



UNITED STATES OF AMERICA

National Report

**United States-Canada
Hydrographic Commission (USCHC)
Nova Scotia, Canada
May 16th, 2016**

1. Hydrographic Office/Service

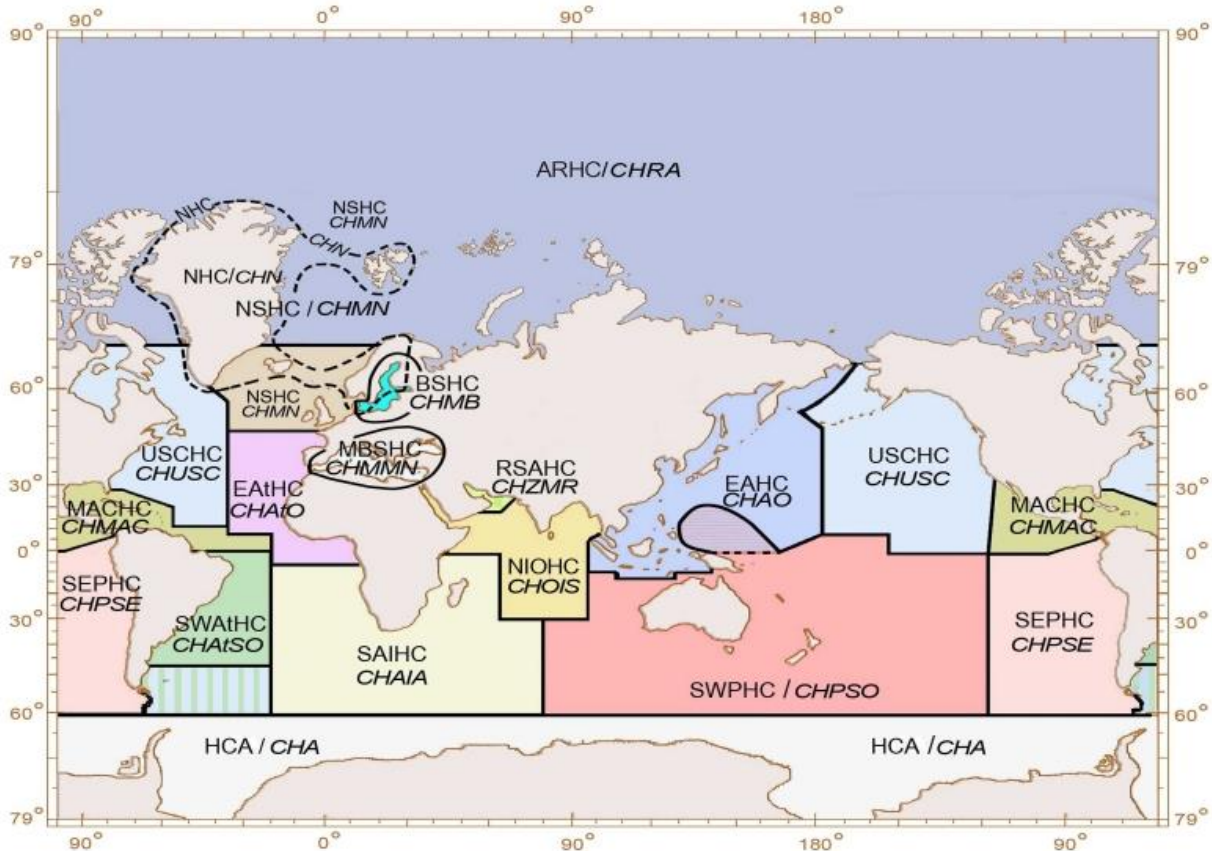
This National Report provides specific information pertaining to individual products and services of primary interest to the United States and Canada Hydrographic Commission (USCHC). U.S. domestic and international hydrographic services are primarily conducted by three government agencies: The National Oceanic and Atmospheric Administration's (NOAA) Office of Coast Survey (OCS), the National Geospatial-Intelligence Agency (NGA) Maritime Safety Office, and the Naval Meteorology and Oceanography Command (CNMOC, U.S. Navy). A fourth agency, the U.S. Army Corps of Engineers, is responsible for hydrographic surveys in designated U.S. federal waterways and inland rivers, and produces U.S. inland ENC's (IENCs).

