SUBCOM

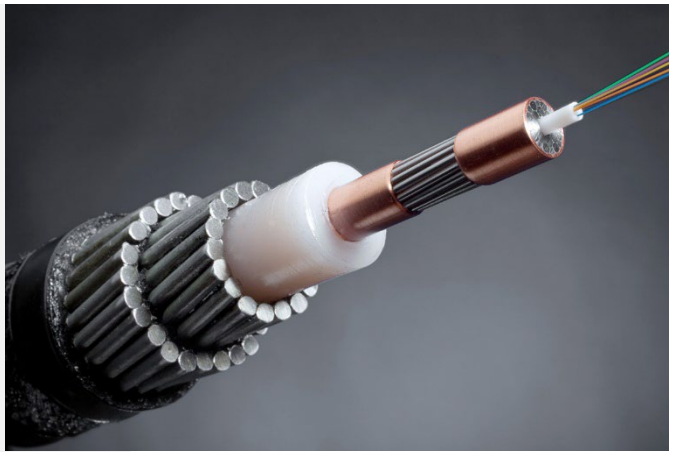
Telecommunications Cables Sharing the Seabed in the NY Bight

Maritime Risk Symposium - Maritime College – State University of New York
Panel 3: Subsea infrastructure Quality Standards and Assurance
November 2023

Dr. Ronald J. Rapp (SubCom)

SubCom Marine Services: Who We Are

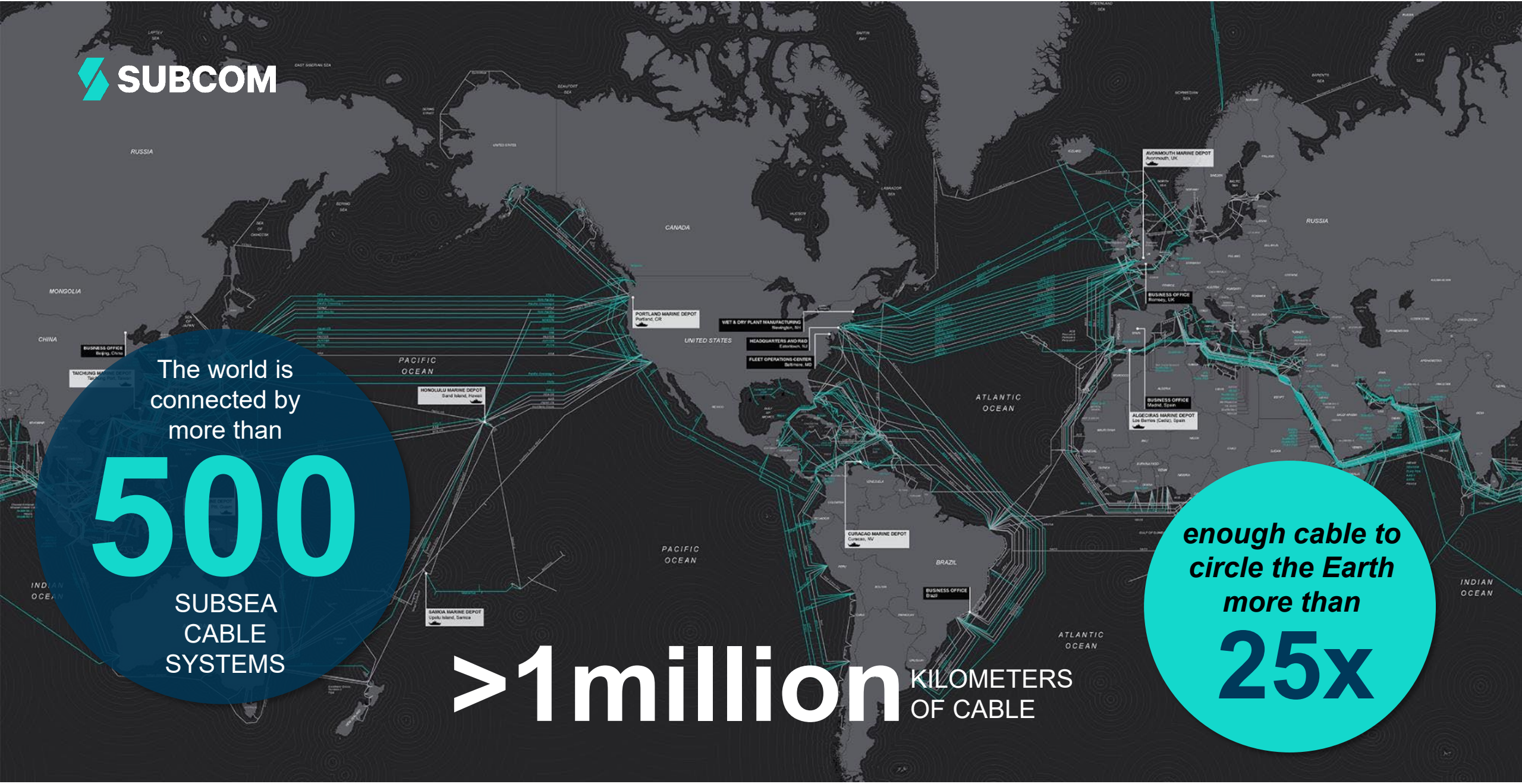
SubCom **engineers**, **manufactures**, and **installs** subsea fiber optic data cables - the unsung heroes of global communication.



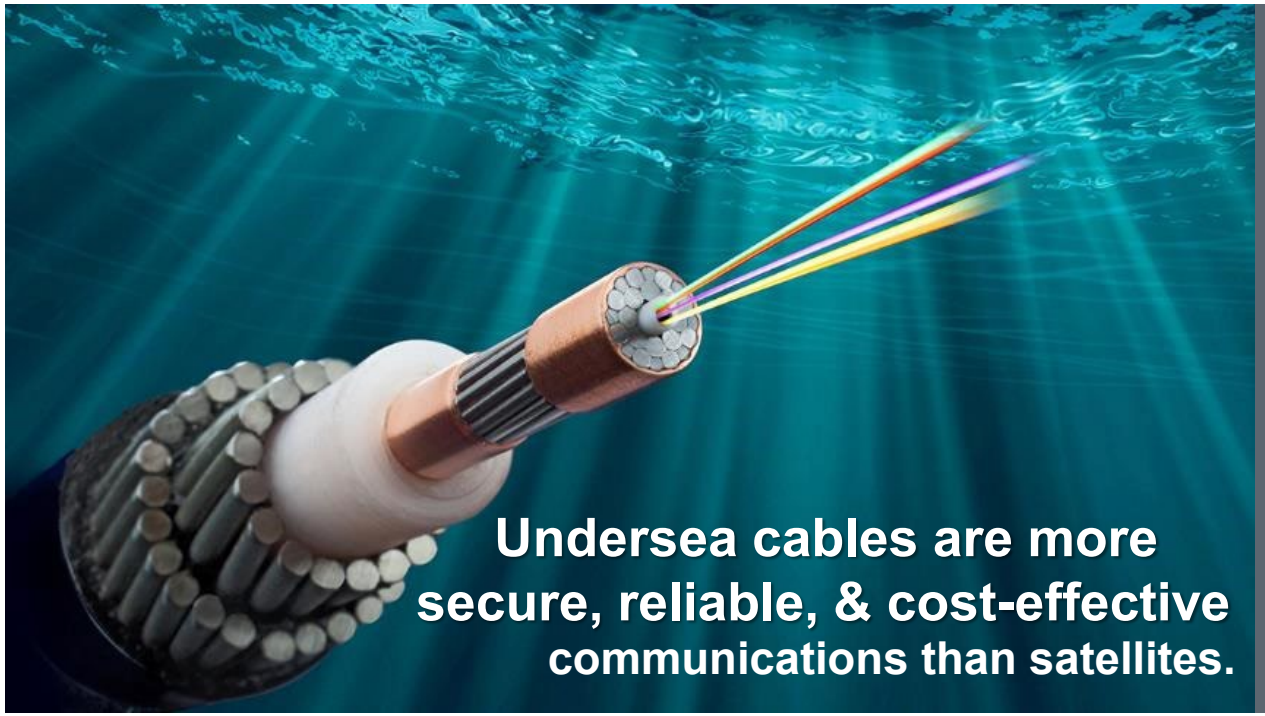
With an unrelenting focus on **quality**, **reliability**, and **value**, SubCom offers flexible end-to-end building blocks for the high-tech networks that are the **backbone of the world's digital infrastructure**.

