SouthCoast Wind Offshore Wind Energy Project
NOAA Fisheries Essential Fish Habitat Comments
on EPA Draft NPDES Permit No. MA0006018

The lessee has applied to the Environmental Protection Agency (EPA) for a National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act (CWA). Our EFH Conservation Recommendations (CRs) # 9, 10, 11, 12, and 13 issued on September 23, 2024 are associated with operation of the proposed offshore converter station for projects 1 and 2. Below we provide additional comments, technical assistance, and recommendations specific to the draft NPDES permit and associated Fact Sheet for the SouthCoast Wind converter station for project 1.

Attachment A Biological and Thermal Monitoring Requirements

- We acknowledge that the proposed full water column sampling (within about 15 feet of the bottom) with a 61-centimeter Bongo net towed in an oblique manner through the depth zone is consistent with the sampling methods used in NOAA's Ecosystem Monitoring (EcoMon) Program.
- In an effort to further align monitoring activities to the goals and objectives presented in the NOAA Fisheries and BOEM Federal Survey Mitigation Strategy, we recommend coordination with our Northeast Fisheries Science Center (NEFSC) staff from the EcoMon survey prior to and throughout the first year of ichthyoplankton and zooplankton sampling to cross-verify the identification of collected samples. We recommend this include at a minimum a check-in prior to initiating biological monitoring, and twice a year following that. Relevant metadata should additionally be shared with our NEFSC. Coordination with NEFSC staff will help ensure the use of consistent protocols and verified specimens to potentially allow for direct incorporation of monitoring efforts and data with the NEFSC EcoMon plankton database.
- Further information is needed on the specific protocol for egg preservation. We would recommend formalin preservation for microscopic identification as ethanol can denature egg proteins, and make visual identification difficult.
- We acknowledge that the field methods include both ichthyoplankton and zooplankton monitoring. We concur that this type of monitoring is necessary as the converter station and associated cooling water intake structure overlap the Nantucket Shoals tidal front. Persistent tidal mixing zones associated with Nantucket Shoals creates aggregations of eggs and larvae (ichthyoplankton and zooplankton).
- Should our EFH CR #9 not be accepted and therefore the converter station not be relocated to locations closer to 50 m or greater depths, additional sampling should be required. The proposed quarterly sampling frequency will not allow for an evaluation of the effects of the converter station operation on Atlantic cod spawning success in the project area. The monitoring would need to be expanded to include additional sampling to allow for the evaluation of impacts to cod early life stages from the operation of the converter station within an area of cod spawning activity. The frequency of sampling, currently required for standard entrainment monitoring, is insufficient to evaluate impacts of the converter station operation on early life stages of cod. Should the proposed

location of the converter station remain, we recommend that ichthyoplankton monitoring frequency be increased from quarterly sampling to weekly sampling during peak egg and larval presence between December through April of each year. We understand this sampling frequency is greater than required for standard ichthyoplankton monitoring; however, this level of sampling would be necessary to draw conclusions about impacts to early life stages of cod from siting the converter station in a cod spawning area.

Ambient Monitoring

A. Biological Monitoring

- The draft NPDES permit states that after four years of monitoring the Permittee may request a reduction in ichthyoplankton and zooplankton monitoring frequency. We recommend ichthyoplankton and zooplankton monitoring be conducted for the full permit term or as long as an open loop cooling system is operating. Additionally, a reduction in monitoring should not be granted without consultation with NMFS. The goal of ichthyoplankton and zooplankton monitoring should be to develop abundance estimates of ichthyoplankton and zooplankton in the project area and to further estimate entrainment by operation of the converter station and estimate potential population level effects. An extended time series is necessary, as ichthyoplankton and zooplankton distribution may shift as a result of project operation. Additionally as stated in the draft NPDES permit, changing water temperatures associated with climate change could also lead to shifts in the assemblage of aquatic organisms in the area of the Facility, which could change the species being entrained. Entrainment monitoring over the permit term will provide valuable information about any changes in the densities of early life stages at the converter station over time. Additionally, Page 59 of the Fact Sheet states that "Based on present plans, there may be as many as eight converter stations off the southern coast of New England that withdraw water for cooling. Therefore, the cumulative effects of siting multiple cooling water intake structures in relatively close proximity to each other will be considered by EPA (and other agencies) as *future* permits are evaluated." However, the SouthCoast wind converter station may be the second converter station with a cooling water intake structure constructed as the Sunrise Wind converter station is currently being constructed. Cumulative effects of siting multiple cooling water intake structures in relatively close proximity to each other should be considered starting with this permit. In addition to the reasons stated above, monitoring for the life of the project will provide valuable information on the cumulative effects of cooling water intake structures. An extended time series is necessary as ichthyoplankton and zooplankton distribution may shift as a result of operation of multiple cooling water intake structures.
- We recommend that the permittee begin to collect baseline data for both standard and cod egg and larvae sampling as soon as possible prior to construction and operation of the project as the presence of the structures in the lease area could potentially alter the distribution and transport due to effects on hydrodynamic processes. We typically recommend three years of baseline data.

