

# New York State Offshore Wind Maritime Technical Working Group (M-TWG)

## CABLING WORKSHOP:

### **ADVANCING CABLE ROUTING COORDINATION WORKSHOP SUMMARY**

April 2023

Note: Materials mentioned throughout this summary document are available at  
<https://www.nymtwg.com/>

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## Acronyms and Abbreviations

Acronym	Affiliation
AIS	Automatic identification system
ATB	Articulated tug-barge
BOEM	Bureau of Ocean Energy Management, U.S. Department of the Interior
Cables Assessment	Offshore Wind Cable Corridor Constraints Assessment
COD	Commercial operation date
GW	Gigawatt
Harbor Ops	Harbor Safety, Navigation, and Operations Committee
HRSNOC	Hudson River Safety, Navigation, and Operations Committee
HVAC	High voltage alternating current
HVDC	High voltage direct current
LNM	Local notice to mariners
MARAD	U.S. Department of Transportation (USDOT) Maritime Administration
MARO	Mid-Atlantic Regional Council on the Ocean
MTA	Metropolitan Transit Authority
M-TWG	Maritime Technical Working Group
NEPA	National Environmental Policy Act
NJDEP	New Jersey Department of Environmental Protection
NOAA	National Oceanic and Atmospheric Administration
NYCEDC	New York City Economic Development Corporation
NYSDOS	New York State Department of State
NYISO	New York Independent System Operator
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development
PANYNJ	Port Authority of New York and New Jersey
PEIS	Programmatic Environmental Impact Statement
PSC	New York State Public Service Commission
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
UXO	Unexploded ordnance

# Executive Summary

## *Our Focus*

Siting offshore wind transmission cables while maintaining safe navigation in and around the busy and space-constrained waters of the New York/New Jersey Harbor and Long Island Sound is a shared issue of concern for maritime transportation stakeholders and the offshore wind industry.

To obtain input on this important topic, the Maritime Technical Working Group (M-TWG), led by the New York State Department of State (NYSDOS) with support from New York State Energy Research and Development Authority (NYSERDA), brought together commercial mariners, offshore wind developers, and government agency staff. Participants were invited to discuss concerns, mitigation measures, and solutions to build upon the findings in the NYSERDA Offshore Wind Cable Corridor Constraints Assessment<sup>1</sup> (Cables Assessment) as it relates to the maritime transportation system and navigational safety.

## *Participants*

Approximately 46 attendees participated in a full-day M-TWG Cabling Workshop on March 2, 2023. Participants shared their needs, concerns, and advice related to offshore wind cable routing and corridors in New York State navigable waters.

## *What We Did*

New York State representatives began the workshop by providing context on the current status of offshore wind and transmission planning and where it may be headed next. Participants then worked in interactive breakout sessions focused on distinct geographical regions to discuss constraints, share knowledge, and offer recommendations for cable siting in given areas (without discussing specific proposed cable routes by any developers). Finally, participants engaged in up to two of three key topics identified as pressing for offshore wind planning with mariners. These topics were maritime outreach and coordination, technology and information needs, and policy and procedures.

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<sup>1</sup> Available at: <https://www.nyseda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Transmission-NY-Electricity-Grid>

## *This Report*

This report summarizes the common themes and individual perspectives shared by participants. In some cases, ideas are divergent. The group did not attempt to reach consensus but rather focused on listening to and documenting the concerns and suggestions. This report will be shared with agency staff, M-TWG members, and others interested in the planning and management of offshore wind cables in New York/New Jersey Harbor and its approaches, including the New York Bight and Long Island Sound.

The box lists the considerations for cable planning that represent the key themes and ideas discussed by workshop participants. Ideas may be specific to a certain sector or be broader as a policy consideration.

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### **Considerations For Cable Planning**

- **Due diligence of maritime uses and coastal conditions**
  - Designate offshore wind cable corridors to reduce total subsea cable footprints while facilitating achievement of state renewable energy mandates
  - Avoid anchorage areas and navigation channels, including undesignated but commonly used areas
  - Plan cable routes that will achieve sufficient burial depth and minimize conflicts with vessels
  - Minimize impacts to critical New York City infrastructure (e.g., ports, bridges, tunnels, ferries), federal civil works projects, areas with existing vessel restrictions (e.g., air draft, slack water), aids to navigation, water, and sediment conditions (e.g., contaminated areas, disposal sites), and sand resources
- **Improved communication and coordination**
  - Coordinate cable routes between regulators, developers, and the maritime sector
  - Commit to early coordination with the Harbor Safety, Navigation, and Operations Committee (Harbor Ops), and similar maritime organizations
  - Compile a comprehensive cable installation and operations resource and education materials for the maritime community
  - Monitor cable depth and location conditions regularly and update mariners as changes occur
  - Update navigation charts with cable routes during construction and operations and require that all vessels use the latest charts, including incoming foreign vessels

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- Establish a single point of contact for mariners to request cable status during and after installation
  - Commit to consistent agency participation in relevant meetings
  - Coordinate on cable repair and maintenance to minimize maritime impacts
  - **Future-proofing designs**
    - Install cables at adequate depths and offsets to accommodate reasonably foreseeable future harbor deepening and resilience projects
    - Provide guidelines on planning for future environmental baseline conditions
    - Identify landfall sites with co-benefits for transmission, offshore wind, and working waterfronts (e.g., Plum Island, Rikers Island, Fort Wadsworth)
  - **Consider adjustments to the liability structure for cable damage and anchor strikes that may vary by location and/or incentivize longer lasting, secure cables.**
  - **Incorporate technology solutions**
    - Improve cable mapping and monitoring to track vertical and horizontal changes via sensors in real time
    - Provide access to a centralized database or accurate guide for all current geospatial data, including cable routes
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## Next Steps

This workshop summary presents a range of perspectives, ideas, and needs that should be thoughtfully considered at project and policy levels, as appropriate, by M-TWG members and others working on offshore wind and maritime transportation issues of importance. The M-TWG commits to undertaking the following steps in the near term:

- Update the M-TWG website with links to common-language and educational resources on subsea cables
- Finalize and disseminate the Anchorage Assessment study and common practice anchorage area dataset
- Coordinate with Harbor Ops and NYS Department of Public Service to schedule a training on the New York State Article VII review process for siting all maritime transmission facilities
- Evaluate workshop feedback and explore opportunities for building consensus and specific recommendations with maritime and offshore wind industries

# Introduction

## *Meeting Context*

The Maritime Technical Working Group (M-TWG), with support from New York State Energy Research and Development Authority (NYSERDA), New York State Department of State (NYSDOS), the Maritime Association of the Port of New York and New Jersey, and the New York Offshore Wind Alliance, convened a workshop to inform New York State’s offshore wind planning and build upon the findings in the NYSERDA Offshore Wind Cable Corridor Constraints Assessment<sup>2</sup> (Cables Assessment). The workshop was held on March 2, 2023, in New York City.