SINCE 1955, SUBCOM HAS DEPLOYED ENOUGH CABLE TO CIRCLE THE EQUATOR MORE THAN 21 TIMES.

SUBCOM


SUBCOM
The world is connected by more than
500
SUBSEA CABLE SYSTEMS
>1million
KILOMETERS OF CABLE
enough cable to circle the Earth more than
25x
RUSSIA
CANADA
UNITED STATES
MONGOLIA
CHINA
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
BRAZIL
PORTLAND MARINE DEPOT
Portland, OR
WET & DRY PLANT MANUFACTURING
HEADQUARTERS AND R&D
FLEET OPERATIONS CENTER
HONOLULU MARINE DEPOT
SAMOA MARINE DEPOT
CURACAO MARINE DEPOT
AVONMOUTH MARINE DEPOT
BUSINESS OFFICE
ALGECIRAS MARINE DEPOT

Why Entrust so Much to Subsea Cables?



Only undersea cables provide the real-time connections and huge carrying capacity necessary for **live video**, instant **financial transactions**, **gaming**, and host of other applications.

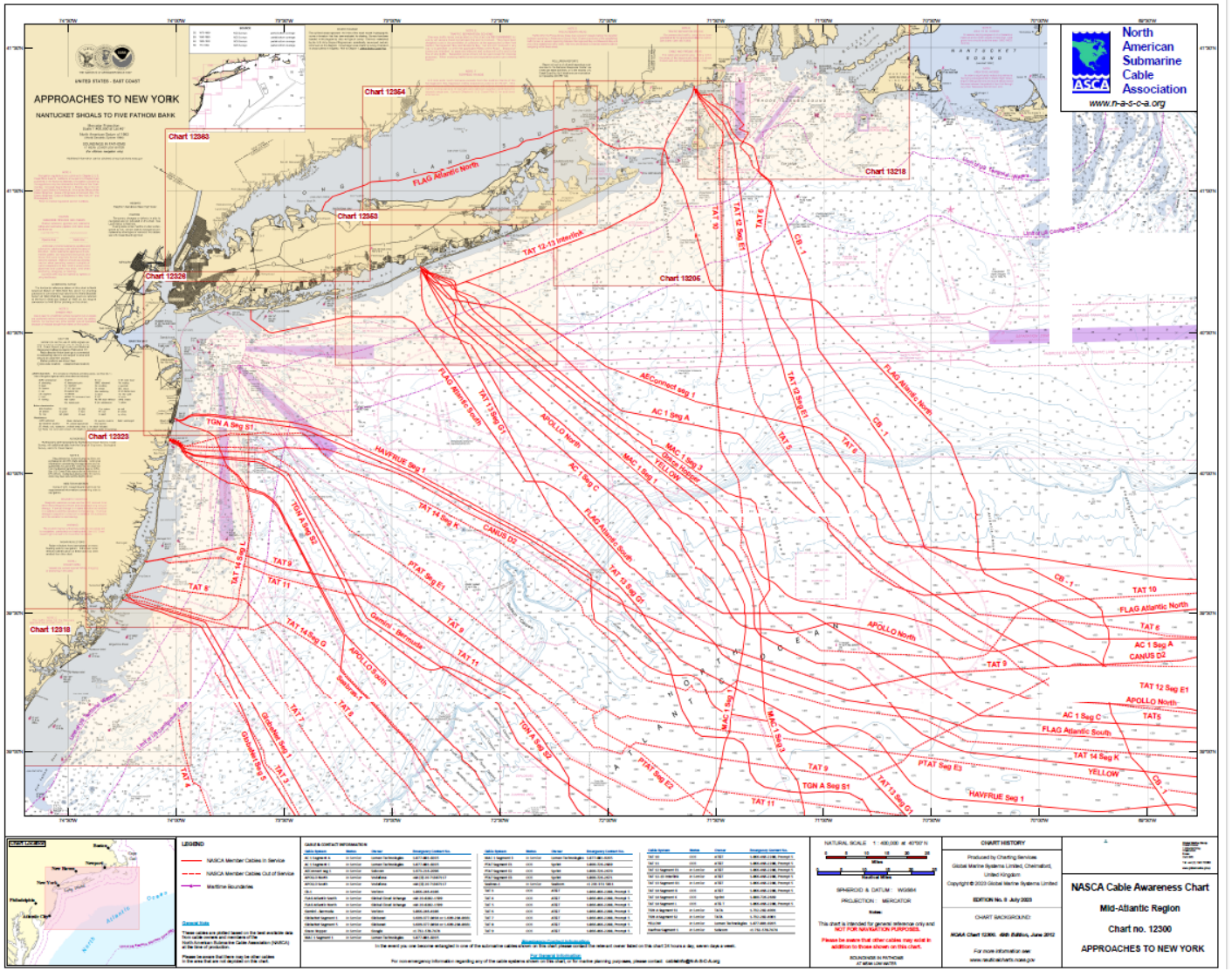
Fiber optic undersea cables transmit communications at the **speed of light**, by far the fastest transmission medium. The delay between sending and receiving a communication on an undersea cable is measured in mere milliseconds.

Telecommunications Cables in the NY Bight

Telecommunications cables landing in the US Northeast have been a critical hub for global commerce and communications for decades.

More recently, connections to global data centers form the backbone of today's internet.

Telecom cables are a critical infrastructure transiting the NY Bight.



Submarine Telecommunications Cables in the NY/NJ Bight

The first modern submarine telecommunications cable in the NY bight landed in southern NJ at Tuckerton in1963. TAT-3 was the third transatlantic telephone cable, in operation from 1963 to 1986. It had 414 kHz of bandwidth, allowing it to carry 138 telephone circuits (simultaneous calls).

Today there are approx. 30 active fiberoptic cables that cross the NY Bight. These carry primarily internet traffic including financial transactions.

Early cables were not buried and suffered numerous fishing faults. Undersea plow technology allowed cables to be buried 60cm into the seabed. Today 1.5m to 2m burial depth is typical and making them sufficiently protected from fishing gear (scallop and clam dredges are the primary risk).

Cable burial is the most effective method for protecting cables. Due to firm and sandy sediment that is amenable to burial, cables in the NY bight suffer very few faults as compared to other parts of the world. Globally there are approx. 200 cable fault per year, many in Asia and the UK.

Today cable routes are planned with modern GIS data tools and data sets and with a thorough risk assessment in what we call a Desktop Study. Then a detailed hydrographic survey is conducted including a burial assessment survey along the chosen cable route. Cables are typically buried to 1000m water depth, up to the depth of fishing risk.

Armored cables laid on the continental shelf are 1.5 to 2 inches in diameter. Beyond the continental shelf, a small diameter unarmored cable is surface laid directly on the seabed along the abyssal plain, smaller than a garden hose.

Key to the planning is communication and liaison with all stakeholders and seabed users and with government permit agencies.

[USACOE coordinates telecom cable applications, BOEM coordinates power cable and renewables]

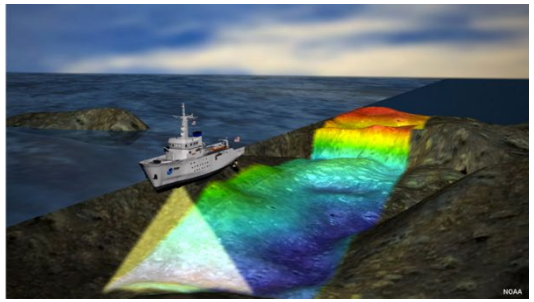
Once installed, cables are charted so mariners are made aware of their location. A Cable Awareness program supplemented with AIS to identify vessels over cables has proven an effective means of cable protection when they can be contacted and provided with cable route data.

