FINDING OF NO SIGNIFICANT IMPACT (FONSI)
PURSUANT TO THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
AND DECISION DOCUMENT

U.S. NATIONAL SCIENCE FOUNDATION (NSF)
OCEAN OBSERVATORIES INITIATIVE (OOI)
PIONEER ARRAY MODIFICATIONS AND RELOCATION TO THE MID-ATLANTIC BIGHT

The U.S. National Science Foundation (NSF) prepared a Final Supplemental Site-specific Environmental Assessment environmental assessment (SSSEA) for the proposed NSF Ocean Observatories Initiative (OOI) Pioneer Array modifications and relocation to the southern Mid-Atlantic Bight (MAB) (Proposed Action). The SSSEA was prepared pursuant to the National Environmental Policy Act of 1969 (42 United States Code [U.S.C.] §4321 *et seq.*; NEPA), the Council for Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] 1500-1508), and NSF procedures for implementing NEPA and CEQ regulations (45 CFR 640). This Finding of No Significant Impact / Decision Document (FONSI/DD) incorporates by reference as if fully set forth herein the SSSEA and the analyses and conclusions set forth in the concurrences issued by the U.S. National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) for this Proposed Action. The conclusions from the SSSEA and other federal regulatory processes were used to inform the Division of Ocean Sciences (OCE) management of potential environmental impacts of the Proposed Action. OCE has reviewed and concurs with the SSSEA findings.

1 PURPOSE

The SSSEA was prepared to assess the potential impacts on the human and natural environments associated with proposed changes to components of the NSF OOI Pioneer Array, including: 1) proposed relocation from the northern MAB on the New England Shelf (Pioneer NES) to the southern MAB east of Nag's Head, North Carolina (henceforth "Pioneer MAB"; SSSEA Figure 1); 2) modifications in the mooring design; and 3) inclusion of additional scientific instrumentation.

The SSSEA tiers to OOI documentation previously prepared pursuant to NEPA[1], including a Programmatic Environmental Assessment (PEA; NSF 2008); a Site-specific Environmental Assessment (SSEA; NSF 2011a); FONSIs (NSF 2009a, 2011b); and Supplemental Environmental Reports (SER; NSF 2009b, 2013, 2015). Additionally, the NSF recently prepared a Final EA titled, *Final Environmental Assessment / Analysis of Marine Geophysical Surveys by R/V Marcus G. Langseth off North Carolina, Northwest Atlantic Ocean* (NC Survey Final EA; NSF 2023) for a project that occurred slightly south of the proposed Pioneer MAB Array Project Area; the NC Survey Final EA included information on fisheries (Sections 3.7 and 4.1.6.5) and on whale watching (Section 4.1.6.6) and is incorporated by reference.

Background of the OOI Coastal, Regional, and Global Scale Nodes

To provide the U.S. ocean sciences research community with the basic sensors and infrastructure required to make sustained, long-term, and adaptive measurements in the oceans, the NSF Division of Ocean Sciences supported the creation of the NSF OOI major facility. The final design and form of the OOI was the result of planning guided by input from the U.S. and international scientific community.

[1] Previous OOI NEPA documentation is available on the NSF website: https://www.nsf.gov/geo/oce/envcomp/.

The OOI infrastructure includes cables, buoys, deployment platforms, moorings, junction boxes, electric power generation (e.g., solar, wind, and undersea cabled power supplies), mobile assets (i.e., autonomous underwater vehicles [AUV] and gliders), and two-way data telemetry systems. This large-scale infrastructure supports sensors located at the sea surface, in the water column, and at or beneath the seafloor. As described in detail in the PEA, the OOI facility consists of three main physical infrastructure elements designed for providing observations across global, regional, and coastal scales. The Pioneer Array represents a Coastal Scale Node and was designed to be relocatable approximately every 5 years with new locations proposed by the scientific community. The operation and management (O&M) of the OOI is supported directly by the U.S. National Science Foundation through an award to Woods Hole Oceanographic Institution.

Scope of the SSSEA

As noted, the SSSEA focuses only on those activities and the associated potential impacts, including cumulative impacts, not previously assessed in the tiered OOI NEPA documents: relocation of the Pioneer Array from the original Pioneer NES to the proposed Pioneer MAB location; modifications to the mooring components and mobile assets as applied to the proposed Pioneer MAB relocation; and inclusion of additional scientific instrumentation.

All other components, installation, and O&M activities of the OOI would remain unchanged from the description and analysis presented in the PEA, SSEA, and SERs for the Pioneer NES Array.

2 SUMMARY OF THE PROPOSED ACTION AND ALTERNATIVES

The SSSEA evaluated two alternatives: 1) Proposed Action: Relocating the Pioneer Array with modifications to the MAB; and 2) No Action.