The M-TWG is an independent and non-decisional advisory entity made up of representatives from the maritime transportation sector, navigation community, and offshore wind developers who provide guidance and advice on how to responsibly advance New York State’s offshore wind energy development. The regional focus of this group is the New York/New Jersey Harbor and its approaches, including the New York Bight and Long Island Sound.

Since its inception in 2018, M-TWG members have consistently identified offshore wind cabling as a priority topic requiring coordination and thoughtful planning due to the potential conflicts that could arise within the busy and space-constrained waters of the Harbor and its approaches.

The workshop was convened in response to needs identified by stakeholders and to advance offshore wind cable coordination in New York State waters and designed to provide a number of benefits:

- Sustain the momentum of responsible offshore wind development
- Deepen the understanding of needs and issues associated with cable installation through New York State navigable waters
- Discuss cable minimization and mitigation measures included in the Cables Assessment
- Nurture relationship building between offshore wind and maritime stakeholders and federal and state partners

Workshop discussions focused on offshore wind cable routing and geographic areas in and around New York City and Long Island where the need for offshore wind transmission and onshore interconnection

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<sup>2</sup> Available at <https://www.nyserdanyny.gov/All-Programs/Offshore-Wind/Focus-Areas/Transmission-NY-Electricity-Grid>

are greatest. Other transmission projects are under development, including in the Hudson River, but these projects are currently beyond the scope of the M-TWG and were not discussed.

A subset of M-TWG members provided valuable expertise and guidance in planning the workshop over a six-month period to ensure adequate representation across industries and the prioritizing of issues for discussion.<sup>3</sup>

## *New York State Context Presentations*

### **State Goals and Process**

Greg Lampman, Director of Offshore Wind at NYSERDA, presented on the status of offshore wind in New York State to set the stage for the workshop.<sup>4</sup> The state's current offshore wind target is 9 gigawatts (GW) by 2035, of which approximately half is currently under development (4.3 GW). The Climate Action Council's scoping plan suggests that 16-18 GW of total offshore wind may be necessary to meet the New York State Climate Act mandates of the minimum 9 GW of offshore wind by 2035 and requires achievement of 85% reduction in emissions below 1990 levels by 2050, as well as 100% zero-emissions electricity by 2040.

New York's third Offshore Wind Solicitation, dubbed NY3, is expected to procure at least 2 additional GW and requires that cabling in constrained areas be HVDC (high voltage direct current) which minimizes cable quantity because it is a more energy dense technology capable of carrying more power per cable than HVAC (high voltage alternating current). With respect to NYSERDA's Cables Assessment, participants were provided a draft form of the assessment for review in advance of the Workshop. The Cables Assessment has been published as of late March 2023. NYS planning efforts regarding subsea cable siting have been jointly coordinated with state agencies from New Jersey and Connecticut, and representatives from both state agencies were in attendance.

Master Plan 2.0: Deep Water, a comprehensive roadmap which encompasses a suite of site assessment studies that will help identify new deeper water lease areas (extending east from the 60-meter contour

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<sup>3</sup> Special thanks to Cabling Workshop planning members Ian Corcoran (Hudson River Pilots), Michele DesAutels (U.S. Coast Guard), Fred Zalzman (New York Offshore Wind Alliance), Stephen Lyman (Maritime Association), and Eric Johansson (State University of New York Maritime College).

<sup>4</sup> Presentation slides are available on the M-TWG website: <https://www.nymtwg.com/wp-content/uploads/2023/03/Lampman-MTWG-Workshop-03022023.pdf>



beyond the continental shelf break) as “Areas for Consideration”, is currently under development. As concerns raised by stakeholders will be identified and amplified within Master Plan 2.0, NYSERDA will submit Areas for Consideration recommendations to the Bureau of Ocean Energy Management (BOEM) by late 2023/early 2024. Although a full navigational risk assessment for the aggregate build out of anticipated offshore wind projects has yet to be conducted, once lease areas have been identified, NYSERDA will determine what additional analytical work is required to continue responsible offshore wind development. Stakeholder engagement and public outreach, inclusive of the M-TWG, remain critical parts of NYS offshore wind development.

## Electric Infrastructure Planning

Liz Grisar, Deputy Director at the NYS Department of Public Service’s Office of Electric, Gas, and Water, presented on the state’s electric infrastructure planning process, considerations, and timelines.<sup>5</sup> The New York Independent System Operator (NYISO) is authorized to undertake a Public Policy Planning Process (also referred to as “Order 1000”) to solicit transmission proposals that address a public policy need and to recover costs through ratepayers. The New York State Power Grid Study, published January 2021, concluded that there are opportunities to better coordinate offshore wind transmission compared to the status quo of radial cables from individual offshore wind projects.<sup>6</sup>

The New York State Public Service Commission (PSC) is evaluating whether to use a more centrally planned process to develop offshore wind transmission into New York/New Jersey Harbor. Because the PSC focuses on New York State projects and goals, it is not obligated to review other regional offshore wind projects. The current NYISO Order 1000 process started in August 2022 and had an open public comment period at the time of the workshop. The PSC will decide if transmission is needed in the current planning cycle.<sup>7</sup> Stakeholder conversations by members of the M-TWG and others provide important guidance to transmission developers and NYISO evaluators in this process.

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<sup>5</sup> Presentation slides are available on the M-TWG website: [https://www.nymtwg.com/wp-content/uploads/2023/03/MTWG-forum-slides2\\_NYS DPS.pdf](https://www.nymtwg.com/wp-content/uploads/2023/03/MTWG-forum-slides2_NYS DPS.pdf)

<sup>6</sup> For more information about the New York Power Grid Study, see the website: <https://www.nys erda.ny.gov/About/Publications/Energy-Analysis-Reports-and-Studies/Electric-Power-Transmission-and-Distribution-Reports/Electric-Power-Transmission-and-Distribution-Reports---Archive/New-York-Power-Grid-Study>

<sup>7</sup> Filings related to the PSC’s consideration of offshore wind planning can be found under Case 22-E-0633 at <https://dps.ny.gov/>

# Maritime Considerations for Cable Siting and Operations

Workshop participants were asked to discuss considerations for routing cables with as little impact as possible to existing maritime uses in two geographic regions, the New York/New Jersey Harbor and Long Island Sound and the East River. This section first provides general considerations and suggestions for how to mitigate the unavoidable impacts common to both geographic regions, followed by more specific feedback.

