DEPARTMENT OF THE NAVY
NAVAL UNDERSEA WARFARE CENTER DIVISION
1176 HOWELL STREET
NEWPORT RI 02841-1708

IN REPLY REFER TO:
5090
Ser 1023/087
September 26, 2016

Mr. David Reis
Federal Consistency Coordinator
Coastal Resources Management Council
State of Rhode Island and Providence Plantations
Oliver H. Steadman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, RI 02879-1900

Dear Mr. Reis:

SUBJECT: UPDATE TO COASTAL CONSISTENCY DETERMINATION FOR THE NARRAGANSETT BAY SHALLOW TRACKING RANGE

The Naval Undersea Warfare Center Division, Newport (NUWCDIVNPT), submits the enclosed Coastal Consistency Determination (CCD) for your review. This document updates the previously submitted consistency determination for the Installation of the Narragansett Bay Shallow Tracking Range in Narragansett Bay (CRMC File No. A2014-05-080). It discusses the current state of the tracking range, including modifications to the design and the ensuing operation.

In accordance with the Code of Federal Regulations (15 CFR Part 930.34), NUWCDIVNPT has conducted a review of the proposed project for consistency with the Coastal Resource Management Program. The enclosed consistency determination concludes that the proposed project is consistent to the maximum extent practicable with the Council's relevant enforceable policies outlined in the Rhode Island Coastal Resources Management Plan.

Concurrence on this consistency determination is requested. Please contact Mr. Chris Tompsett at (401) 832-5845 should you have additional questions regarding this activity.

Sincerely,

Joseph Murphy
Chief Engineer, Physical Operations
and Support Department
By Direction

Enclosure: 1. Update to the Coastal Consistency Determination for the Installation of the Narragansett Bay Shallow Tracking Range, Narragansett Bay, Rhode Island

September 2016

Update to the Coastal Consistency Determination for the Installation of the Narragansett Bay Shallow Tracking Range, Narragansett Bay, Rhode Island

Prepared by:

Naval Undersea Warfare Center Division
Newport, Rhode Island

Enclosure (1)

CHAPTER 1 PROPOSED ACTION

This Coastal Consistency Determination (CCD) serves as an updated version of a previously-submitted "Installation of the Narragansett Bay Shallow Tracking Range, Narragansett Bay, Rhode Island" (CRMC File No. A2014-05-080). The Rhode Island Coastal Resources Management Council (RICRMC) concurred with the CCD on May 19, 2014. That CCD, in turn, was a modification to the original proposal titled "Install underwater hydrophone array and electro-optical trunk cable; North Range Test Area, East Passage, Narragansett Bay" (CRMC File No. A2009-07-037). RICRMC concurred with that CCD on July 15, 2009. However, the 2009 proposed project was not performed and was reduced to only the underwater hydrophone array called the Narragansett Bay Shallow Tracking Range (NABSTR). The NABSTR has been installed within the boundaries of the Narragansett Bay Restricted Area, as defined by Title 33 Code of Federal Regulations (CFR) § 334.80 (33 CFR § 334.80). This CCD update discusses the current state, including modifications to the design and the ensuing operation.

As originally proposed, the NABSTR was to consist of approximately 8 miles (mi; 12.88 kilometers [km]) of cable buried 3 feet (ft; 1 meter [m]) deep. Twenty-four hydrophones/electronics nodes were to be spaced at 1,640 ft (500 m) intervals (Figure 1-1). The cable burial and hydrophone array installation was expected to take approximately 15 days. The earliest it was expected to occur was in the September through October 2014 timeframe. If the installation time changed, however, it would be scheduled to avoid the February and March spawning season for winter flounder.

The actual cable installation occurred over 24 days in the August through September 2015 timeframe. The tracking array consists of approximately 3.7 mi (6 km) of cable mostly buried 2 to 4 ft (0.6 to 1.2 m) deep. There are twelve hydrophones/electronic nodes and one anode spaced at intervals from 1,510 ft to 1,700 ft (460 m to 520 m) apart. The electronic nodes and the anode were buried to the depth of the array cable. The connecting trunk cable was also installed and is approximately 1.4 miles (2.3 km) in length. It connects the array to the Naval Undersea Warfare Center Division, Newport (NUWCDIVNPT) Stillwater Basin facility located on Burma Road in Middletown, RI. The array and trunk cable has an abrasion-resistant outer jacket and a diameter of 0.4 inches (in; 1 centimeter [cm]). It weighs approximately 0.10 pounds (lbs; 0.05 kilograms [kg]) per foot (0.30 m) in water.

There were eight locations of unprotected array cable due to existing obstructions on the bottom either across or along the array route (a pipe, a cable, debris, and a mooring block). In addition, the first approximately 800 ft (244 m) of the trunk cable within Coddington Cove was initially laid on the bottom. The remaining length out to the array was buried 2 to 4 feet (0.6 to 1.2 m) deep.

The next phase in the installation was the attachment of hydrophones to the acoustic nodes, and burying the remaining 800 ft (244 m) of trunk cable lying on the bottom in Coddington Cove. This work was performed by divers using a hand-held water jet pump to temporarily fluidize the

sediment to embed the components. This phase was performed in the June/July 2016 timeframe and took 17 days.

In the final installation phase divers placed bags of cement around and over the portions of exposed array cable. The cement bags were sealed in separate plastic bags to keep them dry during deployment. Once in place on the sea floor, the plastic bags were punctured to allow water to infiltrate and the cement to harden. Approximately 380 square feet (35 square meters) of bottom was covered by the hardened cement bags. Covering the eight areas of exposed array cable was performed over 2 days in early July 2016.

