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UNITED STATES OF AMERICA

National Report

**North Indian Ocean
Hydrographic Commission (NIOHC)
Chittigong, Bangladesh
14-16 March 2016**

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

National Geospatial-Intelligence Agency <http://msi.nga.mil/NGAPortal/MSI.portal>

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

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Hydrographic Office/Service

This National Report provides specific information pertaining to individual products and services of primary interest to the North Indian Ocean Hydrographic Commission (NIOHC). 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), 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).

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.

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

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

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. 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.

NGA fully supports the U.S. Open Data Policy and is a regular supporter of making data available to support ongoing crisis situations such as 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.

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/>



Participating NIOHC member states within the OGP include: Sri Lanka and the United States.

Surveys

A statutory mandate authorizes NOAA to provide nautical charts and related hydrographic information for the safe and efficient navigation of maritime commerce as well as providing basic data for engineering, scientific, and other commercial and industrial activities within the nation's 3.4 million square nautical mile EEZ.

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 U.S. Navy surveys waters outside the United States and in the territorial waters of other nations through diplomatic channels and international agreements. 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 in the region.

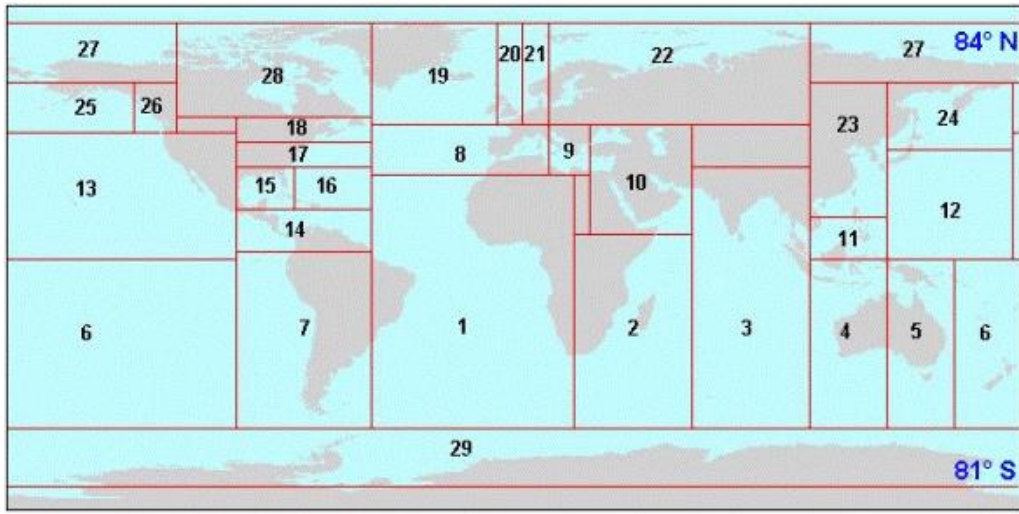
New Charts and Updates

DNCs



The U.S. produces many DNCs (Digital Nautical Chart®) in the NIOHC region. The DNC is produced by the National Geospatial-Intelligence Agency (NGA) and is an limited distribution, vector-based, digital database containing significant features essential for safe marine navigation. The DNC uses the Vector Product Format, 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. NIOHC data is included in DNC regions 02, 03 and 10. See coverage below.



DNCs are maintained by NGA with new source information from the U.S. and primary charting authorities (host nations). These products are limited distribution and thus are not available for public sale or download except DNC libraries covering U.S. territorial waters or where source data restrictions allow. However, data can be shared by host nations through bilateral agreements. DNC data can also be converted to ENC by a host nation with some training and the right software tools.

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

ENCs

The U.S. does not produce ENCs within the NIOHC region.

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.

Regional ENC Coordinating Center (RENC) Membership

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 is expected to be finalized in early 2016.

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.

RNCs and Paper Charts

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.