## General

Participants named the following considerations for cable siting and operations:

- **Avoid existing usage areas.** Cable routes should avoid navigation channels, anchorage areas, aids to navigation, and federal civil works projects, where possible. Participants noted the significant spatial constraints in the region that could make it challenging to avoid all of these features. When planning project-specific routes, details should be provided to demonstrate where avoidance is not possible, how these usage areas were considered and balanced with competing priorities, and how impacts would be minimized and mitigated.
  - When navigation channel and anchorage crossings are needed, cables should overlap for the shortest distance, such as at right angles, as feasible.
  - Consideration should be made for the presence of commonly used maritime corridors and all anchorage areas, not just those officially designated. Some anchorage areas are custom and have been in practice for decades, while others have been expanding unofficially. Some participants noted that unofficial anchorages are challenging to incorporate as they do not have the same designation or regulations associated with them as official anchorages.
  - Some participants noted that if they had to choose one over the other, cables should run through an anchorage before running through a navigation channel. Others disagreed as this goes against common practice to avoid all anchorages.
- **Balance risks.** Cable siting should be informed by a risk assessment that analyzes vessel type and use in the area.
- **Co-locate cables.** Multiple cables should be co-located or sited within a corridor so mariners can more easily avoid them and should take into account technical separation requirements or other constraints.

- **Carefully coordinate cable installation.** Cable installation should be coordinated so that impacts to vessel traffic and terminal operations are avoided or minimized, as feasible. Some participants said construction sequencing is as important as cable routing.
  - A tradeoff exists between deeper burial and installation time. Beyond typical plow burial depth, the plow may be required to make multiple passes to achieve deeper depths, which requires more installation time. There was discussion about weighing the benefit from deeper cable burial against the level of impact to partial and/or full lane closures.
- **Establish “no repair” zones.** Some participants recommended designating no repair zones in congested areas to preserve safe navigation and access, while others expressed concerns with this recommendation. Developers face opportunity cost concerns and increased risks to cables when the timing or location of repair activities is restricted.
- **Availability of repair vessels.** Domestic and/or Jones Act-compliant maintenance vessels should be available throughout project operation to ensure prompt cable repair should any faults occur.

Participants named the following mitigation ideas and considerations:

- **Mitigation in the context of cable siting and operations.** Some participants expressed concerns with discussing mitigation in this context because it should be project-specific and analyzed through the environmental review or National Environmental Policy Act (NEPA) review process. In general, discussions of potential mitigation should include the phrase “where technically feasible.”
- **Coordinate cable routes and depths.** Participants discussed specific ways that routing and burial depths could mitigate impacts to maritime uses.
  - Subsea mapping of operational and abandoned cable and/or pipelines to provide critical data for cable routes reducing crossings or operational subsea infrastructure and eliminating the need to cross abandoned subsea infrastructure by removing the obstruction.
  - New projects should be sited within the same corridor as existing projects under development (e.g., Empire Wind).
  - Cables should be sited at a minimum of 0.5 miles from a navigation channel or anchorage.
  - Interstate coordination should be considered when non-NYS waters may present a less impactful routing solution.

- The project should ensure adequate cable burial depth, typically at least 15 feet or more in federally designated areas where future dredging may occur. Some participants recommended deeper burial depths, while others said this would cause longer cable installation timeframes and more disruption.
  - Secondary channels should be considered first over primary channels when or wherever possible.
  - Target burial depth should be sufficient to avoid needing secondary cable protection, which poses a potential hazard to mariners.
  - Horizontal direct drilling should be used in or near navigational areas, and when the bottom is rock, to minimize impacts to mariners.
  - Future-proof cable routes and incentivize proper planning to avoid needing adjustments due to Harbor deepening or other installations. For example, the Harbor deepening project will increase channel depths to -55 feet, but depths of -60 feet may be required in the near future.
- **Update navigational charts.** Participants provided specific input on how nautical charts can be improved. Cable routes and/or corridors should be incorporated into navigation charts before cables are installed. Foreign-flagged vessels should also update their nautical charts before approaching the Harbor.
    - Prior to construction, electronic nautical charts and NOAA S-1000 should include cable construction routes. These routes should be updated with as-built installed locations.
    - Foreign-flagged vessels often use outdated nautical charts. Incongruent information of subsea infrastructure increases the risk of incidents with cables.
    - Visible and electronic aids to navigation can be used to mark the cable route during installation.
    - Mechanisms should be explored in which the Coast Guard could require vessels to update their charts at a certain frequency or before entering a certain area.
  - **Cable monitoring.** The location and depth of cables should be monitored and made available, with real-time data and alerts if possible. The waterways discussed are dynamic systems with sediment movement occurring routinely and after storm events, which could alter the location of installed cables over time.

- **Track lessons learned to improve mitigation measures.** Lessons learned from current projects under review and construction should be shared.
  - Effective regulatory requirements could be compiled for reference by agencies and developers.
  - More coordination with regulators is needed to reduce conflicts between mitigation measures (e.g., the time-of-year restriction on landfall activities from Memorial Day through Labor Day conflicts with time-of-year restrictions to protect Atlantic sturgeon during cable installation).

## New York/New Jersey Harbor

Participants discussed how to route offshore wind cables into New York/New Jersey Harbor and along the South Shore of Long Island with as little impact as possible on existing maritime traffic and without introducing new hazards. They also brainstormed what mitigation measures might be helpful. Detailed maps of this region were annotated by workshop participants and can be found in the *Appendix*.

Participant input included the following:

- **Plan around existing maritime traffic and anchorage sites.** Existing patterns of maritime traffic and the potential for cumulative impacts should inform cable construction timing and sequencing.
  - Cables should avoid the Narrows where possible by routing around or using existing substations that do not require routes through this location.
  - Construction sequence can also have impacts. Projects selected in the NY3 solicitation could have simultaneous commercial operation dates (CODs) and construction timelines could impact vessel traffic in the Harbor if not accounted for.
  - On the Hudson River, cables should avoid the navigation channel and anchorage locations. Vessels could anchor anywhere in an emergency because there are no assist tugs in the Hudson River.
    - Secondary channels in the Hudson River identified by Harbor Ops should be primary cable corridors. NYSDEC should evaluate these areas for cable routes.
  - The South Shore has an existing undesignated fairway.
  - The east side of the Ambrose Channel may be preferred for cable siting and co-location with proposed projects to form a cable corridor.
  - Ambrose Anchorage will soon be a federally designated anchorage and had up to 35 vessels during the peak of the COVID-19 pandemic. The area used by anchoring vessels stretches for many miles to the east, well beyond the area that is proposed to be designated.

