

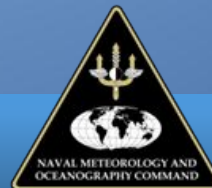
# Marine Spatial Data Infrastructure Working Group

United States of America (USA)  
National Report



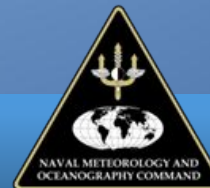
# POLICY AND GOVERNANCE

United States of America, MSDI



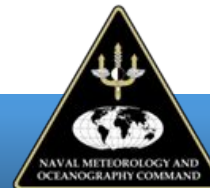
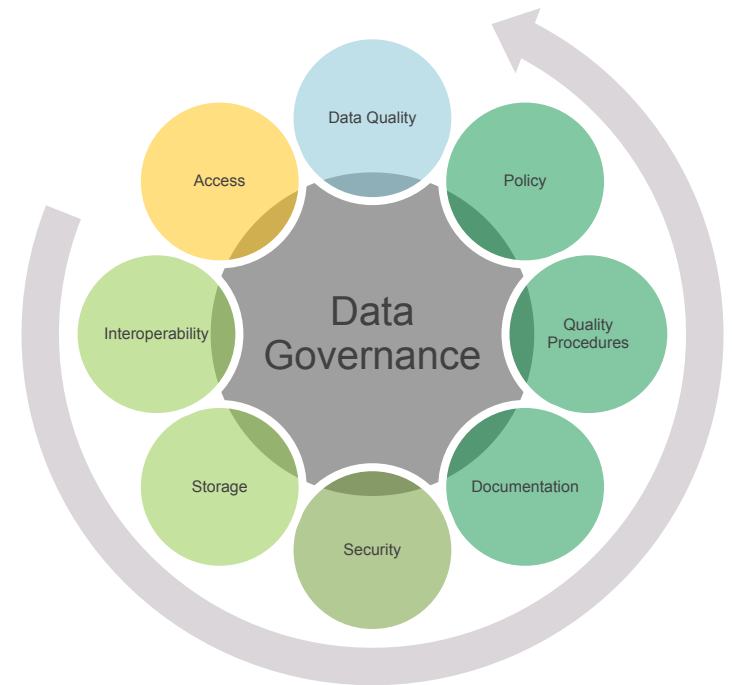
# US - International MSDI Participation

- IHO MSDIWG
- IHO Arctic Regional Hydrographic Commission (ARHC)
  - Arctic Regional MSDIWG (ARMSDIWG)
- IHO Meso American & Caribbean Sea Hydrographic Commission (MACHC)
  - MACHC MSDIWG (MMSDIWG)
- UN-GGIM Working Group on Marine Geospatial Information (WG-MGI)
- OGC Marine Domain Working Group (Marine DWG)
  
- IHO-OGC Marine Spatial Data Infrastructure Concept Development Study (MSDI-CDS)



# Data Governance

- Objective
  - Facilitate the handling, accessibility, and quality of data.
- General Data Governance Components
  - Data Quality
  - Policy
  - Quality Procedures
  - Documentation
  - Security
  - Storage
  - Interoperability
  - Access



# Policy

## National Policies / Legislation

- **Presidential Executive Order 13840** – Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States.
- **Geospatial Data Act of 2018 (GDA)**
- **Foundations for Evidence-Based Policymaking Act of 2017**
  - Title II – Open Government Data Act

H. R. 302

*One Hundred Fifteenth Congress*  
*of the*  
*United States of America*

AT THE SECOND SESSION  
Begun and held at the City of Washington on Wednesday,  
the third day of January, two thousand and eighteen

*An Act*

To provide protections for certain sports medicine professionals, to reauthorize Federal aviation programs, to improve aircraft safety certification processes, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

As it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,



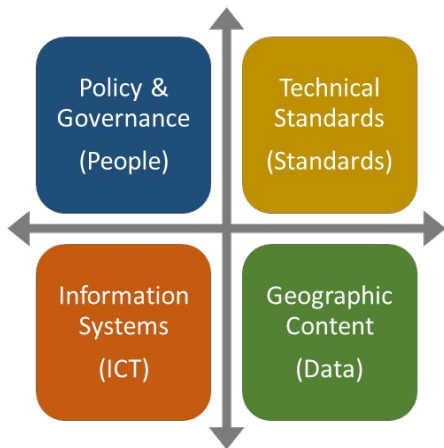


## NOAA Office of Coast Survey MARINE SPATIAL DATA INFRASTRUCTURE (MSDI) STRATEGY

**Marine Spatial Data Infrastructure (MSDI)** - From shipping to energy exploration, activities at sea have increased, just as they do on land. In order to ensure sustainable use of the oceans, prioritizing marine activities is essential and relies on a vast amount of Geospatial Information. MSDI is a tool that enables easier and more convenient access to various Marine Spatial Data. It is comprised of data, technical standards, information systems, policy and people. Coast Survey plays a pivotal role in the development of the United State's MSDI.