2.1 Proposed Action: Relocating the Pioneer Array with Modifications to the MAB

Pioneer MAB Array

The MAB of eastern North America is characterized by a relatively broad shelf, a persistent equator-ward current originating from the north, a well-defined shelf break front separating shelf and slope waters, distributed buoyancy inputs from rivers, variable wind forcing, and intermittent offshore forcing by Gulf Stream rings and meanders. The Pioneer MAB Array is designed to resolve transport processes and ecosystem dynamics within the shelf-slope front, which is a region of complex oceanographic dynamics, intense mesoscale variability, and enhanced biological productivity. It would collect high-resolution, multidisciplinary, synoptic measurements spanning the shelf and shelf-break on horizontal scales from a few kilometers to several hundred kilometers.

The proposed Pioneer MAB Array would be a T-shaped array located off the coast of Nags Head, North Carolina, starting approximately (~) 24 km (13 nm) offshore, extending ~59 km (32 nm) east/west and 49 km (26 nm) north/south across the continental shelf, centered at the shelf-break front (SSSEA Figure 1 and Table 1), referred to as the Project Area.

Similar to the original Pioneer NES Array, the Pioneer MAB Array would employ Shallow Water Moorings, Coastal Surface Moorings, Coastal Profiler Moorings, Gliders, and AUVs to sample on multiple horizontal scales from the air-sea interface to the seafloor. The Shallow Water Moorings (SSSEA Figure 1) would be equipped with a small surface expression for navigational aids and data telemetry equipment, a profiling vehicle to sample the water column, and would be moored to the seabed with an inductive wire and electromechanical (EM) stretch hoses, allowing incorporation of a benthic node for seabed instrumentation. The Coastal Profiler Moorings (SSSEA Figure 3) would be similar to the Shallow Water Moorings but would not have a benthic node. The Coastal Surface Moorings (SSSEA Figure 4) would be equipped with a surface expression carrying navigational aids, data telemetry systems, instrumentation to measure surface meteorology and air-sea fluxes, fitted with power generation capability, and moored with EM stretch hoses to the seafloor,

allowing incorporation of a benthic node for science user instrumentation. In total, 10 moorings would be deployed in 7 locations, as the Coastal Surface Moorings are paired with other moorings at the same location (SSSEA Figure 1).

The Shallow Water Moorings (SSSEA Figure 2) would be deployed in 30-meter (m) water depths, and the Coastal Profiler Moorings (SSSEA Figure 3) would be deployed in 100-m and 300-m water depths. The Northeast and Southeast Coastal Profiler Moorings were initially proposed to be deployed in 600-m water depth. Taking into consideration comments received during the NEPA public comment period (SSSEA Appendix G), these moorings would be deployed in 300-m water depths to mitigate potential impacts on longline fisheries. Additional information regarding this change can be found in SSSEA Section 3.1.2.6.1 Fisheries. The Coastal Surface Moorings (SSSEA Figure 4) would be deployed in 30-32-m and 100-m water depths.

Gliders and AUVs would run missions in the vicinity of the moored array. The approximate surface expressions of the underwater track lines indicating the glider and AUV paths are shown in SSSEA Figure 1. Both gliders and AUVs move slowly forward while also moving up and down in the water column. Gliders would run continuously along their pre-determined paths (SSSEA Figure 1) while AUVs would be deployed for limited periods.

To support the environmental assessment of the proposed new location, regulatory (SSSEA Appendix B), desktop (SSSEA Appendix C), and marine archeology studies (SSSEA Appendix D) were undertaken by OOI and its contractor, Tetra Tech, Inc. (Tetra Tech). Further details of the efforts to identify locations for the moorings in the Project Area were included in the Coastal and Global Scale Nodes (CGSN) Site Characterization (SSSEA Appendix E). A remotely operated vehicle (ROV) was used to inspect the seabed and verify that anchoring the scientific moorings within each proposed 2-km by 2-km (1-nm by 1-nm) square, or Mooring Site, would have minimal to no impacts to environmental resources (SSSEA, Appendix F).

Modifications to the Moored Array

A list of components previously assessed in the PEA, SSEA, and SERs for Pioneer NES Array versus the proposed components for Pioneer MAB Array in the SSSEA is provided in Table 2 of the SSSEA.

The Coastal Surface and Coastal Profiler Moorings proposed for the Pioneer MAB Array location are identical in design to the Pioneer NES Array moorings. The new deployment depths would alter the length of the riser components but would not alter the design or material types.

Two Shallow Water Moorings are proposed at the new MAB location. These moorings would operate similarly to the existing Coastal Profiler Mooring, utilizing an instrumented vehicle that moves up and down along a taut wire (SSSEA Figure 2). All components of the Shallow Water Mooring are based on existing designs, incorporating elements of both the Coastal Surface Moorings and Coastal Profiler Moorings from Pioneer NES Array.