### Regional Context

From a maritime perspective, the New York/New Jersey Harbor will be the most difficult area in which to site cables as it is already a heavily trafficked area with numerous existing utilities, subsea infrastructure, and constrained waterways. The Cables Assessment estimates that about 5-6 GW of offshore wind (including Empire Wind) will need to interconnect through New York City and 3 GW, which may be increased, through the South Shore (including Sunrise Wind, South Fork Wind, and Empire Wind), which may be increased. Participants noted that there are ongoing plans to deepen the harbor, which for a period of time was the busiest port in the nation and continues to grow.

- **Consider and balance critical New York City infrastructure.** Plans for siting cables should consider port needs and existing infrastructure.
  - Routing should be done in a manner that advances our working waterfronts in creating new jobs and opportunities as well as offshore wind.
  - Plans should account for water siphons between Brooklyn and Staten Island.
- **Slack water and sand resources are key considerations.** Natural environmental conditions should inform cable siting and operations. Slack water is needed for certain vessels to navigate through constrained waters and under air-gap restricted bridges.
  - All cable-laying operations should cease during slack water in Arthur Kill and Kill Van Kull to enable vessel navigation.<sup>8</sup>
  - Participants noted challenges at the Bayonne Bridge and Verrazano Bridge related to cruise ship navigation during slack water.
  - Traffic in the Kill Van Kull is currently restricted to larger vessel traffic during certain phases of the tide.
  - Sand borrow areas are important for storm recovery and community resilience and should be avoided where possible or have deeper cable burials when crossing to allow for continued use of the borrow areas.

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<sup>8</sup> Slack water is defined as the state of the tide when it is turning, (e.g., highest or lowest water levels, with the lowest current speed).

## Long Island Sound and East River

Participants discussed how to route offshore wind cables through Long Island Sound and the East River with as little impact as possible on existing maritime traffic and without introducing new hazards. They also brainstormed what mitigation measures might be helpful. Detailed maps of this region were annotated by workshop participants and can be found in the *Appendix*.

- **Plan around existing maritime uses.** Where feasible, cables and routes should avoid existing commercial navigation and recreational uses. Participants provided specific examples where cable routes should avoid commercial navigation and other recreational or national defense uses.
  - Commercial uses for consideration include the following:
    - Long Island Sound generally has different patterns of commercial navigation than the vessel type and density in the New York/New Jersey Harbor. Commercial vessels are most frequently articulated tug-barge (ATB) units that transport refined products. ATB units vary in size and include units similar in size of a product tanker. Large container vessels do not pass all the way through the East River into the Sound; however, some liquid and dry bulk tankers occasionally transit this route.
    - Hunts Point is the largest food distribution center in the Northeast; transportation is via commercial vessels.
  - There are many existing maritime routes:
    - Cables should avoid existing mooring buoys.
    - Coordinate with ferry traffic and peak seasonal (recreational) vessel traffic.
    - Where feasible, cables should avoid any Recommended Navigation Routes shown in nautical charts and observe similar requirements as for designated navigation channels. There are two designated routes, one in eastern Long Island Sound through The Race and the second in western Long Island Sound near Hells Gate.

### Regional Context

The Long Island Sound and East River, though not as congested as the New York/New Jersey Harbor, present unique challenges due to shared authority across multiple states, varying currents and geologic features, different vessel types, and an active naval base. The Cables Assessment estimates that about 2 GW of offshore wind (which may be increased) will interconnect through the Long Island Sound (including Beacon Wind). The area also features unofficial navigation routes and high-value real estate, which present additional challenges in cable siting.



- The eastern Recommended Navigation Route is in a popular recreational boating area and is critical in emergency response situations to rescue boaters.
- Where practicable, avoid federal channels and anchorages and areas that are either designated or common practice (e.g., Montauk Point, Kings Point).
- Deepwater access needs to be preserved between Rikers Island and LaGuardia Airport.
- Federal/national defense uses should be coordinated, such as at the naval base in New London, Connecticut, which launches submarines.
- The State of Connecticut should be included in cable routing discussions.
- **Identify suitable environmental conditions.** Participants provided specific examples of environmental considerations for cable siting.
  - The East River is narrow, with strong currents and existing channels and anchorage concerns that are exacerbated by exposed bedrock. These conditions not only make it difficult to navigate but also increase the complexity of cable installation, timing, maintenance, operations, repairs, and decommissioning. Cable burial to sufficient depths may not be possible, which increases risks to mariners. All phases of cable work should be carefully orchestrated with vessel movements to limit disruptions.
  - The Race has forceful currents, hard bottom, rocky outcroppings, and sand waves that also make cable installation and maintaining cable burial depth challenging.
  - Eastern Long Island Sound has sensitive ecological communities and important fisheries habitat.
- **Explore potential opportunities.** Participants gave examples of specific sites that may be suitable for offshore wind infrastructure development.
  - Rikers Island and Plum Island could be repurposed for cable landfall or points of interconnection to support offshore wind interconnection to the grid. Plum Island is currently being decommissioned, so there may be opportunities for corridors or areas for multiple projects. Some participants noted that Plum Island is serviced by one high-voltage subsea cable that is surface-laid between the island and mainland, which may pose a challenge.
  - The waters south of Valiant Rock in Long Island Sound are not frequented often by mariners and may be favorable for cable siting.

- **Examine existing water and sediment conditions.** Participants provided suggestions on mitigation measures.
  - Some Participants noted a preference for burying cables at least 15 feet deep. Siting cables in the deepest waters of Long Island Sound would mitigate anchor strikes.
  - Participants said offshore disposal areas should be avoided (these areas are not shown on maps).