### Why Marine Spatial Data Infrastructure?

- Blue Economy** - Support sustainable use of ocean resources through data access.
- Open Data** - Compliance with U.S. Federal Open Data Policies and the G8 Open Data Charter, among others.
- Efficiency** - Reduce manual data creation and enable machine to machine analytics to improve timeliness of data delivery.
- Decision Making** - Unlock the power of Geospatial Information that exist within Navigational Charts in order to better inform decision makers.



### Coast Survey's MSDI Strategy

- Develop core datasets from the Coast Survey Nautical Information System.
- Deliver core datasets via web-enabled services.
- Collaborate with Federal, State, Local, and Private partners on data dissemination.
- Develop internal Data Policy & Governance to ensure the integrity of core datasets.
- Engage with International partners through the International Hydrographic Organization (IHO) MSDI Working Group (MSDIWG).

### What constitutes an MSDI ?

**Policy & Governance (People)** - Builds a linkage to regional, national, or organizational strategy for sharing and exchanging information. Requires willingness to cooperate between various organizations that create, share, and use information to implement policy.

**Technical Standards** - International Standards for geographic information exist or are being developed and , in many areas, sector-based standards are being put in place that depend on these over-arching standards.

**Information Systems** - Technical Infrastructure (both hardware and software) enable the delivery of data and services to allow the viewing, sharing, transformation and downloading of data.

**Geographic Content** - Arguably the most important component of MSDI. Data can be broken into two main categories: **Reference Information** including any geographic feature that is used as a location reference for other information (often referred to as the data that "most people use most of the time") and **Application Information** known as the outer layer information which is generally application or business specific.

### OUR WORLD OCEAN provides

- THE AIR WE BREATHE** - **>50%** The ocean produces over half of the world's oxygen and stores 50 times more carbon dioxide than our atmosphere.
- CLIMATE REGULATION** - **70%** Covering 70% of the Earth's surface, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns.
- TRANSPORTATION** - **76%** Percent of all U.S. trade involving some form of marine transportation.
- RECREATION** - From fishing to boating to kayaking and whale watching, the ocean provides us with so many unique activities.
- ECONOMY** - **\$282 billion** Amount the U.S. ocean economy produces in goods and services. Ocean-dependent businesses employ almost 3 million people.
- FOOD** - The ocean provides much more than just seafood. Ingredients from the sea are found in surprising foods such as peanut butter and soy milk.
- MEDICINE** - Many medicinal products come from the ocean, including ingredients that help fight cancer, arthritis, Alzheimer's disease, and heart disease.

Office of Coast Survey  
NAUTICALCHARTS.NOAA.GOV



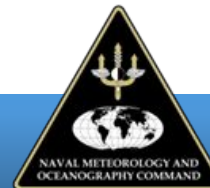
# INFORMATION SYSTEMS

United States of America, MSDI



# Information Systems

- Charting Information / Production Databases
  - National Bathymetric Source (NBS)
  - Nautical Information System (NIS)
- Server Infrastructure
  - GIS Servers (Internal & External)
  - Database Servers (Internal & External)
  - Physical vs. Virtual....
- Software
  - Esri
  - Caris
  - Seven Cs
  - Etc.





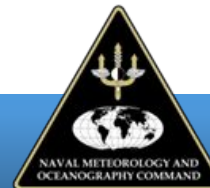
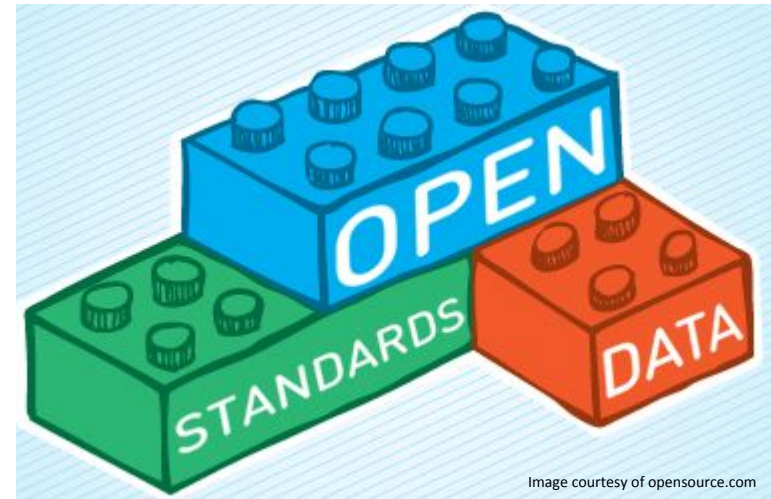
# TECHNICAL STANDARDS

United States of America, MSDI



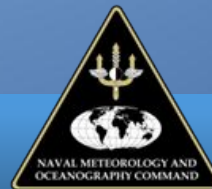
# Technical Standards

- *IHO S-100 Standard*
- *Open Geospatial Consortium (OGC) Standards*
- *Federal Geographic Data Committee (FGDC) Metadata Standards*



