

Fisheries Compensation Overview – *Preliminary Draft, Revision 1*

Fisheries Technical Working Group (F-TWG)



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Preliminary Draft: February 2021
Revision 1: February 2022

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ACRONYMS AND ABBREVIATIONS

AIS	Automatic Identification System
ASMFC	Atlantic States Marine Fisheries Commission
AWEA	American Wind Energy Association
BMP	Best Management Practice
BP	British Petroleum
CARES	Coronavirus Aid, Relief, and Economic Security Act
EOEEA	Executive Office of Energy and Environmental Affairs
FLO	Fisheries Liaison Officer
FLOWW	Fisheries Liaison with Offshore Wind and Wet Renewables Group
FMP	Fishery Management Plan
F-TWG	Fisheries Technical Working Group
GCCF	Gulf Coast Claims Facility
GOSR	Governor's Office of Storm Recovery
LNG	Liquefied Natural Gas
LIPA	Long Island Power Authority
MOP	Massachusetts Ocean Partnership
MW	Megawatt
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
NYSDEC	New York Department of Environmental Conservation
NYSERDA	New York State Energy Research & Development Authority
OCS	Outer Continental Shelf
OSW	Offshore Wind
PSEG	Public Service Enterprise Group
RI CRMC	Rhode Island Coastal Resources Management Council
RI SAMP	Rhode Island Special Area Management Plan
RSA	NOAA's Research Set-Aside
UK	United Kingdom
U.S.	United States
VMS	Vessel Monitoring System
VTR	Vessel Trip Report
WEA	Wind Energy Area

1 INTRODUCTION

The hierarchy of effective co-existence is to first take avoidance and minimization measures, where impacts cannot be fully avoided or minimized, mitigation measures would be implemented, with financial compensation as one potential form of mitigation. Although compensation is at the bottom of this hierarchy, it is a necessary consideration for co-existence between offshore wind development and the fishing industry, and providing a framework or agreement on mechanism of compensation implementation will likely be necessary as offshore wind development expands in the U.S.

The intent of this document is to provide an overview and summary of existing fisheries compensation within the offshore wind (OSW) industry and other marine industries. Fisheries compensation has been utilized as a mitigation approach in other countries as well as the U.S., and those programs are summarized here, for comparison. While there is currently no overarching regulatory mechanism for compensation, some states have already required developers to establish compensatory funds to offset potential impacts to the commercial fishing industry, or to fund research programs aimed at better understanding those potential impacts. Collectively, such programs have established the beginnings of how these types of compensatory mitigation strategies might work within the U.S. offshore wind industry.

This report is not intended to be a formal framework or recommendation, but rather a platform to initiate discussions of compensation considered between project developers, commercial fishermen, and permitting agencies as a mitigation tool to offset potential impacts to the commercial fishing industry. Since the former iteration of this report, eight states requested the development of a federal-level compensation framework to be developed by BOEM and BOEM has begun the planning process for addressing fisheries compensation guidance (Joint Governors Letter 2021; BOEM 2021), with draft guidance expected in 2022.

2 OFFSHORE WIND INDUSTRY IN SOUTHERN NEW ENGLAND AND THE NEW YORK BIGHT

Worldwide, the demand for renewable energy is rising as a result of the increased desire by countries to find alternative, clean energy sources to reduce carbon emissions and the associated impacts expected from climate change. Offshore wind development is of interest due to the consistency and speed of winds off the coast and its energy-source proximity to densely populated, coastal municipalities. Offshore wind energy generation has been around globally since the first projects came online in Europe in the early 1990's. The first offshore wind farm, Vindeby Offshore Wind Farm, was installed off Denmark in 1991 and has been on a rapid increase of scale and efficiency over the thirty-year span of the industry. As of 2020, Europe leads the world in offshore wind generation with 22,072 megawatts (MW) generated from 110 windfarms (EvWind 2020). European countries with installed capacity for offshore wind include Belgium, Denmark, Finland, France, Germany, Ireland, Netherlands, Norway, Portugal, Spain, Sweden and the U.K. (EPRS 2020).

Currently, the United States has two fully-installed and operational offshore wind projects; Ørsted's Block Island Wind Farm (30 MW) and Dominion's Coastal Virginia Offshore Wind pilot project (12 MW). The

American Wind Energy Association¹ (AWEA) estimates by 2030, the offshore wind industry is expected to invest between \$28 and \$57 billion into the U.S. economy. With an expected annual economic output of \$12.5 to \$25.4 billion per year, depending on installation levels and the proportional supply chain growth during that time, project development, construction, operations and decommissioning efforts within the industry are expected to support between 45,000 to 83,000 jobs in the U.S. (AWEA 2020a). Offshore wind development is of particular interest off of the Atlantic coast due to consistently strong wind resources and its proximity to a gradually-sloping, relatively shallow seabed along the continental shelf (AWEA 2020b).

In the New York Bight and Southern New England area, there are currently four OSW projects that have power purchase agreements with NYSERDA to bring power into New York State (see Figure 1). These include Equinor/BP's Empire Wind 1 (816 MW), Equinor/BP's Empire Wind 2 (1,260 MW), Equinor/BP's Beacon Wind (1,230 MW), and Ørsted/Eversource's Sunrise Wind (880 MW). An additional power purchase agreement with the Public Service Enterprise Group (PSEG) & Long Island Power Authority (LIPA) is also in place for Ørsted/Eversource's South Fork Wind project (130 MW). New York State has set a goal of 9,000 MW of offshore wind energy generation by 2035. This goal has also been codified into law (Climate Leadership and Community Protection Act) which furthermore directs the State to be 100% carbon free by 2040, and to reduce greenhouse gas emissions to 85% of 1990 levels by 2050.

¹ Now known as the ‘American Clean Power Association (ACP)’. However, the citations here were published prior to the name change, therefore referring to ‘American Wind Energy Association (AWEA)’, for consistency with those references.

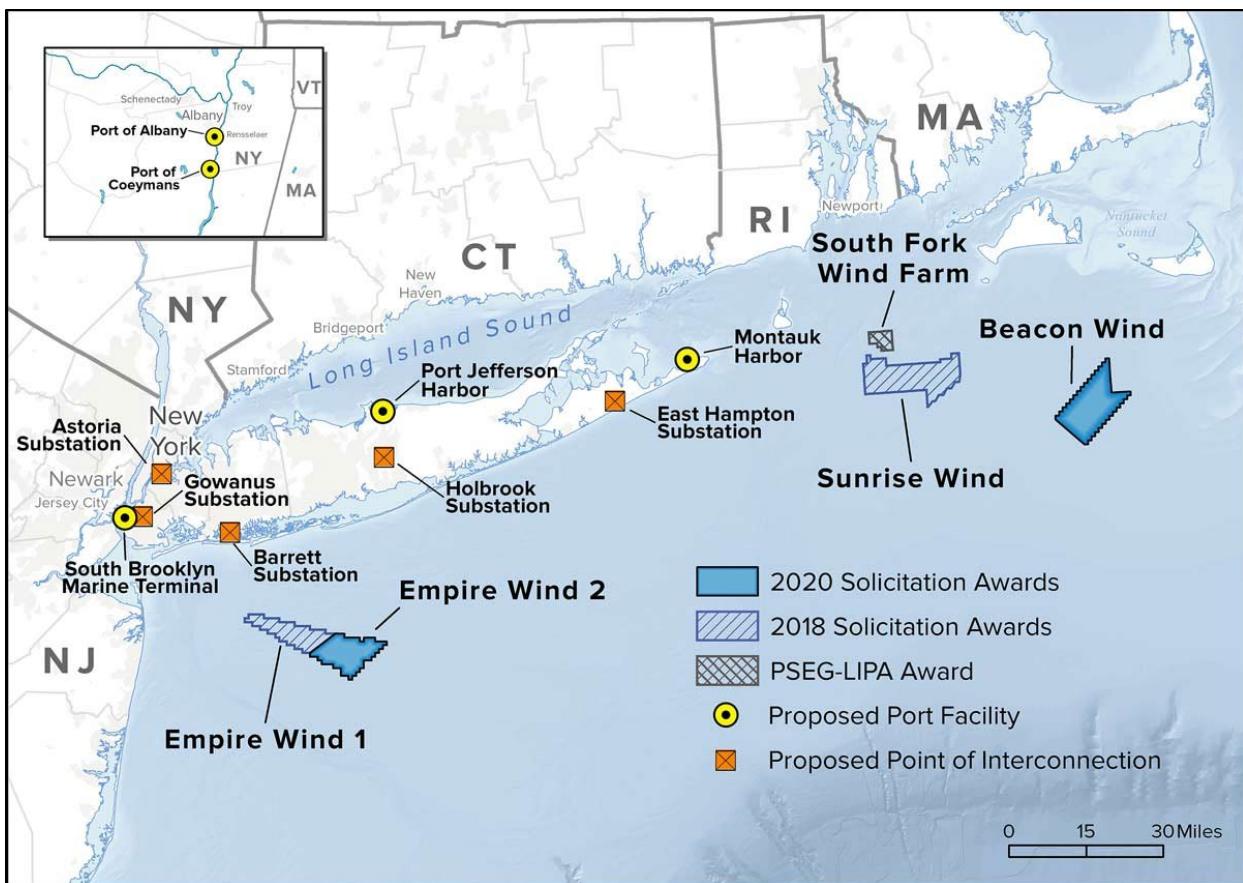


Figure 1. Offshore Wind Lease Areas in the New York Bight, and Southern New England with Power Purchase Agreements with NYSERDA and PSEG-LIPA .