The final configuration of the NABSTR array is shown in Figure 1-2. Figure 1-3 shows the final version of the hydrophone housing assembly.

The presence of cabling, and the vulnerability of the hydrophone housing assemblies require the prohibition of all anchoring, fishing, and towing of a drag of any kind within the footprint of the NABSTR. As an example of why this is necessary, a data transmission cable installed in the Narragansett Bay Restricted Area (CRMC File Number 2003-02-068) only lasted 6 months before it was broken by human activity. The cable was installed to a 3 ft (1 m) depth but was exposed in some areas where it passed over rock. It is believed that the damage was caused by anchoring.

Jet Plow Methodology

Jet Plow embedment was the method of installation used in the initial phase of the NABSTR project. That technology uses a specifically designed cable vessel and a hydraulically powered device that simultaneously lays and embeds the submarine cable system in one continuous trench. Using water pump systems onboard the cable vessel, the jet plow device is hydraulically pressurized with seawater. The jet plow device (Figure 1-4) hydraulically fluidizes a trench into the seabed sediments that, depending upon location along the route, would be approximately 22 in (56 cm) wide to a depth of approximately 3 ft (1 m) below the current bottom. Because the trench is fluidized, sediment covers the cable during burial and it is not necessary to re-cover the cable after installation. The Jet Plow is designed to minimize both the trench dimensions and the amount of sediment removed from the trench.