Typical Telecom Cable Installation Project

Marine Cable Project

Permitting Marine Documentation	Desktop Study Cable Route Survey	Marine Liaison Fisheries	Environmental Health and Safety

Bathymetry, geotechnical, sub-bottom, and side scan data to support route engineering, cable selection, installation and burial



Route Design, Cable Route Survey, Permitting & Consultations + Seabed Inspections > to protect cables & protect other Seabed users

Phases of Submarine Cable Installation

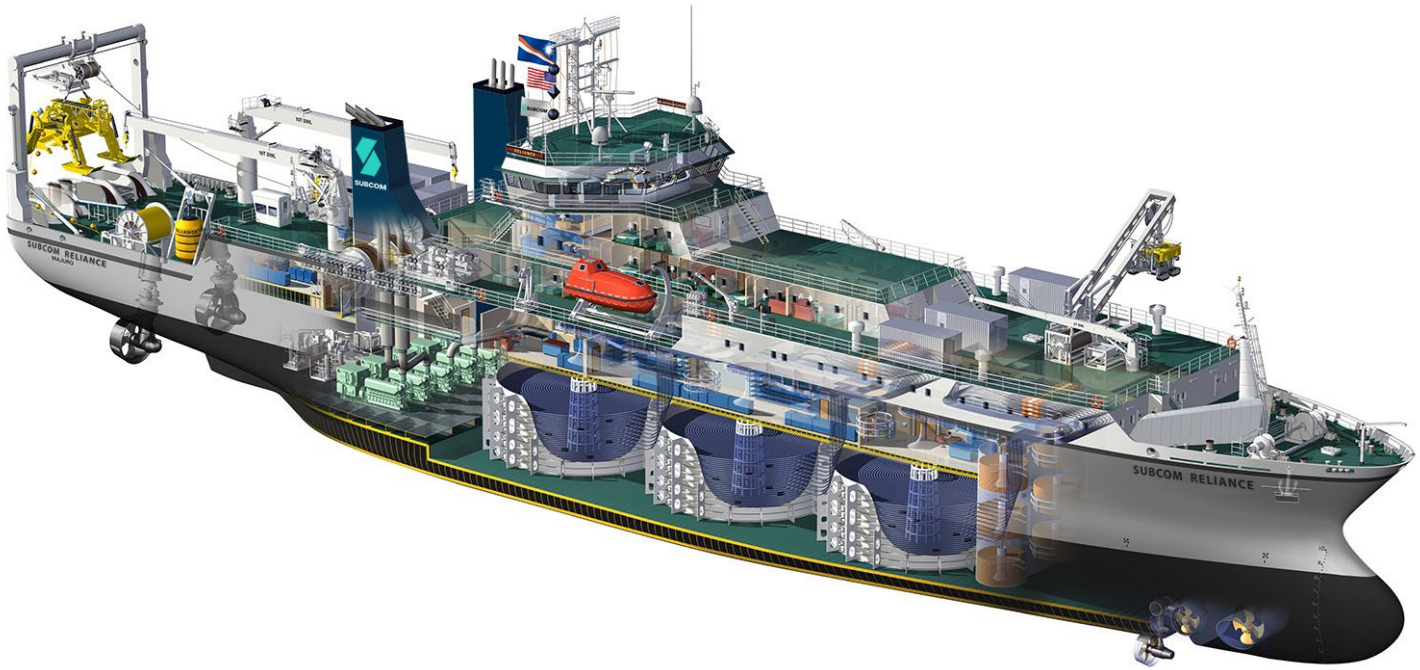
PLANNING	• Desktop Study • Route Survey and Selection • Burial Feasibility (not in ABNJ) • Installation Modeling	*Focus on risk avoidance and risk mitigation*
INSTALLATION	• Shore Ends (where cable lands on shore) • Cable Burial (only in shallow water) • Surface Lay (in deepwater) • Branching Unit/Nodes	*Use of best practices, tools and equipment*
POST INSTALLATION SUPPORT	• Marine Liaison • Cable Maintenance • Global Technical Support Center	*Education, network monitoring and cable repair services*

SUBCOM

SubCom Cable Ships for Laying New Systems and Repairing Existing Cables

The six “Reliance Class” vessels are the heart of the SubCom cable ship fleet. Specifically designed and constructed for cable maintenance and construction, these are the most versatile cable ships in the industry.

- Purpose built
- 140m length
- 5500 + MT cable capacity
- 84 persons
- 0+ days endurance



OUR RELIANCE CLASS CABLE SHIP FLEET

SubCom Reliance
SubCom Dependable
SubCom Responder
SubCom Decisive
SubCom Resolute
SubCom Durable

Marine Construction & Installation - Protection with Burial

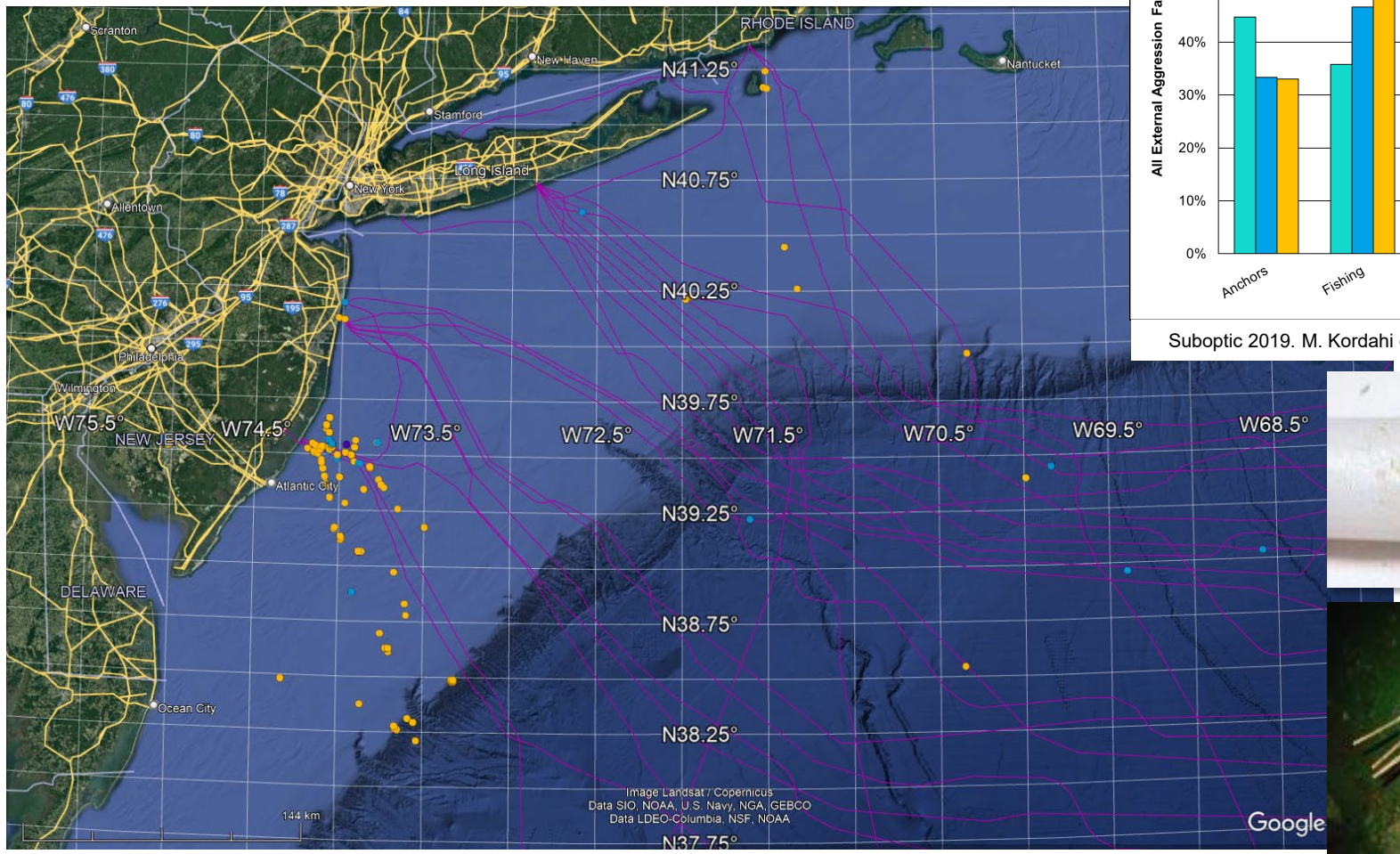
Example of Submarine Cable Installation Tools