## Maritime Outreach and Coordination

Some participants shared suggestions and made recommendations to improve coordination between the maritime sector and offshore wind developers:

- **Essential information for mariners related to process.** To plan and coordinate with offshore wind companies and state and federal agencies, mariners need to know the following:
  - *Which agencies are responsible for approving routes, cable operations and maintenance plans.*
  - *What happens at the end of a cable's operational life.*
  - *What stage of development the project is in.* For example, Harbor Safety, Navigation, and Operations Committee (Harbor Ops) members are sometimes asked to review proposals at various stages of completeness. Members may not fully understand the specific stage they are asked to review something (is an offshore wind company just testing an idea or is it a review of an actual proposal).
  - *How best to participate in the project review.* For example, maritime organizations are not familiar with the New York State Article VII review process and may benefit from an educational training. Stakeholders should consider whether Harbor Ops is suited to be the *de facto* maritime sponsor or as an intervenor in Article VII cases.
  - *Coordination on water installations.* The New York State Article VII process should include formal outreach to maritime organizations for all in water installations.
- **Recommendations for good coordination among sectors.**
  - *Clarify roles.* Mariners need more information on the agencies and companies responsible for approving various aspects of routes, cable operations, and maintenance plans.
  - *Facilitate coordination on cable routes.* Until developers have offtake agreements, agencies may be best suited to coordinate cable routes. When offshore wind developer competition warrants it, regulators could bring developers together to determine routing and coordinate plans. Developers noted, for example, that Vineyard Wind, Mayflower Wind, and Bay State have been closely coordinating while concurrently going through their Construction and Operations Plan review.
  - *Establish a single point of contact (e.g., developer liaison).* It would be helpful if offshore wind companies had a single point of contact for the maritime industry, such as the fisheries

- liaison that some offshore wind projects have. For offshore wind companies, it would be helpful to have one agency or utility point of contact about the cabling process (from inception to decommissioning).
- *Ensure consistent agency participation.* Some state agencies are not regularly attending the forums that exist for coordination with mariners. All key agencies need to be present.
  - **Stakeholders to include.** Participants suggested stakeholders who should be involved in the development of offshore wind projects:
    - Maritime stakeholders engaged through Harbor Ops or other similar channels because they offer diverse expertise and can provide efficiencies for developers.
    - State and city representatives and other multi-state agencies like the Port Authority.
    - U.S. Coast Guard to assist with ground-truthing information from developers prior to Harbor Ops reviews through regular meetings/discussions with developers.
    - Army Corps of Engineers to facilitate Coast Guard and maritime operators' concerns into applicant approvals.
    - New York State Department of Environmental Conservation (NYSDEC) to reconsider exclusion zones thus providing optimum cable routing.
    - State power needs sited in state waters.
    - NYSDEC engagement in discussions of dredging in state waters.
  - **Forums.** Participants provided examples for types of forums for conducting outreach.
    - Hold town hall meetings, particularly if new infrastructure is proposed for development. This forum may be less important if projects use existing infrastructure.
    - Increase real-time communication. There are solutions like technology applications in the fishing industry, but there should be a cohesive, integrated app for all projects. Mariner safety and awareness of projects can be broadcast via apps.
    - Conduct briefings to mariners.

## Technology and Information Needs

Some participants shared ideas on information or technologies that might help in overcoming the challenges for the cable siting discussed in the workshop. They also identified data gaps that pose challenges to the maritime and/or offshore wind industries. These included the following technologies and data gaps:

- **A comprehensive cable installation resource.** A resource designed for non-developers, including agency and maritime representatives, to provide basic guidelines and specifications for single cable designs and multiple cable corridor designs.
  - *Width of a survey corridor.* Participants specifically discussed the amount of space a cable installer needs to allow for micro-siting and avoid additional surveys.
  - *Extent of offshore wind vessel traffic.* The maritime industry would also like to better understand the extent of offshore wind vessel traffic that will be expected through all stages of cable installation and operations and maintenance, such as details on the number and type of vessels engaged in a cable laying spread, the space and time frames required, and length of time that channels could be impeded.
- **Examine future environmental conditions.** Environmental impact analyses should be based on current baseline conditions and also incorporate future changing conditions. Wind developers should account for changing future conditions when designing projects. For example, whale and lobster populations are projected to fluctuate as their habitats shift due to warming ocean temperatures. In response, vessel traffic and other use cases would need to shift. Vessel sizes and numbers are increasing as activity in the Harbor grows.
- **Improve cable mapping and monitoring in real time.** Participants provided specific examples of helpful technologies and information. The Local Notice to Mariners (LNM) is useful information but is not available spatially nor at a sufficient resolution. Pilots and other professional organizations have staff dedicated to receiving, interpreting, and educating in-house mariners, but the system is too burdensome for many others to use. Information, such as the following, needs to be available in real time to mariners:
  - *Cable sensors capable of monitoring cable depth in real time.* Monitoring or reporting restrictions could be imposed when cables are in proximity to naval operations or other national security assets.

- *Information on the precise and real-time location* of existing cables and other buried infrastructure, including tunnels, Metropolitan Transit Authority (MTA) uses, and other utilities.
- *Charts delineating common practice anchorage areas.* Participants asked for access to the shapefiles that COWI developed as an M-TWG product.<sup>9</sup> Mariners and developers do not currently have access to those charts.
- *Real-time information.* An agency or entity should be responsible for disseminating real-time information.
- *App to access project-specific information.* Offshore wind developers are working with an app developer to be able to share project-specific information in real-time (e.g., from whale surveys).
- *Cable information displayed graphically.* Mechanisms should be explored in which cable information can be displayed graphically, in real time, similar to automatic identification system (AIS) vessel data. The U.S. Coast Guard is exploring whether LNM safety publications can be published in a live graphical format, but it is not clear if and when such a product will become widely available.
- **Essential information for mariners related to safe vessel operations.** Mariners would like to know the following for safe operation of their vessels:
  - Key findings from cable survey work (e.g., delineation of unexploded ordnance, UXO)
  - What installation activities are planned and underway and implications for mariners
  - What maintenance activities are planned and underway
- **Information of existing waterway uses.** Participants provided specific examples of use cases for further information.
  - Gain input from the Department of Homeland Security on any national security risk posed by cable corridors
  - Delineate how municipalities use waterways (e.g., local regattas, fireworks) and how such activities may impact cable projects.

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<sup>9</sup> The M-TWG Anchorage Assessment study and accompanying data will be available on the M-TWG website (<https://www.nymtwg.com/>) when final.