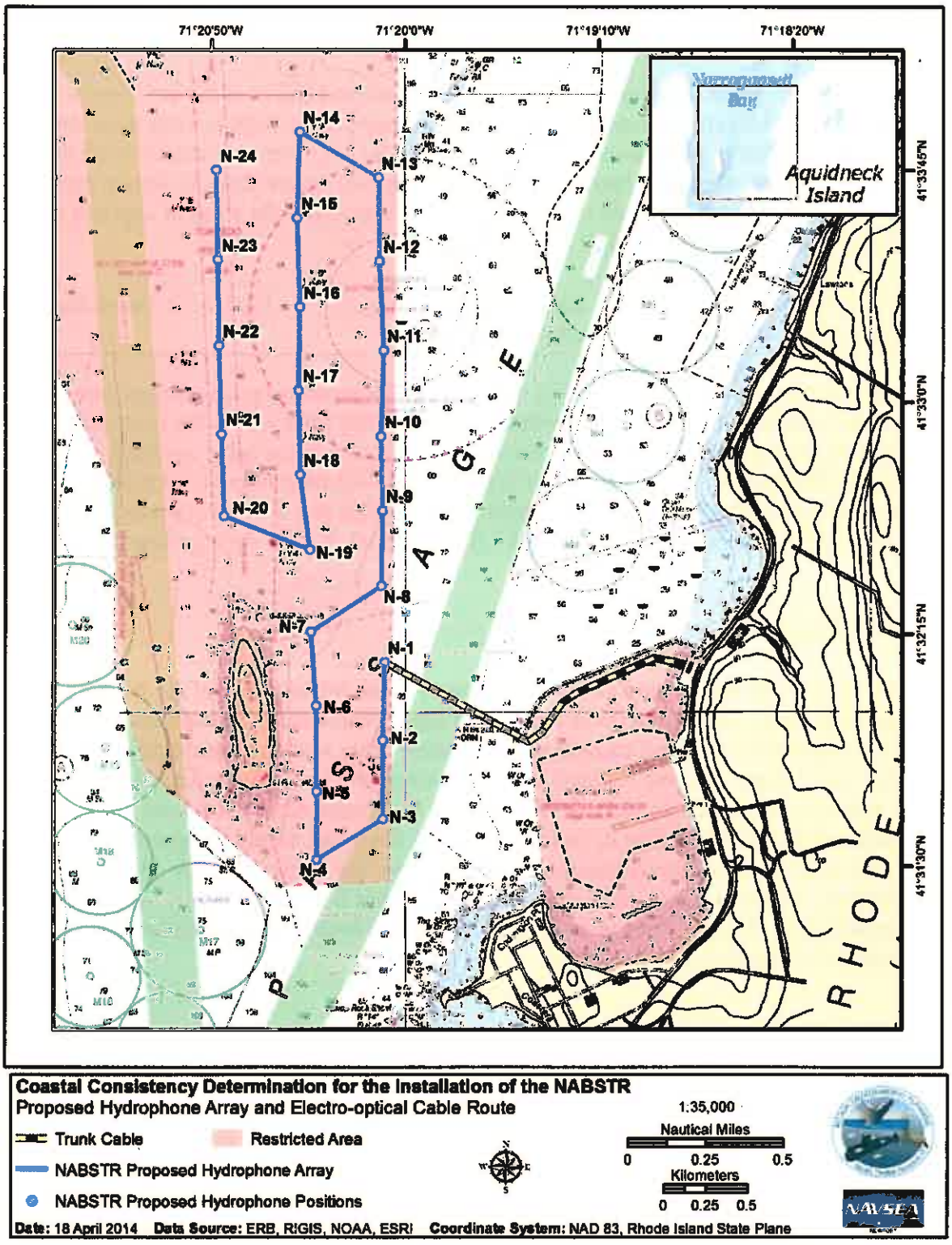

Figure 1-1. Proposed NABSTR Installation

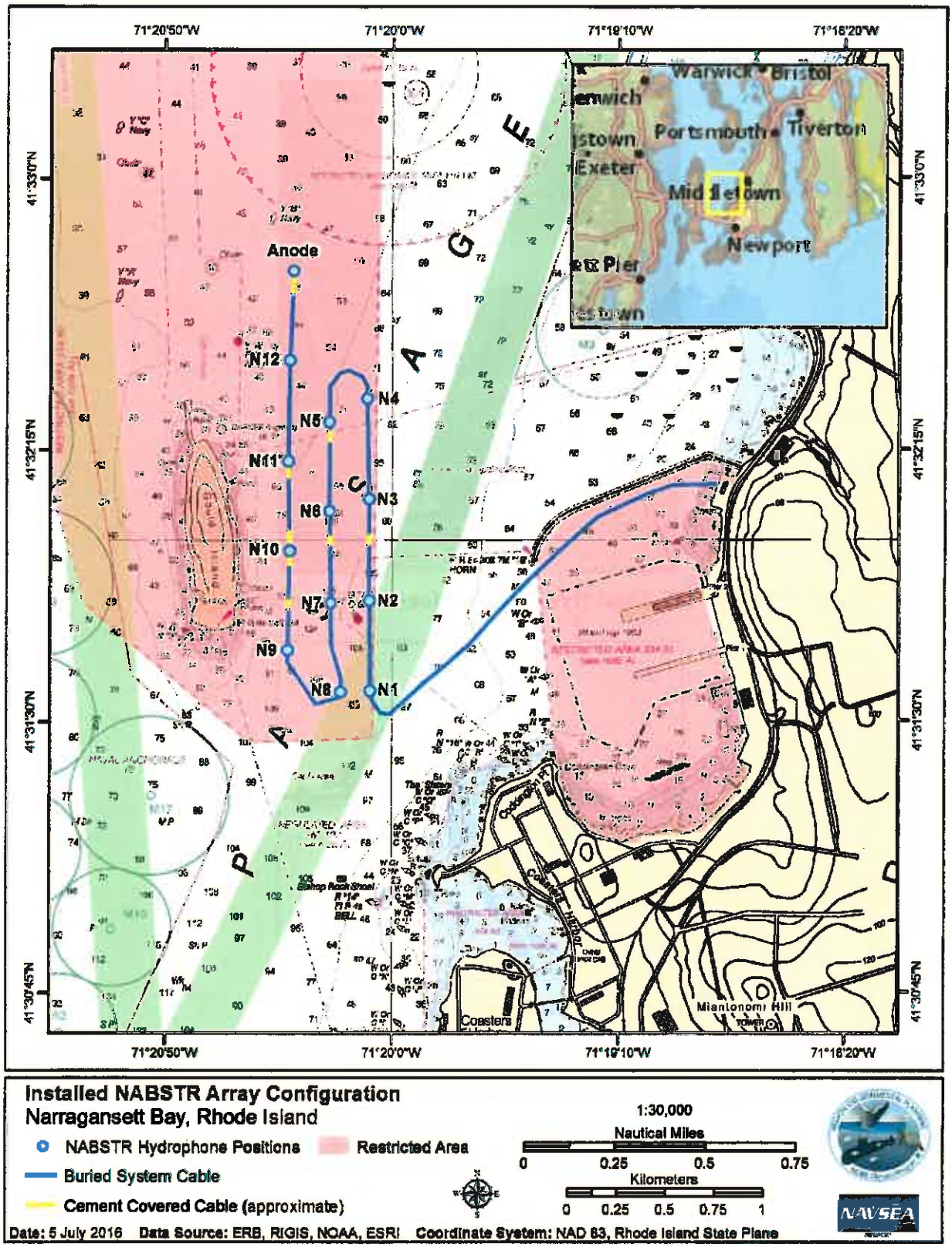

Figure 1-2. Current NABSTR Array Configuration

Figure 1-3. Final Hydrophone Housing Assembly Design

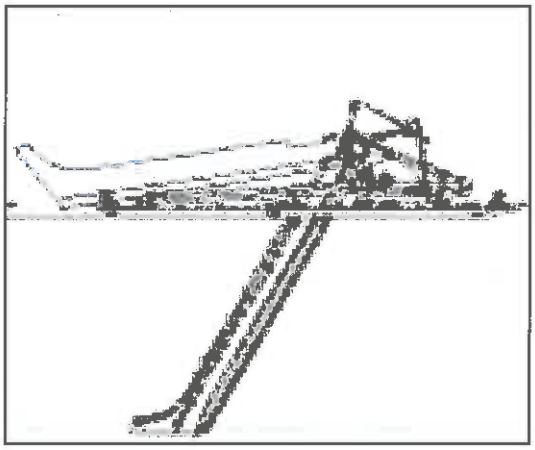

Figure 1-4. Illustration of Jet-Plow Device

Prior to burial, the proposed cable route was surveyed for any obstructions along the bottom by sidescan sonar. The jetting process created a small plume of sediment extending up to 7 ft (2 m) off of the bottom, depending on the velocity of the currents in the area. Between 10% and 35% of the sediment is estimated to have entered the water column. The concentration of sediment within the water column and its subsequent persistence, dispersion and settling was also dependent on the sediment type. The trunk cable was installed in mainly silty sand, while the array was installed mostly in sand-silt-clay and clay-silt sediments. Applied Science Associate's *Sediment Transport Analysis of Cable Installation for Block Island Wind Farm and Block Island Transmission* System (Mendelsohn et al 2012) evaluated jet plow cable installation in similar

sediment types. This study found that silt and clay particles would persist longer in the water column and settle more slowly, but the majority of the sediment would be expected to redeposit within approximately 330 ft (100 m) of the jet plow route.