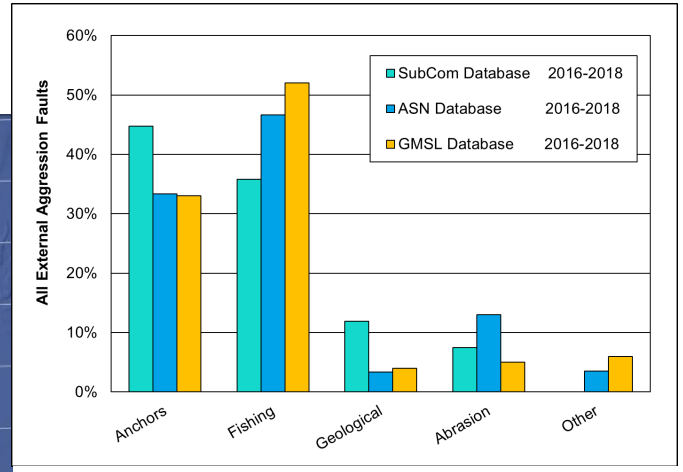
SUBCOM

Historical Telecom Cable Faults – Fishing and Anchoring

The vast majority of cable faults are on older cable cables along the early routes to Tuckerton NJ, when cables were not buried or not buried below threat of clam and scallop dredging.

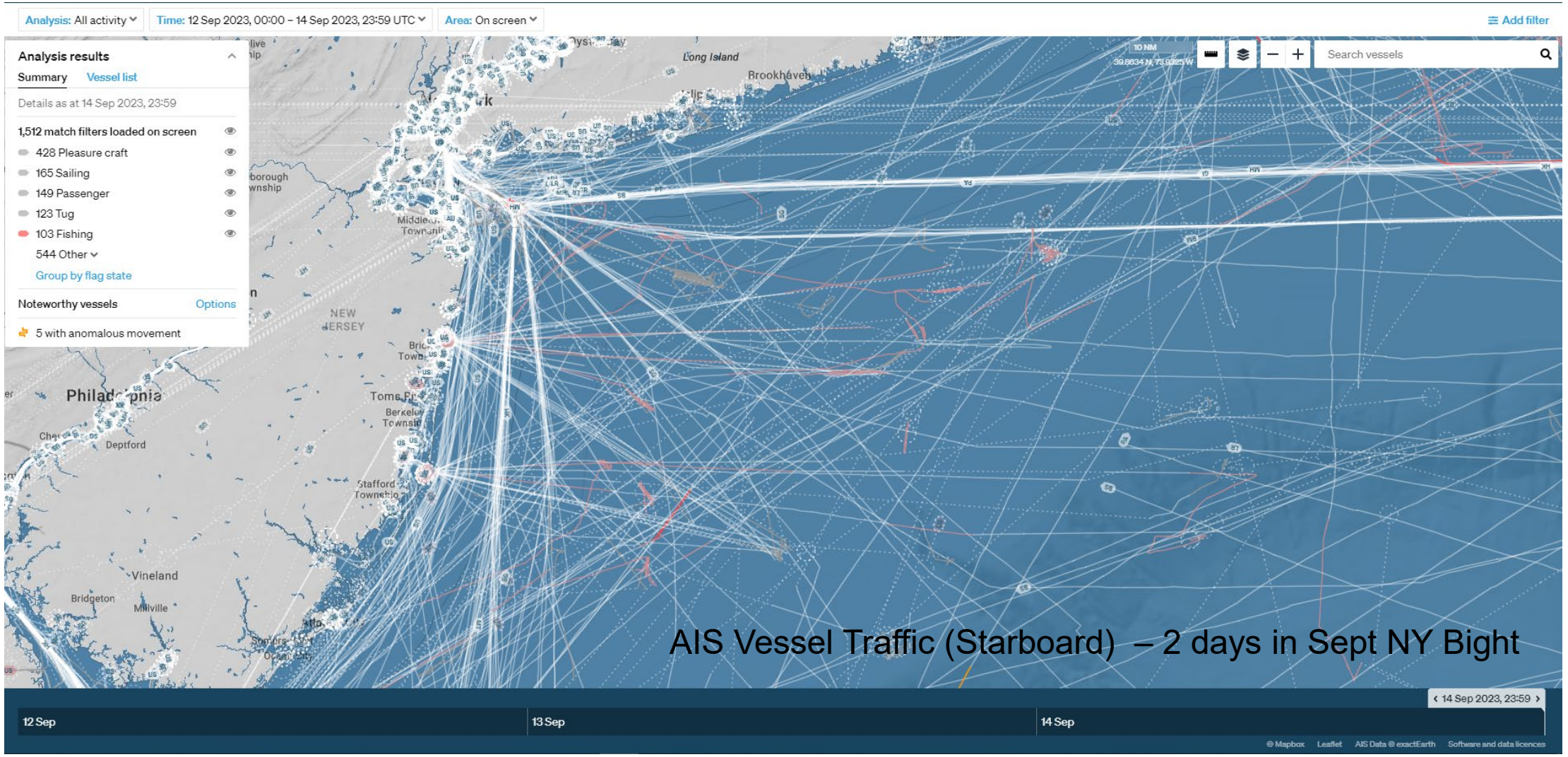
In last three decades, fault rates have been greatly reduced with deeper burial.



