as required by the MMPA on the basis of population size and trends data, and is then peer reviewed by the Atlantic Scientific Review Group to assess right whales status annually. No consultation with the TRT membership is required.

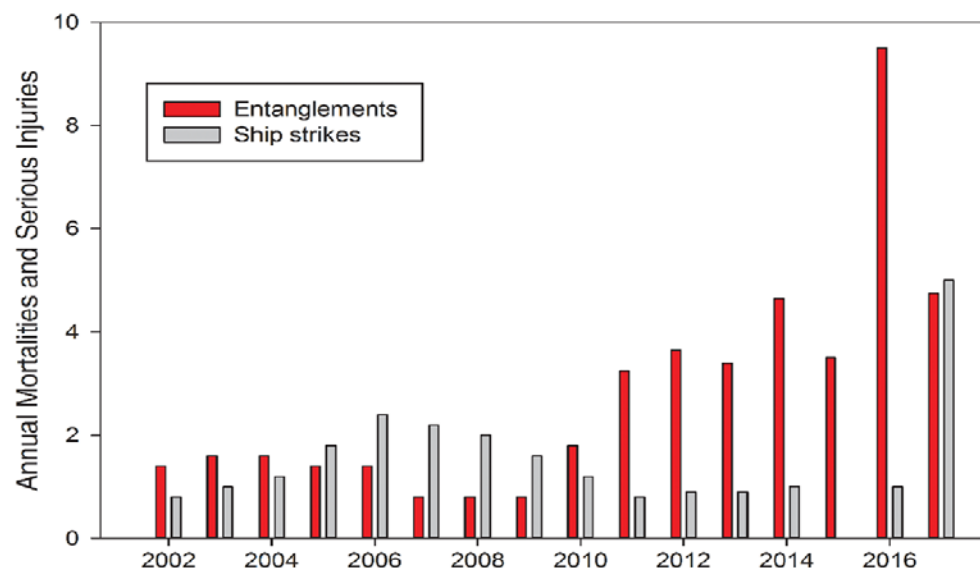


Figure 1. Diagnosed North Atlantic right whale vessel and entanglement mortality and serious injury (2002–2017). Reprinted from Moore, 2019.

**Proposed Gear Modifications to Reduce Entanglement Risk are Reasonable** Proposed measures developed by the TRT included reducing both the number and the strength of endlines (lines that go from the ocean surface to the bottom)—measures that would reduce entanglement risk and severity to adult whales while still meeting the economic needs of the fishing community. The letters from Maine’s elected officials implied that this would lead to a “failure of the lobster industry”. In fact, there are peer-reviewed papers that suggest some right whale risk reduction actions may be economically beneficial to lobster fisheries in the Gulf of Maine (Wilson, 2010; Myers et al., 2007). Further, the growing demand for sustainable seafood, suggests that the Maine lobster fishery would be well-served by assuming a leadership role in making lobster fisheries “whale safe”. Failure to resolve the right whale issue may even create a greater economic risk to the industry as buyers begin to seek lobster fisheries that are not driving an iconic large whale to extinction.

**Summary** Entanglement in lobster and crab pot gear is undoubtedly contributing to the North Atlantic right whale’s looming extinction. There are additional threats to right whales that include shipping, ocean noise that masks whale communication, climate change, and fisheries interactions with other types of gear and in Canada. However, reducing entanglements in east coast waters of the United States is a critical part of a comprehensive strategy for right whale survival and recovery. Over the last ten years, entanglement in fishing gear has been the main cause of population decline that, if continued, will be catastrophic to the species (Corkeron et al. 2018; Pace et al., 2017; Kraus et al, 2016). It will also become an impediment to the pot fishing communities, which would likely be forced to close entirely, if the right whale population reaches a critically low level. As scientists, we call on Maine, together with all New England states and their representatives, to provide their full support for NOAA’s efforts to develop and implement new, effective, and science-based risk-reduction measures that will protect both whales and fishermen from the serious risks they both face.