As noted above, a jet pump rather than a jet plow was used to install the hydrophone housing assemblies and embed the final 800 ft (244 m) of cable in Coddington Cove. The jet pump generates approximately 90 psi pressurized water and was used from a workboat on the surface. The jetting process created a small plume of sediment extending up to 3 ft (1 m) off of the bottom. Minimizing turbidity caused by this process was crucial to the project, because particles suspended in the water decrease visibility and would cause delays in the operation.

CHAPTER 2 CONSISTENCY WITH RICRMP ENFORCEABLE POLICIES

The RICRMC has classified Narragansett Bay and adjacent shorelines according to different use categories called type waters. Each type water has specific policies associated with it. The hydrophone array and trunk cable was installed within three designated type waters: Type 2 waters (Low-Intensity Use Waters), Type 4 waters (Multipurpose Waters), and Type 6 waters (Industrial Waterfronts and Commercial Navigation Channels) (Figure 2-1).

2.1. TYPE 2 WATERS – LOW INTENSITY USE

The waters surrounding Gould Island are designated as Type 2 waters. The RICRMC's policy for Type 2 waters applicable to the proposed action is to "maintain and, where possible, restore the high scenic value, water quality, and natural habitat of these areas, while providing for low-intensity uses that will not detract from the value" (Section 200.2, part C.1., RICRMP). Additionally, RICRMC states that "activities and alterations to public areas abutting Type 2 waters shall not interfere with the public's enjoyment of these waters."

Consistency with RICRMP Policies

The initial installation of the hydrophone array and trunk cable did not fall under any of the situations, conditions, or proposals deemed by the RICRMC as having a significant adverse effect on Rhode Island's coastal resources (Section 200.2, C.2. and 3., RICRMP). Also, the installation of the hydrophone array and trunk cable did not interfere with the public's enjoyment of the Gould Island coastline.

The final phase of the hydrophone array and trunk cable installation also did not interfere with the public's enjoyment of the Gould Island coastline. There was no impact to Type 2 waters; therefore, completion of the NABSTR installation was consistent with these defined policies of the RICRMP.

2.2. TYPE 4 WATERS – MULTIPURPOSE WATERS

The waters between Coddington Cove and Gould Island are designated as Type 4 waters. The RICRMC's policy for Type 4 waters applicable to the proposed action is to "maintain a balance among the diverse activities that must coexist in Type 4 waters. The changing characteristics of traditional activities and the development of new water-dependent uses shall, where possible, be accommodated in keeping with the principle that the Council shall work to preserve and restore ecological systems." (Section 200.4, Part C, RICRMP). Water uses include boating, commercial and recreational fishing, commercial shipping, aquaculture, and scientific research. A large portion of Type 4 waters includes important fishing grounds and fishery habitat. The hydrophone array and trunk cable is installed through some of these fishing grounds and habitats, including that of the winter flounder. The two main fisheries in the area of the hydrophone array and cable installation are the American Lobster Fishery and Bottomfish Fishery (Powell, 2007).