3 COMMERCIAL FISHING INDUSTRY IN SOUTHERN NEW ENGLAND AND THE NEW YORK BIGHT

The commercial fishing industry plays an important socioeconomic role throughout much of the coastal United States (U.S.) and the communities surrounding the New York Bight are no exception. Here, the commercial fishing industry not only directly supports fishermen, captains, processors, and dealers, but also influences multiple community and state-level tourism and service industries. The combined fishing effort in the Mid-Atlantic and New England regions accounts for 1.153 billion pounds of seafood, with a landed valued of \$1.999 billion in 2019 (NOAA Fisheries 2020a).

For the purpose of this document, offshore wind development in New York state is expected to overlap with Massachusetts, Rhode Island, Connecticut, and New Jersey, based on the locations of the Lease Areas and the Export Cable Route Corridors that will be used to deliver power to New York. While Beacon Wind and Sunrise Wind each have power purchase agreements with NYSERDA, the Lease Areas are part of the Massachusetts Rhode Island Wind Energy Area, with potential impacts overlapping into these regional fisheries, in addition to those of the New York Bight and Long Island Sound.

In the region of Southern New England and the New York Bight, the commercial fishing industry supports 231,000 jobs. Including full-time and part-time careers supported directly or indirectly by the sale of seafood or purchases of inputs to the commercial fishing industry (NOAA Fisheries 2018a). Massachusetts produces the majority of commercial fishing-related jobs in the area (128,000), and is followed by New York (44,000), New Jersey (39,000), Rhode Island (15,000), and Connecticut (5,000) (NOAA Fisheries 2018a).

The top ten species, ranked by value and weight, for each state in southern New England and the New York Bight are shown in Table 1.

Table 1. Top Species Landed in Southern New England by Value and Weight, 2019

New York			
Species	Value Landed (millions)	Species	Pounds Landed (millions)
Squid, Longfin	\$6.8	Scup	4.1
Quahog Clam	\$6.1	Squid, Longfin	4.0
Golden Tilefish	\$4.0	Goosefish	1.5
Summer Flounder	\$3.5	Quahog Clam	1.5
Scup	\$3.2	Silver Hake	1.4
Eastern Oyster	\$1.4	Golden Tilefish	1.1
Silver Hake	\$1.3	Atlantic Surfclam	1.0
Black Sea Bass	\$1.2	Menhaden	1.0
Tautog	\$1.1	Winter Skate	1.0
Goosefish	\$1.0	Summer Flounder	0.9
New Jersey			
Species	Value Landed (millions)	Species	Pounds Landed (millions)
Sea Scallop	\$96.4	Menhaden	78.0
Menhaden	\$13.4	Squid, Shortfin	21.6
Atlantic Surfclam	\$11.9	Atlantic Surfclam	17.6
Squid, Shortfin	\$9.2	Sea Scallop	10.5
Blue Crab	\$8.1	Atlantic Mackerel	5.5
Squid, Longfin	\$7.2	Blue Crab	5.3
Summer Flounder	\$5.1	Squid, Longfin	4.9
Black Sea Bass	\$2.7	Goosefish	1.9
American Lobster	\$1.7	Scup	1.8
Bigeye Tuna	\$1.6	Winter Skate	1.8
Massachusetts			
Species	Value Landed (millions)	Species	Pounds Landed (millions)
Sea Scallop	\$397.2	Sea Scallop	41.9
American Lobster	\$94.4	Haddock	18.7
Eastern Oyster	\$30.1	Squid, Shortfin	17.9
Haddock	\$18.3	American Lobster	16.9
Atlantic Surfclam	\$16.6	Atlantic Surfclam	15.7

Quahog Clam	\$8.2	Goosefish	14.0
Jonah Crab	\$8.1	Acadian Redfish	11.6
Goosefish	\$8.1	Quahog Clam	11.1
Squid, Shortfin	\$7.2	Winter Skate	10.0
Soft Clam	\$6.5	Atlantic Herring	9.9

Rhode Island

Species	Value Landed (millions)	Species	Pounds Landed (millions)
Sea Scallop	\$24.5	Squid, Shortfin	18.7
Squid, Longfin	\$20.2	Squid, Longfin	13.3
American Lobster	\$11.0	Butterfish	6.5
Squid, Shortfin	\$10.9	Silver Hake	5.7
Eastern Oyster	\$5.7	Little Skate	5.6
Summer Flounder	\$5.6	Scup	4.6
Quahog Clam	\$5.4	Winter Skate	4.3
Butterfish	\$4.8	Jonah Crab	4.2
Silver Hake	\$3.4	Goosefish	3.2
Jonah Crab	\$3.4	Sea Scallop	2.7

Connecticut

Species	Value Landed (millions)	Species	Pounds Landed (millions)
Sea Scallop	\$6.5	Squid, Longfin	2.2
Squid, Longfin	\$3.6	Little Skate	1.6
Summer Flounder	\$1.1	Scup	1.1
Conchs	\$0.9	Sea Scallop	0.7
Scup	\$0.8	Silver Hake	0.7
American Lobster	\$0.7	Skates	0.5
Skates	\$0.6	Conchs	0.3
Silver Hake	\$0.5	Goosefish	0.3
Channeled Whelk	\$0.5	Summer Flounder	0.3
Black Sea Bass	\$0.2	Winter Skate	0.3

Note: These names represent aggregations of more than one species. They are not inclusive, but rather represent landings where we do not have species-specific data. Selecting "Flatfish," for example, will not return all flatfish but only those where we do not have more specific information. Species common names such as "conch" are sometimes reported as "knobbed whelk" or "channeled whelk", but refer to the same organism, locally referred to as "conch".

Source: NOAA Fisheries 2020a

Fishing grounds within the New York Bight are important to the regional commercial fishing industry. VTR data modeled by NMFS/GARFO indicate that the primary FMPs within the New York Call Areas are Atlantic scallop, summer flounder, scup and black sea bass, surfclam and ocean quahog, and Atlantic mackerel, squid and butterfish (GARFO 2018). Between 2012 and 2016, these FMPs accounted for over 45 million lbs. caught in the New York Call Areas, valued at over \$335 million (GARFO 2018). Atlantic scallops were the highest landed FMP from within the NY Call Areas (23.4 million lbs. valued at \$268.6 million) followed by ocean quahog (6.2 million lbs. valued at \$47.7 million) (Figure 3).

Vessel Monitoring System (VMS) data for six regional FMPs are provided in Figure 2. It is also important to note that VMS data is not representative of all fisheries within the area, and the following maps included in Figure 2 display speed-filtered data, which represents presumed active fishing and not transit activity.

The southern New England region adjacent to the New York Bight is home to two of the top ten most lucrative ports in the nation. New Bedford, Massachusetts ranks as #1 in the United States by revenue (\$450.8 million), followed by Cape May/Wildwood, New Jersey, ranking #9 (\$90 million) (NOAA Fisheries 2020a). New Bedford's highest value species landed are sea scallops, which accounted for \$450.8 million in 2019 (NOAA Fisheries 2020a), some of which are caught in the New York Bight (Figure 2 and Table 2). The most lucrative port in New York is Montauk (\$17.8 million), followed by Hampton Bays-Shinnecock (\$5.7 million) (NOAA Fisheries 2020a). Publicly available vessel monitoring system (VMS) data can be viewed for each federally managed FMP that requires the use of VMS on the Northeast Ocean Data Portal (northeastoceandata.org).

Fishing effort can further be described by the ‘exposure’ of landings attributed to each of the lease areas (wind energy areas) based on Vessel Trip Report (VTR) data as shown in Table 2. Revenue exposure is the value of landings caught within each discrete Lease Area (Table 2). NOAA Fisheries has developed data summaries of the previous fishing activity between 2008 to 2018 within each Lease Area (NOAA GARFO 2020). This data highlights annual landings and revenue by species, gear type, and fishery management plan within each area, as well as the revenue by port and vessel dependence upon operations in each area.

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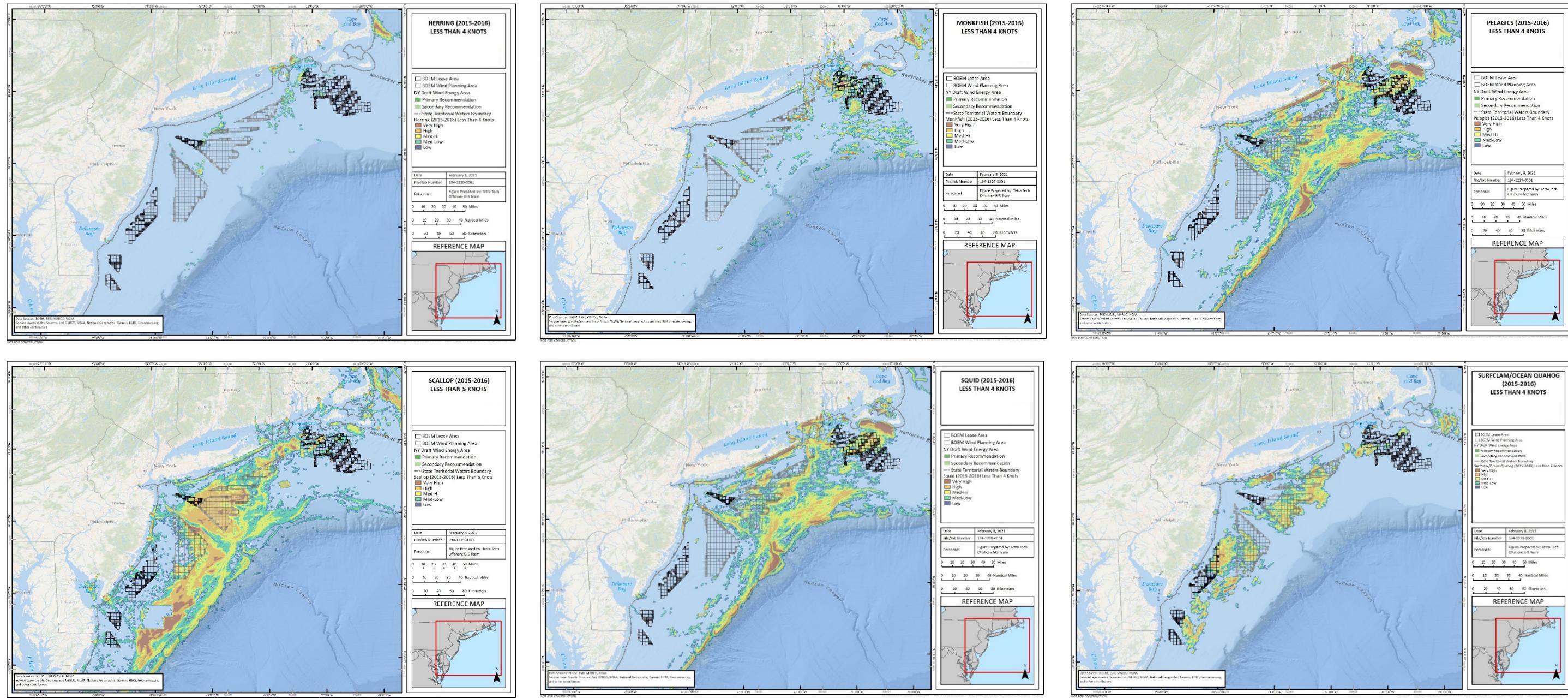


