June 2, 2026

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National Marine Fisheries Service (NMFS)
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Subject: Comments of the National Ocean Industries Association and EnerGeo Alliance in Response to Advance Notice of Proposed Rulemaking To Amend the North Atlantic Right Whale Vessel Strike Reduction Rule

Deputy Assistant Administrator Rauch,

The National Ocean Industries Association ("NOIA") and EnerGeo Alliance ("EnerGeo") are pleased to provide the attached comments to the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service ("NMFS") in response to the Advance Notice of Proposed Rulemaking To Amend the North Atlantic Right Whale Vessel Strike Reduction Rule ("proposed rule") published in the Federal Register on March 3, 2026. For more than 50 years, NOIA has been committed to ensuring strong, viable U.S. offshore industries capable of meeting the needs of our nation in an efficient and environmentally responsible manner. NOIA's members include energy developers and the businesses - large and small - who do the work of building, supplying, and servicing these projects. EnerGeo Alliance is the global trade alliance for the energy geoscience and exploration industry, representing the companies that discover, develop, and deliver energy to the world. With over 50 years of trusted scientific expertise and data-driven advocacy, EnerGeo works globally to advance informed, science-based government policies and responsible energy exploration, production, and operations.

NOIA and EnerGeo, on behalf of the offshore energy industry, stand ready to work with the Administration to ensure a balanced approach to promote energy dominance and environmental and species protection. Please contact Erik Milito, President, NOIA, for questions or further discussions.

Very respectfully,

Erik Milito, President
National Ocean Industries Association

Dustin Van Liew, Senior Vice President, Global Policy
EnerGeo Alliance

I. Introduction

The National Ocean Industries Association ("NOIA") and EnerGeo Alliance ("EnerGeo") are pleased to provide these comments to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service ("NMFS") in response to the Advance Notice of Proposed Rulemaking To Amend the North Atlantic Right Whale Vessel Strike Reduction Rule ("Advance Notice") published in the Federal Register on March 3, 2026.

For more than 50 years, NOIA has been committed to ensuring strong, viable U.S. offshore industries capable of meeting the needs of our nation in an efficient and environmentally responsible manner. NOIA's members include energy developers and the businesses - large and small - who do the work of building, supplying, and servicing these projects.

EnerGeo Alliance is the global trade alliance for the energy geoscience and exploration industry, representing the companies that discover, develop, and deliver energy to the world. With over 50 years of trusted scientific expertise and data-driven advocacy, we work globally to advance informed, science-based government policies and responsible energy exploration, production, and operations.

NOIA and EnerGeo acknowledge that while speed reductions are effective in reducing the risk of lethal vessel collisions with North Atlantic right whales (NARWs), this rulemaking and associated efforts at NMFS should focus on establishing a path to performance-based standards and a standardized protocol for evaluating efficacy of alternative risk reduction measures, which technology developers could use to validate their solutions as an alternative to speed limits. In addition to ensuring the establishment of performance-based standards, NMFS should use this rulemaking to support development of a framework that will allow comparison of emerging technology solutions to speed restrictions. This would enable evaluations of measures that could provide similar and improved risk reduction. Such evaluation has already begun in the scientific community and is discussed further below.

The rulemaking should also establish a clear and transparent pathway for review, approval, and use of new technologies. This should include requirements for NMFS to develop clear procedures for third party verification of technologies against a set standard. The framework should allow for adaptive management, enabling operators to incorporate emerging technologies as they mature and demonstrate effectiveness in reducing vessel collision risk compared to the risk reduction achieved by speed restrictions.

New technologies that meet transparent, performance-based standards and are demonstrated to achieve equivalent or greater reductions in vessel-strike risk should be eligible for approval as alternatives to speed restrictions and other traditional mitigation measures, rather than being added to those measures.

When turn signals were invented, people were not asked to use turn signals with hand signals and semaphore sticks; turn signals replaced hand signals and semaphore sticks as the mechanism for signaling turns in cars. Similarly, thermal imaging, acoustic monitoring, artificial intelligence (AI), and other demonstrated mechanisms for detecting and avoiding NARWs should be options in place of blanket speed restrictions once efficacy has been effectively demonstrated to a clear benchmark, not required in addition to speed restrictions on the same vessel.

NMFS has broken down its request for comments into several specific topics, which are addressed in the comments below:

- Effectiveness of Technologies to Reduce Vessel Strikes with Whales
- Vessel-size-specific Risk Assessment
- Alternative Management Areas
- Safety Deviation Provision Improvements
- Efficacy of the Speed Rule
- Economic Impacts on Industry
- Outreach

NOIA and EnerGeo appreciate this opportunity to provide data that can improve conservation outcomes for NARWs and address the threat of vessel collision for this species with practicable solutions for industrial activities to coexist with NARWs.

II. Effectiveness of Technologies to Reduce Vessel Strikes with Whales

Technology readiness and research

Although not all vessels are currently subject to speed limit requirements in the current regulation, NMFS has chosen to require all vessels associated with some industries to follow these requirements, including requiring what are voluntary speed reductions for other ocean users, and likely will continue to use its authorization and consultation authorities to do so for developing industries, such as aquaculture and future East Coast oil and gas, treating some industries differently than other ocean users on the East Coast. This means the burdens of the rule disproportionately affect certain industries on the East Coast, which do not have any inherent higher risk of any given vessel encountering NARWs than similar vessels not subject to mandatory speed limits. For example, Incidental

Harassment Authorizations for seismic surveys for oil and gas on the East Coast issued in 2018 implemented a requirement for all project-related vessels, regardless of size, to observe a 10-knot speed limit in Dynamic Management Areas (DMAs), which for other vessels is voluntary, not required, under regulations (83 Federal Register [FR] 63268). The unequal application of the regulations for some authorized industries suggests technological solutions could be a better approach for industries as a whole and could be more equitably applied as there is more flexibility for technology options depending on the type and operations of different vessels, including safety considerations. In general, risk frameworks should incorporate levels of risk specific to a given vessel type to ensure equal treatment across different maritime industries.

NOIA and EnerGeo support NMFS' recent effort to leverage emerging and available technologies to reduce the risk of vessel collision for NARWs. Since the original vessel speed rule was published in 2008, significant advances in real-time whale detection technologies have occurred, as well as advancements in forecasting whale presence. The MITRE report cited in the Advance Notice (91 FR 10580) provides a valuable resource regarding technology readiness levels (TRLs) of whale detection technologies that are currently available and clearly demonstrates that whale detection technologies have advanced significantly since 2008 (Kirsch et al. 2025)[1]. Studies on these technologies further indicate their readiness levels. Technology improvements include physical improvements, as well as analytic improvements through deep learning, artificial intelligence, and other new methods.