NOAA, Office of Coast Survey <http://www.nauticalcharts.noaa.gov>

NGA, Maritime Safety Information <http://msi.nga.mil/NGAPortal/MSI.portal>

Naval Meteorology and Oceanography Command <http://www.navmetocom.navy.mil>

U.S. Army Corp of Engineers <http://www.nauticalcharts.noaa.gov/staff/usace.html>



Information for Regional Hydrographic Commissions are available at : [IHO Regional Commissions](#)

United States Open Data Policy – Managing Information as an Asset

Information is a valuable national and global resource. The U.S. considers information a strategic asset to the U.S. Federal Government, its partners, and the public. In order to ensure the U.S. Federal Government is taking full advantage of its information resources, agencies are directed to increase operational efficiencies, reduce costs, improve services, support mission needs, ***and increase public access to valuable government information.***

The access to data and services, usable to the public, can help fuel entrepreneurship, innovation, and scientific discovery – all of which improve lives and contribute significantly to job creation. This policy is available at: <https://www.whitehouse.gov/sites/default/files/omb/memoranda/2013/m-13-13.pdf>

Many hydrographic data, products and services produced by the U.S. HO's are generally made available for download at no cost. For nautical products and services, web deliveries of digital versions of most data are available free to the public.

NOAA

For access to survey data: <http://www.nauticalcharts.noaa.gov/hsd/hydrog.html>

For access to charting data: <http://www.nauticalcharts.noaa.gov/staff/chartspubs.html>

NGA

NGA Hydrographic Products are no longer offered for sale to civilian customers by the National Aeronautical Charting Office (NACO) or the US Government Printing Office (GPO); however, authorized reproductions of these products can still be purchased from commercial vendors. For access to charting data: <http://msi.nga.mil/NGAPortal/MSI.portal>

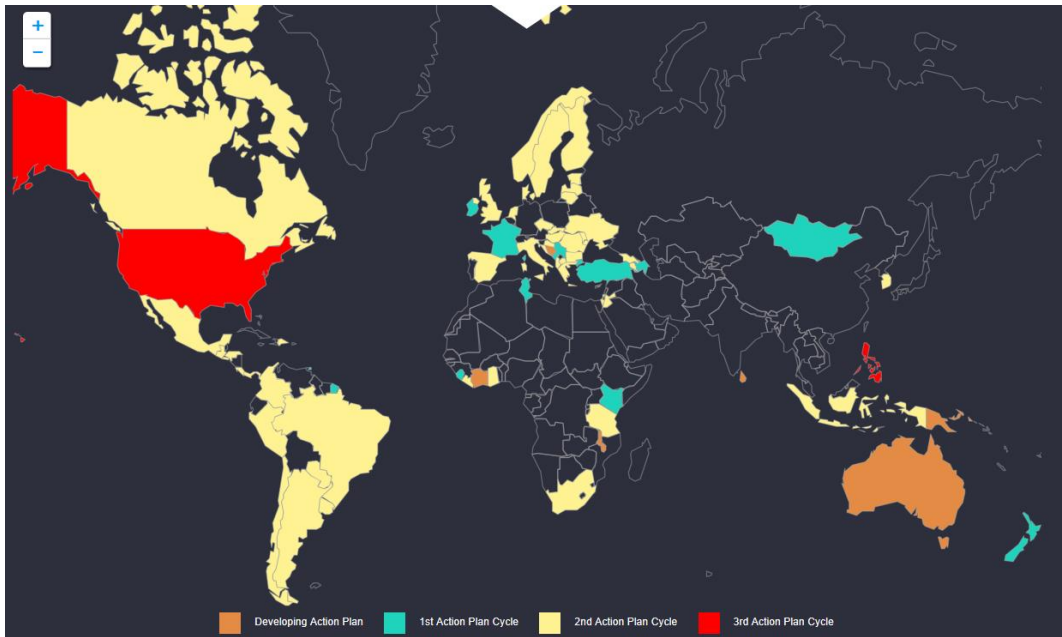
NGA fully supports the U.S. Open Data Policy and is a regular supporter of making data available to support crisis situations such as Nepal Earthquake, Ebola Outbreak to also include Arctic Support and Wildlife Tracking. Past support has also included the Haiti earthquake several years ago, or more recent significant weather events such as hurricanes. This data supports not only the U.S. agencies that are responding to the crisis but also the many responding partners as well. Access to the NGA data portal can be found at: <https://nga.maps.arcgis.com/home/>

NAVY

In addition to navigation safety products and services, the U.S. is committed to making these data available in a variety of formats to as many users as possible.