- The permittee should be required to share all biological monitoring data with NOAA Fisheries including both raw data, through-screen velocity at the entrance of the CWIS, and entrainment estimates.

Ambient Monitoring

B. Thermal Monitoring

- The draft NPDES permit states that ambient thermal monitoring must be conducted during the spring of the second year of full-scale operation to verify the assumptions of the thermal model and document the extent of the thermal plume. CORMIX modeling results show that at a modeled outfall at 12 m depth, and at a maximum discharge temperature of 90 degrees Fahrenheit, there is variation in the seasonal thermal plume. We recommend ambient thermal monitoring be conducted for two seasons (winter and spring) to validate the thermal model and extent of the thermal plume. Winter and spring would be important due to the potential impacts to cold pool formation in winter and potential impacts to the spring bloom. Additionally, NMFS recommends temperature monitors be placed at the discharge to verify assumptions of the maximum daily and average monthly effluent temperature.
- We recommend the permittee be required to share all ambient thermal monitoring data with NOAA Fisheries.

Cooling Water Intake Structure Requirements

- It is our understanding from the draft NPDES permit that Under Section 316(b) of the CWA, NPDES permit requirements for point source dischargers that operate a cooling water intake system (CWIS) must require that the location, design, construction, and capacity of the CWIS reflect the "best technology available for minimizing adverse environmental impact" (BTA). 33 U.S.C. § 1326(b). Further, The CWA specifies that the NPDES permit is valid for five years from the date of issuance and that the permit may be reissued upon expiration. Given the extensive life span of the project, at least 25 years, and the unmitigated effects of the proposed operation, we recommend that the offshore converter station CWIS be retrofitted with a closed-cycle cooling system when the technology is made commercially viable. The feasibility of upgrading the proposed CWIS with a closed-cycle cooling system and/or incorporating best available technologies should be evaluated every five years upon re-application of the NPDES permit for operation of the converter station. We recommend this be included as a condition of the NPDES permit.

5.1.5 Ocean Discharge Criteria

Site-Specific ODCE

- Page 33 of the Fact Sheet states that "A review of the benthic physical and biological resources in the project area was provided in Appendix M of the Facility's COP, which states that "[t]he Lease Area is mostly homogenous with little relief" and is "considered Soft Bottom habitat with *no complex features*"." NMFS notes that this is an inaccurate and misleading description of the lease area. Upon further review of the acoustic data collected for the project, multibeam backscatter depicts several high to medium return areas which appear to depict benthic ridge features carved out within the lease area. Additionally, SPI/PV data collected for the project depicts several areas of biogenic habitat (i.e., polychaete beds) which are considered complex habitat.

- Page 35 of the Fact Sheet states that “In addition to its proximity to Nantucket Shoals, the entire area of the wind farm project is located within the area recommended by the NEFMC as a Habitat Area of Particular Concern (HAPC). Specifically, the OCS-DCl location has been designated by NOAA Fisheries as a HAPC for Summer Flounder Submerged Aquatic Vegetation (SAV).” NMFS notes that this is incorrect. The entirety of the lease area and a portion of the export cable corridor overlaps the Southern New England HAPC. Portions of the cable corridor overlap summer flounder HAPC as the video surveys completed for the project depict extensive SAV.