New and emerging technologies can support the success of dynamically declared areas for vessel speed limits and can provide new and better real-time detection technologies that will reduce the risk of vessel collision for vessels operating at speeds above 10 knots. In combination with new technologies, more effective outreach to mariners and rewards for voluntary compliance could further reduce risk of vessel collision with NARWs. Some examples of methods for improved data and analytics for use of technologies include the following that are not cited in the MITRE report (Kirsch et al. 2025)[1]:

- Vickers et al. (2021)[2] reported on robust systems for detecting NARWs using deep learning methods to reduce background noise in passive acoustic monitoring, showing substantial improvements to accuracy.

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[1] Kirsch, C.C., Weber, T. and Adams, M., 2025. Technology Readiness Levels (TRL) for North Atlantic Right Whale Detection and Vessel Strike Risk Reduction. MITRE Technical Report. Accessed at: https://www.fisheries.noaa.gov/s3/2026-02/Vessel-Strike-Risk-Reduction-TRLReport.pdf

[2] Vickers, W., Milner, B., Risch, D. and Lee, R., 2021. Robust North Atlantic right whale detection using deep learning models for denoising. The Journal of the Acoustical Society of America. 149(6):3797-3812.

- Hodul (2026)[3] reported recent development of an automated detector for identifying NARWs in satellite images, and Davies et al. (2025)[4] also developed a semi-automated detection tool for NARWs in satellite imagery.
- Kirsebom et al. (2020)[5] described deep neural networks developed to recognize NARW upcalls, finding the approach was more robust in varying conditions than traditional approaches.
- Paoletti et al. (2024)[6] described SEADETECT, an automated detection system designed for reducing vessel collision risk.
- Gehrmann et al. (2026)[7] described use of a new processing routine for detection and localization of acoustic upcalls and moans by NARWs. Although focused on stationary buoys, similar approaches are feasible with moving passive acoustic monitoring systems on vessels or gliders.
- Abbot et al. (2025)[8] used field data to evaluate transmission loss of NARW calls, improving understanding of distances to detection.
- Hyer et al. (2025)[9] developed a deep learning technique to improve detection of NARWs and other taxa for real-time mitigation.

Improvements and testing of infrared imaging and acoustic detection technologies are two of the major advancements that support the development of a set of standards to apply to use of technology to avoid vessel collision as an alternative to speed limits. Kirsch et al. (2025)[1] provides references to many examples of technology publications, demonstrating significant effort in technology development. For example, they refer to thermal imaging

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[3] Hodul, M., 2026. Detecting the North Atlantic Right Whale Using Satellite Imagery (Doctoral dissertation, /University of Ottawa). Although Hodul et al. (2022) is in the MITRE report, this 2026 citation is not included in that report.
[4] Davies, K.T., Webster, A., Babu, V., Brillant, S.W., Carlyle, C.G., Lonati, G.L., Sharma, H. and Tsui, O.W., 2025. semi-automated detection of Right Whales (*Eubalaena* spp.) in very high-resolution satellite imagery. Marine Mammal Science. 41(4):e70024.
[5] Kirsebom, O.S., Frazao, F., Simard, Y., Roy, N., Matwin, S. and Giard, S. 2020. Performance of a deep neural network at detecting North Atlantic right whale upcalls. The Journal of the Acoustical Society of America. 147(4):2636-2646.
[6] Paoletti, S., Rumes, B., Pierantonio, N., Panigada, S., Jan, R., et al. 2023. SEADETECT: developing an automated detection system to reduce whale-vessel collision risk. Research Ideas and Outcomes. 9: e113968. https://doi.org/10.3897/rio.9.e113968
[7] Gehrmann, R.A., Kirsebom, O.S., Padovese, B., Frazao, F., Warner, G.A., Thebeau, K.P., Barclay, D.R. and Pecknold, S. 2026. North Atlantic right whale detection and localisation using deep learning, spectrogram cross-correlation, and nonlinear Bayesian inversion. The Journal of the Acoustical Society of America. 159(3):2123-2138.
[8] Abbot, T.A., Granite, E.O., Premus, V.E., Illich, E.D. and Logan, A.P. 2025. North Atlantic right whale localization and source level estimation using two coherently beamformed linear arrays. The Journal of the Acoustical Society of America. 158(5):3917-3928.
[9] Hyer, M.D., Anderson, A.T., Mann, D.A., Mooney, T.A., Aoki, N. and Jensen, F.H. 2025. Robust real-time detection of right whale upcalls using neural networks on the edge. Ecological Informatics. 89:103130.

studies by Baille, Zitterbart, and others that have evaluated effectiveness of thermal technologies and also document the adjustments of these technologies to achieve both effectiveness and cost-reduction for commercial viability. Some additional examples of studies evaluating the ability of technologies to detect whales for real-time mitigation and demonstrate effectiveness that are not cited in the MITRE report are the following:

- Bumstead et al. (2026)[10] reports on the MITRE corporation modeling of reliable detection range of cetaceans imaged with infrared cameras.
- Baumgartner (2025)[11] reports on efficacy of real-time passive acoustic monitoring applied to NARWs.
- Indeck et al. (2025)[12] evaluated real-time detection of NARWs with passive acoustic monitoring on gliders.
- Álvarez-González et al. (2023)[13] reviews unmanned aerial vehicles in marine mammal research. Drones have potential for whale detection in mitigation contexts. Monteforte et al. (2026)[14] evaluated "Drone-In-A-Box" technology for real-time detection rates of marine megafauna.

Programs like CObal-NAV[15] and Whale Aware[16] along with technologies like Whalespotter[17] and SEADETECT,[18] are being used to increase the time to react and avoid NARWs. According to Alaska Business (2025),[19] the large shipping company, Matson, has successfully trialed three WhaleSpotter units on its container ships to detect large whales

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[10] Bumstead, J., Kirsch, C.C., Weber, T., Adams, M., Sheline, C. and De los Santos, H. 2026. Modeling Reliable Detection Range of Cetaceans Imaged with Infrared Cameras. bioRxiv. 2026-02.

[11] Baumgartner, M., 2025. Efficacy of real-time passive acoustic monitoring near wind energy industrial activities for mitigating risks to right whales. Endangered Species Research. 57:413-430.