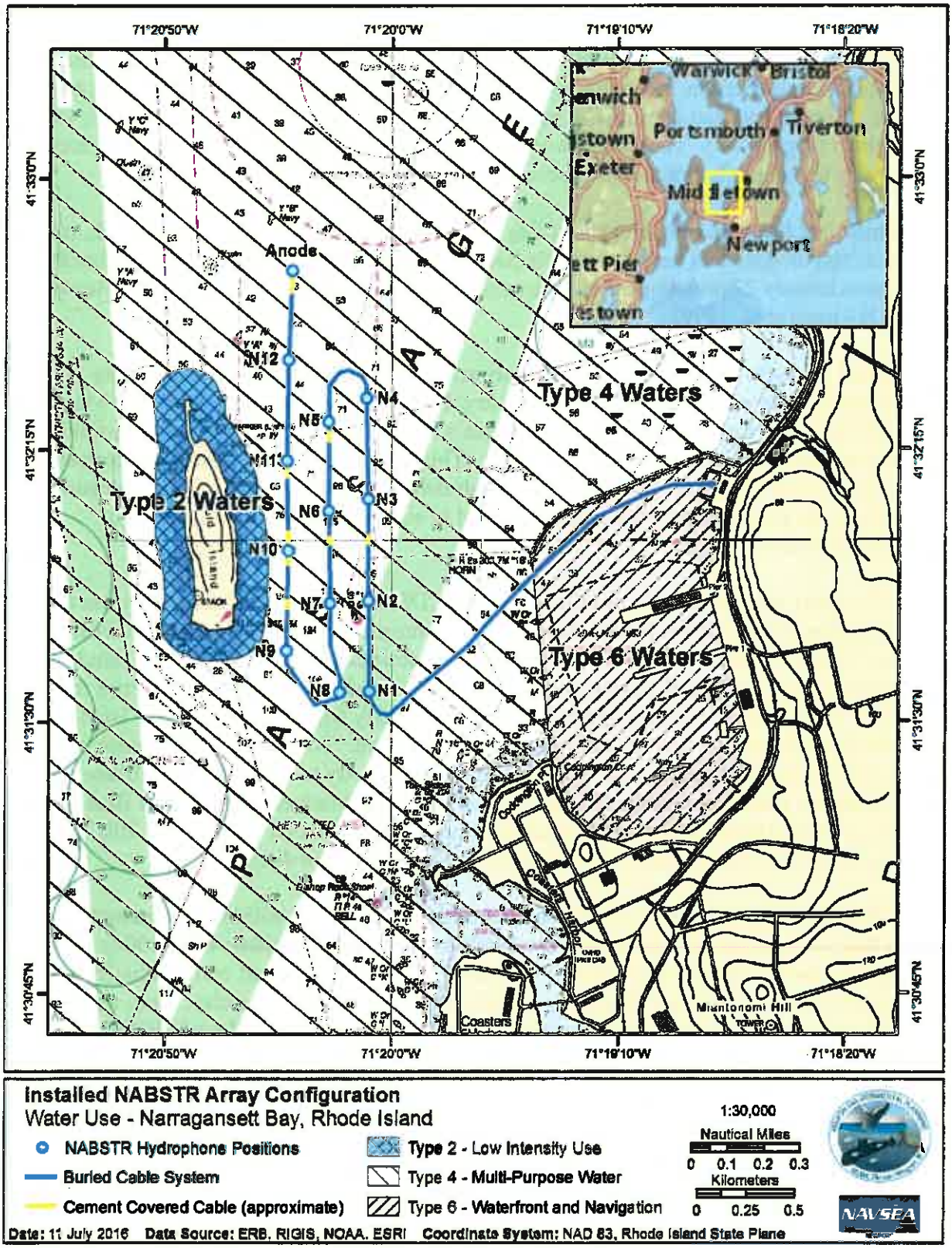

Figure 2-1. Type Waters Surrounding the NABSTR Installation Site

Consistency with RICRMP Policies

The lobster fishery is extremely important to the local economy of Rhode Island with a majority of the locally issued permits belonging to commercial fishermen (NUWCNPT 1997; DeAlteris et al. 2000). Lobster pots and commercial pot buoys are typically offshore of large islands, such as Gould Island (Figure 2-2). The east side of Gould Island has been identified as a major area of high-density buoy distribution in Narragansett Bay.

The mobile gear fisheries of Narragansett Bay include bottom trawls that harvest finfish, lobster, and squid; and dredges that harvest mussels (DeAlteris et al. 1999). It was estimated that there were approximately 22 mobile-gear vessels annually working the lower Narragansett Bay in the 1990s (DeAlteris et al. 1999).

The original plan was that the hydrophone array and trunk cable installation would take approximately three weeks to complete. Prior to cable installation, a public Notice to Mariners and a notification to the Rhode Island Lobsterman's Association by Navy personnel would inform local fishermen of the impending project. This notification would allow lobstermen to remove or relocate lobster pots, and for bottomfish fishermen to avoid the area. As a result of these efforts, the proposed action was not expected to significantly affect the lobster or bottomfish fisheries.

Prior to the array and trunk cable installation, NUWCDIVNPT sent a Notice to Mariners to the U.S. Coast Guard (USCG) via Naval Message. Unfortunately, that notice was not published. A published Notice to Mariners was, in turn, to trigger a notification from the Rhode Island Department of Environmental Management's (RIDEM) Rhode Island Marine Fisheries to fishermen. In the absence of the trigger for RIDEM to notify fishermen, the Rhode Island Lobsterman's Association was not notified of the installation. To avoid a reoccurrence, the current process includes sending the Notice to Mariners directly to both Mr. Ed LeBlanc at the USCG to ensure publication in the District 1 Local Notice to Mariners, and to Curt Blanchard at RIDEM. If local fishermen provide contact information to NUWCDIVNPT Code 70B (john.t.hamilton@navy.mil) they will also receive this notification directly.

Winter flounder were the most common species of demersal finfish within Narragansett Bay, even as their abundance fluctuated from the 1960s to the 1990s (DeAlteris et al. 2000); though no longer the most common, they are still abundant. Flounder are fished commercially in coastal areas using otter trawls and are frequently found in soft substrate such as clay, sand, and gravel. Although no trawling occurs in the remaining area of cable installation (Powell 2007), any disturbance (including the installation of the cable) to the bay floor during spawning could have an adverse effect on winter flounder. Winter flounder typically breed and spawn between February and March (DeAlteris et al. 2000) on sandy bottoms at depths of 6.56-262.4 ft (2-80 m). Flounder eggs form clumps and sink to the bay floor where they incubate for 15 to18 days before hatching. The final phase of installation of the hydrophone array and trunk cable did not occur during the spawning season of winter flounder. As a result, the range installation did not significantly affect the winter flounder fishery.

The initial jet-plowing caused physical disturbance to the Narragansett Bay seabed. This sediment disturbance resulted in temporarily-decreased visibility and resuspension of particles,

contaminants, and nutrients (DeAlteris et al. 2000). Mobile fishing gear utilized in Narragansett Bay and waters further offshore, such as bottom trawls and dredges, also resuspend fine sediment into the water column (DeAlteris et al. 2000). A scallop dredge is about 16 ft (5 m) wide, and a typical commercial scallop vessel will tow two dredges at once. In comparison, the Jet Plow has a width of 10 ft (3m). In areas of frequent seabed disturbance due to natural processes, the effects of resuspension of sediments due to fishing activity are limited, as the benthos has adapted to an actively mobile seabed (DeAlteris et al. 1999).

Because the hydrophone array and trunk cable installation is a one-time event, and because the Narragansett Bay has a good amount of tidal mixing (current range of 0.3 to 1.0 knots), these physical and geo-chemical effects of installation are not considered to be significant.

The completion of the hydrophone array and trunk cable installation involved divers embedding components in the sediment using a jet pump which had the same impacts as the jet plow, but on a smaller scale. The impacts from sediment disturbance and sediment resuspension were similar to those described above for the original proposal.