Figure 2. Representative VMS Fishing Activity by Fishery Management Plan (Herring, Monkfish, Pelagics, Scallops, Squid, Surfclam/Quahog) in the Greater New York Bight (< 4 knots; indicating presumed fishing activity)

Table 2. Average Annual Landings Revenue Exposure (2008 to 2018) for Federally-Managed Fisheries within Existing Lease Areas in the New York Bight and Southern New England /a.

Proposed Offshore Wind Project (Lease Area)	Est. Project Size (MW)	Export Cable Landing	Fisheries Compensation Commitments	Average Annual Landings Revenue Exposure by Fishery Management Plan (FMP)						
				Squid, Butterfish, Mackerel,	Summer Flounder, Scup, Black Sea Bass	Surfclam	Scallop	Monkfish	Northeast Multi-species	Other
Ocean Wind 1 (OCS-A 0498)	1,100	NJ	--	\$8,750	\$10,083	\$109,500	\$107,417	\$3,750	\$83	\$250
Atlantic Shores (OCS-A 0499)	2,500	TBD	--	\$18,417	\$26,667	\$1,069,167	\$296,917	\$7,333	\$167	\$42
Empire Wind (OCS-A 512)	2,000	NY	--	\$77,250	\$30,833	\$18,250	\$426,000	\$3,667	\$417	\$3,250
Revolution Wind (OCS-A 0486)	700	RI, CT	--	\$71,083	\$76,417	\$13,583	\$95,833	\$76,167	\$29,417	\$93,250
South Fork Wind (OCS-A 0486)	130	NY	--	\$11,917	\$15,917	\$917	\$32,000	\$30,167	\$13,833	\$18,083
Bay State Wind 1 (OCS-A 0500)	800	TBD	--	\$133,667	\$38,417	\$28,250	\$57,167	\$31,250	\$21,500	\$116,583
Sunrise Wind (OCS-A 0487/0500)	880	NY	--	\$73,250	\$114,500	\$15,583	\$148,833	\$269,833	\$115,750	\$386,917
Vineyard Wind 1 (OCS-A 0501)	800	MA	\$39.3 million	\$190,667	\$49,833	\$2,583	\$8,417	\$16,333	\$8,167	\$61,083
Park City Wind (OCS-A 0501)	804	MA	--	\$92,000	\$47,083	\$0	\$21,667	\$44,417	\$12,583	\$41,000
Beacon Wind (OCS-A 0520)	1,200	TBD	--	\$118,000	\$72,083	\$583	\$16,833	\$46,333	\$6,083	\$10,583
Mayflower Wind (OCS-A 0521)	804	MA	--	\$47,250	\$52,167	\$833	\$19,833	\$12,417	\$2,667	\$3,250
Liberty Wind 1 (OCS-A 0522)	TBD	TBD	--	\$7,417	\$9,667	\$2,583	\$500	\$750	\$83	\$9,250

Average Annual Landings Revenue Exposure from Lease Areas within All Southern New England and the New York Bight Lease Areas Combined (2008 to 2019)	\$70,806	\$45,306	\$105,153	\$102,618	\$45,201	\$17,563	\$61,962
Average Annual FMP Landings Revenue within New England and Mid-Atlantic Regions (2008-2019)	\$43.9 million	\$37.7 million	\$29.2 million	\$471.4 million	\$20.8 million	\$74.4 million	\$1 billion
Percent of Average Annual FMP Landings Revenue Exposure within All Southern New England and New York Bight Lease Areas Combined (2008-2019)	0.16%	0.12%	0.36%	0.02%	0.22%	0.02%	0%

4 FISHERIES COMPENSATION OVERVIEW

Following avoidance and minimization measures for reducing negative impacts from development onto the fishing industry, compensation may serve as a mitigation option to reduce the anticipated financial and environmental impacts that offshore wind development may have on the commercial and recreational fishing industries.

As with other aspects of the offshore wind industry, there are lessons learned to be considered from the previous experience of the European offshore wind industry. Namely, its established models for fisheries compensation and the subsequent mechanisms for determining eligibility, valuation and administration. Since there is no industry-wide standard for fisheries compensation in the U.S., the presented examples will simply provide an overview and describe mechanisms of compensation programs within applicable industries, countries and projects, without passing judgement on any of the programs themselves. Importantly, some countries (i.e., Belgium, the Netherlands) do not allow fishermen to transit through, or fish within, offshore wind farms. This is not the case in the U.S., where no restrictions are expected to be placed on navigation through, or fishing within an offshore wind farm area (with the exception of short-term, spatially small, safety exclusion zones during construction activities).

As previously stated, there is currently no framework for fisheries compensation for maritime infrastructure projects in the U.S. at the federal level. Historically, compensatory mitigation efforts have been used in the U.S. to offset the impacts of other industries on aquatic resources and habitats. Currently, there is limited regulatory applicability to mitigate potential impacts to the fishing industry beyond the oil and gas industry and certain federal disaster programs.

Each of the program examples containing specific compensation plans discussed in this section are also included in a comparison table (Table 5) at the end of this section, which is provided as a summary of the various aspects of each program, as well as its mechanisms of implementation where possible.

4.1 Offshore Wind Industry

4.1.1 United Kingdom

The United Kingdom's (UK) approach to fishing industry compensation aims to mitigate the potential for financial impacts from disruption or displacement during the construction phase of offshore wind projects, and to provide alternative revenue generating opportunities for fishermen (Seafish n.d.). Some of these alternative revenue generating opportunities include utilizing their vessels for guarding and safety roles, as well as providing a survey platform for required environmental monitoring associated with the OSW project.

UK offshore wind projects generally follow the Fisheries Liaison with Offshore Wind and Wet Renewables Group (FLOWW) guidance (FLOWW 2014), which recognizes that:

"Commercial compensation should only be used as a last resort when there are significant residual impacts that cannot otherwise be mitigated. Compensation should only be paid on the basis of factually accurate and justifiable claims. There is therefore an obligation upon affected fishermen to provide evidence (such as three years' worth of catch records and VMS data) to corroborate any such claims." (ForeWind 2014).

Blyth-Skyrme (2010) notes that any calculation to determine appropriate levels of compensation as a mitigation option would need to be based on direct evidence of fishing activity and documented impacts to the individual fisherman, and that availability of such data is critical to establishing levels of compensation based on the following:

- Historical fishing activity on the project site (including logbook evidence);
- Level of restriction on fishing desired by the developer;
- Willingness of fishermen to continue fishing the site post-construction;
- Pressure on other fishing grounds by displaced fishermen;
- Types of fishing methods employed;
- Species of fish caught; and
- Estimated value of the catch from the project site.

When deciding the monetary amounts needed for fair compensation, the UK model includes assessments for the potential economic, financial, social and environmental impacts of the projects. These assessments consider consequences for the UK economy, monetary impacts for fishing operators, impacts on jobs or opportunities and environmental impacts. However, these impacts are only assessed during the construction phase of the project, and do not include longer-term effects that the windfarms may have on the commercial fishing industry. There are six valuation techniques that can be taken to determine the monetary value of impacts more accurately. These include:

1. Proportional area technique;
2. Effort as a proxy for landed value;
3. Effort as a proxy for financial performance;
4. Consultation approach;
5. Resource valuation; and
6. Direct method approach.

Additional details of fisheries compensation programs implemented in the UK are summarized in Table 5, at the end of this section.

4.1.2 Denmark

In Denmark, communication and information sharing between the developers and the commercial fishing industry is at the center of all mitigation and compensation agreements (Danish Energy Agency 2018). Most negotiations from the commercial fishing side are represented by the Danish Fishermen's Association. Compensation is provided for the survey phase, the construction phase, and the operational phase of the project. The potential impacts that may need to be mitigated include:

- Temporary removal of fishing gear;
- Temporary suspension of fishing activities on areas where surveys are being conducted;
- Suspension of all fishing activities from the construction area; and
- Potential suspension of some fishing activities within the wind farm and longer distances to get to new fishing areas.

Besides direct financial compensation, mitigation measures may also include reducing the footprint of exclusion areas by dividing construction area into different phases, providing substitute revenues by hiring fishing vessels and fishermen to aid in construction and operation of wind farm (guard vessels), and allowing fishing with fixed gear inside the wind farm. All impact assessments are calculated using the “worst case scenario” and are supplemented with existing logbook/industry data and interviews with active commercial fishermen.