[12] Indeck, K.L., Baumgartner, M.F., Lecavalier, L., Whoriskey, F. and Davies, K.T.A. 2025. Passive acoustic gliders are effective monitoring tools for dynamic management plans aimed at mitigating whale-vessel Strikes. Conservation Letters. 18(2):e13102.

[13] Álvarez-González, M., Suarez-Bregua, P., Pierce, G.J. and Saavedra, C. 2023. Unmanned aerial vehicles (UAVs) in marine mammal research: A review of current applications and challenges. Drones. 7(11):667.

[14] Monteforte, K.I., Butcher, P.A., Morris, S.G. and Kelaher, B.P. 2026. The efficacy of drone-in-a-box technology for marine megafauna surveillance off coastal beaches. Drones. 10(2):122.

[15] Morissette, L.G. and Goupil, T. 2025. CObal-NAV: Knowledge, Collaboration, and Coexistence with Whales and Navigators–A New Approach to Reducing Ship-Whale Collisions. In OCEANS 2025 Brest, France, June 2025 (pp. 1-7). IEEE. doi: 10.1109/OCEANS58557.2025.11104606

[16] Musemeche, C., 2025. Whale aware: New tech and industry partnerships help ships steer clear. Oceanus. 60(2), p26.

[17] https://www.whalespotter.com/about/

[18] Paoletti, S., Rumes, B., Pierantonio, N., Panigada, S., Jan, R., Folegot, T., Schilling, A., Riviere, N., Carrier, V., Dumoulin, A. and Van Hamme, D. 2023. SEADETECT: Developing an automated detection system to reduce whale-vessel collision risk. Research Ideas and Outcomes. 9: e113968. https://doi.org/10.3897/rio.9.e113968.

[19] Alaska Business. 2025. Accessed at https://www.akbizmag.com/industry/science/matson-deploys-whale-spotting-technology-to-avoid-ship-strikes/ on May 21, 2026.

and has ordered four additional units for vessels serving Hawai'i and Alaska. National Fish and Wildlife Foundation recently completed a call for proposals[20] to promote the development and adoption of innovative technologies that can help reduce vessel collision for NARWs and other large whales via their Vessel Strike Avoidance Fund program (with which NMFS collaborates). The International Association of Oil and Gas Producers Joint Industry Programme has also supported research and technology studies around vessel collision avoidance.

NOAA Fisheries has correctly acknowledged that continued innovation is vital for achieving robust vessel collision risk reduction. NOAA should also leverage agency research and technology evaluation resources to advance the validation of whale detection and near real-time prediction technologies for vessel collision risk reduction. The Advanced Sampling and Technology for Extinction Risk Reduction and Recovery (ASTER) program,[21] which aims to accelerate technological advancements to conserve at-risk species, is one such example. The program themes –including uncrewed systems, AI and machine learning, acoustics, advanced sampling, satellite and uncrewed aerial imagery, and advanced statistical methods – all have relevance to vessel collision risk reduction.

Option to use technology in lieu of speed limits

The use of detection technologies that are able to detect whales at sufficient mitigation distances or be effective in reduced visibility conditions may reduce the risk of collision more than speed limits. The distance at which a vessel would need to adjust direction or speed to reduce collision risk after a whale is detected will vary depending on the vessel parameters, but as noted below, with clear standards and validated technologies, an option to use technology to reduce risk of vessel collision as an alternative to speed limits may be capable of achieving risk reductions equivalent to or greater than those achieved through speed limits when supported by appropriate performance validation, while simultaneously reducing impacts to industry costs and schedules and human health and safety.

Gende et al. (2019)[22] reports that slight changes in course can sometimes be preferable to slowing ships in response to sighted whales, in part because of the distance needed to achieve safe speed reduction. They developed a conceptual model around operational and

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[20] https://www.nfwf.org/programs/vessel-strike-avoidance-fund/vessel-strike-avoidance-fund-2026-request-proposals

[21] https://www.fisheries.noaa.gov/endangered-species-conservation/advanced-sampling-and-technology-extinction-risk-reduction-and

[22] Gende, S.M., Vose, L., Baken, J., Gabriele, C.M., Preston, R. and Hendrix, A.N. 2019. Active whale avoidance by large ships: components and constraints of a complementary approach to reducing ship strike risk. Frontiers in Marine Science. 6:592.

observational constraints and simulated decision-making that could be considered in assessing how technology fits into active whale avoidance and how technology can increase the probability of detection in such a model. They also define a "cone of concern" that could be applied to the technology field of view/detection. Further, they developed models to assess distances to detection that are needed at differing speeds; for example, simulated large cruise ships needed to begin changing course 741 meters from the whale at 10 knots and 1,121 meters from the whale at 19 knots.

Zitterbart et al. (2013)[23] states that thermal imaging has an almost uniform detection probability within a radius of 5 km and outperforms observers in terms of number of detected whale blows. Likewise, Zitterbart et al. (2020)[24] found thermal infrared imaging and automatic detection systems out-performed human observers in number of whales detected. A variety of thermal detection systems used by protected species observers are described in Bureau of Ocean Energy Management (2025)[25], which also describes evaluation criteria and includes a report summary of relevant literature on infrared camera technologies.

In addition to thermal technologies, mobile passive acoustic monitoring systems are improving and can allow for directional accuracy of detection of whale vocalizations. Indeck et al. (2025)[12] reported that gliders with near real-time passive acoustic monitoring were effective at detecting NARWs and triggering mitigation actions (in that case, in the form of dynamically declared areas). Thode et al. (2021)[26] also evaluated optimization of towed passive acoustic monitoring array design and performance and provided a software package to allow users to determine whether a given towed array configuration could meet localization requirements. Premus et al. (2022)[27] demonstrated that multiple gliders with overlapping detections of NARWs could determine precise locations of vocalizing

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[23] Zitterbart, D.P., Kindermann, L., Burkhardt, E., and Boebel, O. 2013 Automatic Round-the-Clock Detection of Whales for Mitigation from Underwater Noise Impacts. PLoS ONE. 8(8):e71217. https://doi.org/10.1371/journal.pone.0071217

[24] Zitterbart, D.P., Smith, H.R., Flau, M., Richter, S., Burkhardt, E., Beland, J., Bennett, L., Cammareri, A., Davis, A., Holst, M. and Lanfredi, C. 2020. Scaling the laws of thermal imaging–based whale detection. Journal of Atmospheric and Oceanic Technology. 37(5):807-824.

[25] Bureau of Ocean Energy Management. 2025. Efficacy of thermal detection technology for nighttime protected species observer surveys. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 57 p. Obligation No.: 140M0121D0006. Report No.: OCS Study BOEM 2025-006.