Sincerely,

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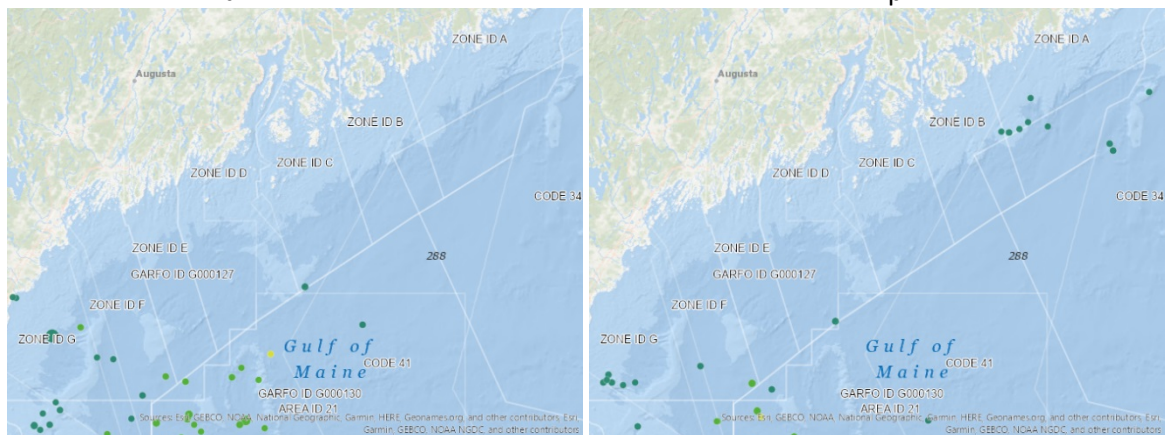
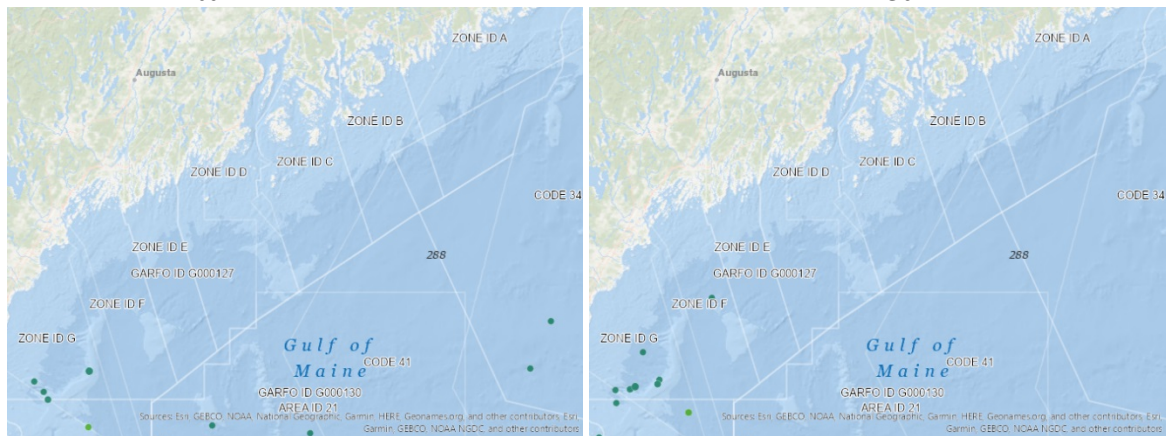
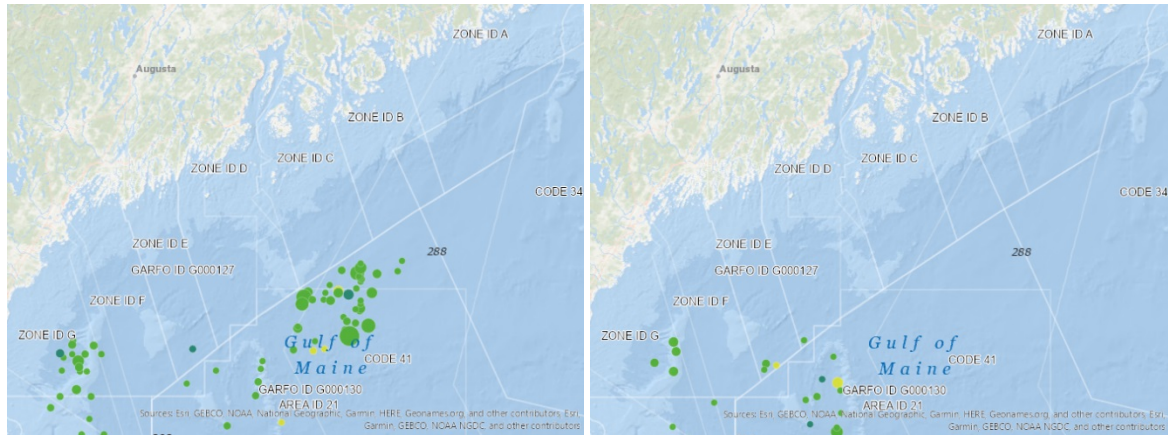
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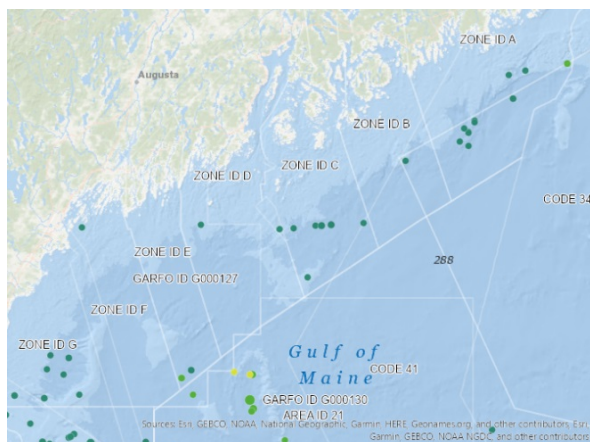
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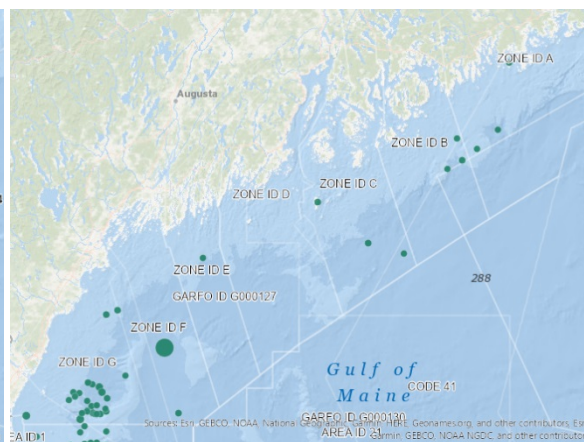
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Representative Chellie Pingree  
Representative Jared Golden  
Maine Governor Janet Mills  
Maine Lobstermen's Association: Patrice McCarron and Kristan Porter  
Maine Department of Marine Resources Commissioner Kelliher  
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Portland Press Herald  
Bangor Daily News  
Boston Globe