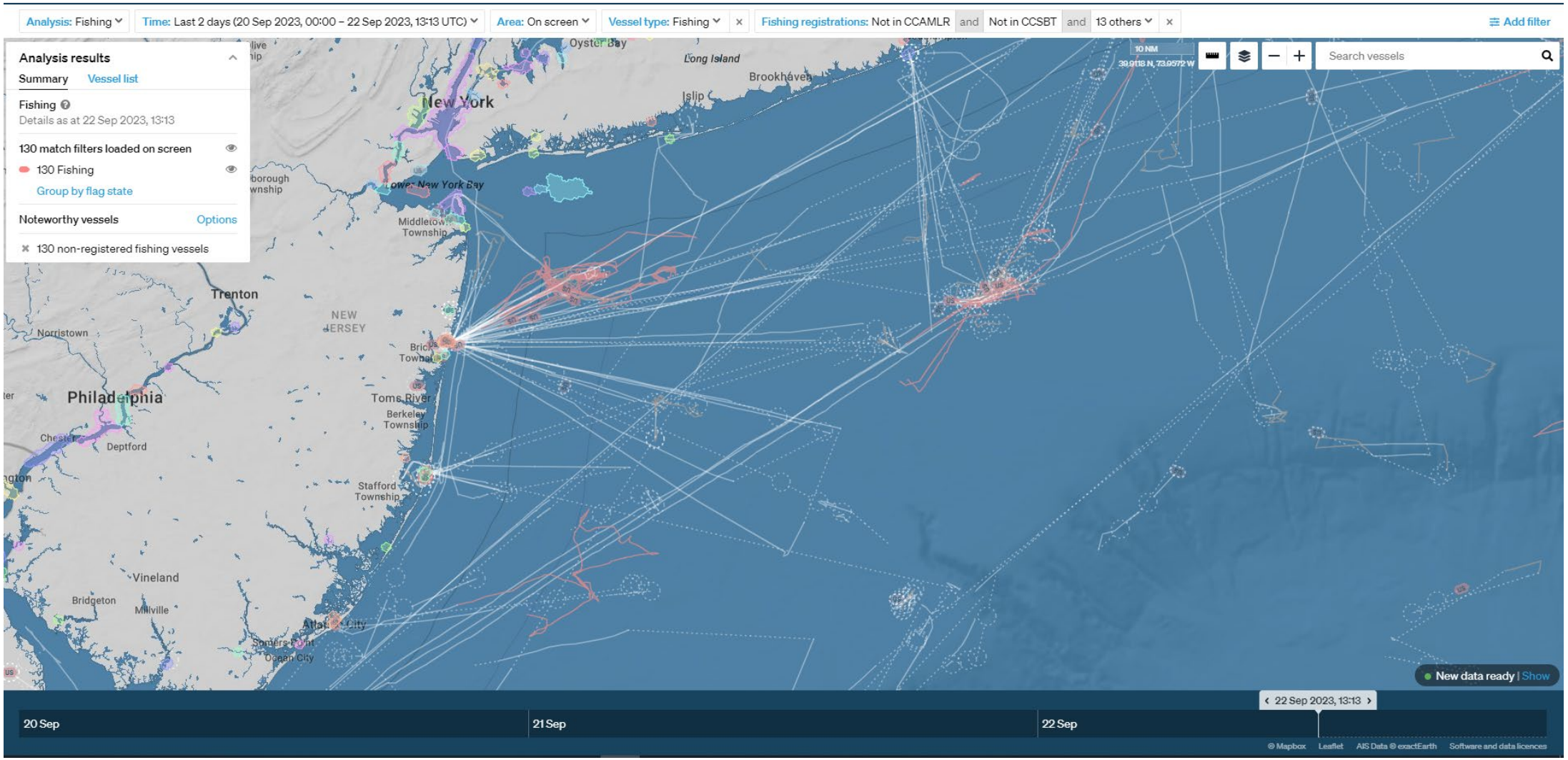


Suboptic 2019. M. Kordahi et al. New Orleans, LA, April 2019

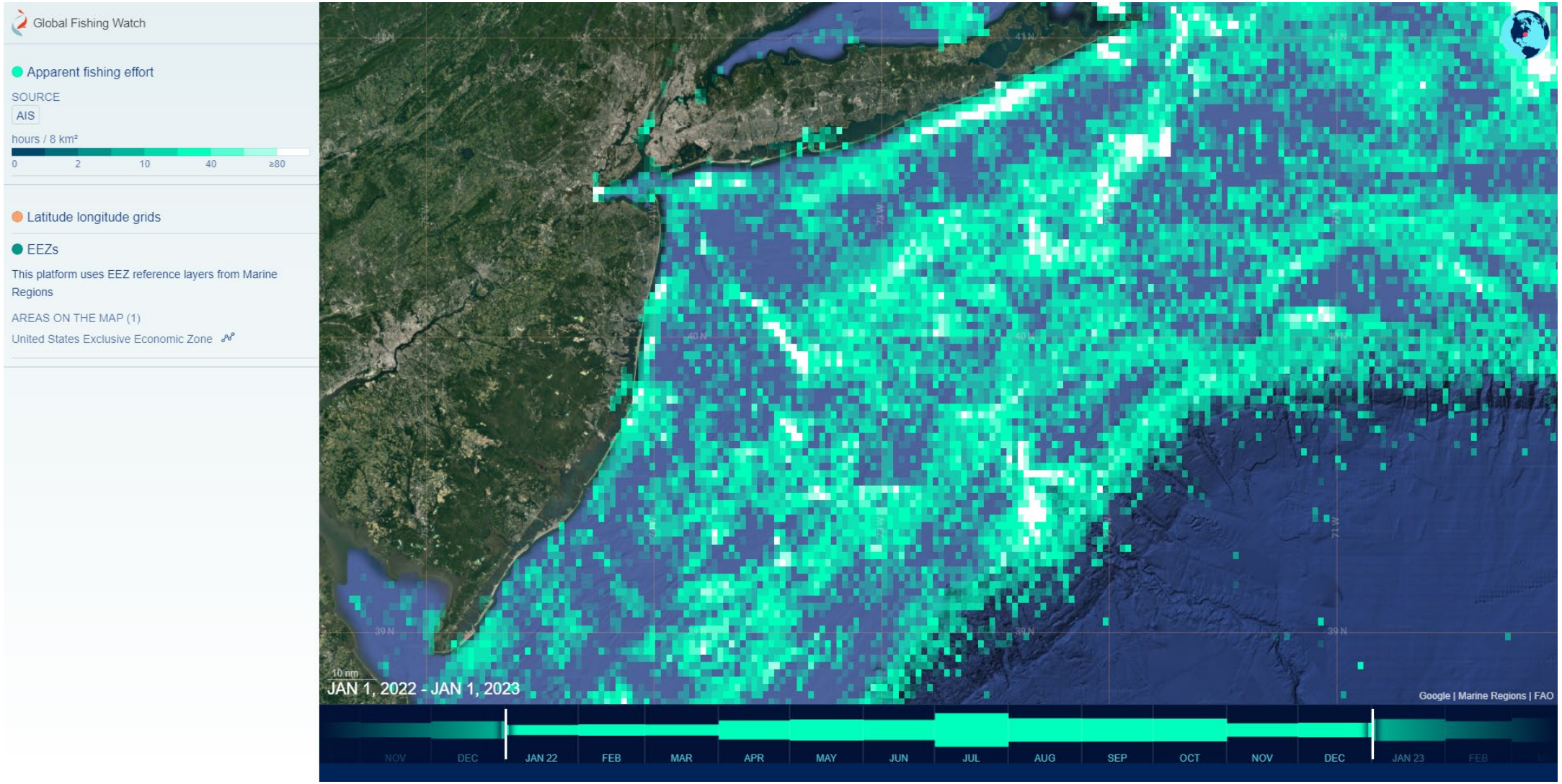
The NY Bight is also a heavily used transit area to major ports utilized by cargo ships, tankers, commercial and recreational fishing, and pleasure craft



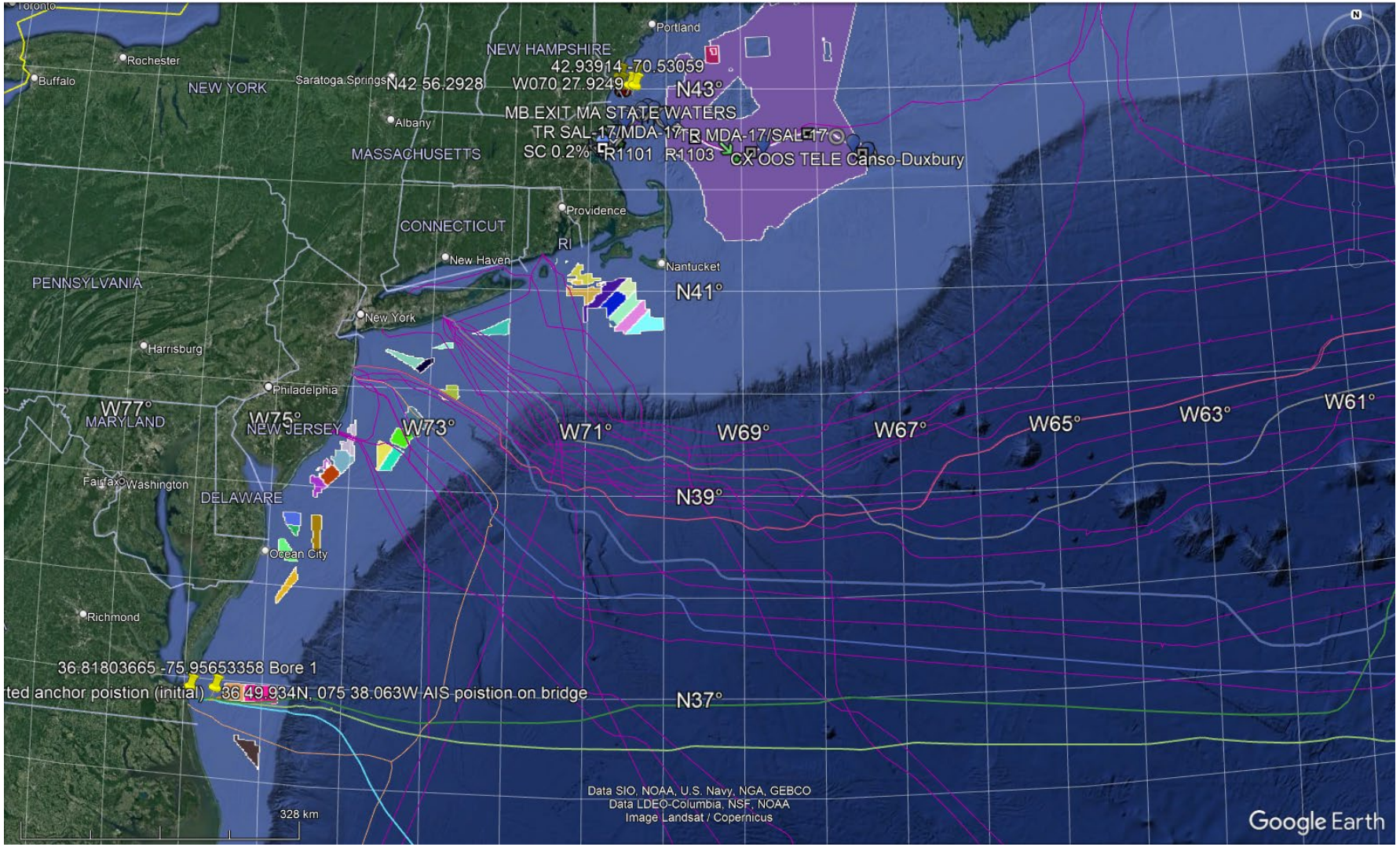
AIS Vessel Traffic (Starboard) – 2 Days in Sept NY Bight – Fishing Vessels