The final installation phase also involved covering exposed array sections that could not be embedded with bags of cement. The approximately 380 square feet (35 square meters) of bottom coverage was spread over eight locations and resulted in some new hard-bottom habitat in a region that predominately has sand-silt-clay and clay-silt sediments. This change in bottom type in these discrete areas is not expected to threaten the vitality of Rhode Island fisheries.

The completion of the hydrophone array and trunk cable installation had temporary impacts on water quality and created small areas of hard bottom. Anchoring, fishing, or towing a drag of any kind will be prohibited within the footprint of the NABSTR. The Navy must enforce this restriction in order to protect the array and the mission of NUWCDIVNPT. This will have impacts on the fishing community's current practices but would be in accordance with existing regulations at 33 CFR § 334.80. Therefore, completion of the NABSTR installation is consistent with the defined policies of the RICRMP for Type 4 waters to the maximum extent practicable.

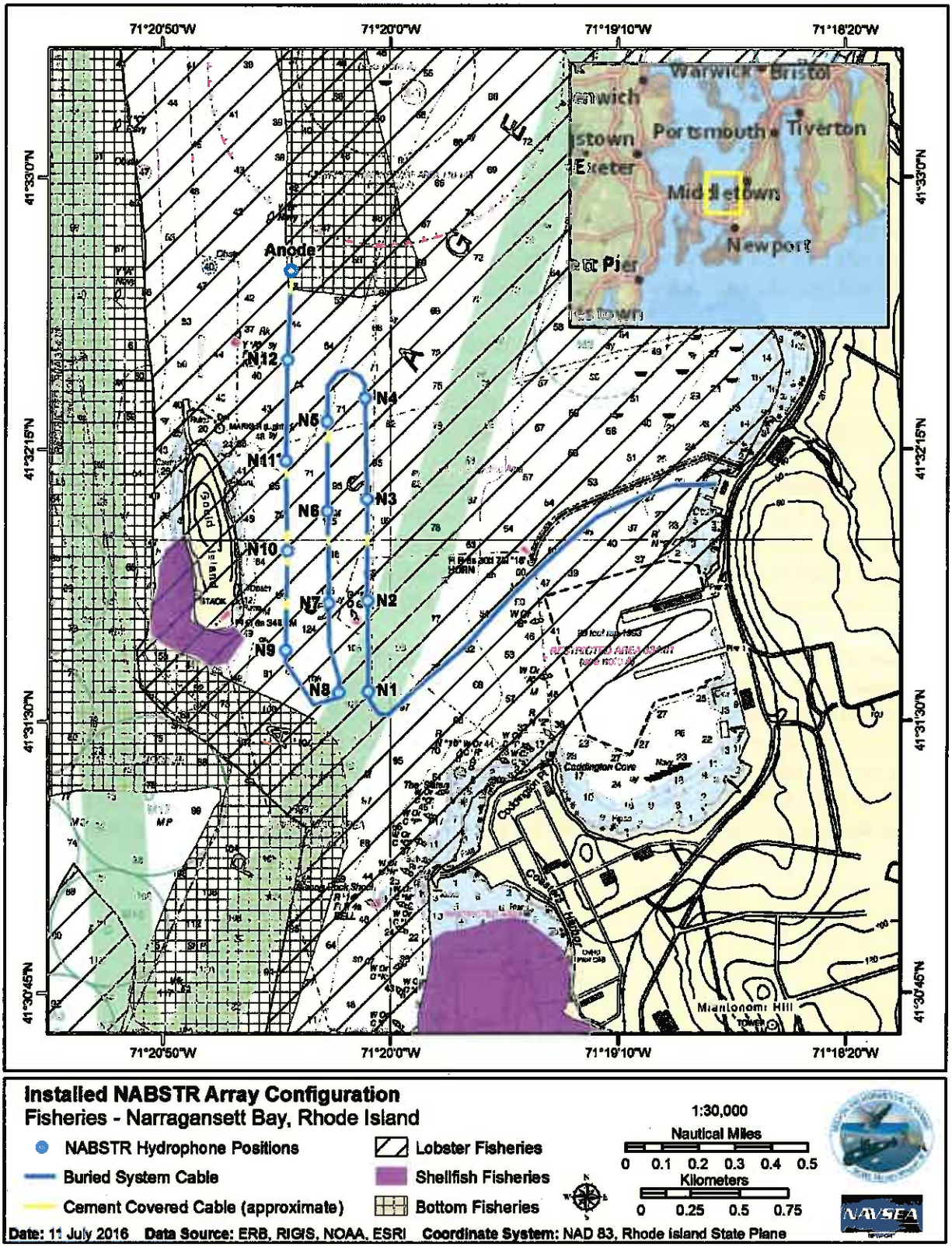

Figure 2-2. Fisheries in the Vicinity of the NABSTR Installation Site

2.3. TYPE 6 WATERS – INDUSTRIAL WATERFRONTS AND COMMERCIAL NAVIGATION CHANNELS

Type 6 waters include water areas that are "extensively altered in order to accommodate commercial and industrial water-dependent and water-enhanced activities" (RICRMP Section 200.6, Part A). The RICRMC's policy for Type 6 waters applicable to the proposed action is the "Highest priority uses of Type 6 waters and adjacent lands under Council jurisdiction are: (a) berthing, loading and unloading, and servicing of commercial vessels; (b) construction of maintenance of port facilities, navigation channels, and berths; and (c) construction and maintenance of facilities required for the support of commercial shipping and fishing activities. The Council shall prohibit activities that substantially detract from or interfere with these priority uses" (RICRMP Section 200.6, Part C.2.). The waters adjacent to Naval Station (NAVSTA), Newport and NUWCDIVNPT, however, are unique in that they are generally closed to recreational and commercial traffic (33 CFR § 334.81). However, NAVSTA Newport does allow some types of commercial fishing activity to occur in the area.