Additional Scientific Instrumentation

During the Pioneer Array relocation planning process, additional measurements were requested by the scientific community. The Pioneer Array moorings were designed to allow the addition of new instrumentation through minor modifications in bracketry. New instrumentation includes phytoplankton imaging via imaging flow cytometry on coastal surface moorings, turbidity using optical measurement on coastal surface moorings, near-surface velocity using acoustic measurement on coastal profiler mooring and shallow water moorings, and suspended particulates using optical measurement on coastal surface moorings.

Installation, Operation & Maintenance

The Pioneer MAB Array is proposed to be deployed in April 2024. Following deployment, the moored array would be serviced using a University-National Oceanographic Laboratory System (UNOLS) Global or Ocean

Class vessel in April/May and August/September of each year (i.e., every 6 months). These periods offer the most suitable weather and sea conditions to perform the mooring recoveries and re-deployments. Vessel scheduling issues, other unforeseen events (e.g., weather) might require that some maintenance cruises occur outside of the planned time window in a given year. Other activities during the maintenance cruises include Glider recoveries/deployments as necessary, and AUV surveys. Gliders would require recoveries and deployments between maintenance cruises (every 75-90 days) using smaller research or charter vessels. AUV surveys are planned for every 2 months and would also require small vessel cruises except for the two times per year that surveys would be conducted during the mooring maintenance cruises. A proposed schedule for installation, operations, and maintenance is included in the Table 3 of the SSSEA.

The installation of the Pioneer MAB Array infrastructure and routine O&M activities would be the same as those described in the 2011 SSEA (refer to Section 2.2.6 of the PEA [NSF 2008]). They would be carried out following standard methods and procedures currently used by the ocean observing community, such as the National Oceanic and Atmospheric Administration's (NOAA) National Data Buoy Center (NDBC); regional ocean observing programs funded by the NOAA Integrated Ocean Observing System (IOOS) (https://www.ioos.noaa.gov); and other federal agencies (e.g., U.S. Department of Energy, see: https://www.pnnl.gov/projects/wind-forecast-improvement-project-3). The moorings deployed at Pioneer NES included anchors and benthic nodes that were designed to be fully recoverable minimizing impacts to the seabed. The successful recovery of the Pioneer NES Array infrastructure in November 2022, proved the effectiveness of the design. There would be no changes to the installation of the Pioneer MAB Array components, as addressed in Sections 2.1.1.3 and 2.1.1.4 and Tables 2 and 3 of the 2013 and 2015 SERs.

2.1.1 Standard Operating Procedures (SOPs) for Installation and O&M of the Proposed Modifications to the Pioneer Array

The proposed modifications to the Pioneer Array do not require any changes or additions to the SOPs (also refered to as "Special Operating Procedures") that were presented in the 2011 SSEA (NSF 2011a, Section 2.2.10, Table 2-13).

The following SOPs, included in Table 4 of the SSSEA, would continue to be followed to avoid and minimize any potential impact to ocean uses/users, (e.g., marine traffic and commercial fishing activities):

1- All Pioneer Array moorings would be permitted as Private Aids to Navigation (PATONs) through the U.S. Coast Guard (USCG). Surface buoys would be marked per USCG requirements, with all required lights and markings, with locations appearing in the Notice to Mariners (NOTMAR) and Local Notice to Mariners (LNM). Surface buoys would be marked with contact information, which would be included in the NOTMAR and LNM with suggested buffer zones* around moorings. Should any vessel accidentally snag Ocean Observatories Initiative (OOI) moorings or equipment, they would be instructed to contact that number and/or the USCG. As Pioneer Array moorings would be considered PATONs, they are protected by USCG rules and regulations pertaining to Aids to Navigation (33 Code of Federal Regulations [CFR] 66 and 33 CFR 70). Penalties for interference, collision, and vandalism can be levied by the USCG in accordance with 33 CFR 70. So long as surface buoys are marked per regional USCG requirements, all lights and markings are operating correctly, and the infrastructure is on the marked location (i.e., as described in NOTMAR and LNM), the OOI project is not liable for snagging of or damage to any gear or vessel.

2- Locations for all moorings and associated components of the Pioneer Array would be published on NOAA charts once moorings are listed in the USCG NOTMAR and LNM. In addition, accurate locational information would be made available to fishers to assist their avoidance of the instruments.

3- The coordinates for Pioneer Array autonomous underwater vehicles (AUV) and glider mission boxes would be published through a NOTMAR. Gliders and AUVs would be marked with the name of the

owning organization and a contact telephone number that fishers can call to report potential entanglements.