Additional details of fisheries compensation programs in Denmark are summarized in Table 5, at the end of this section.

4.1.3 Norway

In Norway, coexistence measures between the commercial fishing industry and oil and gas developers within the North Sea and Barents Sea include compensation, information sharing between industry members and fishing organizations and FLOs, and early planning for unforeseen incidents (Norwegian Oil and Gas Association 2013). Norway has enacted regulations regarding the implementation of compensation for the fishing industry due to impacts from the oil and gas industry (Petroleum Business Act, 8, §1-6). Claims are divided up between damage caused by seizure of fishing grounds and damage caused by pollution and waste. A tribunal will process the claim within four months of submission. The claims should include evidence of the nature of the injurious object, the position of the damage event, the nature of the damage, the course of the damage, the experience from previous fishing in the area, and reports on inspections carried out by the Norwegian Petroleum Directorate (Petroleum Business Act 8, §5). However, steps should be taken by both parties to minimize impacts prior to the need for compensation (Norwegian Oil and Gas Association 2013).

4.1.4 United States

Although looking to established European programs for fisheries mitigation and compensation is a helpful starting point for observing models used elsewhere, the European fishing industry is much different than the nature of the United States fishing industry in terms of catch types, fisheries management, and overall effort. Several states and companies within the United States have developed forms of compensation for the fishing community. They take different approaches and rely on different types of data. However, state-by-state approaches mitigation and compensation do not consider the transboundary nature of marine fisheries and how activities in one state impact the industry in another. BOEM is currently addressing federal-scale fisheries mitigation and compensation guidance to potentially address this limitation in regional approach.

Under the Coastal Zone Management Act, development or action within federal waters that may reasonably affect any state land or water resource must be consistent with enforceable policies of the State’s coastal management program (BOEM 2022). Therefore, any offshore wind project that will have impacts within state land or coastal water must be approved by the state agency, and through this channel, the individual states become part of the mitigation process including compensation efforts.

4.1.4.1 Rhode Island SAMP

The Rhode Island Ocean Special Area Management Plan (Ocean SAMP) was developed in preparation of the siting and construction of the Block Island Wind Farm, to develop and protect Rhode Island's ocean-based resources (Rhode Island Coastal Resources Management Council [RICRMC], n.d.). The Ocean SAMP mentions compensation as a method of mitigation in the Commercial and Recreational Fishing Chapter but does not provide a comprehensive framework for its application (RICRMC 2010). It states that:

"Mitigation measures may include, but are not limited to, compensation, effort reduction, habitat preservation, restoration and construction, marketing, and infrastructure improvements. Where there are potential impacts associated with proposed projects, the need for mitigation shall be presumed. Negotiation of mitigation agreements shall be a necessary condition of any approval or permit of a project by the Council. Mitigation shall be negotiated between the Council staff, the [Fisheries Advisory Board] FAB, the project developer, and approved by the Council."

The Ocean SAMP includes a Mitigation Plan that summarizes the various compensation frameworks that resulted from engagement with the fishing communities potentially impacted by offshore marine energy and cable projects, without specifically applying those as part of the Ocean SAMP (Perry and Smith 2012). The example projects included; the Exxon Mobil Hibernia project (Canada), the AT&T trans-Pacific telecommunications cable (Oregon), Central California Joint Cable/Fisheries Liaison Committee (California), Excelerate Energy and Suez Energy offshore Liquefied Natural Gas (LNG) terminals (Massachusetts), Downeast LNG (Maine), various oil & gas projects (U.S. Gulf coast states and California), and a proposed oil & gas lease site in the North Aleutians Basin (Alaska).

Here, direct compensation to fishermen is not intended to replace an adequate fisheries management program. Instead, it is considered a mitigation method that would be negotiated at the time of permit approval by the RICRMC. Such negotiations occurred between the RICRMC and the Developer during the federal consistency process of the Vineyard Wind 1 Project (Vineyard Wind 2019), as described in Table 5.

4.1.4.2 Massachusetts Ocean Partnership

The Commonwealth of Massachusetts 2008 “Oceans Act” provided a mechanism for minimizing the potential adverse impacts of an offshore development project on commercial and recreational fishing, as well as the payment of mitigation fees, where such impacts cannot be eliminated. The Massachusetts Ocean Partnership (MOP) reviewed the approaches used in previous cases and outlined alternatives for consideration by the Executive Office of Energy and Environmental Affairs (EOEEA) (Industrial Economics 2009). In addition to soliciting input from expertise in case studies outside of Massachusetts, four prior offshore energy projects were used as examples for how this process might incorporate compensatory mitigation:

- The Northeast Gateway LNG deep water port in Massachusetts Bay;
- The Neptune LNG deep water port in Massachusetts Bay;
- The Algonquin Gas Transmission Company’s “HubLine” natural gas pipeline; and
- The Siasconset Shore Protection Project on Nantucket.

The MOP identified several key themes across these projects within Massachusetts, and outside of Massachusetts:

- The ad hoc nature of previous impact assessments and compensatory mitigation negotiations for Massachusetts projects has produced inconsistent outcomes, from the perspective of the affected parties.
- A systematic impact assessment and compensatory mitigation process does not exist at a national level. There is an apparent need for processes that are transparent and facilitate information exchange between project developers, regulatory agencies and impacted stakeholders.
- Interviewed fishermen commented on the importance of assessing resource/habitat impacts along with revenue impacts associated with lost fishing opportunities, particularly over the longer term.
- Fishermen are particularly interested in "insurance" against long-term financial impacts rather than being paid upfront for impacts that might happen. At the same time, the developer perspective is tied to the risk of cost uncertainty for unknown impacts or levels of compensation that might be needed. Further development of impact assessment and mitigation methodologies may result in approaches that account for differences in these perspectives.
- There is a universal concern with the quality of the data available to assess impacts of fishing pressure or baseline habitat condition. The resolution and quality of data needed to produce reliable assessments is not currently available.
- During the post-assessment phase, there is concern regarding the allocation of compensation at the nexus between impact and mitigation. i.e. Where does the money go? Who decides? What kind of follow up should there be to ensure the money was well spent?
- A basic level of trust between developers, regulatory agencies and stakeholders is needed to result in a successful outcome.

Similar to other studies of this nature, the MOP doesn't necessarily develop a prescriptive approach to implement fisheries-specific compensatory mitigation. However, it does identify four general approaches for determining what might be an appropriate level of compensation for situations where a project has unavoidable impacts on commercial fishing, as summarized in Table 3. These alternative approaches to economic impact analysis vary in scope and rigor based on availability of data and existing regional compensatory frameworks.

Table 3. Massachusetts Ocean Partnership (MOP) Approach for Developing Fisheries Compensation

Method / Approach	Description	Minimum Data Requirements
Historical Precedent	Use of past compensatory mitigation packages as a basis for establishing a standard compensation rate.	Mitigation package value. Size of project impact area.
Gross Revenue	Use of market data on ex-vessel revenues (total value of landings) to estimate losses per unit area, with or without consideration of regional impacts.	Aggregate landings per unit area, by fishery. Market values, by fishery. Size of project impact area.
Net Income	Calculation of the net economic loss incurred by individual fishermen, with or without consideration of regional impacts.	Number of affected fishermen. Annual revenues. Annual fixed and variable costs. Size of project impact area.
Social Welfare	Application at the project level of a broad measure of the value society places on potentially affected resources and services.	Use is dependent upon completion of formal survey research.

Source: Industrial Economics 2009

4.1.4.3 Power Purchase Agreement Solicitations

The State of New York was the first state to include a request for an optional fisheries compensation plan as part of their offshore wind solicitation process. As part of their 2020 Offshore Wind Solicitation, NYSERDA offered developers an opportunity to present an optional Fisheries Compensation Plan, described below:

"If a fisheries compensation plan is being considered to offset impacts, the Proposer must describe how it will determine instances where all reasonable attempts to avoid and minimize Project impacts, or restoration to predevelopment conditions are not feasible and some type of fisheries compensation plan is warranted. The Proposer must describe how a fisheries compensation plan was, or will be developed; how the Proposer will coordinate with the F-TWG and other entities in the design or review of the fisheries compensation plan, and; how the compensation plan will be administered by an nongovernmental third-party to provide reasonable and fair compensation for impacts that cannot be sufficiently addressed through other means."

In addition to the optional Fisheries Compensation Plan, NYSERDA also requires a Fisheries Mitigation Plan to be submitted as a standalone appendix, stating that:

"The Plan should detail, to the extent practical, specific measures the Proposer will take to avoid, minimize, and/or mitigate potential impacts of the Project on fish and fisheries. Where specific measures are not known for a specific category of impact at the time of proposing, the Plan must describe how the Proposer will work collaboratively with the State, federal agencies and other stakeholders to define avoidance, minimization, and mitigation measures. The Plan should provide a roadmap for the fisheries work to be included in the Project's development and operation and provide a degree of certainty that the Proposer is committed to working collaboratively with stakeholders to develop a cost-effective and responsible Project."

Although not specifically outlined as a requirement, financial compensation may serve as a potential mitigation option set forth by the developer in the solicitation. To date, NYSERDA has not received a

Fisheries Compensation Plan as part of a developer's proposal in response to either the 2020 or 2018 Power Purchase Agreement solicitations.