**Appendix I. Right Whale Sightings in Maine Waters 2006-2018** uncorrected for scale of effort (i.e., sightings per unit effort) (Data from NARW Consortium database). White lines represent Maine and offshore lobster management zones, the Hague line, and fishery management areas. Green dots are 100% certain, yellow dots are probable right whales. Size of the dot corresponds to the number of animals seen.

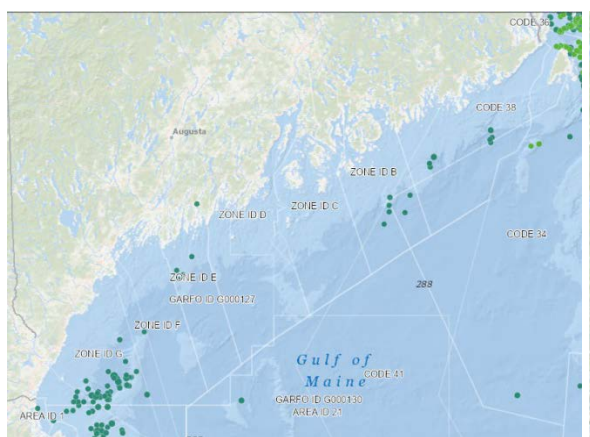




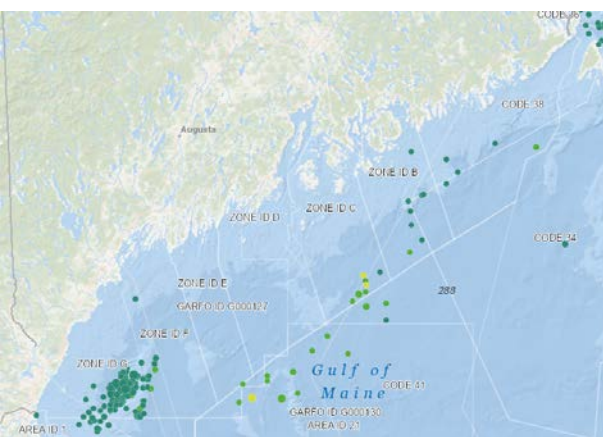
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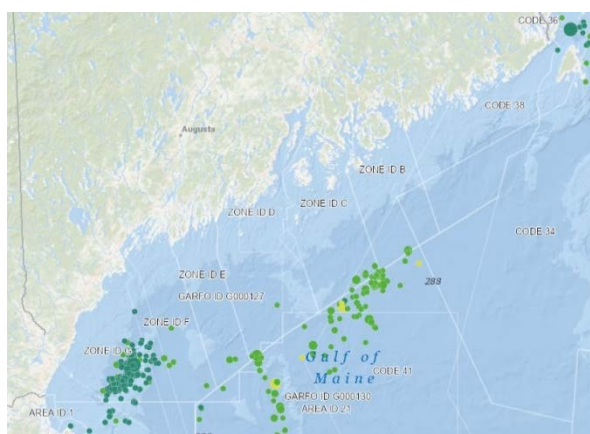
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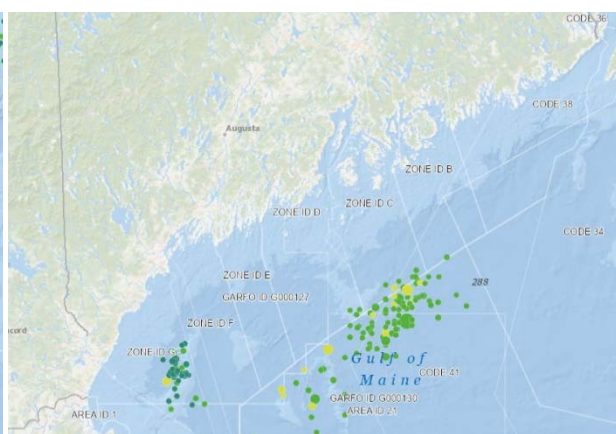
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