2.2 Alternatives Considered

An alternative to conducting the Proposed Action is the "No Action" alternative, which is to not relocate the Pioneer Array with modifications to the MAB. Under the "No Action" alternative, the NSF would not provide funding for the Proposed Action. If the Pioneer Array with modifications was not relocated to the MAB, the "No Action" alternative would result in no disturbance to the marine environment. Although the "No Action" alternative is not considered a reasonable alternative because it does not meet the purpose and need for the Proposed Action, it was included and carried forward for analysis in the SSSEA.

Although the Pioneer Array could be relocated to several sites to collect critical oceanographic data, extensive effort was undertaken by the NSF, OOI, the scientific community, and other interested parties to evaluate potential sites for relocating the array, narrowing the selection based on scientific justification to the proposed MAB site, as described in Section 2.1.4 of the SSSEA. For this reason, relocating the Pioneer Array to other locations as an alternative was eliminated from further consideration. Given that the Pioneer Array is designed to be relocated approximately every 5 years, other locations would be considered and evaluated for future opportunities.

3 SUMMARY OF AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

As the SSSEA tiers off previous documents evaluating the Pioneer NES Array, the affected environment and environmental consequences are the same as those previously discussed and assessed in the 2011 SSEA and 2013 and 2015 SERs; only changes in the geographic location and minor array infrastructure modifications proposed for the Pioneer MAB Array are assessed. No additional impacts from operating the Pioneer NES Array were observed by or reported to OOI. Additional resources that are generally evaluated in preparation of an environmental assessment (EA) were not evaluated in the SSSEA because it was determined that implementation of the Proposed Action would be unlikely to have any effect on those resources. Overall, O&M is anticipated to remain at similar levels to prior operations of the Pioneer NES Array. Therefore, these proposed changes (i.e., relocation and array modifications) were the main scope of the analysis in the SSSEA.

3.1 Proposed Action

Array Modifications

The new array instrumentation (e.g., sensors) would be mounted on or incorporated into the existing mooring designs. The type of measurement, method, impact, and mooring to be installed on-site are listed in Table 5 of the SSSEA.

Acoustic Doppler Current Profiler (ADCP) instruments would be used to measure near-surface current velocities. ADCPs are an existing OOI instrument class and were reviewed as part of the original SSEA and PEA. The ADCPs would operate at frequencies higher than those frequencies considered audible by fish and marine mammals (i.e., greater than 180 kilohertz).

The potential impacts from the moorings would be the same as those already assessed in the PEA, 2011 SSEA, and 2013 and 2015 SERs, which concluded that no significant effects on the environment were expected. For these reasons, none of the new instrumentation or measurements would be anticipated to result in significant or adverse impact to the marine environment, including marine biological resources.

Relocation, Installation, and O&M Activities

The SSSEA analysis builds from the PEA, 2011 SSEA, and 2013 and 2015 SERs and focuses only on the following resources potentially subject to impacts from the Relocation, Installation, and O&M activities:

Geological Resources

The temporary placement of benthic nodes and mooring anchors would result in short-term, insignificant impacts to surface sediments in the immediate vicinity of the proposed Pioneer Array assets, and there would be no significant impacts to marine geological resources. Over time, the natural movement of sediments by ocean currents and burrowing organisms would reestablish natural bottom topography. Upon conclusion of approximately 5 years of operations, the entire system, including anchors, would be removed and relocated in alignment with the 2011 PEA and other OOI environmental documentation. In November 2022, OOI successfully recovered all Pioneer NES Array infrastructure components, including anchors, leaving nothing on the seabed or in the water column. For these reasons, direct and indirect impacts from the proposed activities on geological resources are not anticipated to be significant.

Air Quality

Overall, there would be no change in the level of planned operations and management of the Pioneer Array with the relocation. Proposed activities would result in minor temporary emissions from surface vessels during installation and maintenance activities of the Pioneer MAB Array (SSSEA Appendix C: page 3-36). These emissions would not represent a substantial increase or decrease above existing NES operating conditions, as only a small number of vessels would be used. Upon conclusion of approximately 5 years of operations, the entire system, including anchors, would be removed and relocated in alignment with the 2011 PEA and other OOI environmental documentation. Direct and indirect impacts from the proposed activities on air quality would be negligible and are not anticipated to be significant.

Water Quality

The Project is not anticipated to affect state water quality. Proposed installation, O&M activities at the proposed Pioneer MAB Array would not introduce any materials or substances into the marine environment that would adversely affect marine water quality. The Project would not alter ocean circulation patterns. A minor and localized area for which the benthic nodes and anchors would be placed would likely induce some re-suspension of sediment, but these effects would be local and very brief in duration. Therefore, no direct or indirect impacts to water quality with implementation, operation, or eventual removal of the Pioneer MAB Array are anticipated.