Additionally, NYSERDA's 2020 Offshore Wind Solicitation included a requirement for developers to provide indirect compensation, in the form of financial support, for monitoring key commercial fish stocks and wildlife, stating that:

"Proposers must agree, if awarded an Agreement, to provide financial and technical support to regional monitoring of wildlife and key commercial fish stocks through a minimum contribution of \$10,000 per megawatt of Operational Installed Capacity. Of this, \$5,000 per megawatt of Offer Capacity must be used by the Proposer, in concurrence with NYSERDA, to support regional monitoring of key commercial fish stocks to better understand how offshore wind energy development is potentially altering the biomass and/or distribution of these stocks. Similarly, \$5,000 per megawatt of Offer Capacity must be used by the Proposer, in concurrence with NYSERDA, to support regional monitoring of wildlife to better understand how offshore wind energy development effects distribution and abundance of sensitive species. These monitoring efforts may be committed via regional monitoring organizations or independently by the Proposer (or some combination) upon NYSERDA approval but shall be used to advance the responsible development of the offshore wind energy industry, not necessarily the proposed project."

Other states have taken NYSERDA's approach to including requests for fisheries compensation plans and fisheries mitigation plans as part of the offshore wind solicitation process.

4.1.4.4 Virginia Wind Energy Area Collaborative Fisheries Planning

In 2016, the Virginia Coastal Zone Management Program (in partnership with BOEM and other agencies) developed a process for working with the recreational and commercial fishing sectors in anticipation of the development of the Virginia Wind Energy Area (Virginia Coastal Zone Management Program 2016). One of the purposes of this initiative was to create best management practices (BMPs) regarding communication, design, operation and environmental monitoring of a commercial wind facility. The resulting 'BMP-5', which covered mitigation, included a discussion of the potential for financial compensation, based primarily on examples from the FLOWW recommendations in the UK (FLOWW 2014; Blyth-Skyrme 2010). The FLOWW model, described in Section 4.1.1, consists primarily of developers paying into a third-party fund, rather than direct payments to fishermen. Examples of the types of losses and possible structures for determining financial compensation amounts and durations summarized in the report are outlined below:

- **Types of Losses Considered for Financial Compensation:**
 - Increased costs incurred by fishermen associated with longer transits around exclusion zones and loss of dock space.
 - Gear or vessel loss/repair might occur through entanglement on, or allision with, turbine foundations or snag on cables, etc. during construction or operation.
 - Lost fishing revenue might occur through fixed gear removal during surveys; temporary closures during construction; increased pressure on other fishing grounds during operation due to displacement; or by changes in target species abundance and density during operation.
- **Possible Structure of Financial Compensation:**

- The source(s) and amount of funding should be determined, along with various stipulations that dictate the ‘ground rules’ for payments into, and claims paid by, the fund.
- The term or duration of funding might be limited to construction periods, or extend for the lifetime of the project, through decommissioning.
- Data integrity is necessary for both the developer and the fishermen to have confidence with the information being used to assess potential impacts and compensation levels. If post-construction compensation is pursued, it would likely need to include extensive documentation of a baseline period and subsequent changes in fishing activity, vessel routes, fuel costs, and landings both inside and outside of the project area (resulting from the project). The report also recognizes that direct financial compensation for impacts to individual fishermen may require a level of data and documentation not currently being collected (or shared) by individual fishermen. Therefore, new mechanisms might be required to establish and achieve these data needs.
- The process for submitting claims needs to contain clear instructions, including any required backup documentation, timing, approval/denial of claims, as well as include an appeals process.

This report summarized examples of compensation programs based on what has been implemented in the UK. However, it is important to note that this document does not outline a program that is specific to the Virginia Wind Energy Area.

4.1.4.5 BOEM-Developed Best Management Practices

In 2013, BOEM solicited input from the commercial and recreational fishing industries to provide input in developing BMPs to help minimize potential conflicts between fishermen and offshore wind energy development (BOEM 2013). As part of this effort, BOEM held eight workshops between Maine and North Carolina to discuss outer continental shelf (OCS) wind leasing and identify possible BMPs. One of the outcomes of these workshops was ‘BMP #9’ related to fisheries compensation. However, participants understood that the criterion identified during these sessions were not related to any specific wind energy project or meant to direct compensation to fishermen as a result of lost or reduced fishing grounds or equipment.

BOEM’s ‘BMP #9’ (Measures to Offset Adverse Impacts) includes the following considerations for monetary compensation measures by the lessee to fishermen, such as:

- Access enhancement (e.g. mooring buoys);
- Cost reduction (e.g. fuel subsidy);
- Seafood promotion efforts;
- Permit and vessel buybacks;
- Direct compensation;
- Compensation through a fishing organization; and
- Compensation through the state or municipal government.

Compensation related BMPs have not yet been implemented as part of a BOEM lease stipulation to date. Importantly, BOEM caveats this report with the following statement:

“All of the BMPs and mitigation measures presented here are recommendations from the literature search, stakeholder consultation, and the outreach workshops. Some could be required as lease conditions by BOEM, some are within the regulatory authority of other agencies (e.g., offshore structure marking, fishing effort reduction programs), and some are recommendations for offsetting any adverse impacts to the fishing industry and to enhance lessee interactions with fishing interests, while some are outside the authority of BOEM to require or enforce under current legislation.” (BOEM 2013).

4.1.4.6 Vineyard Wind 1

Vineyard Wind has agreed to provide a financial mitigation package totaling \$39.3 million for its proposed 800 MW “Vineyard Wind 1” project located in the northern-most portion of BOEM Wind Lease Area OCS-A-0501. The mitigation package is divided between the Massachusetts commercial fishing industry (over \$22.6 million) and the Rhode Island commercial fishing industry (\$16.7 million). This direct compensation program will be administered through four different funding mechanisms within Rhode Island and Massachusetts. Both Rhode Island and Massachusetts have received funding from Vineyard Wind through the Fisherman’s Future Viability Trusts and/or Fisheries Innovation Funds.

The purpose of the Rhode Island Fishermen’s Future Viability Trust is to further the policies of the Ocean SAMP with respect to the continued viability and success of Rhode Island’s fishing industry by providing funds to address concerns raised about safety and effective fishing in and around the Vineyard Wind project Area (Vineyard Wind 2019). Vineyard Wind will make payments of \$2.5 million per year for five years (\$12.5 million total) into the trust, and the first installment will be paid within 60 days of financial close. The Rhode Island Direct Compensation Fund will be held in escrow to compensate for claims of direct impacts to Rhode Island vessels or Rhode Island fisheries in the project area. The annual payments over the life of the project for 29 years will total \$4.2 million (Vineyard Wind 2019).

The Massachusetts Fisheries Innovation Fund will provide support to programs and projects through grants to conduct studies on the impacts of offshore wind development on fishery resources and the recreational and commercial fishing industries as well as provide grants for technology and innovation upgrades for fishery participants (and vessels) actively fishing within a wind energy area (Vineyard Wind 2020a). Total payments for the fund over the life of the project will be \$1.75 million (Vineyard Wind 2020a). The Massachusetts Compensation Mitigation Fund will compensate any claims by Massachusetts fishing businesses and will provide a total of \$19,186,016 in funding over the lifetime of the project (Vineyard Wind 2020a).

In addition to direct compensation to commercial fishermen, Vineyard Wind has committed to other means of minimization and mitigation of impacts including implementing a Fisheries Communication Plan, designing the Project layout to allow fishing transit, providing a Gear Loss/ Damage Claim process, and burying the cable deep enough to allow for safe deployment of mobile and bottom-fishing gear (Vineyard Wind 2020b, Vineyard Wind n.d.). Additional details of the fisheries compensation programs for the Vineyard Wind 1 project are summarized in Table 5, at the end of this section.

4.1.4.7 South Fork Wind

Deepwater Wind (now Ørsted) South Fork, published a draft joint proposal with Public Service Enterprise Group (PSEG) Long Island, Win With Wind, Montauk United, Concerned Citizens of Montauk, the Group for the East End, Inc., among others, to outline their Environmental Management and Construction Plan (EM&CP) (Deepwater Wind 2020). In this joint proposal, South Fork acknowledged that a Fisheries Compensation Plan would be needed as part of an EM&CP to “avoid or minimize, to the extent practicable, significant potential impacts to fishing operations” (Deepwater Wind South Fork LLC 2020).

In addition to direct compensation to fishermen, South Fork also committed to various mitigations related to minimum cable burial depth, limited cable protections, gear loss compensation, and other micrositing measures along the cable route (Orsted, n.d.). Deepwater Wind South Fork also agreed to implement a Fishing Community Outreach Program to communicate construction activities through local notice to mariners, including commercial fishermen, recreational fishermen and for hire (charter) fishermen (Deepwater Wind South Fork LLC 2020).

In September of 2020, South Fork made an agreement with the Town of East Hampton to pay them \$28.9 million for land access for the installation and maintenance of export cable from the landing location to the onshore substation (Vecsey 2020). South Fork has also committed \$12 million towards a fishing compensation agreement to be paid in increments over thirty years or \$5.2 million upfront (Walsh 2021).

Additional details of fisheries compensation programs for the South Fork Wind project are summarized in Table 5, at the end of this section.

4.2 Non-Offshore Wind Marine Industries in the United States

4.2.1 NMFS Fishermen’s Contingency Fund

The National Marine Fisheries Service (NMFS) established the Fishermen’s Contingency Fund to compensate commercial fishing industry stakeholders for economic and property losses caused by oil & gas obstructions on the U.S. Outer Continental Shelf (NOAA Fisheries 2018b). The program is funded by assessments paid by the offshore oil & gas industry. Fishermen may access these funds if there was direct damage to their vessel or if they can prove that they incurred losses in income due to the inability or reduced capacity to fish due to oil & gas industry activities (NOAA Fisheries 2018b). In these instances, the amount of compensation is based on 50 percent of the gross income lost and not lost profit.