International Open Government Partnership (OGP)

OGP was launched in 2011 to provide an international platform committed to making governments more open, accountable, and responsive to citizens. Since then, OGP has grown from 8 countries to 69 participating countries. In all of these countries, government and civil society are working together to develop and implement ambitious open government reforms. Additional information regarding the OGP can be found at: <http://www.opengovpartnership.org/>



OGP active partners from the USCHC member states are the United States of America and Canada.

2. Surveys

NOAA

The *NOAA Hydrographic Survey Priorities* available at <http://www.nauticalcharts.noaa.gov/hsd/NHSP.htm> defines the methodology NOAA uses to identify survey priorities across the U.S. EEZ. *NOS Hydrographic Surveys Specifications and Deliverables* has been updated for 2015 and includes new specifications and changes made since the 2014 version. Those who acquire hydrographic survey data in accordance with NOS specifications should use the current version; [2015 Specifications and Deliverables](#).

The Office of Coast Survey 2016 Hydrographic Survey Projects plan for the nation can be viewed online in an ArcGIS at:

<http://noaa.maps.arcgis.com/apps/MapSeries/index.html?appid=c04dbcf9398d4933b9bfacd01758b5e1>.

NAVY

The Navy has five 100 meter multi-purpose survey ships: USNS PATHFINDER, USNS MARY SEARS, USNS BOWDITCH, USNS HENSON, and USNS BRUCE C. HEEZEN. BOWDITCH, HENSON, and HEEZEN carry two 10 meter hydrographic survey launches (HSLs) to conduct

oceanographic, bathymetric, and hydrographic surveys. The USNS MAURY, Navy's newest multipurpose ocean survey vessel, is being fitted out for survey. USNS MAURY is 8 meters longer than the previous ships of the same class to accommodate a moon pool for unmanned underwater vehicle (UUV) deployment and retrieval. Other survey assets employed by the US Navy include Airborne Coastal Survey (ACS) using the OpTech Coastal Zone Mapping and Imaging (CZMIL) system which is flown on a Balsar BT-67 refurbished DC-3 and the Fleet Survey Team (FST), which is a team of highly skilled civilian and military hydrographers. FST employs various small craft for survey including 9 meter SAFE boats (defender class) fitted with multi-beam, 7 meter RHIB with multi-beam, and rapid littoral survey vessels (RLSVs) which are jet skis fitted with a single beam echo sounder and side scan sonar.

NAVOCEANO's survey ships, ACS aircraft, and FST have all been utilized in the past to conduct cooperative hydrographic surveys with countries around the world. In 2015 the U.S. Navy did not conduct any hydrographic surveys for the US-Canada waters and, is not planning any survey for the 2016.

3. New Charts and Updates

NOAA

ENC's

ENC data (S-57) can be obtained in GIS-friendly format for non-traditional users, opening up HO data to a host of new customers and users. New map services are in place to allow others simple access to real-time data streams, creating opportunities for operational coastal intelligence via interactive map viewers. The NOAA ENC Direct to GIS website

(http://www.nauticalcharts.noaa.gov/csdl/ctp/encdirect_new.htm) allows users to display, query and download all available NGA / NOAA ENC data in a variety of GIS/CAD formats, using Internet mapping technology. The NOAA NowCOAST web site (<http://nowcoast.noaa.gov>) is an example of the possibilities created by delivering real-time data for broad customer use.

ENC Distribution

U.S. ENCs, including NGA ENCs, are distributed through PRIMAR, UKHO, Maris, Jeppesen, Chart World, Creative Map Corporation, and directly from NOAA at www.nauticalcharts.noaa.gov.

At the annual meeting of its steering committee in September 2015, the International Centre for Electronic Navigational Charts (IC-ENC) agreed to accept NOAA as a member of its organization and to establish an IC-ENC regional office, “IC-ENC North America.” The agreement between IC-ENC and NOAA was signed in early 2016. Even with the finalization of the agreement, hardcopy charts will still be available to the mariner.

Regional IC-ENC offices conduct full and independent validation of all ENC data from regional members before it is published. They also handle data distribution to value-added resellers on behalf of their members

ENCs in the Great Lakes

Traditionally, the Raster Paper charts (RNCs) were maintained first and also offered more coverage than the ENCs. NOAA has eclipsed the half-way milestone of a multi-year project to complete and maintain the NOAA ENC suite as a premiere product. By the end of calendar year 2017, we expect the Great Lakes ENC suite to be completed - which means there will be equivalent scale coverage as the RNCs. This will include New Edition updates for all Great Lakes ENCs (100+) as well as the creation of many 1st Edition ENCs (over 30.)