Cultural Resources

Potential impacts to cultural resources from the proposed Pioneer MAB Array would only be associated with the placement of 10 benthic nodes and mooring anchors on the seafloor. A desktop marine archeology review study was undertaken during the planning phase to avoid known cultural resources and wreck locations (SSSEA Appendix D). A site survey was conducted of each proposed mooring site however no cultural resources or hazards were located within the survey areas and all documented wrecks or submerged cultural resources would be avoided by greater than the recommended distance of 50 m. Therefore, the placement of the proposed Pioneer MAB Array should avoid and not result in impacts to cultural resources.

Marine Biological Resources

There are 36 species of marine mammals (7 large whales, 18 dolphins [including larger oceanic dolphin species], 1 porpoise, 5 beaked whales, 4 seals, and 1 manatee) that occur in the Southeast Atlantic Outer Continental Shelf (OCS) region, and all are protected by the Marine Mammal Protection Act (MMPA). Six of these species are federally listed under the Endangered Species Act (ESA) as threatened or endangered and are known to be present, at least seasonally, in the Mid-Atlantic, five of which have the likely potential of occurring in the Project Area: Blue whale (*Balaenoptera musculus*); North Atlantic right whale (*Eubalaena glacialis*); Fin whale (*Balaenoptera physalus*); Sei whale (*Balaenoptera borealis*); and Sperm whale (*Physeter macrocephalus*). The five species of sea turtles that have historically been reported to occur in Mid-Atlantic waters off the coast of North Carolina include the following: Atlantic hawksbill (*Eretmochelys imbricata*);

Green (*Chelonia mydas*); Kemp's ridley (*Lepidochelys kempii*); Leatherback (*Dermochelys coriacea*); and Loggerhead (*Caretta caretta*). Appendix C of the SSSEA provides more detailed information on the known marine mammal and sea turtle distributions within coastal North Carolina and the Project Area and summary of key information for each species. Appendix C also indicates species that were not further analyzed as they are unlikely to occur in the Project Area.

The vessels and activity associated with the installation of 10 moorings and associated scientific sensors on the seafloor may cause marine species to temporarily avoid the immediate vicinity of the proposed Pioneer MAB Array individual mooring sites. This impact would not be significant due to the small scale and temporary nature of the proposed activities (estimated time to deploy a mooring with one vessel is 12 to 24 hours). The vessels used for mooring deployment would move very slowly during the activity and therefore would not pose a vessel strike or collision threat to marine mammals or sea turtles. Furthermore, vessels would follow National Marine Fisheries Service (NMFS) standard oceanographic marine mammal vessel strike avoidance guidance and special measures, such as those triggered by temporary Dynamic Management Areas, for the North Atlantic right whale (NARW). Entanglement of marine species is not anticipated because of the rigidity and tautness of the mooring cables and the ability of marine species to detect and avoid the mooring lines. Once installed on the seabed, the proposed mooring anchors and scientific sensors would be equivalent to other hard structures on the seabed, again posing no risk of adverse effect on marine organisms. No known vessel strikes or entanglements were associated with the Pioneer NES Array. Therefore, no significant impacts would be anticipated from the Proposed Action on marine mammal and sea turtle species in the proposed Project Area. While ESA-listed species may be affected, based on and consistent with past OOI NEPA documents, they would not likely be adversely affected (NLAA).

Impacts from the placement of proposed mooring anchors or nodes on the seafloor would include temporary mechanical disturbance of soft sediments and long-term coverage of relatively small areas of substrate by the anchors and scientific sensors. Due to the large water depth in the Project Area, and attenuation of light to such depths, the presence of ESA-listed plant species is not expected. In addition, the video survey of the Project site (SSSEA Appendix F) indicates that the existence of ESA-listed vegetation is unlikely. This video survey also indicates that the presence of ESA-listed invertebrates is unlikely.

Based on the expected size and number of anchors and scientific sensors on the seafloor, ~37 m^2 of Effective Fish Habitat (EFH) may potentially be impacted during installation activities. SSSEA Appendix C, Table 3-1 provides a comprehensive list of EFH which overlaps with the Project Area. Over time, the natural movement of sediments by ocean currents and burrowing organisms would reestablish natural bottom topography. Upon conclusion of approximately 5 years of operations, the entire system, including anchors, would be removed and relocated in alignment with the 2011 PEA and other OOI environmental documentation. The short-term and minor increases in turbidity and sedimentation resulting from system installation and removal would not affect the ability of EFH to support healthy fish populations, and affected areas are expected to recover quickly.

The use of gliders and AUVs around the Pioneer MAB Array is not expected to affect marine species, as they would operate within a relatively small area and move slowly in the water column similar to a dolphin or whale. Gliders are sealed, contain no motors, fuels, or hazardous materials and AUV batteries are sealed with little potential for leakage.