To qualify, fishermen must file a report to NOAA Fisheries within 15 days from when the vessel returned to port with damage. Following the submittal of this initial report, the fishermen must then file a claim of loss/damage within 90 days following the date of when the damage was discovered (NOAA Fisheries 2018b). This claim should contain specific vessel and crew information, a full statement of the circumstances concerning the damage or loss, the amount claimed for property damage or loss, a full statement of the type and extent of damage, and the amount claimed, with supporting documentation for economic loss (NOAA Fisheries 2018b).

4.2.2 Natural Resources Damages Assessment Program

The Natural Resource Damage Assessment (NRDA) process is implemented by NOAA in coastal zones. It is designed to evaluate and restore wildlife, habitats and human resources impacted by oil spills, hazardous waste sites and vessel groundings (NOAA National Ocean Service 2020). This process has been implemented in coastal locations, particularly within the gulf coast of the U.S., where oil spills have resulted in damages to these resources. For damages specifically related to oil spills, the Oil Spill Liability Trust Fund has been established to provide a financial mechanism towards administering cleanup funds (NOAA National Ocean Service 2020). The NRDA process includes the following steps:

- A preliminary assessment determines if impacts have occurred and the potential effects of the incident on natural resources.
- An injury assessment/restoration planning phase allows for quantification of injuries/damages and identification of potential restoration projects designed to offset the losses.
- A restoration phase includes coordination with the Responsible Party, who ultimately pays for the assessment, planning and restoration.

Similar to compensatory mitigation discussed in Section 4.2.3, this type of program is generally habitat based. Further, this mechanism of compensation also does not specifically consider the potential impacts to the commercial fishing industry from offshore wind development. Two examples of the implementation of the NRDA process include the Refugio Beach Oil Spill and the Deepwater Horizon Oil Spill.

4.2.2.1 Refugio Beach

The Plains All American Pipeline spill in May 2015 resulted in a crude oil discharge near the Refugio State Beach, near Santa Barbara, California. The California Department of Fish and Wildlife then imposed a ban on all fishing within a 138 square mile zone of the spill from May 19, 2015 to June 29, 2015 (CA OEHHA 2015). A subsequent natural resources damage assessment (NRDA) determined that the spill resulted in \$60 million in damages. Of this total, \$22.3 million was allocated for natural resource damages. As part of a March 2020 consent decree, the funds are to be used for restoration projects that compensate the public for impacts to wildlife, habitat and recreational uses (California State Lands Commission 2020).

In 2017, a separate class action lawsuit was filed in federal court in which a ‘fisher class’ sought to recover the financial losses incurred by commercial fishermen and processors following the 2015 spill, including the subsequent fishery closure and associated lost revenue (U.S. District Court for the Central District of California 2020). In 2020, the geographic area of impacted fishermen was expanded, which brings the total damages claim up to \$185.6 million (Malo 2020). The class action lawsuit established strict requirements for those eligible to seek claims as part of the ‘fisher class’, including those who had performed specific fishing activity within certain regulated fishing blocks during a 5-year timeframe prior to the spill. Initially, the case had a trial date of September 2020, but due to the COVID-19 pandemic, the Central District Courts remain closed in California. The case is still active, awaiting a rescheduled trial date, and has not yet resulted in any settlement or payout to impacted fishermen.

Additional details of fisheries compensation programs described in the Refugio Beach Compensation Plan are summarized in Table 5, at the end of this section.

4.2.2.2 Deepwater Horizon

The British Petroleum (BP) Deepwater Horizon oil spill in 2010 resulted in substantial damage to the regional marine wildlife, which led to fishing closures in large portions of the region (BOEM 2017). The peak fishing closure area following the Deepwater Horizon oil spill and cleanup covered 37% of the U.S. Federal waters within the Gulf of Mexico, resulting in substantial economic consequences to the Gulf of Mexico fishing industry (BOEM 2017).

Following the spill, BP set aside \$20 billion in escrow in a Claim Compensation Fund to offer reparations to those whose livelihoods had been damaged or threatened due to the incident. Claims could be made to the Deepwater Horizon Economic and Property Damages Settlement until June 2015, just over 5 years after the incident occurred (Deepwater Horizon Claim Center 2020). The Gulf Coast Claims Facility (GCCF) also offered emergency payments covering 6 months of lost income until November 2011. Resulting in \$751 million going straight to the impacted individuals and businesses in the commercial fishing industry (Congressional Research Service 2011). Under the GCCF program, individuals requesting financial compensation had three years to calculate damages from the oil spill and submit a claim for a payment. Those that received emergency payments qualified for a quick payment final claim of \$5,000 for individuals or \$25,000 for businesses (Congressional Research Service 2011).

Additional details of the fisheries compensation programs described in the BP Deepwater Horizon Compensation Plan are summarized in Table 5, at the end of this section.

4.2.3 Compensatory Mitigation under the Clean Water Act

Section 404 of the Clean Water Act authorizes the discharge of dredged or fill material into U.S. waters. For unavoidable impacts to aquatic resources resulting from such discharges, a compensatory mitigation program is in place (EPA 2015). Such mitigations can include direct restoration, mitigation banking or in-lieu fee programs. The permittee is responsible for the implementation and success of the mitigation.

- For permittee responsible mitigation, the restoration is undertaken directly by the permittee to compensate for impacts resulting from a specific project; either on site or off site.
- For mitigation banking, a permittee may purchase ‘credits’ from a mitigation ‘bank’, with values assigned based on the corresponding function of the habitat restored or created.
- For in-lieu fee mitigation, a permittee (or multiple permittees) provides funds to an in-lieu-fee sponsor (typically a state/local agency or third-party organization) to provide resources towards one or more mitigation project(s).

4.2.3.1 Pebble Mine

In 2017, the Pebble Limited Partnership (PLP) proposed to develop a surface mine (copper, gold, molybdenum) and related infrastructure located on the southwestern Alaska coastline. The mine would be in the headwaters of Bristol Bay, which is a productive commercial salmon fishery, accounting for 73.1 million pounds landed with a value of \$128.8 million in 2019 (NOAA Fisheries 2020a). This led to concern of potential impacts to that fishery, as outlined in the project’s Environmental Impact Statement (USACE 2020).

In August 2020, following the release of the final EIS, the USACE indicated that the project could not be permitted under section 404 of the Clean Water Act because the project lacked adequate compensatory mitigation for potential environmental impacts within the Bristol Bay watershed. This was later reinforced in the November 2020 Record of Decision, which denied the Section 404 (dredge and fill) Permit. The PLP included a Compensatory Mitigation Plan as part of their permit application, which included the following components:

- Water quality improvement projects in the surrounding communities adjacent to the project;
- Removal of pacific salmon passage barriers to restore access to up to 8.5 miles of habitat; and
- Marine debris removal along 7.4 miles of coastal habitat.

Despite these proposed mitigations, the USACE determined that the plan was not compliant with the requirements (33 CFR Part 332 and 40 CFR 230). The denial of this permit, for a high-profile project such as the Pebble Mine, reinforces the notion that impacts to commercial fisheries and fish habitat are an important consideration in the evaluation of potential impacts of projects that overlap socioeconomic and natural resources in the marine and coastal environment. The compensatory mitigation proposed by PLP focused on habitat-based compensation to mitigate the potential impacts to the Bristol Bay salmon fishery.

4.3 Federal Disaster Programs in the United States

4.3.1 2020 CARES Act

The Coronavirus Aid, Relief, and Economic Security (CARES) Act allocated \$300 million in aid to states, Tribes, and territories with coastal and marine fishery participants who have been negatively affected by COVID-19 (ASMFC 2020). NOAA Fisheries allocated this \$300 million sum to coastal states and their partners by using readily available multi-year averages to estimate the total average annual revenues from commercial fishing operations, aquaculture firms, the seafood supply chain (processors, dealers, wholesalers and distributors) and charter fishing businesses from each coastal state, Tribe, and territory, as shown in Table 4 (ASMFC 2020).

Table 4: CARES Act Fisheries Funding in the New York Bight

State	CARES Act Allocation to Fisheries (dollars)
Massachusetts	\$27,780,507
Rhode Island	\$3,267,923
Connecticut	\$1,820,764
New York	\$6,696,362
New Jersey	\$11,247,242
TOTAL	\$50,812,798

Source: ASMFC 2020

The Atlantic States Marine Fisheries Commission (ASMFC) is now working with these states to develop plans consistent with the CARES Act that describes funding needs. These include using funds for making direct payments, to support fishery related infrastructure, and providing fishery-specific education that addresses direct and indirect COVID-19 impacts to commercial fishermen, charter businesses, qualified

aquaculture operations, subsistence, cultural and ceremonial users, processors, and other fishery related businesses (NOAA Fisheries 2020b). Following NOAA approval of these funding plans, either the ASMFC, the Pacific States Marine Fisheries Commission, the Gulf States Marine Fisheries Commission, Puerto Rico, and/or the U.S. Virgin Islands will review applications and process payments. Individual states will also have the option to process payments (NOAA Fisheries 2020b).

NOAA Fisheries is also conducting on-going impact assessments on the COVID-19 pandemic on the for-hire and charter industry as well as seafood distributors and processors to may help businesses and communities assess losses and inform long-term recovery and resilience strategies (NOAA Fisheries 2021a; NOAA Fisheries 2021b).

Additional details of the fisheries compensation programs described in the CARES Act are summarized in Table 5, at the end of this section.