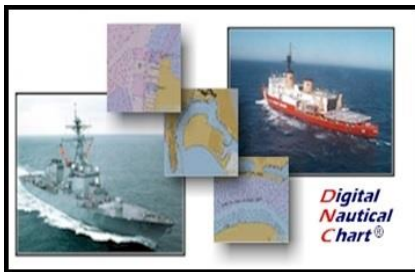
RNCs and Paper Charts

NOAA produces 51 raster and ENC charts in the area of Atlantic Ocean and Great Lakes. As of April 2014, NOAA no longer produces lithographic paper charts with traditional print cycles for new editions. All paper charts are fully updated and available for download as Print-on-Demand (POD) products, or in paper form from one of 17 NOAA-certified chart printing agents.

Problems Encountered

While completing the Great Lakes ENC project, the Marine Chart Division noticed through AIS Great Lakes traffic analysis that many of the charted tracks on the RNC and ENC are no longer used or do not align with transiting vessel routes. We have also noted that translating the recommended tracks from the Polyconic charts into the ENC suite have resulted in recommended tracks that do not line up with the bearing provided - meaning that they are actually incorrect. With the completion of this project in 2017, the Great Lakes ENCs will be maintained as the premier charting product.

NGA



DNC

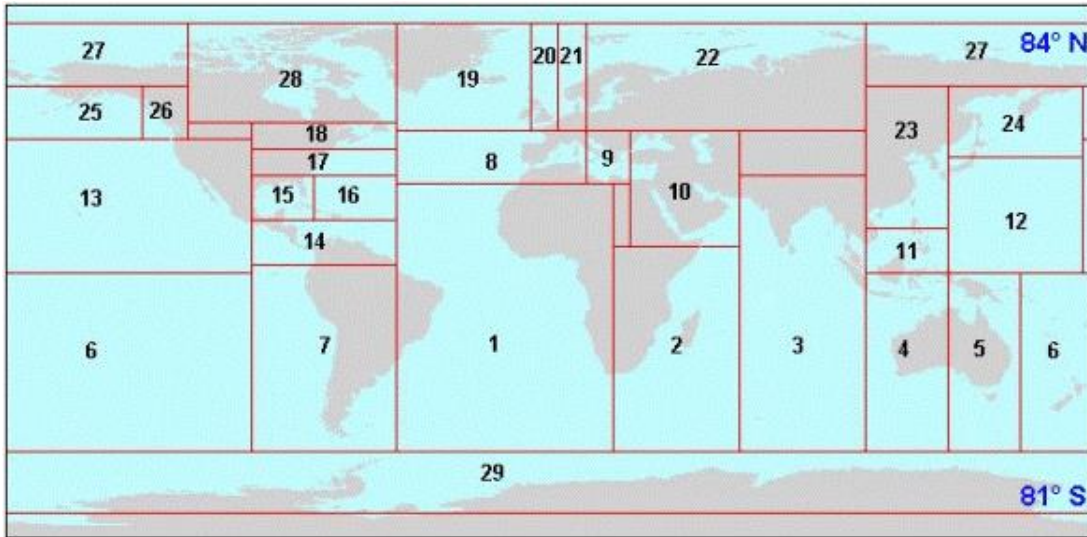
The U.S. has extensive DNC (Digital Nautical Chart®) coverage in the USCHC region. The DNC is produced by the National Geospatial-Intelligence Agency (NGA) and is an unclassified, vector-based, digital database containing significant features essential for safe marine navigation. The DNC uses the Vector Product Format (VPF), which is a NATO standard for digital military map and chart data.

Additional details can be located at: <http://msi.nga.mil/NGAPortal/DNC.portal>, or http://www.nauticalcharts.noaa.gov/mcd/learn_diffENC_DNC.html

DNCs consist of libraries in a variety of scales for complete worldwide coverage. They are maintained with new source information from the U.S. and primary charting authorities (host nations). DNC libraries are considered Limited Distribution products and are not available for public sale or download except for those that are within U.S. territorial waters or in areas where source data restrictions allow them to be released. However, DNC data is shared with host nations for coverage in their territorial waters through formal bilateral exchange agreements

Within USCHC waters, the Canadian DND is a co-producer of DNC across regions 18, 26, 27, and 28 where they maintain approximately 50% of the total coverage. This arrangement has been in place since 2004 and is covered under a formal co-production Memorandum of Understanding (MOU).