- **Geospatial data.** Participants provided specific examples of helpful geospatial data for mariners and offshore wind industry. They would like to have real-time spatial data on the following:
  - Cables and security zones during installations
  - Active cable and pipelines (including but differentiated from those out-of-service)
  - Wreckages and archeological resources
  - Clearinghouse for federal, state, and city resilience projects
- **A central database for all geospatial data.** Participants acknowledged NOAA’s Marine Cadastre, Mid-Atlantic Regional Council on the Ocean (MARCO), and other similar databases. They emphasized that mariners often do not know which database to access for the latest spatial layers nor how other mariners may share their data for publication in these databases.
- **An overview of the liability structure.** Mariners would benefit from having more information on the liability structure in other states and countries. Some participants cited concerns that vessel operators are held liable for anchor strikes on cables. More research is needed into existing standards to determine whether adjustments to the liability structure or programs to distribute or manage the risks should be considered, e.g., that vary by region or location based on areas with higher risk, and/or incentivize longer lasting, secure cables.

## Policy and Procedures

Some participants shared ideas on the design or routing considerations that should be prioritized to inform policies related to offshore wind transmission coordination. The discussion built on the Cables Assessment and weighed potential restrictions that could benefit maritime users with the need to preserve optionality so cable coordination projects can be advanced cost-effectively.

- **Identify potential corridors.** Some participants said the Cables Assessment could be supplemented to identify cable corridors, similar to what New Jersey is doing.
  - New York State could use transmission studies that are being undertaken by the U.S. Department of Energy and apply lessons learned in Europe to establish recommended corridors.
  - States could provide permission to site cables in adjoining state waters provided it best suits routing thus avoiding navigational waters greater than 20 feet deep.
  - Federal agencies could work with neighboring states to establish best practices for cable siting throughout the New York Bight. The U.S. Corps of Engineers is planning New York/ New Jersey Harbor deepening and resilience projects and could recommend siting for cables in and around those civil works projects.
- **Demonstrate that project constraints, risks, and footprints are minimized.** Coordinated cable projects should evaluate how they minimize constraints identified in the Cables Assessment. Participants cautioned that detailed analyses cannot be provided for conceptual projects because this strains future feasibility, cost, and supply chain considerations as the project matures. Nevertheless, conceptual projects may be able to demonstrate that they have considered the following:
  - Minimizing corridor widths
  - Minimizing use conflicts not analyzed in detail in the Cables Assessment, including time-of-year restrictions, recreational uses, and vessel traffic that are heavier in the summer and shoulder seasons
  - Minimizing risks to the maritime transportation system during all phases of the project
  - Prioritizing stakeholder and regulatory coordination
  - Range of installation methods to achieve burial depth requirements
  - Undertaking cable monitoring and maintenance



- **Assess cumulative risks and impacts to mariners.** Agencies could commission studies to inform and facilitate future regulatory reviews based on the number of cables anticipated to be needed. Participants acknowledged that individual project proponents may not be suited to develop these studies. Specific examples of analyses that deserve attention and awareness are the following:
  - A cumulative analysis of impacts comparing a status quo of radial cables per project to a coordinated approach with one or more cable corridors may help mariners understand the value of tradeoffs. NEPA and Article VII require a cumulative alternatives analysis and may provide a template. BOEM’s Programmatic Environmental Impact Statement (PEIS) for the current lease areas in the New York Bight may be a useful resource for cumulative analyses when published.
  - Conduct a cumulative navigation safety risk assessment for potential cable corridors that is independent of projects and covers state and federal jurisdictions.
  - Conduct a navigation safety risk assessment to include input from Harbor Operations and Safety Committees professional mariner membership.

In addition, workshop attendees had the chance to suggest additions or changes to the Constraints (Tables 2-4 and 2-5) or Siting Principles (Section 4.1) in the Cables Assessment. Individuals had the following suggestions to the assessment:

- Change to Table 2.4: Beach renourishment and resilience projects should be avoided, where possible, or cables should be buried deep below.
- Change to Table 3-4. #4 Bundling HVDC cables may not be technically feasible.
- Change to Section 4.1 #6 (Avoid anchorages and navigation channels): Consider changing to read “Avoid and minimize impacts to anchorages and channels.” In many cases, it may not be possible to avoid anchorages and navigation channels.
- Change to Section 4.1: Add “avoid UXOs.” Micro-siting around UXOs may be possible.