4.3.2 2012 Groundfish Disaster

In September 2012, the Acting Secretary of Commerce issued disaster declarations for multiple fisheries, including the Northeast Multispecies (groundfish) fishery. A groundfish disaster for the Northeast Multispecies Fishery was declared in 2013 and Congress approved a nationwide appropriation of \$75 million in January 2017. Of this, \$38.5 million was allocated by NOAA to the Northeast groundfish fishery in February 2014. New York State was allocated a total of \$1,144,070 in disaster relief funding under two grants that was dispersed into ‘Bins’ (Bin 1= \$584,334 and Bins 2-3 = \$559,736) at the states’ discretion and focused on providing direct assistance to permit holders, providing support for fishing communities and buying back permits (NYSDEC 2017a).

NY State acted through the New York Department of Environmental Conservation (NYSDEC) and engaged the Atlantic Marine Fisheries Commission to distribute the relief package. Public outreach was conducted, and public meetings were held during 2015 and 2016 to solicit industry input and establish three fishery management groups, namely eligible vessels, eligible captains, and eligible crew members. Applications were completed in April 2017 and all awards were distributed by August 2017, with an average of \$51,153.61 per vessel.

Additional details of the fisheries compensation programs described in the 2012 Groundfish Disaster are summarized in Table 5, at the end of this section.

4.3.3 2012 Hurricane Sandy Disaster

In the aftermath of Superstorm Sandy, which devastated the New York and New Jersey coastline in October 2012, New York State established a Small Business Storm Recovery Program that focused on providing economic relief to businesses in areas of the state that were significantly impacted by the storm. The Governor’s Office of Storm Recovery (GOSR) was created in June 2013 to allocate the Federal Community Block Grant – Disaster Recovery funds. GOSR also worked with the New York State Department of Environmental Conservation’s Division of Marine Resources to create a New York Superstorm Sandy Fishery Disaster Relief Program, which provided direct compensation for recreational and commercial fishery businesses through funding provide by separate grants (NYSDEC, 2017b and 2017c). The State University of New York’s Small Business Development Center was also called upon to assist with program outreach, application submissions and eligibility review.

The State of New Jersey enacted Fisheries Direct Assistance Grants to assist fishing industry individuals and businesses with documented, uninsured losses of a consequence from Hurricane Sandy (NJDEP 2015). Around \$2.1 million in funding was allocated to New Jersey from NOAA as part of the federal disaster relief program. Eligible losses for compensation included losses incurred with respect to damage resulting from Superstorm Sandy. These may include lost or damaged fishing gear, lost, damaged or ruined product, replacement or repair of equipment, replacement or repair of infrastructure, and lost revenue during November and December (2012) compared with documented income during the same months in the previous two years (NJDEP 2015).

NOAA/NMFS Grant NA16NMF4830100 assisted commercial fishery businesses. The program was enacted between July 1, 2014 and January 31, 2017. A total of 142 applications were received from three commercial fishing sectors; Aquaculture, Commercial Dealer/Processor, and Commercial Harvester. Out of 142 applications, 103 were approved, resulting in \$2,295,452 in direct assistance awards to offset total claimed applicant losses of \$20,006,878, between all three sectors.

NOAA/NMFS Grant NA16NMF45440016 assisted recreational fishery businesses. The program was enacted between October 1, 2015 and August 31, 2017. A total of 109 applications were received from three recreational fishery sectors: Bait and Tackle, For-hire Party/Charter Boats, and Marinas. Out of 109 applications, 79 were approved, resulting in \$1,508,937 in direct-assistance awards to offset total claimed applicant losses of \$7,140,741, between all three sectors.

Additional details of the fisheries compensation programs described in the 2012 Hurricane Sandy Disaster are summarized in Table 5, at the end of this section.

4.3.4 Fishing Capacity Reduction Programs

NOAA is authorized under the Magnuson-Stevens Fishery Conservation and Management Act to conduct a fishing capacity reduction program (also known as a “buyback program”), if such a program is necessary to prevent or end overfishing, rebuild stocks of fish or to achieve measurable or significant improvements in the conservation and management of the fishery (50 CFR Part 600). The programs may either purchase the value of fishing vessels, the value of their fishing permits, or both (GAO 2000). The intent of capacity reduction programs is to decrease the number of harvesters in the fishery, increase the economic efficiency of harvesting, and to facilitate the conservation and management of fishery resources in each fishery in which NMFS conducts a reduction program (Federal Register 62326-62329). This program is intended to reduce fishing mortality from the fishing industry itself, and not as compensation for fishing displacement due to external factors (such as wind development).

Such programs are typically done in response to a substantial level of overfishing within a particular fishery, not as a routine management tool. Such programs were implemented during the 1990s to achieve capacity reductions in the New England groundfish fishery, the Bering Sea pollock fishery and the Washington State salmon fishery (GAO 2000). While initial catch reductions were achieved, there were also unforeseen and complicating factors that ultimately limited the effectiveness of these programs in improving the long-term sustainability of the fisheries (GAO 2000). This limitation in long-term effectiveness is due in part by vessels that removed themselves from the industry through the buyback program re-entering the same fishery at a later date, shifting to another fishery, or using the funds from the buyback program to later invest in larger and better-equipped vessels (GAO 2000).

In 2010, NOAA established a framework (Federal Register 62326-62329) for such programs to include the following:

- In addition to the appropriate fishery management Council or Governor of a State, a majority of permit holders in the fishery may also request a buyback program.
- If part of a buyback program, a permit holder relinquishes any future limited access system claims associated with the permit or vessel participating in a reduction program and that the vessel (if not scrapped) will be effectively prevented from fishing in Federal or state waters.
- If a vessel is not scrapped, the Secretary of Commerce must certify that the vessel will not be used for fishing in the waters of a foreign nation or fishing on the high seas.
- A fee system shall be considered approved if the referendum votes which are cast in favor of the proposed system constitute at least a majority of the permit holders in the fishery, or 50 percent of the permitted allocation of the fishery, who participate in the fishery.

Fishing Capacity Reduction Programs may contribute information related to the valuation of various aspects of a fishery, including permits, vessels, gear, and/or landings. Information gleaned from these metrics may be beneficial to gain a better understanding of baseline fisheries efforts prior to development activities.

Table 5. Comparison of Fisheries Compensation Programs within the Offshore Wind Industry and other Industries.

Proponent/ Source of Funding	Compensation Program	Total Value	Monetary Mitigation Features			Non- Monetary Mitigation Features		Outreach to Fishermen?	Program in Place Prior to the Occurrence of Potential Impacts?	Implementation Timeframe	Mechanism to Implement	Description	
			Direct Compensation	Research Programs	Gear / Vessel Improvements	Other	Uniform Turbine Spacing	Transit Lane(s)					
United Kingdom		-	✓			✓			Yes	Yes	Based on timeline of offshore wind projects	Fisheries Liaison with Offshore Wind and Wet Renewables Group (FLOWW) guidance	Commercial compensation should only be used as a last resort when there are significant residual impacts that cannot otherwise be mitigated. Compensation should only be paid on the basis of factually accurate and justifiable claims. There is therefore an obligation upon affected fishermen to provide evidence (such as three years' worth of catch records and VMS data) to corroborate any such claims
Denmark		-	✓			✓			Yes	Yes	The life of the Project (construction, operation, decommissioning)	Danish Fisherman's Association. All impact assessments are calculated using the "worst case scenario" and are supplemented with existing logbook/industry data and interviews with active commercial fishermen.	Most negotiations from the commercial fishing side are represented by the Danish Fisherman's Association. Compensation is provided for the pre-investigation phase, the construction phase, and the operational phase of the project. Besides direct financial compensation, mitigation measures may also include reducing the exclusion areas by dividing construction area into different phases, providing substitute revenues by hiring fishing vessels and fishermen to aid in construction and operation of wind farm (guard vessels), and allowing fishing with fixed gear inside the wind farm
Vineyard Wind 1	Rhode Island Compensation Fund	\$4.2 million	✓				✓	✓	Yes	Yes	The life of the Project (construction, operation, decommissioning)	Funds held in escrow, allocated based on direct claims	Vineyard Wind has agreed to provide a financial mitigation package for its proposed 800 MW project located in the northern-most portion of BOEM Wind Lease Area OCS-A-0501. This direct-compensation program is structured as an escrow fund for financial compensation for direct Rhode Island fisheries impact claims.
	Rhode Island Fisherman's Future Viability Trust	\$12.5 million				✓		✓	Yes	Yes	The life of the Project (construction, operation, decommissioning)	Funds to be used in accordance with the purpose of the Trust	Vineyard Wind has agreed to provide a financial mitigation package for its proposed 800 MW project located in the northern-most portion of BOEM Wind Lease Area OCS-A-0501. This program is structured in establishing a Rhode Island Fishermen's Future Viability Trust that will disperse funds in accordance with the purpose of the Trust and the goals of the Rhode Island Ocean Special Area Management Plan (SAMP).
	Massachusetts Compensation Fund	\$19.2 million	✓				✓	✓	Yes	Yes	The life of the Project (construction, operation, decommissioning)	Direct compensation fund held in escrow to be used to cover future claims	Vineyard Wind to provide funds to directly compensate Massachusetts fishermen on potential impacts from the offshore wind project
	Massachusetts Fisheries Innovation Fund	\$1.75 million		✓				✓	Yes	Yes	The life of the Project (construction, operation, decommissioning)	Implemented via supporting programs and projects that support innovative solutions and technology development	Used to invest in studies on the potential impacts of offshore wind development on fisheries resources, improvement in vessels and gear, development of new technology to improve navigation in and around OFW area, development of alternative gear and fishing methods, optimization of vessel systems, technology upgrades for fishery participants (and vessels) that are fishing within the offshore wind area
South Fork Wind	Proposed Fisheries Mitigation Plan	\$12 million or \$5.2 million upfront	✓			✓			Yes	Yes	The life of the Project (survey activities, construction, operation, decommissioning)	N/A	Initial framework on proposed Fisheries Mitigation Plan
NOAA	New York's Groundfish Relief for 2012 Groundfish Disaster Declaration	\$1.1 million	✓						Yes	No	Congressional funding allocation to applicant awards	NYS DEC administered the program and ASMFC administered funding disbursements to approved applicants	Fishery disaster relief program implemented in response a multiple-fisheries disaster declaration issued by the U.S. Department of Commerce
New York State	New York Superstorm Sandy Fishery Disaster Relief Program (Recreational)	\$1.5 million	✓						Yes	No	Congressional funding allocation to applicant awards	Discretionary funding via direct compensation distributed by NY State to approved applicants	Fishery disaster relief program implemented in response to natural disaster event
	New York Superstorm Sandy Fishery	\$2.3 million	✓						Yes	No	Congressional funding allocation to applicant awards	Discretionary funding via direct compensation distributed by NY State to approved applicants	Fishery disaster relief program implemented in response to natural disaster event