DNC Region	Total Library Coverage	Libraries maintained by DND
18	240	147
26	118	40
27	27	11
28	60	27
TOTAL	445	225



For requests regarding DNC data, please contact maritime.international@nga.mil

RNCs and Paper Charts

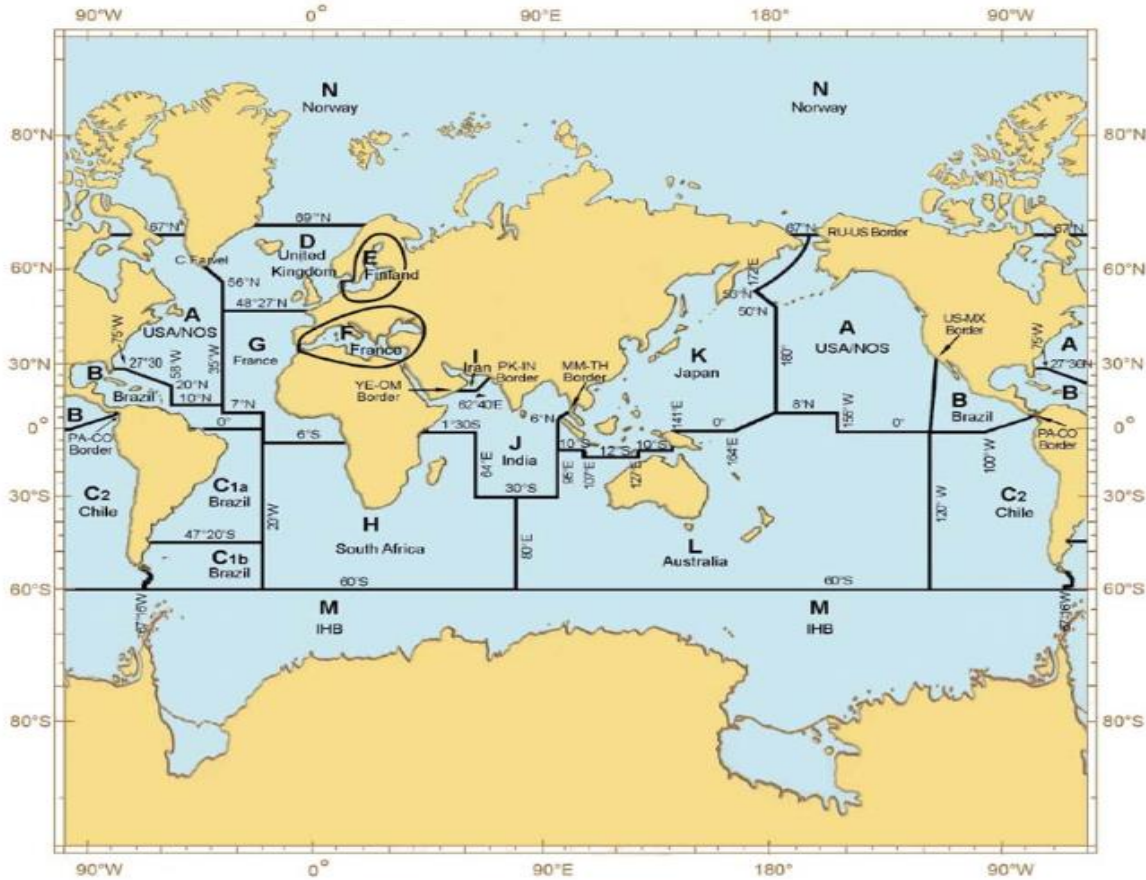
No RNC's or paper charts were produced by NGA in the USCHC region during 2015.

INT Charts

NOAA and NGA share INT chart responsibilities within USCHC region. The U.S. is responsible for eight (8) INT charts within region A. The listing is included in the table below.

INT Region	INT Chart Number	Producer	National Chart Number	INT TITLE	Scale	New Edition Year
A	403	US	108	South East Coast of North America including the Bahamas and Greater Antilles	3,500,000	1994
A	801	US	501	West Coast of North America (Mexican Border to Dixon Entrance)	3,500,000	2009
A	802	US	502	West Coast of North America (United States to Mexico)	3,500,000	1983
A	809	US	504	Hawaiian Islands	3,500,000	1983
A	810	US	500	West Coast of North America (Dixon Entrance to Unimak Pass)	3,500,000	2015
A	811	US	503	Mexico to Ecuador	3,500,000	1996
A	813	US	513	Bering Sea (Southern Part)	3,500,000	2015

A	814	US	514	Bering Sea (Northern Part)	3,500,000	2015
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4. New Publications and Updates

United States Coast Pilot®

The *United States Coast Pilot*® consists of a series of nine regionally-focused nautical books that cover a variety of useful information important to navigators of coastal and intracoastal waters and the Great Lakes. *Coast Pilots 6, 7, 8, and 9* provide information for the USCHC region. U.S. Coast Pilot now offers completely [updated publications](#) every week.