# GEOGRAPHIC CONTENT

United States of America, MSDI



# NGA GEOINT Services

**NGA**  
GEOINT  
SERVICES

**HUMANITARIAN ASSISTANCE  
DISASTER RESPONSE  
(HADR)**

(HADR)

**WORLD MAGNETIC MODEL 2020**

<https://nga.maps.arcgis.com>

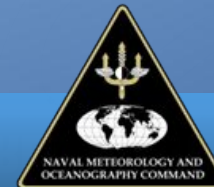
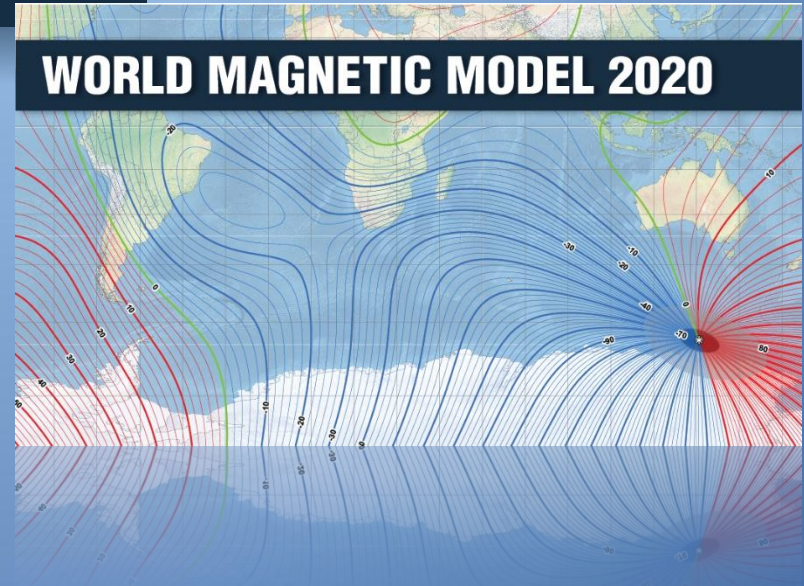


**NGA**  
NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

**GEOINT Services**  
is NGA's effort to deliver commonly used geospatial tools and NSG content to users. It will streamline the backend technology that allows NGA to contribute to the following:

- HURRICANE SUPPORT**  
NGA Hurricane Support
- Antarctica (REMA)**  
Reference Elevation Model Antarctica (REMA)
- ArcticDEM**  
ArcticDEM
- WILDLIFE TRAFFICKING**  
Combating Wildlife Trafficking (Community of)

Special Achievement in GIS  
2015 Award Winner



# NGA GEOINT Services - Digital Elevation Models (DEMs)


### Reference Elevation Model Antarctica (REMA)

SUMMARY REMA DOWNLOAD TOOL BY NGA DEM REVIEWER BY ESRI HILLSHADE VIEWER REFERENCE & RESOURCE MATERIAL

The Reference Elevation Model of Antarctica (REMA) is a high resolution, time-stamped Digital Surface Model (DSM) of Antarctica at 8-meter spatial resolution.

**Polar Geospatial Center**  
University of Minnesota

Purpose



The Reference Elevation Model of Antarctica (REMA) provides the first high-resolution (8-meter) terrain model, any past or future point activities, such as image and ice flow modeling. A powerful new resource for field Digital Elevation Models (DEM) satellite imagery, including data from GeoEye-1, acquired between seasons mostly December and January. Data is derived from Cryosat-2 and Sentinel-1A, and includes relative uncertainties.

### ArcticDEM

SUMMARY ARCTIC DIGITAL ELEVATION DOWNLOAD TOOL DATA MAP PRODUCTS REFERENCE & RESOURCE MATERIAL

#### THE ARCTIC

**Release 7**

ArcticDEM Release 7 completes the outstanding geographic regions of the ArcticDEM production domain.

The National Geospatial Intelligence Agency (NGA) and the National Science Foundation (NSF) partnered with the University of Minnesota and other members of the academic research community, private sector and international partners to create this first-ever publicly available, high-resolution, satellite-based elevation data map of Alaska.

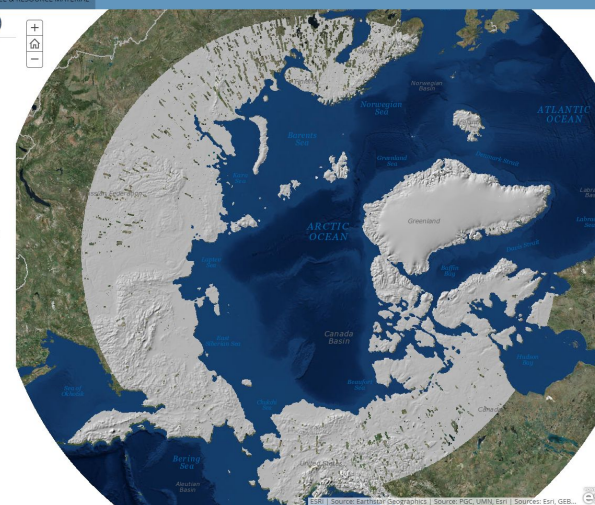
The 3-D digital elevation models, or DEMs, are the first to come from the ArcticDEM project, which was created after a January 2015 executive order calling for enhanced coordination of national efforts in the Arctic.