[26] Thode, A., Abadie, S., and Barkaszi, M.J. 2021. Optimization of Towed Passive Acoustic Monitoring (PAM) Array Design and Performance Study (Passive Acoustic Monitoring Study). Sterling (VA): US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2021-086. 32 p.

[27] Premus, V.E., Abbot, P.A., Kmelnitsky, V., Gedney, C.J. and Abbot, T.A. 2022. A wave glider-based, towed hydrophone array system for autonomous, real-time passive acoustic marine mammal monitoring. The Journal of the Acoustical Society of America. 152(3):1814-1828.

individuals at long ranges. These studies demonstrate that the use of strategically configured towed systems or nearby gliders to detect NARWs in the path of vessels at distances sufficient to take mitigative action could be feasible with today's technology under the right circumstances.

Performance-based standards

Establishment of performance-based standards for the evaluation and approval of technology solutions is important to avoid confusion and inconsistency among industry and individuals implementing regulations. *A modernized rule should specify that, within one year of the effective date, NMFS will develop guidance that sets clear standards that qualify a technology or combination of technologies to be used as an alternative to speed limits and describe methods and accompanying results/variability that are acceptable to demonstrate standards are met.*

Incorporation of whale detection and avoidance technology is key to reducing vessel collision risk while also reducing regulatory burden on offshore industries. In order for the potential of technological innovation to be realized, NMFS must play a key role in providing the necessary guidance and processes for the evaluation and adoption of this technology. At present, there are no standards, and individuals reviewing authorizations can make inconsistent decisions without clear basis regarding acceptance or rejection of technology for mitigation, and the vessel speed rule makes it difficult for regulators to allow alternatives to speed limits to achieve reduced vessel collision risk, driving down commercial interest in investment and development of technologies for better whale detection and avoidance.

The standards established for technology to be implemented as an alternative to speed restrictions should be grounded in a clearly defined framework and the development of these standards by NMFS should be prioritized as a requirement within the rule. NMFS can build on other efforts to consider and develop standards, such as Szesciorka et al. (2025[28]; 2026[29]).

- Standards should be clear, with specific units defined, and categories of vessels or activities for which standards may be different should be well defined and

[28] Szesciorka, A., Severy, M., Ampela, K., Hein, C., Richlen, M.F., Haxel, J.H. and Clerc, J., 2025. Evaluating tools and technologies for monitoring baleen whales during offshore wind foundation installation (No. PNNL-37249). Pacific Northwest National Laboratory (PNNL), Richland, WA (United States).
[29] Szesciorka, A.R., Severy, M., Ampela, K., Hein, C., Richlen, M., Haxel, J. and Clerc, J., 2026. A call to standardize metrics for monitoring baleen whales near marine construction activities. Ocean & Coastal Management. 276:108147.

described (e.g. less maneuverable vessels may need to detect NARWs at greater distance than more maneuverable vessels).

- A benchmark should be set that does not require more risk reduction than is currently achieved by vessel speeds under 10 knots.
- Proposed technology solutions should be assessed, validated, approved, and implemented against the benchmark standards. The methods for validation should be reasonably defined to allow technology and analytics developers and industry to understand how to clearly demonstrate that benchmarks are met.
- The standards and methods defined by NMFS should be developed in conjunction with scientists, technology developers, and industry to achieve practicability and avoid confusion in implementation.
- The guidance should be written such that any reasonable person should be able to determine if proposed technologies meet the standards for operation and validation that have been set, ideally avoiding individual agency personnel inconsistency in decision-making.
- Ultimately, decision-making for accepting or rejecting technology solutions should not be solely the responsibility of an individual at NMFS assigned to review an application, as different people are assigned to different applications which can result in inconsistent application of standards across projects. A review board or appeal process could allow for more thorough review and, thus, more consistency.

A one-size-fits-all approach is unlikely to be effective across different maritime industries, and instead, flexibility for different operational contexts is important. For example, vessels transporting offshore workers are small, fast-moving, and highly maneuverable, with potential for them to react quickly and avoid whales, whereas commercial cargo vessels have limited maneuverability with limited avoidance capabilities. Within the standards, appropriate categories of vessels that are not overly complicated and numerous, but are reasonable to address parameters that highly affect the risk of vessel collision with NARWs should be taken into account. In cases in which operations are in areas with very few NARWs, it may also be appropriate to have less strict standards or potentially remove speed limits and additional technology requirements due to the extremely low risk of vessel collision. The risk could be periodically revisited in the context of further shifts in NARW distribution in the future. Particularly for small commercial vessels, there is significant impetus to avoid vessel collision with whales because of the safety hazards it poses, making the captain and crew highly invested determiners of safe speeds and activities relative to the varying risks of ocean conditions and animal encounters.

An example of how performance-based standards could be developed is the model of performance-based standards for Clean Air Act (CAA) and Clean Water Act (CWA). These standards mandate results but not how to achieve those results. Both statutes use a combination of best practices and technology-based standards in a data-driven, results-oriented framework to guide and facilitate industry innovation to produce solutions to achieve or exceed specified goals. Both Acts call for emissions standards to be set based on data concerning emissions performance and cost of available technologies. Both Acts have achieved massive emissions reductions, while using data related to technical feasibility and cost to adequately balance economic considerations.

In setting national emissions standards under the CAA, the Environmental Protection Agency (EPA) generally sets emissions performance levels rather than mandating use of a particular technology. In fact, the law requires that EPA use numerical performance standards whenever feasible. Emissions standard-setting provisions of the CAA call for an approach that focuses on what the best performers in a particular industry are already doing in practice. For existing sources, EPA must set standards that require at least the level of performance already achieved by the top-performing 12 percent of similar sources. The resulting performance standards give all sources the flexibility to decide the most cost-effective way to comply.

Under CWA, the Best Available Technology Economically Achievable is defined at section 304(b)(2) and represents technology that should achieve best performance within economic constraints of industrial plants. Working in tandem with flexible technology standards, Best Management Practices, described in CWA section 304(e), include a schedule of activities, prohibition of practices, maintenance procedures, and other management practices that EPA has identified to be the best in the industry at preventing pollution. These best practices are integrated into industry standards and constantly being adapted, thereby reducing point source dischargers to achieve the goals of the CWA.

In a similar manner to EPA, NMFS should set standards which industry can reasonably meet or exceed and allow industry to not only find the most economically feasible solutions but also allow those standards to improve through competition and innovation over time.