Proponent/ Source of Funding	Compensation Program	Total Value	Monetary Mitigation Features				Non- Monetary Mitigation Features		Outreach to Fishermen?	Program in Place Prior to the Occurrence of Potential Impacts?	Implementation Timeframe	Mechanism to Implement	Description
			Direct Compensation	Research Programs	Gear / Vessel Improvements	Other	Uniform Turbine Spacing	Transit Lane(s)					
	Disaster Relief Program (Commercial)								Yes	No			
New Jersey	Fisheries Disaster Direct Assistance Grant	\$2.1 million	✓						Yes	No	NOAA funding allocation to applicant awards	Direct funding to eligible individuals and businesses active in the New Jersey Commercial Fishing Industry	Fishery disaster relief program implemented in response to natural disaster event
ASMFC	CARES Act Fisheries Aid	\$300 million	✓		✓				Yes	No	Immediate	The ASMFC, the Pacific States Marine Fisheries Commission, the Gulf States Marine Fisheries Commission, Puerto Rico, and/or the U.S. Virgin Islands reviews applications and process payments	The Coronavirus Aid, Relief, and Economic Security Act (CARES) allocated \$300 million in aid to states, Tribes, and territories with coastal and marine fishery participants who have been negatively affected by COVID-19
British Petroleum/ Deepwater Horizon	Gulf Coast Claims Facility	\$751 million to fishing industry	✓						No	No	Immediate to long-term	Under the GCCF program, persons requesting financial compensation had three year to calculate damages from the oil spill and submit a claim for a payment	Following the Deepwater Horizon oil spill, British Petroleum set \$20 billion in escrow in a Claim Compensation Fund to offer reparations to those whose livelihoods had been damaged or threatened due to the catastrophe
Refugio Beach	Refugio Beach Compensation Plan	\$185.6 million	✓						No	No	Case still active, awaiting trial date	N/A	Fishery compensation plan following an oil spill that closed a 138 square-mile zone to fishing

5 COMMON THEMES FOR FISHERIES COMPENSATION

While a federal or state agency-mandated compensation program might provide an overarching mechanism by which fishermen could be compensated for potential or realized financial losses resulting from construction or operation of an offshore wind farm, such a program does not currently exist. This section describes some of the common elements of compensation programs, such as eligibility requirements, methods of valuation, and program administration, for further discussion between stakeholders. Importantly, this section does not provide recommendations for what a fisheries compensation program might include. Fisheries compensation may include direct compensation in the form of payment or indirect compensation such as gear loss programs. The examples of elements more commonly found in the programs are summarized previously in Section 4.

As compensation strategies begin to emerge in the U.S. offshore wind industry, it is important to not only incorporate lessons learned and challenges from the strategies implemented by the offshore wind industry in other countries, but it is also perhaps equally important to consider how such programs might be implemented within existing U.S. regulatory processes. For example, in an evaluation of compensatory mitigation programs used as a potential solution to fisheries bycatch, Wilcox and Donlan (2007) identified several lessons learned from existing, habitat focused compensatory mitigation programs within the U.S., as adapted below:

- Identify the compensation actions prior to the potential impact occurring to ensure that an adequate compensation option exists, and that it is possible for the impact generated revenue to fund it;
- Establish explicit, quantitative and measurable links between the impact-producing factor and the realized impact to the resource;
- Consider the use of a return-on-investment (ROI) perspective for each mitigation strategy, aligned with stakeholders and developers; and
- Incorporate a framework that allows for adaptability as the industry grows and realized impacts become apparent. For example, mitigation actions would aim to offset the current situation, but allow for quantitative links to be updated as new information becomes available (e.g., to what extent have fisheries changed following OSW project build-out), and mitigation requirements decreased or increased accordingly.

These lessons learned are important when considering how such programs might be applied to a newly emerging industry, such as offshore wind, where potential impacts have been identified, but have not yet been quantified or realized, since most projects have not yet been constructed. The remainder of this section includes considerations for eligibility, valuation and administration of a fisheries compensation program. However, this is not intended to be used as prescriptive method of applying a fisheries compensation plan.

5.1 Eligibility

In order for a compensation program to be effective in reaching the affected individuals or groups, certain eligibility criteria would need to be established in order to determine which individuals or groups might receive compensation, similar to other compensation programs or capacity reduction programs. Each of the

compensation programs described in this document contain some degree of eligibility criteria. In this regard, eligibility criteria might range from simply being a permitholder within an affected fishery, to submitting detailed landings information to determine the extent of which an individual fishermen, crewmember, or dealer is potentially impacted within a particular lease area or cable route. Examples of eligibility criteria might include a combination of one or more of the following:

- Valid state/federal commercial fishing permit;
- Valid vessel registration and applicable registrations;
- Membership in a fisheries cooperative or third-party organization that might be involved in administering a compensation program (where applicable);
- Documentation of state/federal tax status, such as a federal W-9 form, or similar Taxpayer Identification Number and Certification;
- VTR, VMS, AIS data, or vessel logs to establish a documented history of fishing within a particular area;
- Signed affidavit to verify accuracy of information submitted; and
- Signed acceptance of terms and conditions for claims procedure, process, legal rights, liability waivers, or other mutually agreeable terms between both parties.

5.2 Valuation

Similar to establishing eligibility for compensation, or specific claims, a program must establish a consistent means of valuation for the particular aspects of individual claims; catch, gear, time, etc. Examples of a valuation criteria might include:

- Receipts from dealers to establish the value of landings;
- Receipts from equipment vendors to establish the value of gear that might be lost or damaged; and
- Standard method used to assess and establish a ‘fair market value’, including annual depreciation or escalation of value for vessels and equipment.
- Valuation of the societal and cultural importance of fishing and fishing-related business effects

Various financial valuation methods can be applied to offshore wind projects. For example, Reilly (2017) developed a simple model to calculate compensation based on the potential for losses by individual vessels if the development of marine renewable energy project resulted in exclusion from fishing grounds. This model combined spatial data, characterizing fishing activity with landings data (for various vessel sizes), with the assumption that the spatial distribution of fishing effort is a reasonable proxy for the distribution of the value of landings (Reilly 2017). Models such as this could be useful in developing an order of magnitude estimate for the range of potential impacts.

5.3 Administration

The administration of compensation programs can be done either directly through a developer or through a third-party organization. For certain direct claims, such as for vessel/gear/equipment damage from various offshore project components (e.g., foundations, scour protection, cable protection, etc.), those might be most efficiently administered directly through the project developer/owner, provided a clear mechanism for compensation is already established. For such arrangements, there might not be a predetermined limit of

compensation, but rather it might be evaluated on a case-by-case basis throughout the life of the project. Without advocating for any specific administrative program, below are a few examples of existing mechanisms of administration that could be adapted to include, but are not limited to, the following:

- **Third-party administration** – For some projects that may already have an established need for potential compensation prior to project development, it may be in the developer's and the fishermen's best interest to have a third party administer the compensation program. For such programs, fisheries compensation might be administered by local/state agencies, non-governmental organizations, or fishing industry partnerships. Such compensation measures might include indirect compensation, such as research grants, gear improvements, or providing in-depth education about fishing within an offshore wind farm.
- **Direct claims through FLO and developers** – As an alternative to an agency or third-party organization administering a fisheries compensation program, in some cases, a developer-specific direct claims compensation program might be mutually agreeable in establishing a mechanism for fishermen to file a claim for compensation. Most offshore wind developers have employed a fisheries liaison officer (FLO); an individual or team of individuals that provides outreach and coordination within the local/regional fishing community to gain a better understanding of the fishing activity that occurs within the specific Lease Area or Project Area. A direct claims program could be as simple as identifying where potential conflicts/lost revenue might occur, establishing a process for fishermen to file compensation claims, and implementing previously agreed-upon methods to determine the value of compensation claims (e.g., gear damage/loss, lost revenue due to restricted access during construction, etc.).
- **Set-aside programs** – NOAA's Research Set-Aside (RSA) program serves as a parallel, successful industry partnership that might be considered as a model for industry funded fisheries compensation programs. The New England Fishery Management Council established the Sea Scallop RSA Program in 1999. Since then, it has been a successful model of using industry funded resources to generate approximately \$15 million annually, of which \$3 million supports research projects tied to the sustainable management of the fishery. Similarly, as part of its 2020 Offshore Wind Solicitation, NYSERDA mandated financial commitments proportional to project size (\$10,000 per megawatt) intended to fund regional fisheries monitoring programs. States or industry groups might consider a similar program within the wider offshore wind industry, as a mechanism to fund a potential compensatory mitigation program. However, such a program would need to be established prior to a BOEM lease auction and prior to establishing Power Purchase Agreements or Offtake Agreements. This way, the costs of the program implementation could be factored into the lease area bids and the price per megawatt hour of generation capacity calculations.

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