This site hosts Webmaps, map viewers, other DEM exploratory tools, nautical charts, sailing directions and infographics, and a downloadable Pan-Arctic map with mission-specific data layers.

Upon completion, ArcticDEM will encompass all land area north of 60° north latitude. In addition, coverage will include all territory of Greenland, the State of Alaska in entirety, and the Kamchatka Peninsula of the Russian Federation. The project commences with Alaska and will continue to other regions in the Arctic on a continual basis.

This site supports the past U.S. Chair of the Arctic Council and the U.S. Presidential Executive Order on Enhancing Coordination of National Efforts in the Arctic.

RELEASE 7 [Final]



Source: POSC, UMN, ESRI | Sponsors: Esri, GEBCO, Esri



# National SDI



DATA TOPICS ▾ IMPACT APPLICATIONS DEVELOPERS CONTACT

## The home of the U.S. Government's open data

Here you will find data, tools, and resources to conduct research, develop web and mobile applications, design data visualizations, and [more](#).

GET STARTED  
SEARCH OVER 245,897 DATASETS

bathymetry

### BROWSE TOPICS



Agriculture



Climate



Consumer



Ecosystems



Education



BROWSE TOPICS



### GeoPlatform Data.gov Search

Search Data.gov

Enter keywords and press 'Enter'  
Surround phrases with quotations (!)

Search by geography



SELECTED FACETS CLEAR ALL

Dataset Type "geospatial" x

ORGANIZATIONS show all ^

National Oceanic and Atmospheric Administration, 75140  
Department of Commerce

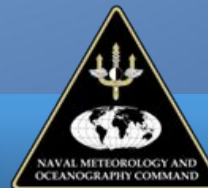
155884 results 25 per page

Search Results Popular

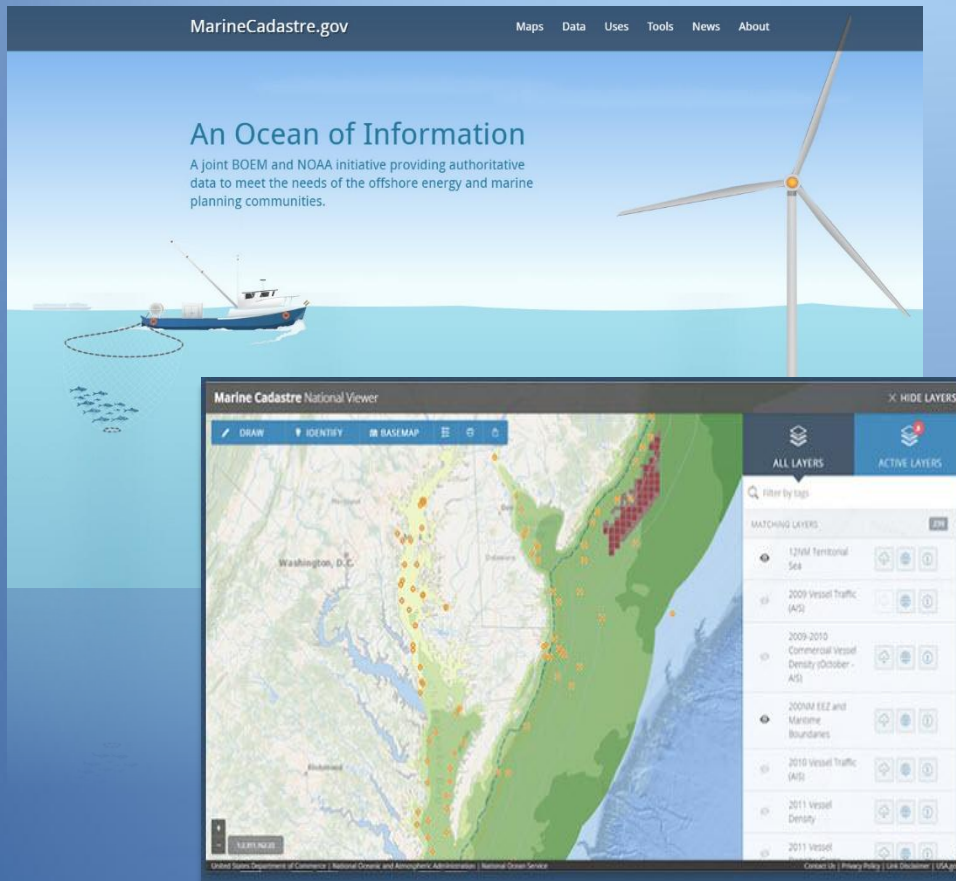
**Pittsburgh Wards Map**  
County Allegheny County / City of Pittsburgh / Western PA Regional Data Center  
Allows users to look up City of Pittsburgh Wards