Publication	Edition Date
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U.S. Coast Pilot 6: covers Great Lakes system, including Lakes Ontario, Erie, Huron, Michigan and Superior, their connecting waters, and the St. Lawrence River	Edition 46, 2016
U.S. Coast Pilot 7: covers California, Oregon, Washington, Hawaii and Pacific Islands	Edition 48, 2016
Coast Pilot 8: covers the panhandle between the south boundary and Cape Spencer	Edition 37, 2015
Coast Pilot 9: covers the Pacific and Atlantic coast of Alaska from Cape Spencer to the Beaufort Sea	Edition 33, 2015

U.S. Coast Pilots can be downloaded at: <http://www.nauticalcharts.noaa.gov/nsd/cpdownload.htm>

Sailing Directions

Sailing Directions, published by NGA, include both Planning and Enroute Guides for the Mariner. Enroute Guides are detailed coastal and port approach information, supplementing the largest scale chart of the area. Each publication is subdivided into geographic regions, called sectors, which contain information about the coastal weather, currents, ice, dangers, features and ports, as well as a graphic key to the charts available for the area. Planning Guides include relevant physical, political, industrial, navigational and regulatory information about the countries adjacent to a particular ocean basin in a single volume.

Publication	Edition Date
<i>Sailing Directions 140</i> – North Atlantic Ocean and Adjacent Seas (Planning)	2015 Edition
<i>Sailing Directions 145</i> – Nova Scotia and the St. Lawrence	2014 Edition
<i>Sailing Directions 146</i> – Newfoundland, Labrador, and Hudson Bay	2014 Edition
<i>Sailing Directions 154</i> – British Columbia	2014 Edition

Sailing Directions can be downloaded from NGA at <http://msi.nga.mil/NGAPortal/MSI.portal>.

List of Lights, Radio Aids and Fog Signals

The NGA *List of Lights, Radio Aids and Fog Signals* and their digital updates are available to the public. Each volume contains lights and other aids to navigation that are maintained by or under the authority of foreign governments. Each volume corresponds to a defined geographic region, and contains more complete information about the navigational aids than can be conveniently shown on nautical charts. New editions are published annually for every volume. The uncorrected publications can be viewed or downloaded in their entirety as PDF files. Corrections to the List of Lights are published in the [Notice to Mariners](#).

Publication	Edition Date
Publication 110, Greenland, the East Coasts of North and South America (excluding continental U.S. A. except the east coast of Florida and the West Indies)	Edition 2016
Publication 111, The West Coast of North and South America (excluding Continental U.S.A. and Hawaii, Australia, Tasmania, New Zealand, and the islands of the north and south Pacific Oceans)	Edition 2015

Publication updates are posted at the NGA Maritime Safety website:

<http://msi.nga.mil/NGAPortal/MSI.portal>

5. Maritime Safety Information (MSI)

Maritime safety information (MSI) means navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended.