5.2.4 BTA for Minimizing Entrainment and Entrapment

A. Potential for Entrainment

- The draft NPDES permit refers to an entrainment analysis that was provided in the NPDES permit application to calculate the number of larvae entrained per year based on projected average monthly intake flows of the converter station for Project 1 (TetraTech and Normandeau Associates, Inc. 2023). However, these predictions may underestimate the total number of larvae that could be entrained and do not provide a representation of the plankton community likely to become entrained by the converter station. The analysis provided in the NPDES permit application was limited in that only NOAA’s Marine Resource Monitoring, Assessment, and Prediction (MARMAP) program and NOAA’s Ecosystem Monitoring (EcoMon) program data was analyzed from 43 unique stations within a 10 miles (16 km) radius from the proposed intake location in Project 1. EcoMon surveys were designed as long-term shelf-wide surveys which sample over the continental shelf from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia. The sampling strata (n= 47) comprise four regions which include Southern New England, Mid-Atlantic Bight, Georges Bank, and the Gulf of Maine. By subsetting samples within a 10-nautical mile radius from the intake location for Project 1, that limits the total number of stations drawn from the strata in which the converter station falls. The EcoMon surveys were designed in that each strata is considered one area of habitat bounded by isobaths. The samples found within the strata are more representative and encompassing of the natural population which exists as opposed to only examining data from a portion of the sampling stations collected in that strata.
- The entrainment analysis referenced in the NPDES permit application did not analyze zooplankton which may become entrained by the CWIS and rather, only focused on the abundance of ichthyoplankton susceptible to entrainment. Zooplankton are a component of essential fish habitat (EFH) for federally managed species. As a result we expect that the entrainment analysis may underestimate the total number of larvae that could be entrained and does not provide an accurate representation of the natural population likely to become entrained.
- Regarding footnote 41 on page 48 of the Fact Sheet, this is a result of outdated data used for the designation and should not be interpreted as a lack of eggs and larvae for Atlantic cod in the area. Currently the EFH maps for Atlantic cod eggs and larvae are based on the relative abundance of juvenile cod during the 1968-2005 fall/spring NMFS trawl surveys and the 1978-1987 NMFS MARMAP ichthyoplankton surveys. We have more recent data available, collected as part of the Mapping the Distribution of Habitat Use of Soniferous Fish on Cox’s Ledge with a focus on Atlantic cod Spawning

Aggregations Project (2019 - 2024) which provides evidence of spawning within and adjacent to the southern New England Wind Energy Areas including the SouthCoast Wind lease area. While the current Atlantic cod EFH designation for eggs and larvae do not overlap the 10 minute square the converter station location is located in, the designation does partially overlap other areas within the lease area. We expect Atlantic cod eggs and larvae to exist throughout the project area. Additionally, the council is planning to update the EFH designations for Atlantic Cod within the next year.

B. Intake Location

- It is not clear how Figure 8 *Average Larval Density in Atlantic Ocean 10m Increments* was developed. While the footnote associated with Figure 8 states this data is based on average densities from EcoMon data from the Atlantic Ocean, the EcoMon survey does not collect depth discrete sampling. Rather, the EcoMon survey only collects integrated water column samples (surface to bottom). It is unclear to NMFS how Figure 8 was generated without depth discrete sampling. NMFS is looking for clarification on how this figure was developed and if the x-axis is displaying bottom depth.
- NMFS does not believe Figure 8 referenced in the draft NPDES permit represents the larval fish concentration vertical depth distribution of the U.S. East Coast, and that the statement “Moreover, like the Gulf of Mexico, larval densities in the offshore environment of the Atlantic Ocean also decrease rapidly with descent to deeper waters as shown in Figure 8” is misleading. Larvae are generally more abundant on the inner-and mid-shelf of the U.S. Northeast shelf (Figure 1). Unfortunately, there is not a lot of depth discrete sampling on the U.S. Northeast Shelf. In general, vertical distribution of larvae is based on species, size (age), time of day, and vertical and horizontal mixing. Smaller (younger) larvae have less ability to control their vertical and horizontal movements. As larvae grow (age), they get better at controlling buoyancy and swimming. Species of larvae is related to what habitat they will try to reach for their juvenile stage, (e.g., estuaries, benthic structure, stay in pelagic environment). NMFS does have unpublished data in our database from the National Science Foundation. Samples were collected primarily on the U.S. Southeast Shelf, but some were collected north of Cape Hatteras (Figure 2). Sampling was conducted with a 1-m tucker trawl net equipped with three 333 μm mesh size nets. The first net sampled from the surface to the bottom or a maximum depth of 50-m (data not shown). The first net was closed when the net reached the bottom and the second net was opened (Deep net). The second net fished from the bottom (or 50-m) to about half the distance to the surface and was then closed (deep net). The third net was opened and fished to the surface (surface net; Figure 3). Larval concentrations were higher in the bottom layer on the inner-shelf, had similar concentration on the mid-shelf, and were higher in the surface layer in the outer shelf (Figure 4). At this time NMFS does not have a recommendation for the depth location of the intakes to reduce entrainment impacts other than requiring closed-loop technology as soon as it comes available.
- As stated in our September 23, 2024 EFH conservation recommendations, NMFS recommends the converter station (and associated cooling water intake system [CWIS]) be relocated offshore of the overlapping benthic ridge feature (located at the 45 m isobath) to locations closer to 50 m or greater depths to minimize impacts to this