**USGS 1 meter Digital Elevation Models (DEMs) - USGS National Map 3DEP Downloadable Data Collection**  
Federal U.S. Geological Survey, Department of the Interior  
This is a tiled collection of the 3D Elevation Program (3DEP) and is one meter resolution. The 3DEP data holdings serve as the elevation layer of The National Map, and provide foundational elevation information

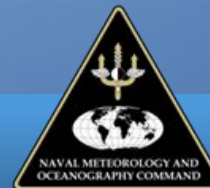
**NOAA U.S. Hourly Precipitation Data**  
Federal National Oceanic and Atmospheric Administration, Department of Commerce  
Hourly Precipitation Data (HPD) is digital data set DSI-3240, archived at the National Climatic Data Center (NCDC). The primary source of data for this file is approximately 5,500 US National Weather



# Marine Cadastre



- MarineCadastre.gov provides direct access to authoritative and trusted datasets.
  - Provides data , tools, and technical support for US Ocean Planning
  - 27+ data providers contributing over 280 data layers
  - Downloadable and Service Enabled
  - National Data Viewer

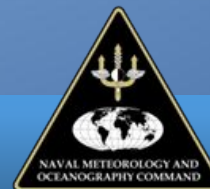


# US Regional Ocean Data Catalogs/Portals

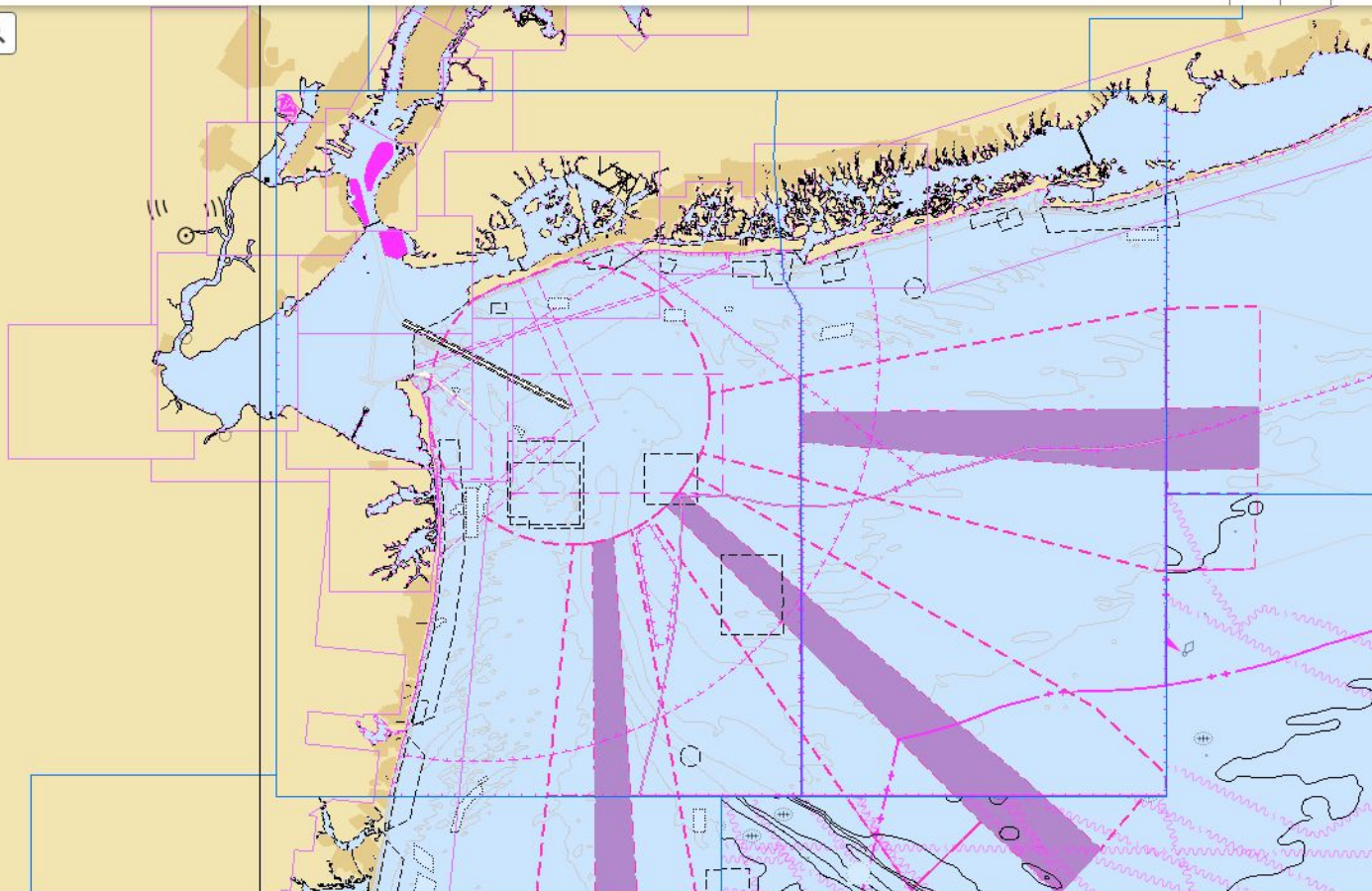
<http://www.northeastoceandata.org/>

<http://portal.midatlanticocean.org>

<http://portal.westcoastocceans.org/>

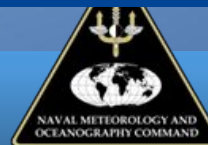


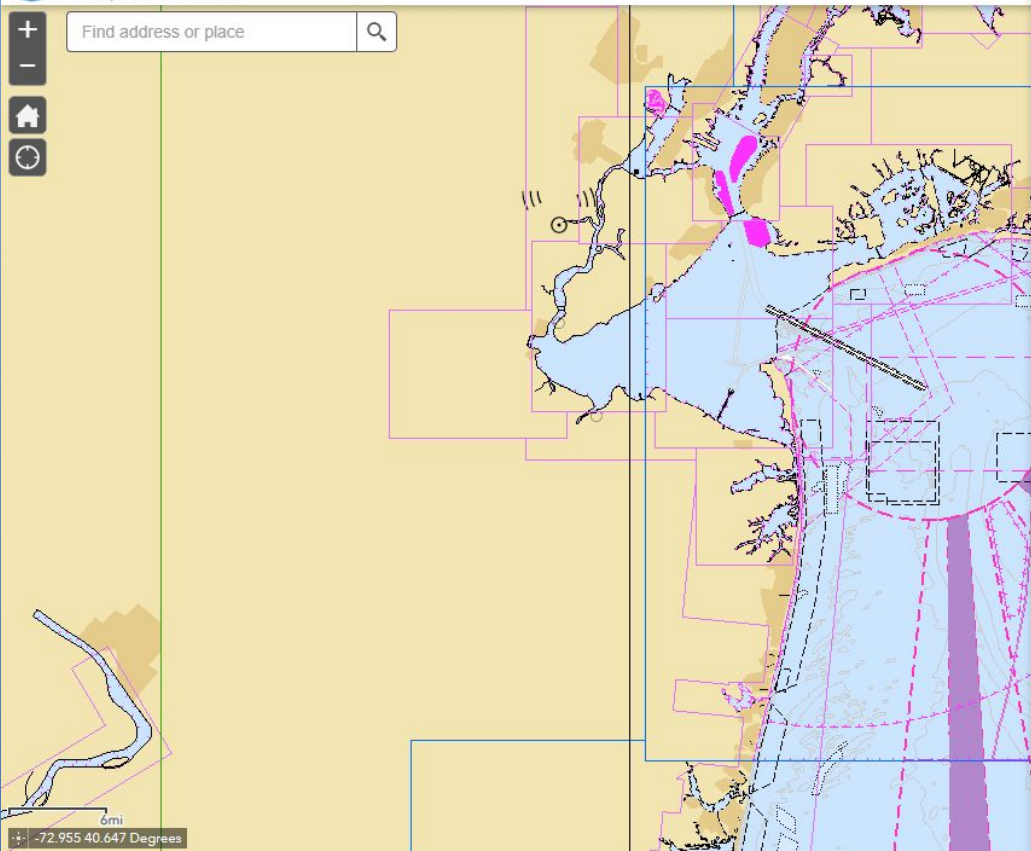




6mi