III. Vessel Size-specific Risk Assessment

The Navy has recently undertaken a vessel size-specific risk assessment (Blondin et al. 2025)[30], which can inform modernization of the vessel speed rule. This study found that the highest risk to NARWs is from vessels over 350 feet (ft). Overall risk of vessel collision in the

[30] Blondin, H., L.P. Garrison, J.D. Adams, J.J. Roberts, C.P. Good, M.P. Gahm, N.E. Lisi, and E.M. Patternson. 2025. Vessel strike encounter risk model informs mortality risk for endangered North Atlantic right whales along the United States east coast. Scientific Reports. 15: https://doi.org/10.1038/s41598-024-84886-z.

general model is predicated on a good understanding of NARW density distribution, which is challenging to assess because of low sighting rates associated with an uncommon (low population) species, seasonal and interannual variability, and shifting distribution of NARWs over time. Blondin et al. (2025) also applies a variety of assumptions that affect the results; but, the general finding with respect to vessel size was that vessels over 350 ft (referred to as ocean-going vessels) comprised 78% of vessel collision risk to NARWs, with large vessels (65-350 ft) contributing 12% of risk and small/medium vessels (26-65 ft) contributing 10% of risk. It was necessary to make additional assumptions regarding the patterns and densities of vessels under 65 ft due to lack of Automated Identification Systems (AIS) on smaller vessels. Regardless of the actual mortality from vessel collision, this study suggests a much smaller component of the risk is associated with vessels under 350 ft. When combined with the information provided in Section VI regarding the fact that vessel collision risk itself is not substantively reduced by speed limits (mortality rates are reduced, but collision rates are generally not), the value of speed limits, particularly for vessels under 350 ft, becomes very limited relative to the potential for alternative technological solutions to directly reduce vessel collision risk.

Blondin et al. (2025)[30] attempts to translate risk into real-world mortality, though real-world mortality estimates are highly dependent on the assumptions of the model and the underlying data regarding density, avoidance, time spent in vessel collision zones, etc. The challenge of applying blanket requirements across vessel classes is that the reality is that no individual vessel has more than a very small risk of collision with a NARW. Risk is higher where whales tend to gather and for vessel types with less detection capability and/or less maneuverability or safety concerns with slowing should a whale be detected.

The size and maneuverability of a vessel is important for assessing the most effective approach to reducing vessel collision risk. Draft was an important factor in the Blondin et al. (2025)[30] model (affecting the collision zone for whales). Similar modeling could be employed to assess the risk reductions associated with different vessel size classes at different drafts and speeds to determine standards for distances at which NARWs would need to be detected forward of the vessel to respond with course alteration to avoid the NARW entirely, rather than simply reduce the lethality of a vessel collision through speed reduction. Such an analysis could also draw from Gende et al. (2019)[22] and should be undertaken by NMFS as part of setting standards for technology alternatives to speed restrictions. The standards should not be based on the worst-case-scenario but could vary depending on reasonable size and draft categories and maneuverability categories in a balance between specificity and practicability.

IV. Alternative Management Areas

Technology and studies demonstrating success of dynamically declared areas

There are now data to support the deployment of real-time detection and forecasting technologies to inform dynamic vessel speed zones that are protective of NARWs and that reduce overall regulatory burden on maritime industries. NOAA should continue to leverage its resources in (a) developing, testing, and deploying these technologies and (b) providing a clear and transparent pathway for approval and use of new technologies. NMFS should further consider using the technologies available to reduce the number of days below 15 days when detections cease and it is reasonable to expect that whales remaining in the area would be detected if they were present.

There are robust systems in place for near real-time NARW detection. Baumgartner et al. (2019)[31] demonstrates the efficacy of near real-time detection of NARWs with acoustic detections monitored with passive acoustic mooring buoys over a 30-40 kilometer range and temporal scales of 24-48 hours. Likewise, gliders with passive acoustic monitoring are effective at detection over large areas (Baumgartner et al. 2013)[32] and are accurate for near real-time detection (Baumgartner et al. 2020).[33] Thus, there are tested and proven systems in place to allow for the successful implementation of dynamically declared speed reduction areas.

Furthermore, the US Coast Guard provides Notices to Mariners and oversees mandatory ship reporting systems that provide continuous whale avoidance guidance. Transmission of locations of dynamically declared areas to mariners are improving, including newer approaches like WhaleApp and AIS transmission (highlighted by NOAA[34]). NMFS uses information from mariners and a comprehensive network of passive acoustic monitoring, including gliders and buoys with near real time detections posted to Robots4Whales,[35] to monitor NARW detections. NMFS reports “Reacting in near real time and using satellite-

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[31] Baumgartner, M.F., Bonnell, J., Van Parijs, S.M., Corkeron, P.J., Hotchkin, C., Ball, K., Pelletier, L.P., Partan, J., Peters, D., Kemp, J. and Pietro, J. 2019. Persistent near real-time passive acoustic monitoring for baleen whales from a moored buoy: System description and evaluation. Methods in Ecology and Evolution. 10(9):1476-1489.

[32] Baumgartner, M.F., Fratantoni, D.M., Hurst, T.P., Brown, M.W., Cole, T.V., Van Parijs, S.M. and Johnson, M. 2013. Real-time reporting of baleen whale passive acoustic detections from ocean gliders. The Journal of the Acoustical Society of America. 134(3):1814-1823.

[33] Baumgartner, M.F., Bonnell, J., Corkeron, P.J., Van Parijs, S.M., Hotchkin, C., Hodges, B.A., Bort Thornton, J., Mensi, B.L. and Bruner, S.M. 2020. Slocum gliders provide accurate near real-time estimates of baleen whale presence from human-reviewed passive acoustic detection information. Frontiers in Marine Science. *7*:100.

[34] https://www.fisheries.noaa.gov/feature-story/messaging-mariners-real-time-reduce-north-atlantic-right-whale-vessel-strikes.

[35] On May 21, 2026, the Robots4Whales website reported 11 buoys and 5 gilders currently deployed. See https://robots4whales.whoi.edu/.

based technologies, we have sent more than 250 alerts to vessels operating in close proximity to right whales."[36] NMFS provides maps and coordinates to vessel operators through the Coast Guard, designated social media sites, the WhaleAlert app, and direct emails and notices for those signed up for email or text notifications, making it easy for mariners to know when NARWs have been observed and/or a dynamically designated area is established. WhaleMap[37] visualizes sighting information that mariners can use to see the latest NARW detections. The Northeast Passive Acoustic Reporting System[38] also gathers acoustic detection data and during mitigation monitoring, these data are expected to be uploaded to this system within 24 hours.

