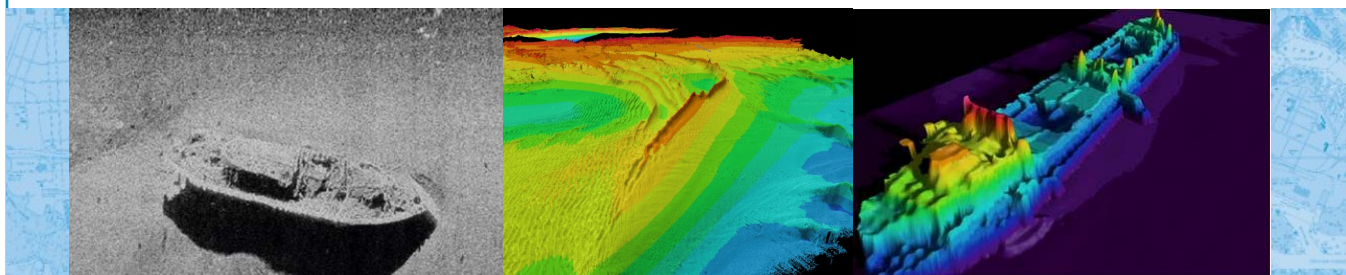


# **AUTOMATED WRECK AND OBSTRUCTION INFORMATION SYSTEM USER'S GUIDE**

April 2013



## **DISCLAIMER**

The software used to enter, store, and retrieve data from the AWOIS was developed and implemented for use by NOS under controlled conditions of software maintenance, input data quality, processing configurations, and output data utilization. NOS makes no warranties, expressed or implied, concerning the accuracy, completeness, reliability, or suitability for any particular purpose of the data contained in or generated by the AWOIS computer program or furnished in connection therewith. Any use of the associated data contained in AWOIS must have the sources correctly cited, wherever appropriate. Furthermore, NOS assumes no liability associated with the use of such data and assumes no responsibility to maintain and update the data in any manner or means after it is released to the user. Any exceptions to these conditions of release must be formally established through negotiated agreements with NOS.

Because the software and associated data were developed, researched, and compiled with U.S. Government funding, no proprietary rights may be attached to them for purposes of sale to the U.S. Government as part of any procurement of ADP products or services.

## **INQUIRIES**

For questions concerning the AWOIS database e-mail: [HSD.Inquiries@noaa.gov](mailto:HSD.Inquiries@noaa.gov)

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## INTRODUCTION

This manual has been compiled to provide users of the National Oceanic and Atmospheric Administration's (NOAA) Automated Wreck and Obstruction Information System (AWOIS) with instructions for obtaining and interpreting AWOIS data.

## BACKGROUND

In 1981, NOAA's National Ocean Service (NOS) implemented the Automated Wreck and Obstruction Information System (AWOIS) to assist in planning hydrographic survey operations and to catalog and store a substantial volume of reported wrecks and obstructions that are considered navigational hazards within U.S. coastal waters. Today, over 10,000 reports have been received, which include unverified accounts of vessel casualties, as well as chronological history. As part of the hydrographic survey planning process, these records are reviewed and those wrecks or obstructions which require additional field investigation are assigned to specific field units for verification. The results of these investigations eventually become part of the AWOIS record so that a permanent history of a wreck or obstruction is always available.

In the past, AWOIS was available to the public in an Adobe PDF and a Microsoft Access MDB format. However, in an attempt to provide a more useful product, in 2013 AWOIS has instead been provided in a Google Earth Keyhole Markup Language (KML) format.

## USE AND LIMITATIONS

Besides functioning as a survey planning tool, AWOIS is of potential value to various users outside of NOS. The historical record of selected wrecks, the accessibility of information in a queryable format, and its reasonable cost make AWOIS an important information source for marine archaeologists, historians, fishermen, divers, salvage operators, and others in the marine community. Interested individuals are encouraged to use the system as a supplement to other sources of information.

However, AWOIS has limitations that should be considered by potential users. Most notably, it is not a comprehensive record of wrecks in any particular area. There are wrecks in AWOIS that do not appear on the nautical chart and there are wrecks on the nautical chart that do not appear in AWOIS. Updates to AWOIS are ongoing; however, it will never completely address every known or reported wreck. The emphasis is constantly placed on wrecks which may be a hazard to navigation. Additionally, features that have been either disproved or salvaged are not included in AWOIS.