40.610 Degrees





### Geoprocessing Tools

- Extract Berthing +
- Extract Harbour +
- Extract Approach -

Layers to Clip\*

- Select All
- AidsToNavigationPVApproach\_Beacon\_Cardinal\_point
- AidsToNavigationPVApproach\_Beacon\_Isolated\_Danger\_point
- AidsToNavigationPVApproach\_Beacon\_Lateral\_point
- AidsToNavigationPVApproach\_Beacon\_Safe\_Water\_point
- AidsToNavigationPVApproach\_Beacon\_Special\_Purpose\_General\_point
- AidsToNavigationPVApproach\_Buoy\_Cardinal\_point
- AidsToNavigationPVApproach\_Buoy\_Isolated\_Danger\_point
- AidsToNavigationPVApproach\_Buoy\_Lateral\_point
- AidsToNavigationPVApproach\_Buoy\_Safe\_Water\_point
- AidsToNavigationPVApproach\_Buoy\_Special\_Purpose\_General\_point
- AidsToNavigationPVApproach\_Daymark\_point
- AidsToNavigationPVApproach\_Fog\_Signal\_point
- AidsToNavigationPVApproach\_Light\_point
- AidsToNavigationPVApproach\_Light\_Float\_point
- AidsToNavigationPVApproach\_Radio\_Station\_point
- AidsToNavigationPVApproach\_Retro\_Reflector\_point
- AidsToNavigationPVApproach\_Radar\_Transponder\_Beacon\_point
- AidsToNavigationPVApproach\_Topmark\_point
- CoastlinePVApproach\_Shoreline\_Construction\_point
- CoastlineLVApproach\_Coastline\_line
- CoastlineLVApproach\_Shoreline\_Construction\_line
- CoastlineLVApproach\_Shoreline\_Construction\_area
- CulturalFeaturesPVApproach\_Airport\_Airfield\_point