important benthic feature and associated biogenic habitat, EFH from entertainment of eggs and larvae that are concentrated in this area as a result of the Nantucket Shoals tidal front, and to reduce impacts to Atlantic cod spawning activity. Currently the CWIS is proposed on the 45 m isobath overlapping the Nantucket Shoals tidal front and is particularly concerning as it risks greater adverse impacts from entrainment of early life stages (eggs and larvae) as well as forage base (e.g., zooplankton and biogenic habitats) that serve as important components of EFH for federally managed species. Additionally, this area is also an important cod spawning habitat, particularly from 50 m depth and shallower (Van Hoeck et al. 2023 and Caiger et al. 2020).. High-resolution geotechnical and geophysical surveys, and benthic habitat mapping data collected in the lease area further confirms the proposed converter station location overlaps an active frontal region due to evidence of defined benthic ridge features with associated biogenic habitat (located at approximately 45 m isobath). Given the location of the converter station within valuable benthic and pelagic habitats, we are concerned by the limited mitigation and monitoring proposed in the EFH assessment and recommend the location be moved further offshore to minimize impacts.

5.2.5 CWIS Requirements

- The draft NPDES permit states that “in response to any exceedance of the 0.5 fps TSV limit, the permittee must implement best management practices to limit, diagnose and resolve the issue as soon as possible. The permittee must, to the extent practicable, restore the TSV to a level at or below 0.5 fps.” We recommend that the intake be shut down when the 0.5 fps threshold is exceeded to minimize impingement and entrapment mortality and entrainment.
- As stated above, the design intake velocity may not always match the operating intake velocity. The screen may get clogged/biofouled and when that happens the intake velocity may reach levels that put organisms at higher risk of entrainment, and larger organisms at risk of entrapment and impingement. The draft NPDES permit does not describe how the permittee plans to maintain a clean screen surface and more information is needed. We recommend automatic physical cleaning systems (U.S Department of the Interior Bureau of Reclamation Research and Development Office 2017).
- NMFS remains concerned that the 5x5 inches (125x125 mm) spacing of the intake bars will entrap juvenile and adult finfish and invertebrate species such as longfin squid within the project area. We recommend further evaluation of how to minimize this risk, such as smaller spacing, cleaning systems, and sensory deterrents as well as additional information on how the permittee plans to monitor for entrapment, impingement, and biofouling.