Global Fishing Watch – One year of Fishing Activity in the NY Bight



US East Coast - VA Beach and North – Telecom Cables and Wind Areas

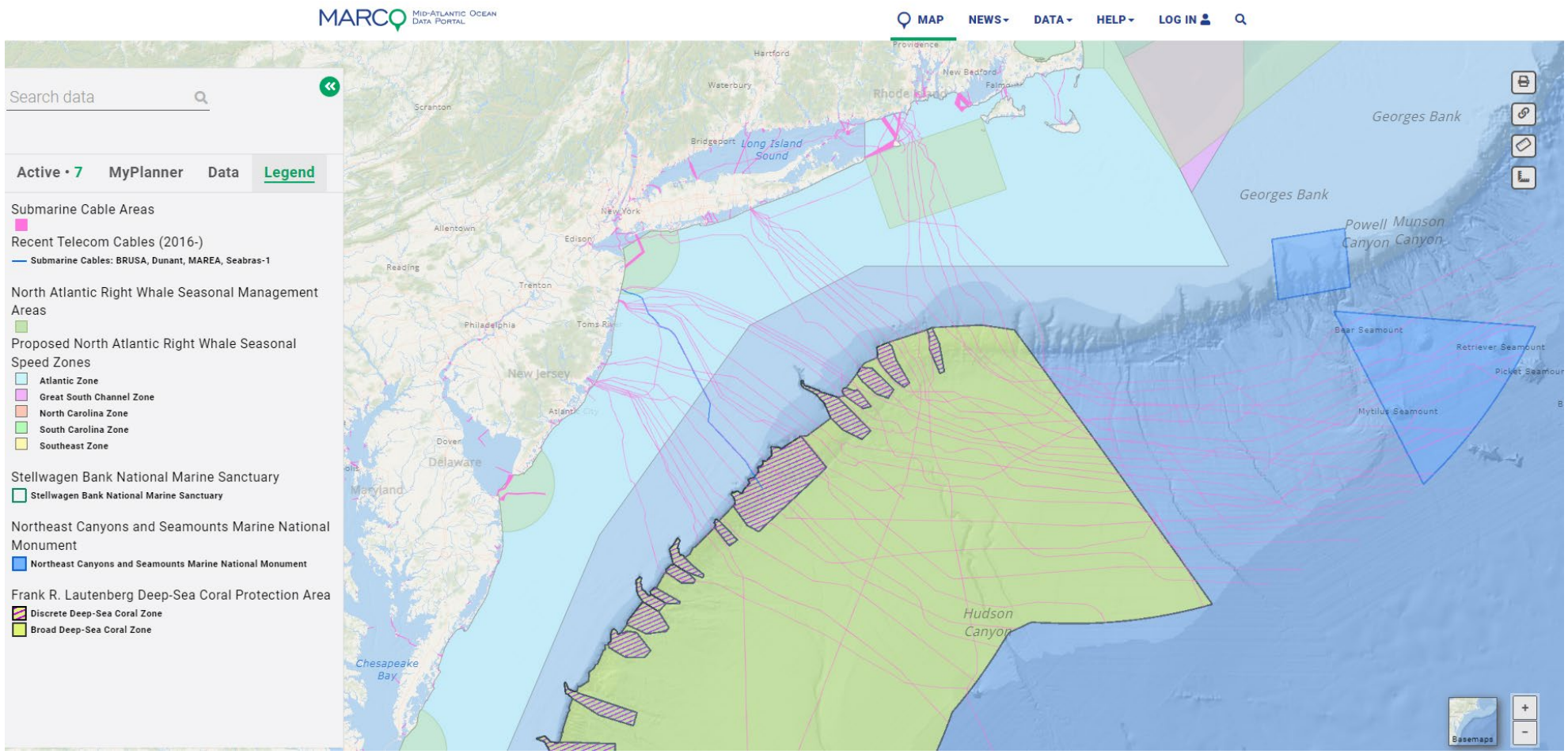


Discussion and coordination between telecom cable owners, route planners and wind area lease holders and wind installers are on-going to ensure wind siting areas and power cables are de conflicted with existing and future telecom cable routes.

The engineering of cable crossings are a major consideration so each cable can be repaired if needed in the future.

Environmental Considerations to Cable Route Planning and Installation

Cable route planners also work with US ACOE, NOAA, and US FWS, and States during the permitting and environmental assessment phase to ensure that we protect the marine eco system during survey, installation, and over the life of the cable.



Mid Atlantic Regional Council on the Ocean

A Forum for Ocean Planning in the Region

MACO Participation

State: Delaware, Maryland, New Jersey, New York, Virginia

Federal: Current federal participants include but are not limited to the Department of Commerce; the National Oceanic and Atmospheric Administration); the Department of the Interior through the US Geological Survey, Bureau of Ocean Energy Management, Fish and Wildlife Service, and National Parks Service; the Department of Agriculture through the USDA Natural Resources Conservation Service; the Department of Defense through the Joint Command, Navy, and/or Army Corps of Engineers; the Department of Homeland Security, US Coast Guard; the Environmental Protection Agency; the Department of Transportation Maritime Administration; and the Department of Energy.

Tribal: Shinnecock Indian Nation

Regional: The Mid-Atlantic Fishery Management Council

Steering Committee

Mike Snyder (Chair)

New York

Kevin Hassell

New Jersey

Kim Cole

Delaware

Wright Frank

Bureau of Ocean Energy Management

Roselle (Henn) Stern

US Army Corps of Engineers

Tricia Hooper

National Oceanic and Atmospheric Administration

Kelsey Leonard

Shinnecock Indian Nation

Jessica Coakley

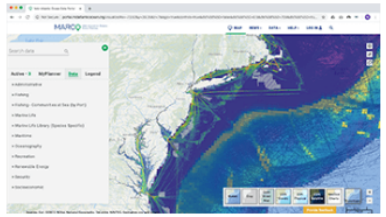
Mid-Atlantic Fishery Management Council

About MARCO

MARCO is the Mid-Atlantic Regional Council on the Ocean, formed in 2009 by a governors' agreement among New York, New Jersey, Delaware, Maryland, and Virginia.

MARCO Partnership Opportunities

MARCO's 2022 – 2024 Work Plan



Mid-Atlantic Ocean Data Portal

The Portal is an ocean planning resource center featuring the Marine Planner, an interactive mapping tool.