NGA produces 246 paper charts for the NIOHC region in the NGA regions 6, 7 and 9 portfolios. However, NGA is withdrawing many from public sale as bilateral agreements are renewed and limited distribution arrangements come into force (only 8 of these 246 are for public sale). The only charts NGA will continue to distribute to the public are those where NGA is the primary charting authority. These are specifically areas where the U.S. conducts the surveys, compiles and issues the chart, and there is no functioning national authority or NGA has specific authority (e.g. Trust Territory of the Pacific).

INT Charts

The U.S. is not responsible for any international series charts in the NIOHC region.

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. U.S. Coast Pilot now offers completely [updated publications](#) every week. *U.S. Coast Pilots* can be downloaded at: <http://www.nauticalcharts.noaa.gov/nsd/cpdownload.htm>

Sailing Directions

Sailing Directions are published by NGA, and digital updates can be downloaded from NGA at <http://msi.nga.mil/NGAPortal/MSI.portal>.

Five (5) volumes of *Sailing Directions* cover the NIOHC region.

Publication	Latest edition
<i>Publication 171</i> – East Africa and the South Indian Ocean	2015 edition
<i>Publication 172</i> – Red Sea and the Persian Gulf	2014 edition
<i>Publication 173</i> – India and the Bay of Bengal	2014 edition
<i>Publication 174</i> – Strait of Malacca and Sumatera	2016 edition
<i>Publication 175</i> – North, West and South Coasts of Australia	2014 edition

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 and are posted at the NGA Maritime Safety website, at <http://msi.nga.mil/NGAPortal/MSI.portal>.

Two (2) volumes of *List of Lights* cover the NIOHC region.

Publication	Edition Date
List of Lights Pub. 112 (Western Pacific and Indian Oceans Including the Persian Gulf and Red Sea)	2015 Edition
List of Lights Pub. 111 (W. Coast N & S America (excluding USA), Australia, Tasmania, NZ, and Islands in the N/S Pacific Ocean)	2015 Edition

Maritime Safety Information (MSI)

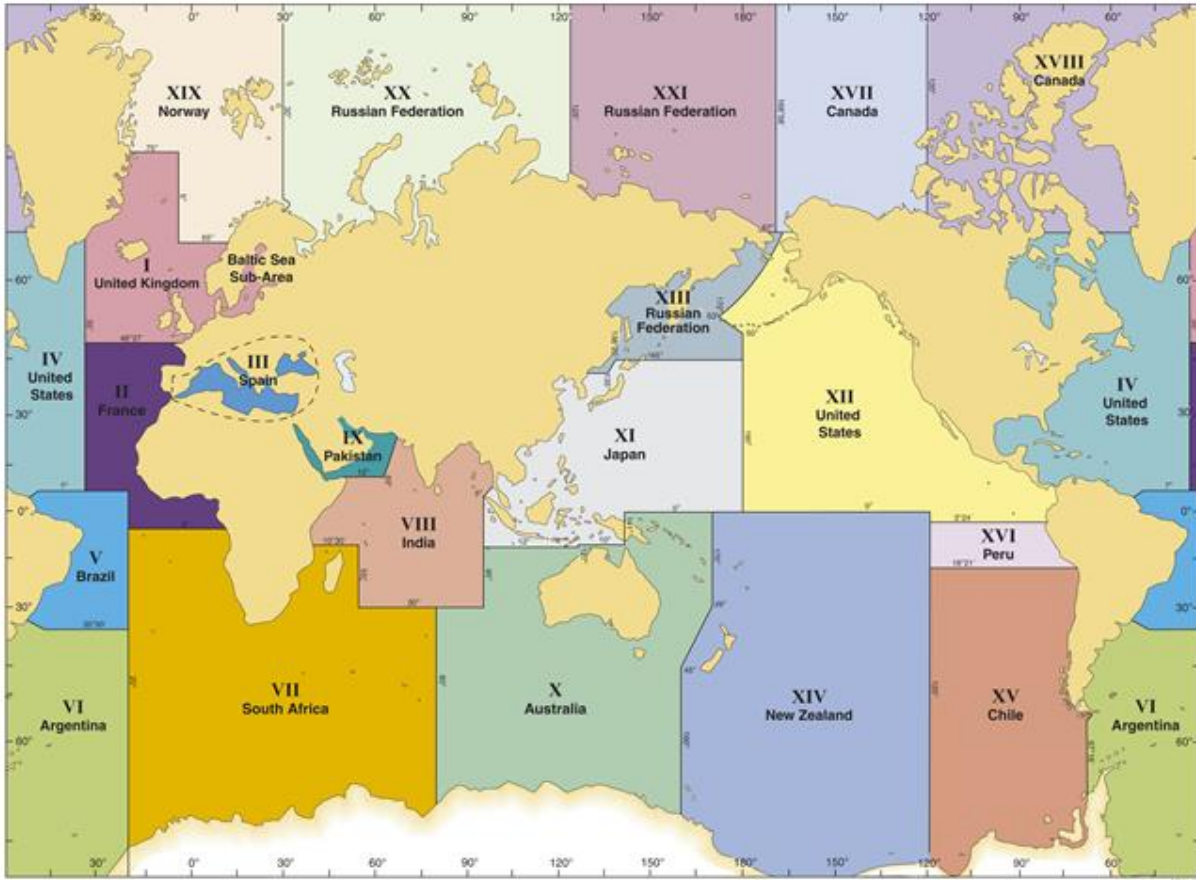
Maritime safety information (MSI) means navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages broadcast to ships in accordance with the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended.