Specific sensitive areas were considered during early planning and placement of the Pioneer MAB Array, including artificial reefs, nursery habitats, critical habitat, seasonal management areas, Essential Fish Habitat (EFH) and Habitat Areas Particular Concern (HAPCs). The Pioneer MAB array would not overlap with Artificial reefs, and although the southern moorings would overlap with a Primary/Secondary Nursery Habitat, the proposed activities do not involve prohibited activities. Four of the Pioneer MAB Array moorings would be located within the loggerhead sea turtle Constricted Migratory Corridor (SSSEA Figure 6); however, it is not anticipated they would impede sea turtle migration. The Pioneer MAB Array would not overlap with

loggerhead sea turtle Coastal Critical Habitat Designation (sargassum habitat). All of the Pioneer MAB Array moorings are located within the North Atlantic Right Whale (NARW) migratory corridor (SSSEA Figure 6); however, the migratory corridor does not require special management considerations or additional protective measures. The proposed activities are small scale and temporary, therefore installation and maintenance are not likely to pose risks of entanglement or collision. The Pioneer MAB Array avoids the two designated NARW critical habitats and does not overlap with the Mid-Atlantic Seasonal Management Areas.

The Pioneer MAB Array is located within an area that contains EFH for certain life stages of 36 fish species, particularly for sharks, tuna and other Highly Migratory Species. The 36 managed species that may occur seasonally or year-round in the Project Area are listed in the SSSEA, Table 3-1, of Appendix C. The small scale and temporary nature of the array would have little to no impact on EFH, and no adverse effects on EFH are expected. The Pioneer MAB Array's southernmost mooring (SSSEA Figure 6) is located within a joint Snapper-grouper/Coral Reefs and Hardbottom/Dolphin and Wahoo HAPC designated by the SAFMC. The small scale and temporary nature of the array would have little to no impact on HAPC. The Pioneer MAB Array survey also did not find any indication of corals (SSSEA Appendix F).

The proposed activities, including Pioneer MAB Array location, installation, and O&M, are not anticipated to have significant effects on marine species, and no adverse effects are anticipated on ESA-listed species or designated loggerhead sea turtle critical habitat. Although the proposed activities may affect EFH and HAPC, no adverse effects on EFH or HAPC are expected. The NSF consulted with NMFS, pursuant to ESA Section 7 and the Magnuson-Stevens Act Fishery Conservation and Management Act, for EFH; NMFS concurred with NSF's determinations (see Section 4).

Socioeconomics

Review of resources within and around the Project Area indicated that recreational boating and fishing, charter fishing, shellfishing, sailboat races, sightseeing, bird and wildlife viewing (including whale watching), surfing, swimming, watersports, visiting beaches, and other activities are common to this part of coastal North Carolina. Due to the distance from shore, most of these activities would not occur near or within the proposed Pioneer MAB Array site. The Pioneer MAB array would not overlap with sand resource areas, dredged material disposal sites, or marine infrastructure. The following activities may be impacted or overlap with the Pioneer MAB Array site:

Fisheries

Detailed information regarding fisheries resources, including information on commercial and recreational fisheries, are included in SSSEA Sections 3.1.1 and 3.3.6 of Appendix C. In North Carolina waters, commercial fishery catches are predominantly various shellfish and finfish. Typical commercial fishing vessels in the North Carolina area include trawlers, gill netters, lobster/crab boats, dredgers, longliners, and purse seiners. In 2021, marine recreational fishers in the waters of North Carolina caught ~22 million fish for harvest or bait, and over 60 million fish in catch and release programs (NSF 2023). These catches were taken by over more than 17.9 million trips. Most of the trips (97 percent) occurred within 5.6 km (3.0 nm) from shore (NSF 2023).

As part of community outreach for the Pioneer Array relocation, OOI made presentations to the scientific community and to the general public, describing the Pioneer MAB Array plans and discussing potential space-use conflicts. Members of the fishing community attended some of these meetings, and follow-on conversations were conducted with commercial longline fishers. It was noted during these discussions that the furthest offshore moorings (Northeast and Southeast, see SSSEA Figure 6) may limit the ability of fishers to deploy free-drifting gear due to the possibility of entanglement.

Fishing activities would not be precluded in the Pioneer MAB Array area, although a safe distance from each Mooring Site (nominally outside of the 2 km by 2 km (1 nm by 1 nm) region at each mooring) would need to

be maintained. Based on 9 years of experience with the Pioneer NES Array, in the presence of similar types of fisheries, it is anticipated that entanglement would be rare and incidental (e.g., a portion of a longline set fouled in a mooring riser) and that fishers would continue to be able to operate in the area. Additionally, to further reduce the potential for space-use conflict, as noted previously and in SSSEA Table 4, all mooring locations would be declared to the U.S. Coast Guard (USCG) and U.S. Army Corps of Engineers (USACE), locations would be published on NOAA charts, Notices to Mariners (NOTMAR), and Local Notices to Mariners (LNM), which would be created and regularly updated throughout the lifetime of the project. Beyond these measures, OOI would continue to conduct outreach and coordinate with commercial fishery organizations to minimize potential impacts to fishing activities.