Check out the latest Portal News & Updates!

Mid-Atlantic Committee on the Ocean

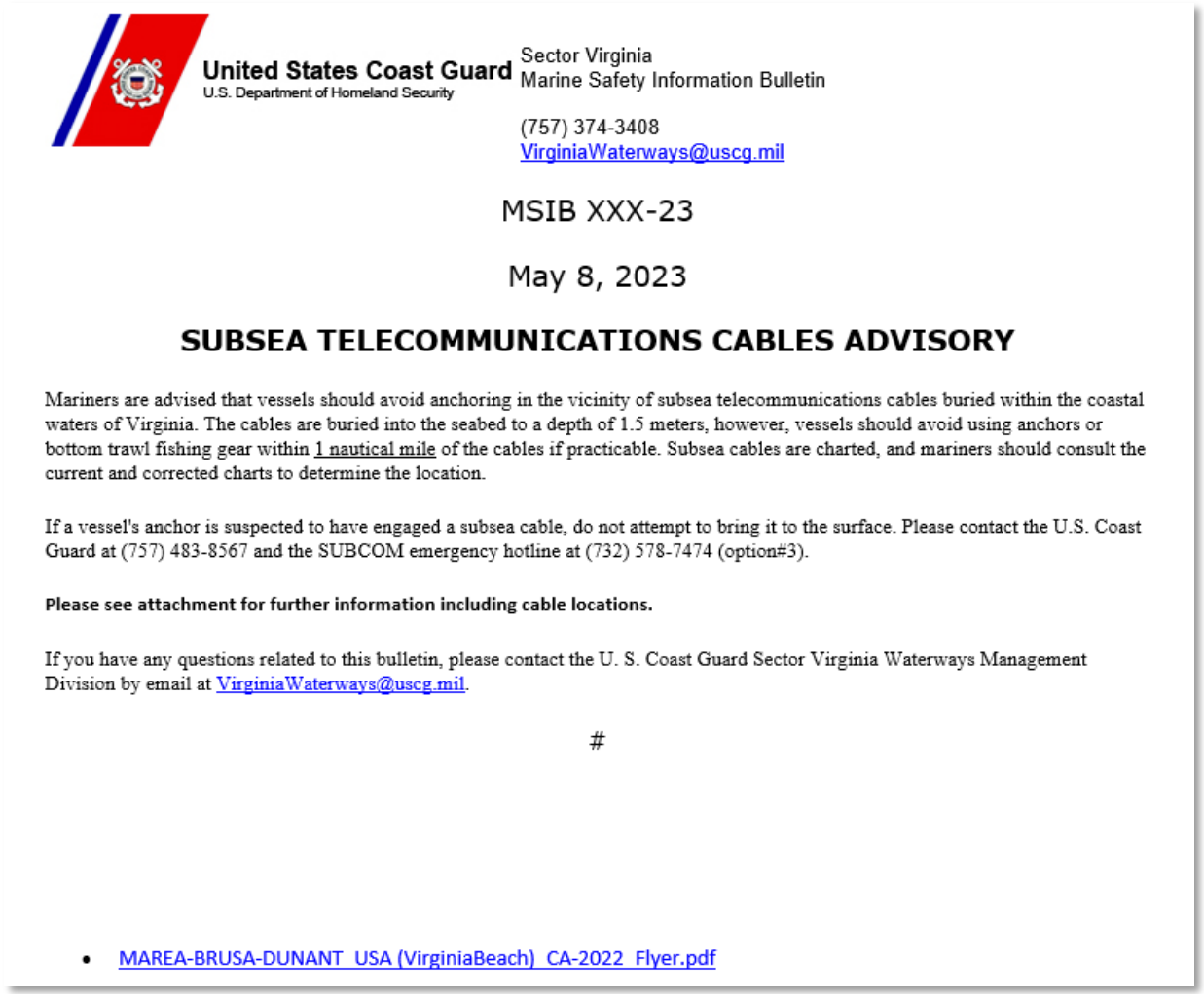
MACO is a committee established by MARCO to foster collaboration among states, federal agencies, the Mid-Atlantic Fishery Management Council, and federally recognized tribes, and to engage stakeholders.

MACO Updates

SUBCOM

Example of Support From the US Coast Guard

Sector VA to Protect Cables from Accidental Anchoring



United States Coast Guard
U.S. Department of Homeland Security

Sector Virginia
Marine Safety Information Bulletin

(757) 374-3408
VirginiaWaterways@uscg.mil

MSIB XXX-23

May 8, 2023

SUBSEA TELECOMMUNICATIONS CABLES ADVISORY

Mariners are advised that vessels should avoid anchoring in the vicinity of subsea telecommunications cables buried within the coastal waters of Virginia. The cables are buried into the seabed to a depth of 1.5 meters, however, vessels should avoid using anchors or bottom trawl fishing gear within 1 nautical mile of the cables if practicable. Subsea cables are charted, and mariners should consult the current and corrected charts to determine the location.

If a vessel's anchor is suspected to have engaged a subsea cable, do not attempt to bring it to the surface. Please contact the U.S. Coast Guard at (757) 483-8567 and the SUBCOM emergency hotline at (732) 578-7474 (option#3).

Please see attachment for further information including cable locations.

If you have any questions related to this bulletin, please contact the U. S. Coast Guard Sector Virginia Waterways Management Division by email at VirginiaWaterways@uscg.mil.

#

- MAREA-BRUSA-DUNANT_USA (VirginiaBeach)_CA-2022_Flyer.pdf

Working Together – Preventive Measures

- Charts, Notices to Mariners, and Cable Awareness Flyers
- The Subsea cable industry long ago recognized the importance of working with the fishing industry and other Marine communities for the protection of cables
  - **If fishermen and other mariners are informed about the importance and locations of cables, in many cases they will take measures to avoid damage to cables & their (fishing) gears.**
  - **An essential step in informing mariners is publication in official notices to mariners and nautical charts,** which are distributed by hydrographic and other authorities in many countries.
- Engaging with other Seabed users is necessary during all phases of the project
  - Route Planning, Permitting, Survey, Installation, Maintenance/Operations Phase - Cable Protection
  - Fishing and dredging risks are not new; but it's important to stay focus… **and essential to cooperate for everyone's interests**

Submarine Cable Protection

Given the economic and national-security importance of submarine cables, it's critical to protect them from physical damage.

Ship anchors and commercial fishing gear pose—by far—the most significant risks of damage to undersea cables.

An undersea cable repair can cost in excess of US $1 million and typically takes 2+ weeks to return the cable to service—or more, depending on permitting requirements, weather, and other factors.

Cable operators work directly with fishermen in many cases to minimize those risks. The most forward-thinking governments establish protection zones around undersea cables and impose strict penalties for damage.

- Fishing practices and patterns continue to be a **primary consideration** in undersea cable projects and design.
- **>90% of cable faults** (2010-2015) **are caused by external aggression**; of this percentage, ~75% are attributed to fishing or anchoring.
- It is therefore critical for governments, cable operators and other marine industries to coordinate to protect undersea cables and minimize communications and Internet outages.

Working together to mitigate risk of external aggression

- If your fishing gear, anchor or dredging gear catch a cable, **DO NOT TRY TO LIFT IT!**

- Contact the local Coast Guard immediately/ & the local submarine cable operator Hotline

Catch fish, not cables!