Seasonal fixed areas *vs* dynamically declared areas

The establishment of blanket time/area vessel speed zones in the form of Seasonal Management Areas (SMAs) in the 2008 rulemaking (73 FR 60173) was intended to afford protection to NARWs by establishing static zones in which vessels greater than 65 ft are required to maintain speeds below 10 knots. One limitation of SMAs is their static nature which is unable to account for interannual variability and shifting habitat use of NARWs. Since 2010, NARW foraging habitat has shifted as oceanographic changes in the Gulf of Maine and Scotian Shelf regions created a less favorable foraging environment for NARWs in these regions, causing NARWs to abandon traditional foraging grounds (Meyer-Gutbrod et al. 2021).[39] Coinciding with this shift, the NARW population has exhibited a higher mortality rate since 2017, losing adult whales to vessel collision and fishing gear entanglement, with many of these vessel collisions occurring in Canadian waters as NARW foraging habitat shifted northward (Meyer-Gutbrod et al. 2021).[39]

Recent NARW sightings reported informally further illustrate the limitations of static management areas. The New England Aquarium (NEAq) Anderson Cabot Center for Ocean Life regularly conducts aerial surveys in the Atlantic Ocean south of New England to document the occurrence of NARWs. According to data presented on the WhaleMap webviewer[40], on January 8, 2026, NEAq aerial surveys flew over the active Mid-Atlantic SMA

[36] Accessed at https://www.fisheries.noaa.gov/endangered-species-conservation/north-atlantic-right-whale-speed-zone-dashboard on May 21, 2026.
[37] Johnson, H., Morrison, D., Taggart, C. 2021. WhaleMap: a tool to collate and display whale survey results in near real-time. Journal of Open Source Software. 6(62):3094, https://joss.theoj.org/papers/10.21105/joss.03094
[38] Accessible at https://www.fisheries.noaa.gov/new-england-mid-atlantic/science-data/passive-acoustic-monitoring-data-upload.
[39] Meyer-Gutbrod, E.L., Greene, C.H., Davies, K.T.A., and Johns, D.G. 2021. Ocean regime shift is driving collapse of the North Atlantic right whale population. Oceanography 34(3):22–31, https://doi.org/10.5670/oceanog.2021.308.
[40] https://whalemap.org/WhaleMap/ accessed on June 1, 2026

off Rhode Island and documented no NARWs within the SMA, but 15 NARWs outside the SMA. On February 28 2026, NEAq aerial surveys documented two NARWs within the active Mid-Atlantic SMA off Rhode Island and 28 NARWs outside the SMA. And on April 10 2026, NEAq aerial surveys documented no NARWs within the active Mid-Atlantic SMA off Rhode Island and 33 NARWs outside the SMA. These NARW sightings outside the SMA led to the declaration by NMFS of DMAs, while the active SMA afforded little to no protection for those NARWs at these times. Assessing effort relative to sighting rate, as well as acoustic detection rates would be useful to determining presence in the SMA. The shifting and variable use patterns of NARWs support the use of dynamic rather than static areas as a mechanism for protection.

There is also a risk trade-off in forcing vessels undertaking industrial activities (a significant proportion of ocean-going vessels) to spend more time on the water to complete their work. The more time a vessel is at sea, the higher the collision risk as well (the vessel is available to have a collision for longer time). To get work done, speed limits may mean that more vessels may ultimately be needed to complete work on schedule, also increasing the numbers of vessels at sea. There is an inflection point where speed zones likely increase the risk because of more time spent and more vessels at sea. Extended transit times may alter overall vessel exposure and operational patterns, which warrants further evaluation when assessing the net conservation benefits of different management approaches. It is not clear exactly where that inflection point is, but the use of SMAs, which, according to recent studies, do not have significant NARW presence may actually increase risk to NARWs through this mechanism. Because time spent on the water is a factor in vessel collision risk, it may be useful to incorporate this variable into the modeling by Blondin et al. (2025)[30] to consider how that affects the risk profile when dynamic and static speed areas are applied as management tools, and when they are not.

Robust and flexible systems (e.g., mobile gliders[41] that can be shifted to areas of concern, multiple systems to alert mariners) are sufficient to allow for successful use of dynamic areas without reliance on static seasonal areas, which are not representative of real-time distribution or indicative of current high-density areas as a result of shifts in NARW distribution over time. Predictions of persistence based on real-time occurrence data

[41] Glider technologies have also been improving – see Indeck et al. (2025): Indeck, K.L., Baumgartner, M.F., Lecavalier, L., Whoriskey, F., Durette-Morin, D., Pettigrew, N.R., McSweeney, J.M., Thorne, L.H., Gallagher, K.L., Edwards, C.R. and Meyer-Gutbrod, E. 2025. Glider surveillance for near-real-time detection and spatial management of North Atlantic right whales. Oceanography. 38(1):13-21.

could help to better apply dynamic areas for better conservation outcomes; a tool for such predictive modeling has been developed by Brusa et al. (2026).[42]

The proven use of dynamically declared areas (when enhanced technology is not used as an alternative), which are based on near real-time data provided by the extensive network of vessels and monitoring, should be used instead of static or seasonal speed zones in a modernized rule, at least for vessel types under 350 ft based on the risk profile in Blondin et al. (2025).[30] While compliance with NARW DMAs has historically been low (NMFS, 2020), NMFS should look to existing models of dynamically declared vessel speed zones that have proven effective and that represent collaborations between maritime industries, researchers and regulatory agencies. An example is provided in Section VIII.

V. Safety Deviation Provision Improvements

The safety deviation provision in the rule allows a vessel to operate at a speed necessary to maintain safe maneuvering if conditions require operation at greater than 10 knots, requiring confirmation by the pilot or master of the vessel and documentation of reasons for the deviation. NOIA and EnerGeo request that the safety deviation provision be expanded to include “health and well-being” along with safety. The standard at which the vessel can “maneuver safely” is unclear, and should be clarified to explicitly include consideration for significant increase in potential for injury and/or seasickness/severe discomfort of mariners that inhibits their ability to work on the vessel or the potential for damage to equipment that is not likely if a different speed were maintained. Sustained periods of 10 knot transit, under some conditions, can present a significant health, safety, and well-being risk to vessel crews and technicians, substantially increasing seasickness in personnel and introducing the risk that personnel would not be able to safely perform duties. In addition to costing industry more, uncomfortable or dangerous working conditions can negatively impact the physical and mental health of offshore workers and the offshore industry’s ability to maintain and provide a healthy and safe environment and ultimately retain these highly skilled and trained workers.