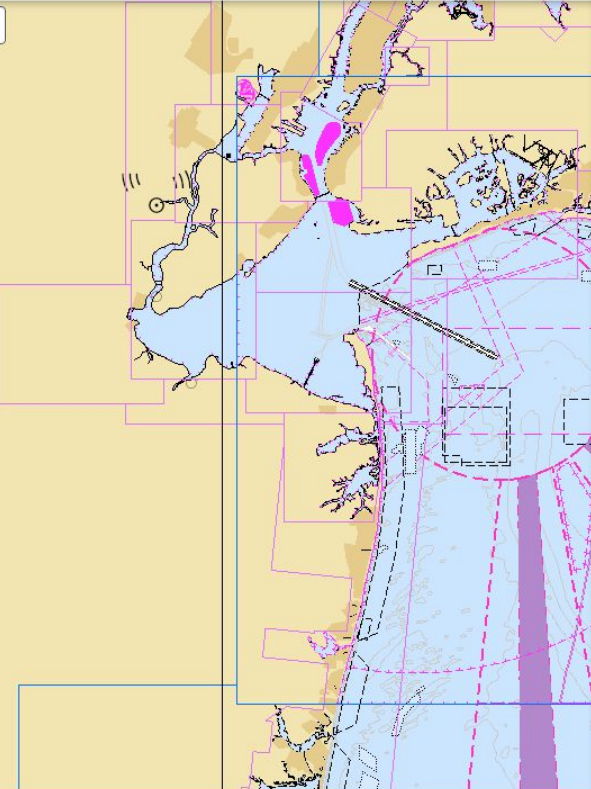
- Extract Coastal +
- Extract General +
- Extract Overview +





Find address or place

Map navigation controls: Home, Refresh, Zoom In (+), Zoom Out (-)



0mi  
-72.954 40.630 Degrees

### Geoprocessing Tools

- Extract Berthing
- Extract Harbour
- Extract Approach
  - TracksAndRoutes\Approach\_Recommended\_Route\_Centerline\_line
  - TracksAndRoutes\Approach\_Recommended\_Track\_line
  - TracksAndRoutes\Approach\_Traffic\_Separation\_Line
  - TracksAndRoutes\Approach\_Traffic\_Separation\_Schema\_Boundary\_line
  - TracksAndRoutes\Approach\_Deep\_Water\_Route\_Part\_area
  - TracksAndRoutes\Approach\_Fairway\_area
  - TracksAndRoutes\Approach\_Ferry\_Route\_area
  - TracksAndRoutes\Approach\_Inshore\_Traffic\_Zone\_area
  - TracksAndRoutes\Approach\_Precautionary\_Area
  - TracksAndRoutes\Approach\_Recommended\_Traffic\_Lane\_Part\_area
  - TracksAndRoutes\Approach\_Recommended\_Track\_area
  - TracksAndRoutes\Approach\_Traffic\_Separation\_Zone\_area
  - TracksAndRoutes\Approach\_Traffic\_Separation\_Schema\_Lane\_Part\_area
  - TracksAndRoutes\Approach\_Two\_Way\_Route\_Part\_area

Area of Interest\*

Feature Format\*

- Shapefile - SHP - .shp
- File Geodatabase - GDB - .gdb
- Shapefile - SHP - .shp**
- Autodesk AutoCAD - DXF\_R2007 - .dxf
- Autodesk AutoCAD - DWG\_R2007 - .dwg
- Bentley Microstation Design (V8) - DGN\_V8 - .dgn
- Extract General