Although there may be overlap with some fisheries industries, given past experience, the relatively small footprint of the Pioneer MAB Array, and the fact that fisheries would not be precluded from the area, any impacts would not be anticipated to be significant. Feedback on the Draft SSSEA during the NEPA public comment period was received from an individual longline fisher (SSSEA Appendix G). Comments included concern for the original 600-m water depth location of the Northeast Coastal Profiler Mooring. The primary issue was the potential for the mooring to impede longline fishing activities because of line entanglement risks. The offshore moorings are needed to maintain a cohesive array and to accomplish the described science mission. Placement between the 300-m and 600-m contour is required to ensure ocean processes are measured beyond the shelf break. In response to the concerns raised, the originally planned 600-m locations (Northeast and Southeast moorings) would be moved westward to the 300-m contour. This new mooring position would reduce the likelihood of impacts to longline fishing activity.

Tourism, Recreation, Vessel Traffic, Other

Based on boat size and tour duration, there are several dolphin or other wildlife watching tour vessels that operate in the general region but would not be expected to venture far offshore. Once installed, the Pioneer MAB array would not be anticipated to have any impacts on wildlife watching industry; even during installation and maintenance, the impacts would be negligible involving at most, very brief, temporary displacement from the site and minor visual impacts (e.g., observation of the installation vessel). Wreck SCUBA diving is a popular recreational activity in the waters off North Carolina and typically occurs at depths less than 100 m (NSF 2023); due to avoidance of wrecks, impacts from the Proposed Action would not be anticipated on SCUBA activities. Vessel traffic, as noted in the NC Survey Final EA, occurs throughout the region. The additional vessel traffic associated with the installation and O&M of the Pioneer MAB Array would not be anticipated to conflict with other vessel traffic or significantly increase activity above current levels.

While other human activities could occur in the area, in addition to those noted above, it would not be anticipated that the Pioneer MAB Array would impact these activities, as they would not be prohibited from occurring within the proposed array area. Although a small buffer would be incorporated around array moorings, these would be noted on navigation charts and the array could be easily avoided. Further, the Pioneer MAB Array would be short term and temporary. For these reasons, while there may be minimal overlap with tourism, recreation, and vessel traffic, no significant impacts are anticipated.

3.2 Cumulative Impacts and Other Projects within the Project Area

Cumulative effects refer to the impacts that result from a combination of past, existing, and reasonably foreseeable projects and human activities. Cumulative effects can result from multiple causes, multiple effects, effects of activities in more than one locale, and recurring events. A desktop study was undertaken by Tetra Tech in support of Pioneer MAB planning to review other activities that could occur in the Project Area (SSSEA Appendix C). Additionally, the NC Survey Final EA Section 4.1.6 included information on cumulative effects of past, present, and reasonably foreseeable projects that is also relevant for the Pioneer MAB Array. These studies found the following activities could occur in the Project Area (SSSEA Figures 5

and 6): research, offshore energy development, sand borrow activities, vessel traffic, military activities, fisheries, and tourism/whale watching.

Additionally, to better understand stakeholder interests and activities undertaken in the Project Area, OOI conducted several outreach activities to academic institutions, federal agencies and regulators, and ocean users in the region.

Several institutions, state and federal agencies, tribal communities, and other ocean users from across the U.S. were invited to the Pioneer relocation workshops sponsored by the NSF and organized by the OOIFB (SSSEA Appendix G). These potential stakeholders included NOAA, BOEM, National Aeronautics and Space Administration, USACE, USCG, U.S. Navy, offshore energy developers, fisheries, and academic institutions.

Although these and the other noted human activities (e.g., whale watching, vessel traffic, etc.) could occur within the Project Area, it is anticipated that the Pioneer MAB Array would not interfere with these other activities due to the small footprint, localized/temporary nature (approximately 5 years) of the project, and avoidance measures put in place. This anticipation of no interference is guided by past experience with the Pioneer NES Array. More details are included in the SSSEA Section 3.2 and Appendix C. Overall, the combination of the proposed activities with other activities occurring in the region would be expected to produce only a negligible increase in overall disturbance effects on the marine environment; therefore, no significant impacts are anticipated.

3.3 No Action Alternative

An alternative to conducting the proposed activity is the "No Action" alternative, that is, do not deploy the Pioneer Array to MAB and modify the array. If the Pioneer Array was not modified and deployed to MAB, the "No Action" alternative would result in no disturbance to the marine environment attributable to the proposed activity; however, valuable data about the marine environment, including climate variability, would be lost. Oceanographic data of significant scientific value that would provide new knowledge for our oceans in general and the southern MAB in particular would not be collected. This would limit the ability of the greater scientific community to gain new insights on how oceanic processes operate and change under different conditions both in the short and long term. The "No Action" alternative would not meet the purpose and need for the proposed activity.