VI. Efficacy of the Speed Rule

Multiple scientific studies have concluded that reduction in speed of vessels generally results in reduced risk of whale mortality from vessel collision and that vessel size is also

[42] Brusa, J.L., Linden, D.W., Gahm, M.P., Patterson, E.M., Good, C.P., Pendleton, D.E., Roberts, J.J., Cole, T.V., Blondin, H. and Cholewiak, D.M. 2026. Predicting spatiotemporal persistence of rare species: An example with North Atlantic right whales. Ecosphere. 17(3):e70582.

an important parameter (e.g., Conn and Silber 2013[43]; Vanderlaan and Taggart 2007[44]). While data indicate that overall documented mortalities from vessel collisions of NARW in the US have declined since the implementation of the 2008 rule (NMFS 2020)[45], the effectiveness of the rule in slowing vessel speeds overall is not clear. The NARW Vessel Speed Rule Assessment (NMFS 2020)[45] found that average (distance weighted) vessel speeds have slowed within SMAs both during active and inactive periods – with slower vessel speeds documented in months when the SMAs were not active – indicating that factors other than the vessel speed rule may be influencing a move to slower transit speeds, possibly including emission pollution controls and fuel savings (NMFS, 2020).[45] The Assessment also found that while there had been a decline in the total number of documented NARW vessel collision mortalities in the US since the 2008 rule was published, there was an increase in serious and non-serious injuries since implementation of the 2008 rule (NMFS, 2020).[45] This is perhaps not a surprising result given the early literature upon which the rule was built found that speed reductions would result in less lethal collisions but not necessarily less collisions overall (e.g. Laist et al. 2001).[46]

There are several studies over time evaluating efficacy of the rule in reducing mortalities (e.g., Laist et al. 2014[47]; Redfern et al. 2024[48]). Mortality reduction appears to have occurred as a result of decreased vessel speeds, particularly for vessels larger than 300 ft, though models to assess the reductions must rely on a variety of assumptions. Reduction in vessel speed is assumed to make it more likely that crews or observers on vessels will be able to see and react to whales at the surface faster than if the vessel were travelling at greater speed. This may be true, depending on the conditions and the maneuverability of the vessel, but as noted, the literature does not seem to support significant reduction in collision as much as it supports reduction in lethality of collisions.

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[43] Conn, P.B. and Silber, G.K. 2013. Vessel speed restrictions reduce risk of collision-related mortality for North Atlantic right whales. Ecosphere. 4(4):1-16.
[44] Vanderlaan, A.S. and Taggart, C.T. 2007. Vessel collisions with whales: the probability of lethal injury based on vessel speed. Marine Mammal Science. 23(1):144-156.
[45] National Marine Fisheries Service. 2020. North Atlantic Right Whale (*Eubalaena glacialis*) Vessel Speed Rule Assessment. National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD.
[46] Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S. and Podesta, M. 2001. Collisions between ships and whales. Marine Mammal Science. 17(1):35-75.
[47] Laist, D.W., Knowlton, A.R. and Pendleton, D. 2014. Effectiveness of mandatory vessel speed limits for protecting North Atlantic right whales. Endangered Species Research. 23:133-147.
[48] Redfern, J.V., Hodge, B.C., Pendleton, D.E., Knowlton, A.R., Adams, J., Patterson, E.M., Good, C.P. and Roberts, J.J. 2024. Estimating reductions in the risk of vessels striking whales achieved by management strategies. Biological Conservation. 290:110427.

VII. Economic Impacts on Industry

Speed restrictions negatively impact commercial operations. By NMFS' own estimates, the increased transit times caused by the vessel speed rule cost $28.3 million to $39.4 million annually (Industrial Economics 2020).[49] The vast majority of these estimated costs were incurred by the shipping industry at the time the data were analyzed (2017). This only accounts for direct costs and does not account for secondary impacts such as higher prices for consumers. In addition, costs are likely significantly higher now, as the Panama Canal expansion (completed in June 2016) greatly increased vessel traffic on the East Coast and because of other increased offshore development in recent years and expected development in the future, such as aquaculture opportunity areas, ocean mineral exploration, and offshore data centers.

Speed restrictions result in increased construction and operational costs. Depending on distances vessels need to travel from shore, speeds limited to 10 knots could easily double transit time between an operation and maintenance base and offshore energy, aquaculture, or other industrial platforms and will reduce the daily maintenance time available, as extra hours of the day must be devoted to transit.

Technologies also incur costs, but many systems are becoming reasonably priced through commercialization and demand driving production. The cost of using technologies to detect and avoid whales also is comparatively fixed and predictable. In comparison to technology solutions, dynamically declared areas are not very predictable and therefore are difficult to budget for and are likely to also affect schedules more, which can result in substantial costs related to delays in offshore projects. Having a choice to use technologies that meet clear criteria in lieu of vessel speed limits would allow industry to better plan budgets and schedules and avoid unanticipated costs that are ultimately borne by both the industry and customers.

Although seasonal static areas are more predictable than dynamically declared areas, this is not a substantive economic benefit in the context of seasonal static areas for two reasons: (1) currently, SMAs are implemented with DMAs, so SMAs are not a substitute for DMAs, and (2) for commercial industries like oil and gas or aquaculture for which most vessels are at low-risk for NARW collision (vessels are <350 ft[30]), static seasonal areas are a burden that may slightly reduce an already extremely low risk but could be replaced fully by dynamically designated areas to avoid constant speed reductions, which result in time and cost impacts, in the areas where there are currently SMAs. As noted in Section IV, SMAs

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[49] Industrial Economics, Incorporated. 2020. Economic Analysis of the North Atlantic Right Whale Vessel Speed Restriction Rule. National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD.

currently designated to capture high use areas by NARWs have high variability and NARWs have shifting distribution, so some of these areas may no longer be reflective of actual high densities of NARWs.

VIII. Outreach

A model for incentivizing voluntary speed reduction is the Blue Whales Blue Skies program on the West Coast of the US, a partnership between regulatory agencies, research institutions, and environmental NGOs which monitors speeds of vessels 300 gross tons and larger that pass through voluntary Vessel Speed Reduction zones where ships are encouraged to reduce speeds and that recognizes participating shipping companies with high cooperation rates for transits that reduce vessel collision risk to whales. For vessels >355 ft enrolled in the program, speed reductions during the 2025 season were associated with a 25.5% reduction in vessel collision risk to blue whales (which have a higher risk of vessel collision on the West Coast than the East Coast) when compared to vessel speeds during the 2025 non-vessel speed reduction season. When compared to speeds during the 2016 non-vessel speed reduction season, risk was reduced by 39.7% (Nisi, 2025)[50]. Risk reduction estimates were similar across species. This represents just one potential model of cooperation with dynamic speed zones that provides an incentive for voluntary compliance.