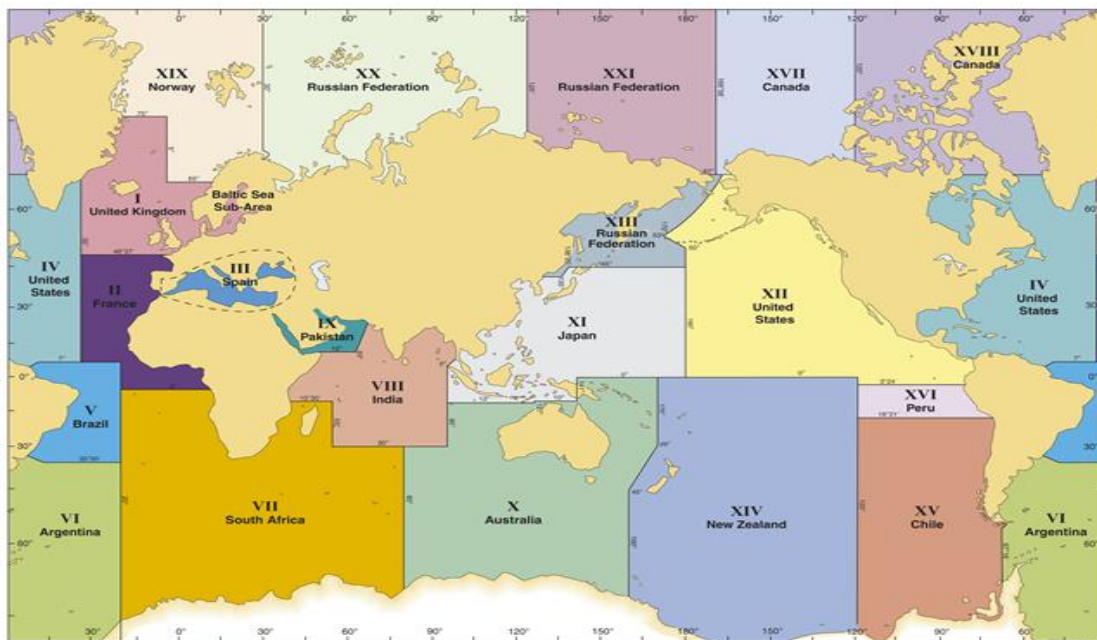
As the NAVAREA IV and XII Coordinator, NGA issues the navigational warnings for these areas and are broadcast and uploaded to <http://msi.nga.mil/NGAPortal/MSI.portal>. NGA requests the assistance

of all member states within the these two regions to relay pertinent maritime safety information for promulgation to navsafety@nga.mil.

The International Maritime Organization has designated NAVTEX as the primary means for transmitting coastal urgent marine safety for instantly distributing maritime navigational warnings, weather forecasts and warnings, search and rescue notices and similar information to ships worldwide. Eleven NAVTEX stations are operational in NAVAREA IV and XII and is broadcasted from Coast Guard facilities in Cape Cod, Chesapeake VA, Savannah GA, Miami FL, New Orleans LA, San Juan PR, Cambria CA, Pt. Reyes CA, Astoria OR, Kodiak AK, Honolulu HI, and Guam. (NAVAREA XI). The broadcast coverage area for NAVTEX stations vary between 200 and 500 nautical miles from shore.

The NAVAREA coordinator is the authority charged with coordinating, collating and issuing navigational warnings for a designated NAVAREA within the IMO/IHO World-Wide Navigational Warning Service (WWNWS) (see figure below).

Mr. Peter Doherty is the NAVAREA IV & XII Coordinator, Peter.M.Doherty@nga.mil.



NAVAREAS for coordinating and promulgating navigational warnings under the World-Wide Navigational Warning Service.

6. C-55 Update

The purpose of IHO Publication C-55 is to provide base data for governments and supporting international organizations as they consider the best means by which to implement responsibilities set out in Chapter V, Regulation 9, of the Safety of Life at Sea (SOLAS) Convention. It also informs IHO input to the United Nations Global Maritime Assessment.

The most recent U.S. update to C-55, *Status of Hydrographic Surveying and Nautical Cartography Worldwide*, is as follows:

- A = percentage which is adequately surveyed
- B = percentage which requires re-survey at larger scale or to modern standards
- C = percentage which has never been systematically surveyed

	A	B	C
Depths < 200m	17	1	0
Depths > 200m	0	0	94

Coverage of charts published by the U.S. in the USCHC region, where:

- A = percentage covered by INT series, or a paper chart series meeting the standards in M-4
- B = percentage covered by Raster Navigational Charts (RNCs) meeting the standards in S-61
- C = percentage covered by ENC's meeting the standards in S-57

Purpose/Scale	A	B	C
Offshore passage/Small	100%	100%	100%
Landfall and Coastal passage/Medium	100%	100%	100%
Approaches and Ports/Large	100%	100%	100%
Percentage of Group A showing depths in metres	2.8%		
Percentage of Group A referenced to a satellite datum	100%		

The latest C-55 publication can be found online at http://www.iho.int/iho_pubs/CB/C-55

7. Capacity Building

The United States is an active participant in the IHO Capacity Building Sub-Committee (CBSC), and the US/NGA directly supports the IHO Maritime Safety Information (MSI) training course. The latest MSI course was conducted in Muscat, Oman in December 2014.