Consistency with RICRMP Policies

The initial action did not interfere with the construction and maintenance of ports or navigational channels that support commercial shipping or fishing; the action did not limit or decrease access to such facilities. Impacts to Type 6 waters were insignificant; therefore, installation activities were consistent with these defined policies of the RICRMP.

The embedding of approximately 800 ft (244 m) of trunk cable in Coddington Cove to complete the array installation likewise did not interfere with the construction and maintenance of ports or navigational channels that support commercial shipping or fishing; the action did not limit or decrease access to such facilities. Impacts to Type 6 waters were insignificant; therefore, completion of the NABSTR installation is consistent with these defined policies of the RICRMP.

2.4. SUBMERGED AQUATIC VEGETATION: EELGRASS

Similar to the type waters discussed above, RICRMC has policies to preserve, protect, and restore submerged aquatic vegetation (SAV), in particular eelgrass (*Zostera marina*; RICRMP Section 300.18, Part A). Eelgrass is known to occur in dense beds along the Atlantic coast of the U.S., including limited areas of Narragansett Bay. Significant changes in sedimentation rates can inhibit the growth of eelgrass if it occurs for extended periods of time. Additionally, eelgrass is very sensitive to light and fails to photosynthesize even at modest reductions in light. As a result, its maximum depth is typically 32 feet (9.8 m) or less in clear waters (Rhode Island Coastal Resources Management Council (RICRMC) 2007).

Eelgrass is an important habitat for many marine resources in Narragansett Bay, as well as for many recreational and commercial fisheries, and is considered Essential Fish Habitat for many species. In addition to providing a significant food source to many marine organisms, eelgrass also provides refuge, nursery, and spawning habitats for various fish species (Rhode Island Coastal Resources Management Council (RICRMC) 2007).

Polices regarding SAV that pertain to the proposed action are:

- The Council shall assess the potential impacts to SAV and its habitat from proposed activities on a case-by-case basis. Such impacts may include, but shall not be limited to, the introduction of excess nutrients, sedimentation, shading, and/or disruption of SAV and SAV habitats (RICRMP Section 300.18, Part C).

- All impacts to SAV and SAV habitat shall be avoided where possible and minimized to the extent practicable. Where the impacts are substantial or cannot be avoided or minimized, the Council may deny the application. The Council may exercise greater discretion if the proposed site is adjacent to or includes a restoration site and/or the site includes the sole source of SAV habitat (RICRMP Section 300.18, Part C).

Consistency with RICRMP Policies

Eelgrass beds are known to occur within the shallow waters of Narragansett Bay (Bradley et al. 2007). As indicated by Figure 2-3, the NABSTR was not installed in areas of known eelgrass occurrence. Sediment from the jet plow operation was suspended in the water column during initial cable installation. As previously discussed, however, most of that sediment re-settled within 330 ft (100 m) of the jet plow path. The closest the installation was to any eelgrass bed was approximately 800 ft (244 m). As a result, the proposed project did not significantly impact eelgrass. Therefore, installation of the NABSTR was consistent with the defined SAV policies of the RICRMP.

The final phase of NABSTR installation also created some sediment resuspension when jetting in components. The closest this occurred to any known eelgrass bed was approximately 900 ft (275 m) at Node 11. As discussed above, the suspended sediment re-settled on the bottom well before reaching the eelgrass bed. As a result, the proposed project did not significantly impact eelgrass. Therefore, completion of the NABSTR installation is consistent with the defined SAV policies of the RICRMP.