IX. Actions Requested

1. Current SMAs based on prior NARW hotspots are not reflective of new and changing use patterns and interannual variation and should be supplanted by dynamically designated areas.

Some of the current SMAs no longer have high NARW densities, as seasonal distributions have shifted. Some SMAs were designated in port areas, which may reflect higher vessel activity, but several SMAs seem to be focused on previously high-density areas of NARWs, such as Off Race Point, Great South Channel, and Mid-Atlantic, which information suggests may no longer be hotspots, such as the lack NARWs observed by NEAq the Mid-Atlantic SMA as noted above in Section IV. Potentially, deployment of passive acoustic monitoring, use of satellites, gliders, and other technology can monitor the areas where there are currently SMAs if they remain areas of concern to NMFS. NMFS can rely on implementation of dynamically designated areas instead in those areas currently administered as SMAs. As described above, NMFS has a robust and improving program

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[50] Nisi, Anna. 2025. Estimated reduction in whale ship-strike risk during the 2025 Protecting Blue Whales and Blue Skies voluntary vessel speed reduction program in California waters. Available at https://bluewhalesblueskies.org/wp-content/uploads/2025-BWBS-ship-strike-risk-report-1.pdf.

that identifies areas for dynamic designation in near real-time with fast and effective communications to mariners that are improving with new programs and more reliance on technology like AIS. NMFS could use the existing data and studies of the relationships of NARW use patterns to dynamic conditions and make predictions about where NMFS should have the most coverage from gliders and buoys or other detection equipment each season in as much as it overlaps with vessel activities. This would be an enhancement of the current approach to DMAs and SMAs that could allow the replacement of SMAs for better protection of NARWs. If NMFS has remaining concerns about vessels that have poor maneuverability and constitute the majority of vessel collision risk (vessels >350 ft; Blondin et al. 2025), NMFS could consider maintaining seasonal areas for vessels in that size category.

2. Vessels subject to non-discretionary 10-knot speed limits within dynamically designated areas or other speed restrictions applied through the MMPA authorization process, ESA Section 7 consultation process, federal consistency review, or other NOAA authorities should have the option to propose detection and avoidance technologies in lieu of speed restrictions. MMPA authorizations and ESA consultations should reflect the standards in the final vessel speed rule and the guidance developed by NMFS (see #3). If the applicant / action proponent meets those standards, authorizations and consultations should not be able to require vessel conditions more restrictive than those in the rule (unless there are data to indicate the activity has resulted in vessel collision previously).

The studies cited above provide ample evidence, in conjunction with the MITRE TRL study, that a variety of technologies have demonstrated potential to achieve similar or better vessel strike reduction than the current SMA/DMA speed limit system, warranting further evaluation through a standardized performance-based framework. A dynamically designated area 10-knot speed limit could be applied if a vessel operator did not choose to apply a technological solution to reduce vessel collision risk, but the option to use alternatives should be clearly stated in the regulation and guidance, as well as included in authorizations and consultations, without prescribing specific technologies. The rule should specifically state that technologies can be proposed in lieu of, and not be required in addition to, speed limits. New technologies or combinations of technologies may not be exactly “equivalent” to speed restrictions as they are currently implemented, but benchmarks that achieve the conservation goals and meet the needs of ESA and MMPA could be applied to support effective alternatives. The point of speed restrictions is not to restrict speed for its own sake but rather to reduce likelihood of vessel collision and reduce lethality of vessel collision with NARWs. Any approach that likewise achieves this goal to a similar or better degree could be considered an alternative to vessel speed limits.

NOIA and EnerGeo would like to emphasize that, as noted above, some industries have had dynamically designated areas and other speed restrictions applied differentially (e.g. the Atlantic seismic example provided above in Section II). It is important that regulations be consistently and equally applied across industries and individual projects within industries. A statement to clarify this intent should be included within the rule or its preamble. The rule should also state that the vessel collision avoidance measures in the updated rulemaking supersede requirements that are in conflict or not aligned within active MMPA authorizations, ESA consultations, or consistency concurrences, such that permittees with existing authorizations and permits are not held to different standards than others.

3. The regulation should stipulate that within one year of the effective date of the new regulation, NMFS will publish a guidance that outlines the standards that must be met by proposed technology solutions and will also describe methods that can be used to demonstrate those standards are met to allow the technology to be used as an alternative to speed restrictions to reduce vessel collision risk with NARWs.

Standards would include benchmarks, like distances to detection and maneuverability of the vessel relative to detection distance, and the acceptable methods, measurements, and variability for testing and demonstrating that benchmarks are met. NOIA and EnerGeo recommend a guidance to allow for regular updates and adaptation as new technologies are developed and tested. Benchmarks should not exceed current expectations for risk reductions via speed limits and other mitigation measures, though potentially, some technologies will be more effective than traditional mitigation. Guidance should be developed in collaboration with scientists, technology developers, and industry to support effectiveness and practicability.

Guidance should include a transparent and comprehensive process by which the technologies can be validated in a timely manner for qualification, with a clearly outlined framework for adoption of the technologies deemed at higher TRLs to replace speed limits as appropriate for particular vessels or projects. This process should not be limited to evaluation of individual technologies but should instead evaluate the potential for detection technologies, prediction tools, and near real-time data on NARW presence to be used in concert to increase detection capability and reduce vessel collision risk. Such an approach will foster innovation and investment, reduce costs to industry and consumers, and provide flexibility to meet a goal rather than have a prescribed mitigation approach that is ultimately likely to be less effective than goal-oriented, performance-based outcomes.

The guidance should be developed by the Office of Protected Resources and implemented across relevant NOAA offices that provide authorizations and consultations regarding NARWs or otherwise are engaged in decision-making associated with NARWs and vessel speed limits. Standards should be considered valid for application across federal statutes to the extent possible, and guidance should be adopted by NMFS as a whole to avoid redundancy in review and potential conflict and inconsistency across authorizations and consultations, such as those associated with MMPA and ESA. Collaboration and adoption by other agencies with decision-making authority as pertains to offshore projects, such as the Bureau of Ocean Energy Management, the Federal Energy Regulatory Commission, and the U.S. Army Corps of Engineers, would also be helpful in future permitting and consultation activities.