# Appendix

## Meeting Participants

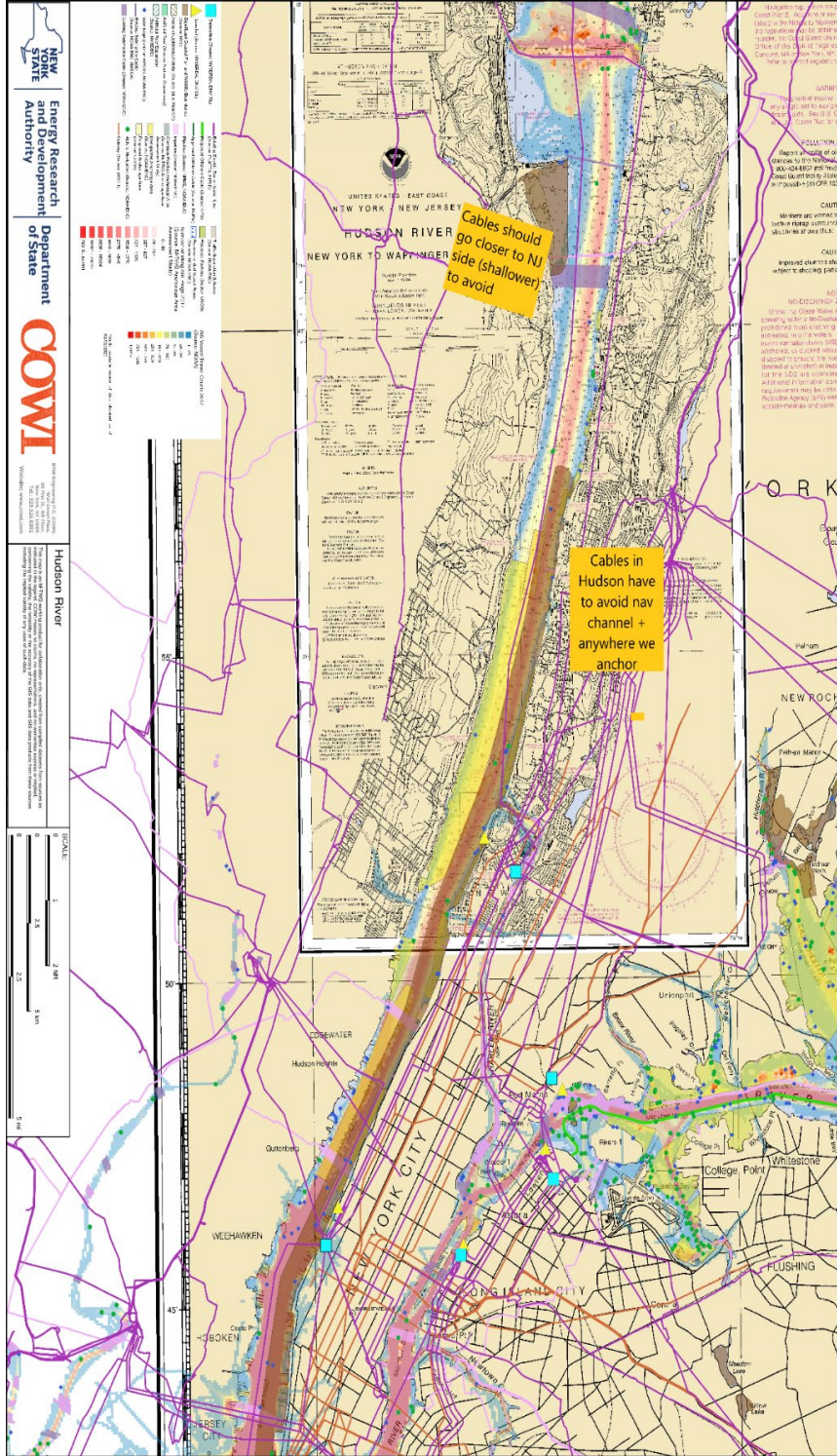
Last Name	First Name	Affiliation
Amir	Faisal	Attentive Energy
Arzu	Tess	New York State Energy Research and Development (NYSERDA)
Baker	Lance	Port Authority of New York and New Jersey (PANYNJ)
Behal	Girish	New York Power Authority (NYPA)
Brust	Colleen	New Jersey Department of Environmental Protection (NJDEP)
Cooper	Brent	COWI
Darrell	Chuck	New York Shipping Assoc.
Dashkoff	Fred	Metro Pilots
DeCruz	John	United Sandy Hook Pilots Association/Chair Harbor Safety, Navigation, and Operations Committee (Harbor Ops)
Diedrich	Josh	Reinauer
Corcoran	Ian	Hudson River Pilots/Hudson River Safety, Navigation, and Operations Committee (HRSNOC)
Ferguson	Ona	Consensus Building Institute
Flaum	Jeremy	New York State Department of Public Service
Gallagher	Gwendolyn	New York Sea Grant
Galvin	Edward	Cadmus
Grisaru	Elizabeth	NYS Department of Public Service
Handell	Naomi	U.S. Army Corps of Engineers (USACE)
Hitchen	Greg	CG Sector New York
Huber	Sherryll	New York State Energy Research and Development (NYSERDA)
Johansson	Eric	Maritime College, State University of New York/Vice Chair Harbor Ops. Vice Chair Harbor Safety, Navigation, and Operations Committee (Harbor Ops)
Justice	Larry	Hudson River Maritime Industry Alliance
Kowalski	Josh	Hudson River Maritime Industry Alliance
Lampman	Gregory	New York State Energy Research and Development (NYSERDA)
Lewis	Julia	Equinor
Lyman	Steve	Maritime Association
McLean	Laura	New York State Department of State (NYSDOS)
Minck	Chris	U.S. Army Corps of Engineers (USACE)
Morkan	Tom	U.S. Department of Transportation (USDOT) Maritime Administration (MARAD)
Pezdek	Stephan	Port Authority of New York and New Jersey (PANYNJ)
Reed	Daniel	Shell
Richardson	Adam	Interport Pilots
Robins	Rick	Community Offshore Wind
Rodstrom	Chris	Vineyard Wind (CIP-Avanguard)
Ryba	Steve	U.S. Army Corps of Engineers (USACE)

Last Name	First Name	Affiliation
Samoteskul	Katya	Invenergy
Sidor	Lauren	NYSDEC
Siskind	Esther	Bluepoint Wind
Snyder	Mike	New York State Department of State (NYSDOS)
Stuck	Matt	U.S. Coast Guard District 1
Taffet	Max	New York City Economic Development Corporation (NYCEDC)
Thompson	Brian	Connecticut Coastal Program
Vahey	Brian	American Waterway Operators
Vietri	Robert	U.S. Army Corps of Engineers (USACE)
Wilkie	Sabine	COWI
Zalcman	Fred	New York Offshore Wind Alliance (NYOWA)
Zwier	Roberta	Rise Light and Power