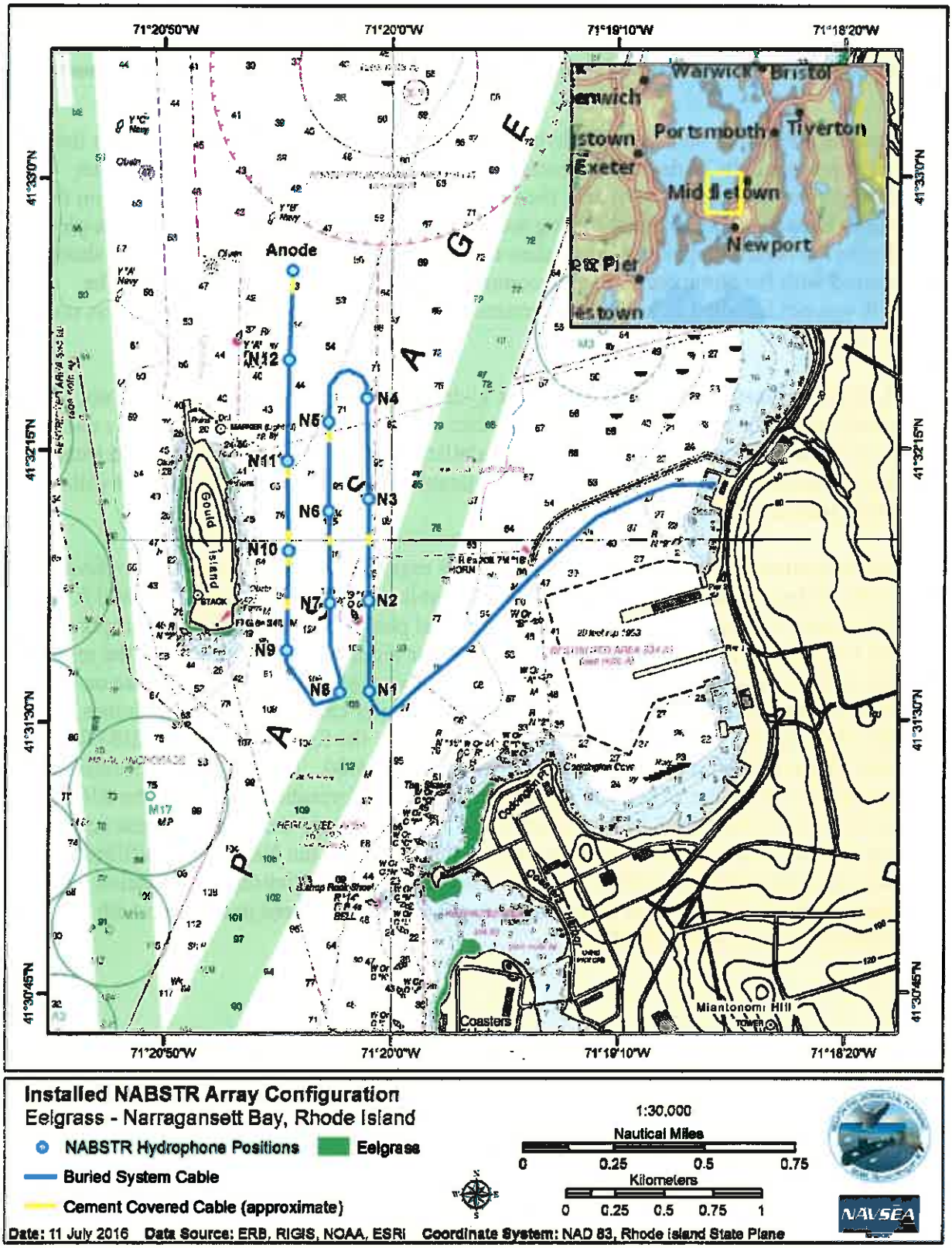

Figure 2-3. Eelgrass Located in the Vicinity of the NABSTR Installation Site

CHAPTER 3 CONCLUSION

The initial installation of the NABSTR hydrophone array and trunk cable occurred over the course of approximately 24 days. The installation avoided the spawning season of winter flounder (February through March) and, therefore, did not have any significant effects on that population. Impacts to commercial fishing were minimized with use of the efficient jet-plow technology. Preventive action has been taken to help eliminate future communication shortfalls that occurred with the commercial fishing community during the initial installation. The NABSTR was not installed in or in close proximity to known eelgrass beds so there was no effect on SAV.

Overall, the initial installation of the NABSTR hydrophone array and trunk cable did not significantly affect the resources under the jurisdiction of the RICRMC or the public's use or enjoyment of those resources. Therefore, the installation of the hydrophone array and trunk cable was consistent to the maximum extent practicable in that it was fully consistent with the enforceable policies of the RICRMP.

The final installation steps included efforts to harden exposed cabling, connect hydrophones to the acoustic nodes, install hydrophone housing assemblies, and bury the remaining 800 ft (244 m) of trunk cable in Coddington Cove. While the final phases of the NABSTR hydrophone array and trunk cable installation and its subsequent use did not significantly affect the resources under the jurisdiction of the RICRMC, it will have a limited effect on the public's use or enjoyment of those resources. For the protection of the array cable and the hydrophones, all anchoring, fishing, and towing of a drag of any kind within the footprint of the NABSTR will be prohibited. This prohibition is consistent with 33 CFR § 334.80. This regulatory provision limits the Navy's discretion to be fully consistent with the enforceable policies of the RICRMP because the installed cable and hydrophones could be significantly damaged by these activities that have impacts on the bottom and, as a result, would preclude the Navy from fulfilling its mission to develop undersea warfare systems. Therefore, the installation and operation of the hydrophone array and trunk cable is consistent to the maximum extent practicable with the enforceable policies of the RICRMP.

CHAPTER 4 REFERENCES

33 CFR § 334.80 (2003), "Narragansett Bay, RI; Restricted Area," *Code of Federal Regulations* Code of Federal Regulations, p. 508.

33 CFR § 334.81 "Narragansett Bay, East passage, Coddington Cove, Naval Station Newport, Naval Restricted Area, Newport, RI," *Code of Federal Regulations*.

Bradley, M., K. Raposa, and S. Tuxbury (2007), "Report on the Analysis of True Color Aerial Photography to Map and Inventory *Zostera marina L.* in Narragansett Bay and Block Island, Rhode Island".

DeAlteris, J., L. Skrobe, and C. Lipsky (1999), "The Significance of Seabed Disturbance by Mobile Fishing Gear Relative to Natural Processes: A Case Study in Narragansett Bay, Rhode Island," in *Fish Habitat: Essential Fish Habitat and Rehabilitation*, L. R. Benaka (ed.), American Fisheries Society, Symposium 22, Bethesda, MD, pp. 224-237.

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NUWCNPT (1997), "Integrated Natural Resources Management Plan, Main Site, Middletown, Rhode Island", Naval Undersea Warfare Center Division Newport, Newport, RI, p. 102.

Powell, C. (2007), "GOULD Island Cable Installation," Jamestown, RI, private communication with H. Burnell, 12 October 2007.

Rhode Island Coastal Resources Management Council (RICRMC) (2015), "Coastal Resources Management Program: As Ammended", State of Rhode Island, Providence, RI, p. 270.