Training Opportunities available in the United States

Training opportunities are available at various institutions in the United States. Two Category A certified hydrographic programs are available through:

- The University of Southern Mississippi (USM)
 - www.marine.usm.edu/hs.php
- The University of New Hampshire (UNH)
 - www.marine.unh.edu/research/ccom.html

COMNAVMETOCOM has partnered with USM for their program and NOAA has a similar arrangement with UNH for their Category A program. COMNAVMETOCOM also offers a six-month category B International Hydrographic Management and Engineering Program and mobile training via its Naval Meteorology and Oceanography Professional Development Center in Gulfport, Mississippi. COMNAVMETOCOM's Category A and B programs and mobile training also qualify for Security Cooperation assistance.

Capt. Andrew Armstrong, NOAA (ret.), NOAA co-director of the Joint Hydrographic Center at UNH, is a member of the FIG/IHO/ICA International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers. As a member of the board, Capt. Armstrong is available to advise institutions on establishing hydrographic training curricula and preparing submissions to the International Board for Category A or Category B recognition. (andy.armstrong@noaa.gov).

In July 2015, NOAA, the University of New Hampshire, and GEBCO conducted a Chart Adequacy Evaluation Workshop in Silver Spring, Maryland. The Workshop was co-sponsored by NOAA and the UKHO with 15 participants from 13 nations attending. This workshop provided training regarding a chart adequacy assessment procedure using automatic-identification system (AIS) data and satellite-derived bathymetry (SDB). Currently, the U.S. is preparing to offer the course again in July 2016. For further information, please contact Anthony.Klemm@noaa.gov or Dr. Shachak Pe'eri at shachak@ccom.unh.edu.

8. Oceanographic activities

General Bathymetric Chart of the Oceans (GEBCO)

The United States participates on the IOC-IHO Guiding Committee for GEBCO, and hosts the IHO Data Centre for Digital Bathymetry at NOAA's National Centers for Environmental Information (NCEI) (formerly the National Geophysical Data Center, NGDC).

NOAA distributes the International Bathymetric Chart of the Arctic Ocean (IBCAO) digital grid at <http://www.ibcao.org/> The goal of this initiative is to develop a digital data base that contains all available bathymetric data north of 64° North, for use by mapmakers, researchers, institutions, and others whose work requires a detailed and accurate knowledge of the depth and the shape of the Arctic seabed. Initiated in 1997, this undertaking has so far engaged the volunteer efforts of investigators who are affiliated with 24 institutions in 10 countries. ARHC members (Canada, Denmark, Norway, Russia, and the U.S.A) contribute to this initiative, as does the ARHC observer member state Iceland.

Crowdsourced Bathymetry

The NOAA Office of Coast Survey is providing financial support for an IHO-initiated project to develop a global database for crowdsourced bathymetry hosted by the IHO Data Centre for Digital Bathymetry (IHO DCDB). The IHO DCDB, co-located with NOAA's National Centers for Environmental Information (NCEI), is building the infrastructure necessary to provide archiving, discovery, display and retrieval of global crowdsourced bathymetry data from mariners around the world. NOAA is coordinating with the Association of Arctic Expedition Cruise Operators (AECO) to ingest Arctic data to test the new system. The vision is to tap into the enthusiasm for mapping the ocean floor by enabling trusted mariners to easily contribute data to fill the gaps in our current bathymetric coverage.

Crowdsourced bathymetric data can be used to identify areas where nautical charts are inadequate and proper hydrographic surveys are needed or can be applied to nautical charts when the source and uncertainties of the data are well understood. The key to successful CSB efforts are volunteer observers who operate vessels-of-opportunity in places where charts are poor or where the seafloor is changeable and hydrographic assets are not easily available.

9. Other activities

The International Hydrographic Organization Data Centre for Digital Bathymetry (IHO DCDB) was established in 1988 to steward worldwide bathymetric data on behalf of the IHO Member States. The Centre provides long term archive of and access to single and multibeam deep and shallow water ocean depths contributed by a range of mariners. The IHO DCDB welcomes bathymetric data and metadata, accepts descriptions and spatial footprints of data that is already online and of data that are not publicly available to provide easy search and discovery

Information can be obtained at <https://www.ngdc.noaa.gov/iho/>

NGA representative on the MSDI Working Group (MSDIWG) is currently updating the IHO Publication C-17 Ed. 2 (Spatial Data Infrastructures “The Marine Dimension” Guidance for Hydrographic Offices). Other activities include representing the IHO MSDIWG at the Open Geospatial Consortium on the Maritime Ad-hoc Group meeting in Washington D.C.