## *Annotated Maps*

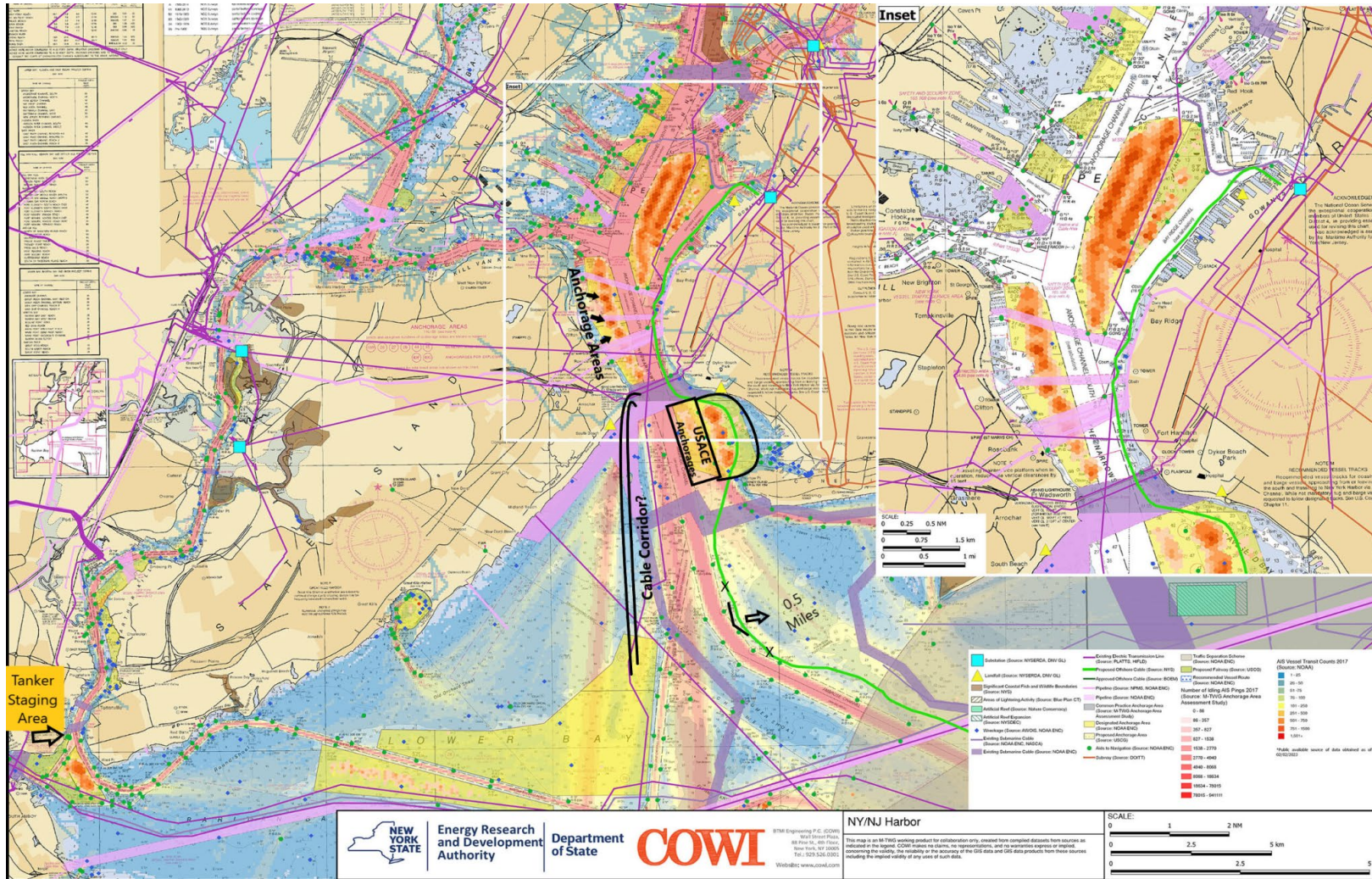
Large maps were available for each regional breakout session at the M-TWG workshop to guide the discussion and allow participants to visually communicate their preferences. Some participants chose to annotate the maps, and their edits are compiled in the four maps below. Many participants chose to provide verbal feedback. Therefore, the annotated maps do not represent consensus on cable routing nor do they reflect all cable routing input discussed.

# Hudson River Annotated Map





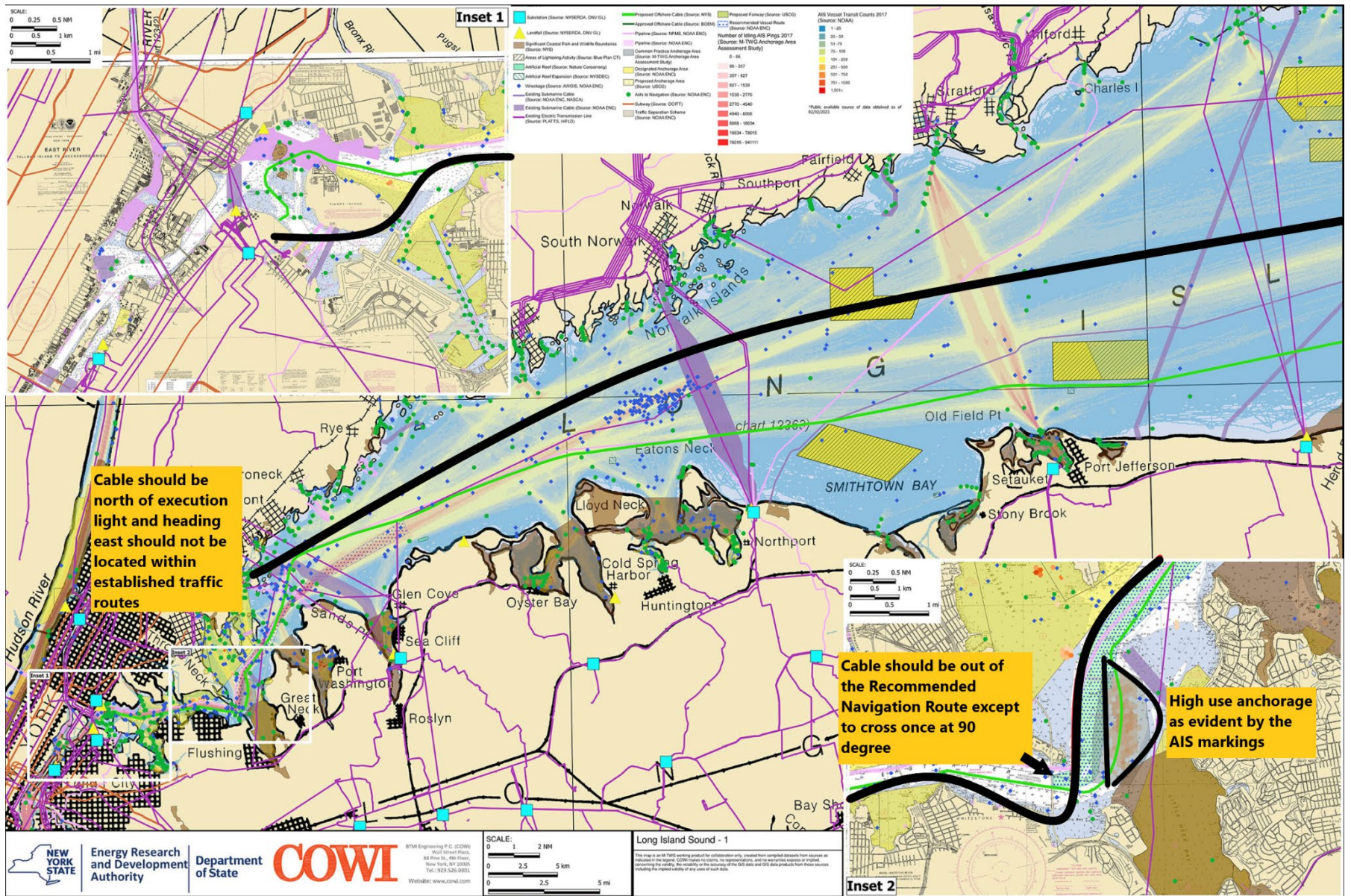
# New York/New Jersey Harbor Annotated Map











Cable should be north of execution light and heading east should not be located within established traffic routes

Cable should be out of the Recommended Navigation Route except to cross once at 90 degree

High use anchorage as evident by the AIS markings