4 SUMMARY OF OTHER CONSIDERATIONS REQUIRED BY NEPA

The public outreach process for Pioneer MAB Array started in 2020 with presentations at several locations to obtain input (SSSEA Appendix G) and the organization of focused workshops (e.g., Innovation Labs). Participants of these meetings were interested in seeing the Pioneer Array move from the NES to the MAB, and remained engaged with the process of selecting the final location. In the site selection processes the involvement of scientists, educators, engineers, and representatives from government agencies, philanthropic, fishing community and other stakeholders was encouraged. Additionally, as also noted in SSSEA Section 4.1, as part of planning efforts, OOI coordinated with potential stakeholders to avoid potential space-use conflicts, including the U.S. Navy, and several outreach activities were undertaken (SSSEA Appendix G).

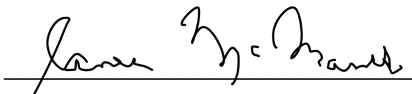
On September 29, 2023, the Draft SSSEA was posted on the NSF website (http://www.nsf.gov/geo/oce/envcomp/index.jsp) for a 30-day public comment period, and notices were sent to tribes, government agencies and potential interested parties. Six comments were received (see Appendix G). Although most expressed support for the OOI and the Proposed Activity, one comment was actionable, which resulted in the movement of the original 600-m contour Northeast and Southeast Coastal Profiler Moorings to the 300-m contour area; see SSSEA Section 3.1.2.6.1 Fisheries for further information. The Final SSSEA reflects this change, along with site survey findings, updates related to the successful conclusion of regulatory processes and consultations (as noted throughout and below), and other minor editorial/typographical adjustments; these changes did not alter the overall conclusions of the Draft SSSEA.

As noted above and described in more detail in the SSSEA Section 4.0, NSF took into consideration compliance with other relevant statutes and processes. Pursuant to the MMPA, it was determined that the Proposed Action, would not require an Incidental Harassment Authorization or Letter of Authorization and no further action was required. NSF initiated ESA Section 7 informal consultation with NMFS; NMFS concurred with NSF's determination the proposed action is not likely to adversely affect the ESA-listed species and designated critical habitat under NMFS jurisdiction. NSF consulted with NMFS for EFH; NMFS concurred with NSF's determination the proposed activities may affect EFH, however no adverse effects on EFH are expected, and offered no EFH conservation recommendations. Desktop and marine archeology studies were used to locate the mooring sites and avoid all documented shipwrecks and cultural resources. The site survey performed by OOI (SSSEA Appendix F) supported the planning documentation and no evidence of shipwrecks or cultural resources were located. As part of the Draft SSSEA NEPA public comment period, the North Carolina State Historic Preservation Office reviewed the project and provided written confirmation that they are aware of no historic resources which would be affected by the project pursuant to Section 106 of the National Historic Preservation Act (SSSEA Appendix G). No tribal cultural or historic resources were identified at the proposed array mooring locations or anticipated to be impacted.

The OOI management office as operator of the array, is responsible for obtaining all licenses and permits for the proposed activities, including U.S. Army Corps of Engineers (USACE) Nation-wide Permit #5 and Private Aids to Navigation (PATONS) from the U.S. Coast Guard.

5 CONCLUSION

The attached SSSEA was prepared and evaluated pursuant to NEPA and in accordance with CEQ regulations at 40 CFR 1500-1508, and NSF's NEPA implementing regulations at 45 CFR Part 640. I have concluded that, based on the analyses contained in the SSSEA, tiered OOI NEPA documentation, regulatory processes, and the entire environmental compliance record, the proposed relocation of the Pioneer MAB with modifications, installation and O&M, would not result in any significant direct, indirect, or cumulative impacts. Nor does it constitute a "major Federal action significantly affecting the quality of the human environment" when considered individually or cumulatively in the context of NEPA. Therefore, an environmental impact statement is not required and will not be prepared; no further study under NEPA is required, and a Finding of No Significant Impact is thus warranted. NSF's compliance with the Marine Mammal Protection Act, Endangered Species Act, Coastal Zone Management Act, Magnuson-Stevens Fishery Conservation and Management Act–Essential Fish Habitat, and National Historic Preservation Act has also been completed. Accordingly, on behalf of NSF, I hereby authorize the issuance of a Finding of No Significant Impact and approve the Proposed Action as described in the SSSEA to commence.



05 Feb 2024

James McManus
Division Director
Division of Ocean Sciences
U.S. National Science Foundation

Date

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