Attachment A Figures

Figure 1

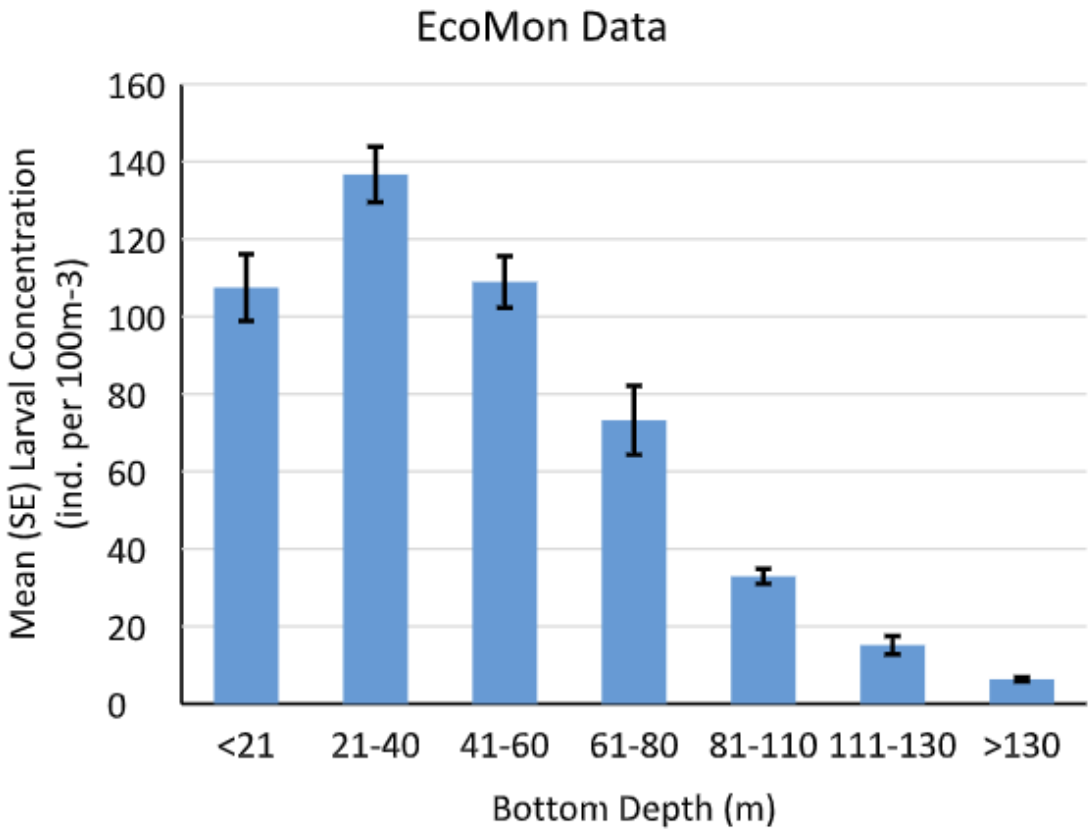


Figure 2

Figure 3

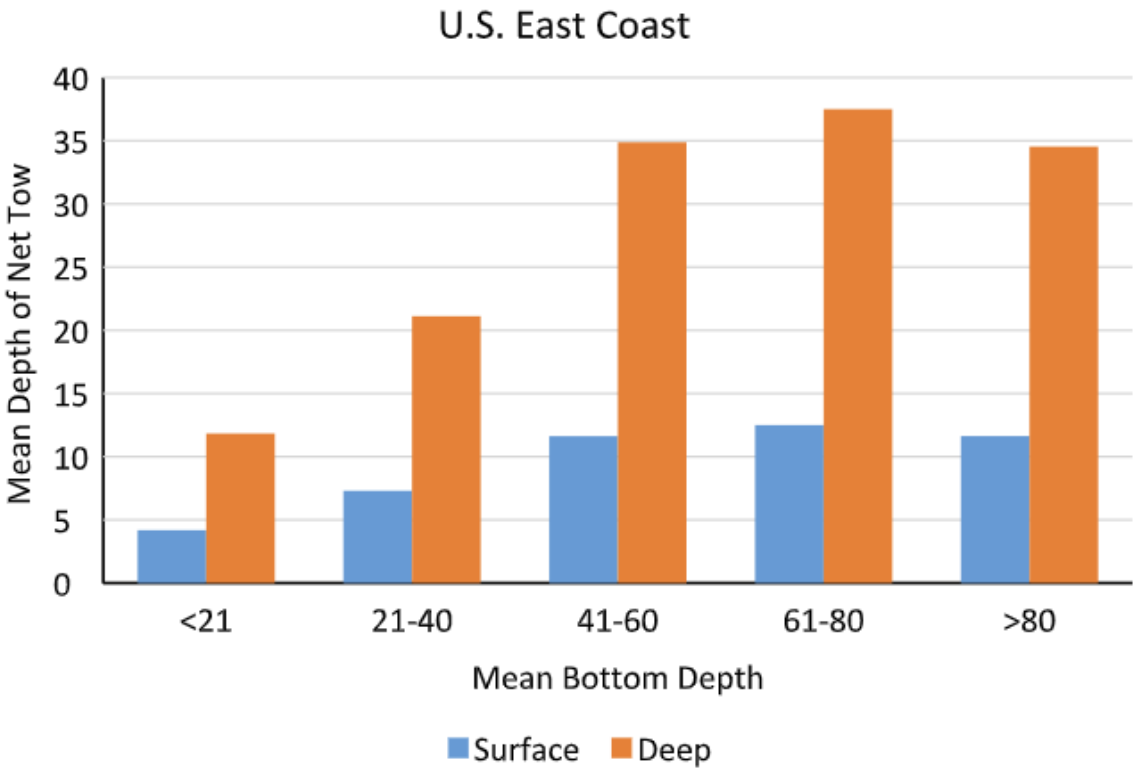
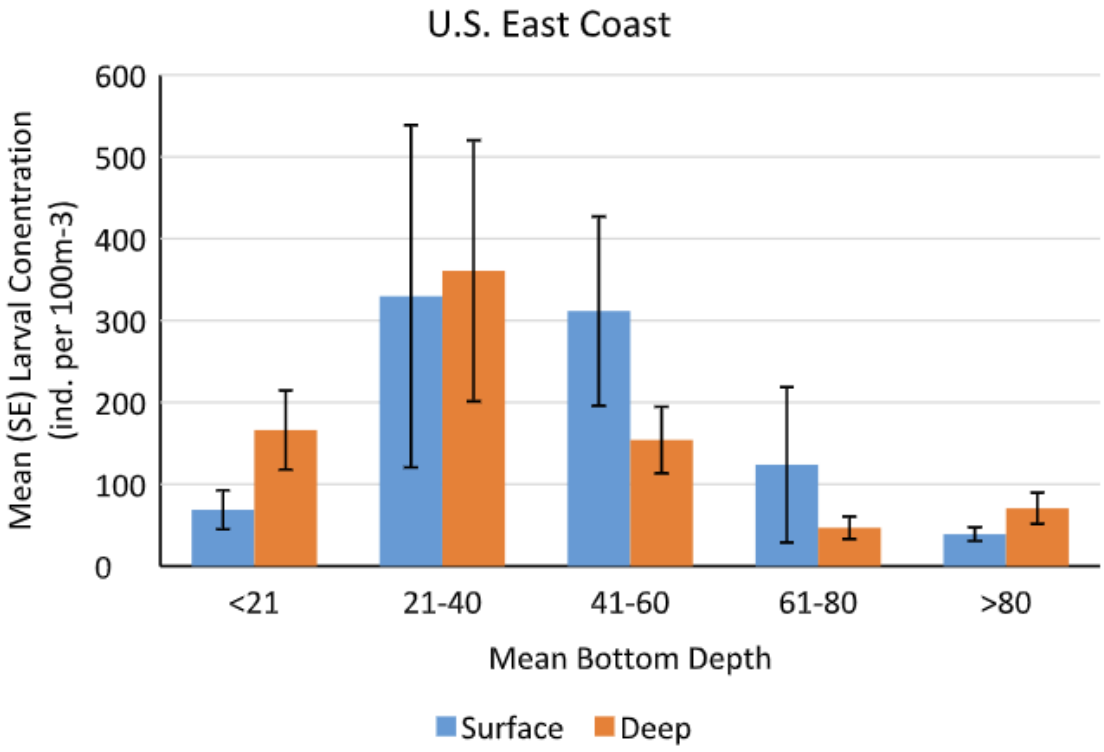

U.S. East Coast
Mean Depth of Net Tow
40
35
30
25
20
15
10
5
0
<21
21-40
41-60
61-80
>80
Mean Bottom Depth
Surface
Deep

Figure 4


U.S. East Coast
Mean (SE) Larval Conentration (ind. per 100m-3)
600
500
400
300
200
100
0
<21
21-40
41-60
61-80
>80
Mean Bottom Depth
Surface
Deep