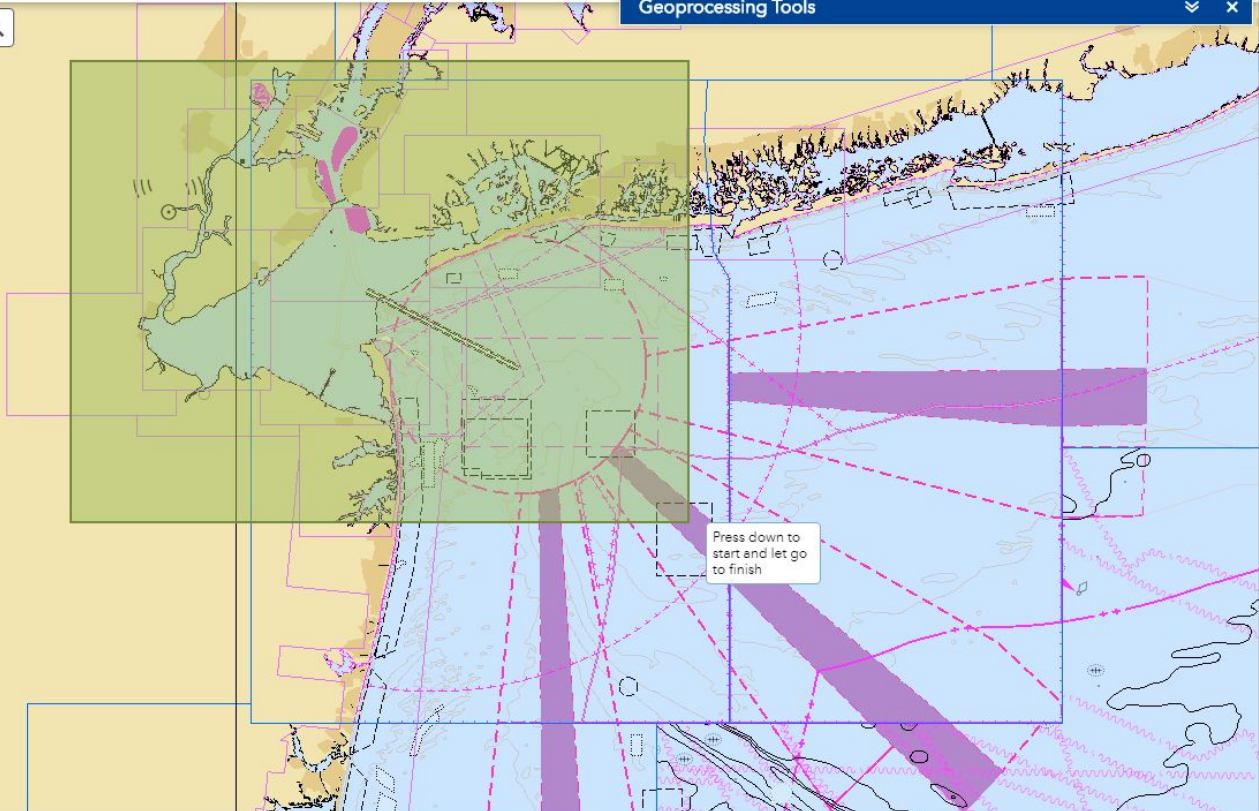
Extract Overview



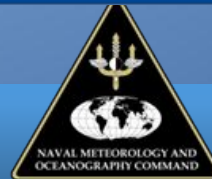


Geoprocessing Tools

Find address or place



-74.364 40.734 Degrees






Catalog X

Navigation: Favorites > Downloads > extractedData\_approach > zipfolder

Name	Type	Date	Size
Approach_Beacon_Lateral_point.shp	Shapefile	2/21/2020 4:47 PM	1 KB
Approach_Buoy_Cardinal_point.shp	Shapefile	2/21/2020 4:47 PM	1 KB
Approach_Buoy_Isolated_Danger_po	Shapefile	2/21/2020 4:47 PM	1 KB
Approach_Coastline_line.shp	Shapefile	2/21/2020 4:47 PM	336 KB
Approach_Daymark_point.shp	Shapefile	2/21/2020 4:47 PM	1 KB
Approach_Shoreline_Construction_a	Shapefile	2/21/2020 4:47 PM	1 KB
Approach_Shoreline_Construction_li	Shapefile	2/21/2020 4:47 PM	89 KB

Metadata | Geography | Table



Catalog

Project Portal Favorites

★ Add Item

- NOAA Chart Tile Service on tileservice.charts.noaa.gov.wmts
- Working
- Downloads
  - CARIS LOTS 4.1.1
    - extractedData\_approach
      - zipfolder
        - Approach\_Beacon\_Lateral\_point.shp
        - Approach\_Buoy\_Cardinal\_point.shp
        - Approach\_Buoy\_Isolated\_Danger\_point.shp
        - Approach\_Coastline\_line.shp
        - Approach\_Daymark\_point.shp
        - Approach\_Shoreline\_Construction\_area.shp
        - Approach\_Shoreline\_Construction\_line.shp



Manage Untitled - Catalog

Project Catalog Insert Analysis View Imagery Share Folders

Clipboard Organize Create Metadata

Contents

- Project
  - Maps
  - Toolboxes
  - Databases
  - Styles
  - Folders
  - Locators
  - Portal
    - My Content
    - Groups
    - All Portal
    - Living Atlas
  - Favorites
    - NOAA Chart Tile Service on tileservice.c
    - Working
    - Downloads
      - CARIS LOTS 4.1.1
      - extractedData\_approach
        - zipfolder

Catalog X Map

Navigation: Favorites > Downloads > extractedData\_approach > zipfolder

Name	Type	Date	Size
Approach_Beacon_Lateral_point.shp	Shapefile	2/21/2020 4:47 PM	1 KB
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Approach_Buoy_Isolated_Danger_po	Shapefile	2/21/2020 4:47 PM	1 KB
Approach_Coastline_line.shp	Shapefile	2/21/2020 4:47 PM	336 KB
Approach_Daymark_point.shp	Shapefile	2/21/2020 4:47 PM	1 KB
Approach_Shoreline_Construction_a	Shapefile	2/21/2020 4:47 PM	1 KB
Approach_Shoreline_Construction_li	Shapefile	2/21/2020 4:47 PM	89 KB