معدات صيد الأسماك متصلة بكبل ، فلا تحاول رفعه.
إذا كان مربط السفينة أو معدات نعرات أو

SUBCOM

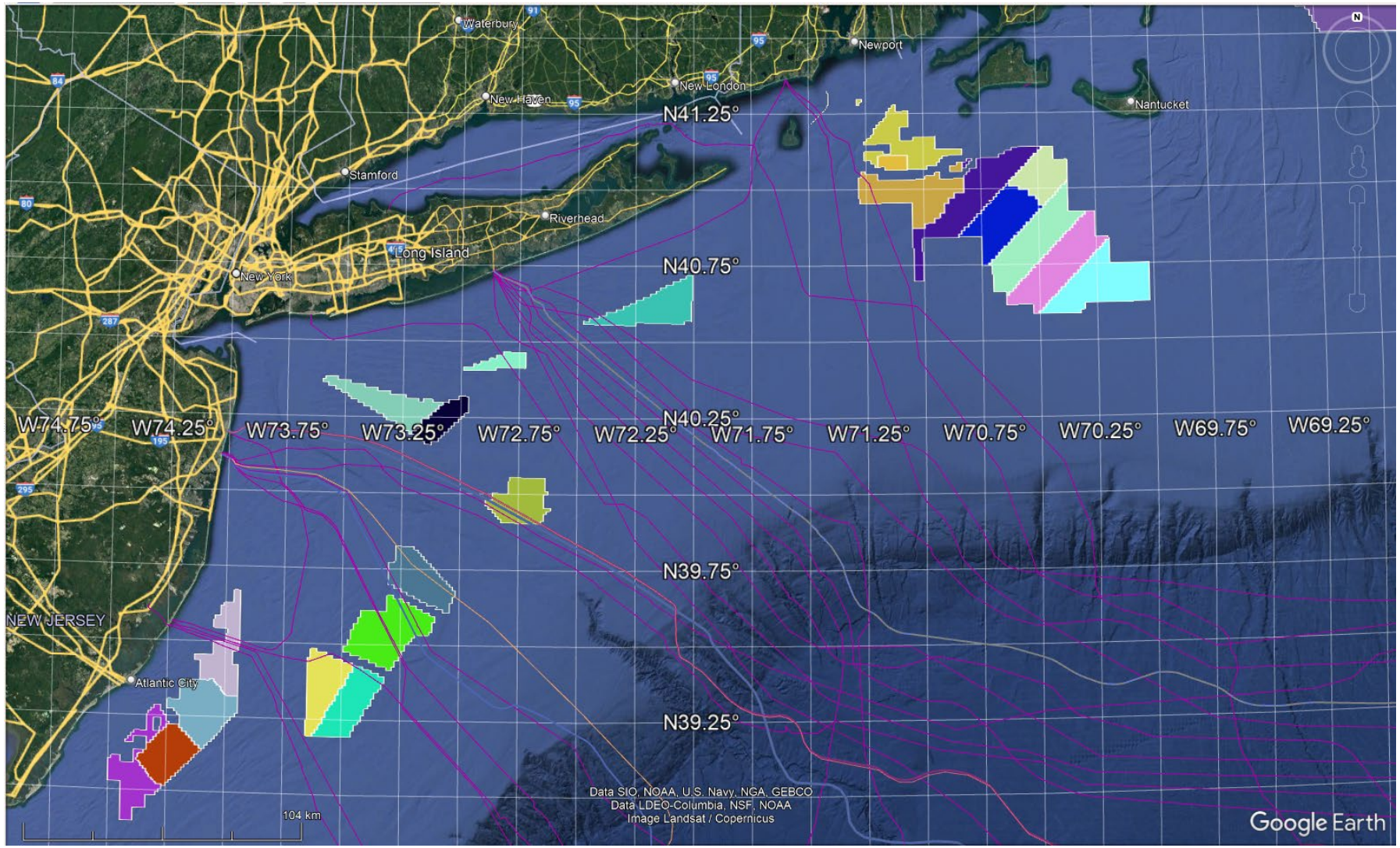
The Way Forward….

- Coordination and communication of marine activities among stakeholders and regulatory agencies. The MidAtlantic Ocean Planning Body is a good example combined with a data portal for marine spatial planning.
- Timely, accurate, and complete charting of cables and other infrastructure on nautical charts and available on ECDIS systems (eliminate ability to turn off cable layers on the bridge.)
- A training component in the maritime academies on anchoring near telecom and power cables and pipelines.
- Continued support from the US Coast Guard to warn vessels that are anchored to ready to anchor near submarine cables and pipelines. Guidance has been issued in VA Beach.

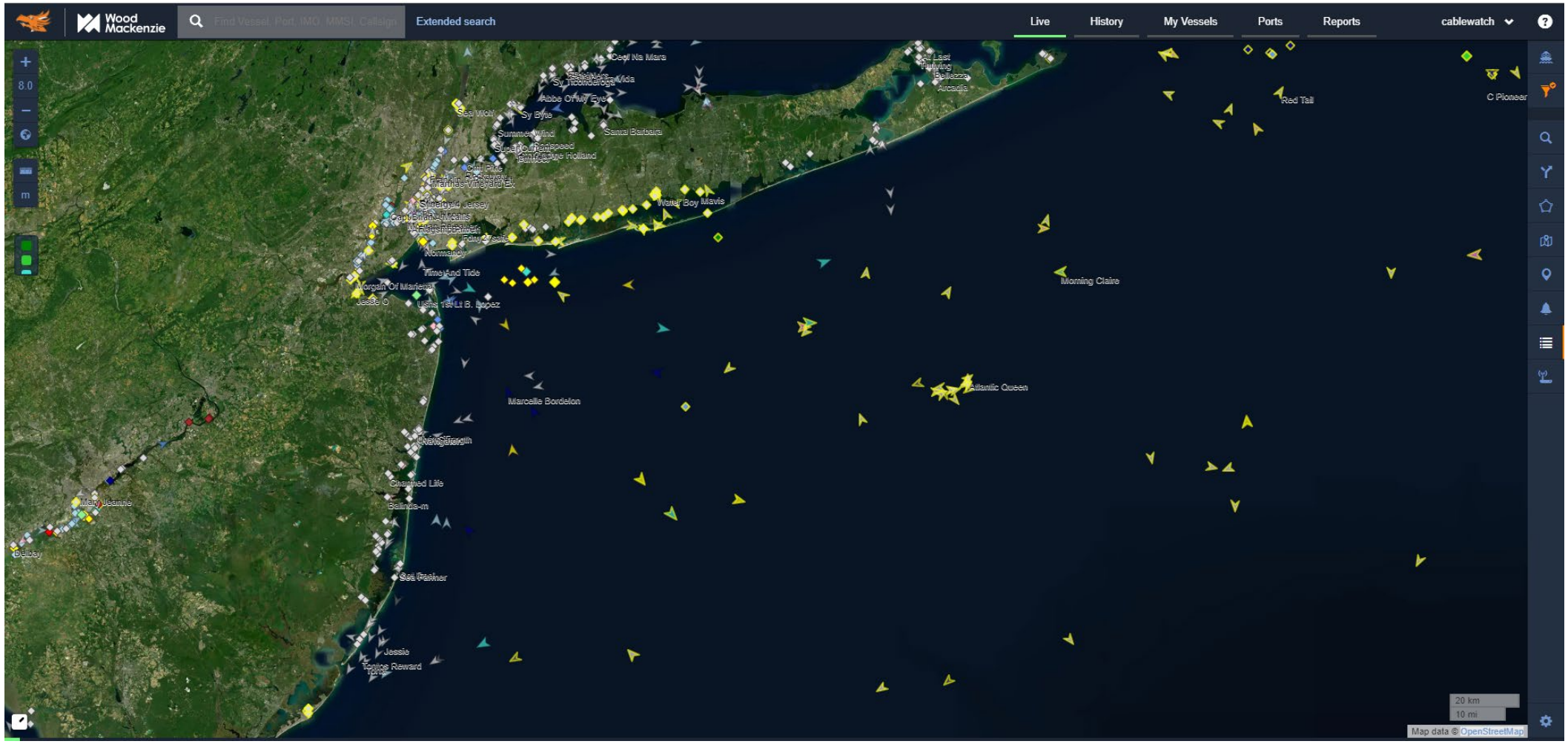

SUBCOM
Thank You, Any Questions?

Backup Slides

NY Bight Telecom Cables and Wind areas



NY Bight Terrestrial and Satellite AIS Vessel Traffic Sept 22, 2023



NY Bight Terrestrial AIS Vessel Traffic Sept 22, 2023 (S&P Maritime Portal)