Maritime safety information is of vital concern to all ships. It is therefore essential that common standards are applied to the collection, editing and dissemination of this information.

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) .

NGA is the NAVAREA IV and XII Coordinator within the WWNWS and also acts as Chairman for the IHO WWNWS-Sub-Committee (SC).

NGA issues navigational warnings in the form of HYDROPACS for the the NIOHC Region. These are broadcast and uploaded to <http://msi.nga.mil/NGAPortal/MSI.portal>.



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

C-55 Update

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

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

Capacity Building

The United States is an active participant in the IHO Capacity Building Sub-Committee (CBSC), and the U.S./NGA directly supports the IHO Maritime Safety Information (MSI) training course. No MSI training course was offered in the NIOHC Region in 2015.

Training Opportunities available in the United States

There are two Category A certified hydrographic programs in the U.S. recognized by the International Federation of Surveyors/ International Hydrographic Organization/International Cartographic Association International Board on Standards of Competence for Hydrographic Surveyors: at the University of Southern Mississippi (<https://www.usm.edu/marine/hydrographic-science-overview>); and at the University of New Hampshire (<http://ccom.unh.edu/education>).

Capt. Andrew Armstrong, NOAA (ret.), the 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).

One Category B hydrographic training program is also available through the U.S. Navy, the International Hydrographic Management and Engineering Program (IHMEP). IHMEP is the longest running hydrographic training course in the U.S. The program provides students with a working knowledge of hydrography with 26 weeks of lecture and hands-on training. The program is IHO/FIG Category B Certified (2011) with all graduates receiving an academic certificate. Those interested need to send a letter of request to your respective in-country Office of Defense Cooperation or to U.S. Naval Attaché at the U.S. Embassy, identifying the course by its Military Articles and Service Listing (MASL) number P-169208 under the title of Hydrographic Management and Engineering Program, course ID S-8G-0500.

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

Oceanographic Activities

GEBCO

The United States participates on the IOC-IHO Guiding Committee for GEBCO and chairs the IHO IRCC Crowdsourced Bathymetry Working Group. It also hosts both the IHO Data Centre for Digital Bathymetry (IHO DCDB) and the online GEBCO Gazetteer of Undersea Features at NOAA's National Centers for Environmental Information (NCEI). NCEI is in the process of enhancing the infrastructure and interface of the IHO DCDB to accommodate crowdsourced bathymetry data.

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. 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.