Additionally, users should be aware that the AWOIS position may not agree with a charted position for a similar feature. Most of these differences are minor and due to the fact that the paper chart cannot always show a location as accurately as a digital list. Other more significant differences are generally due to a time lag in updating either the chart or AWOIS.

## FILE FORMAT

AWOIS records are provided in KML format. KML is an XML grammar and file format for modeling and storing geographic features such as points, lines, images, polygons, and models for

display in Google Earth, Google Maps, and other applications<sup>1</sup>. KML has a tag-based structure with names and attributes used for specific display purposes, and is therefore easily queriable. KML is an international standard maintained by the [Open Geospatial Consortium, Inc. \(OGC\)](#).

An example of KML AWOIS file, opened in Google Earth can be seen in Figure 1.

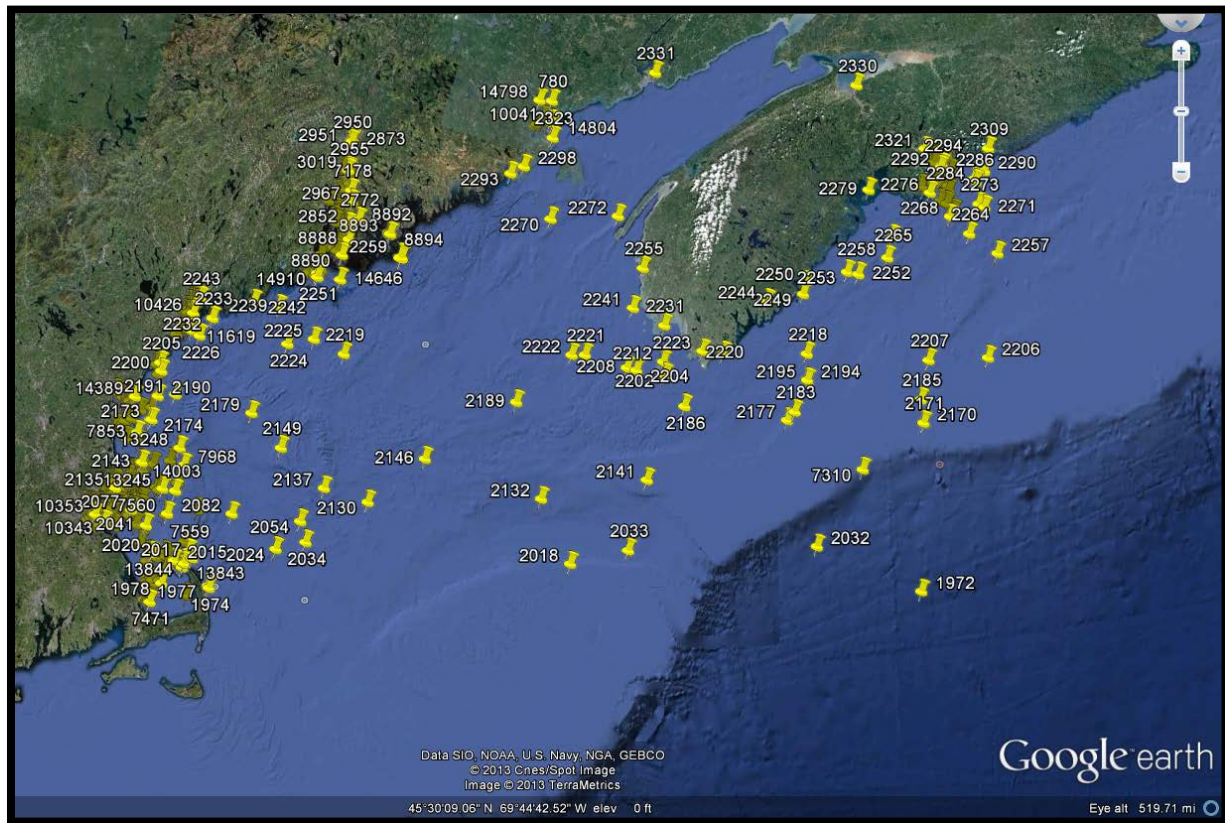


Figure 1 - Overview of AWOIS records in Google Earth

## AWOIS REGIONS

AWOIS records can be downloaded from the NOAA website by region. The regions are listed in Appendix A – AWOIS Area Codes. The approximate geographic limits of each of each region are displayed in Figure 2.

<sup>1</sup> "About KML." support.google.com/earth/bin/answer.py?hl=en&answer=148118. Google. 2013. Web. January 15, 2013.

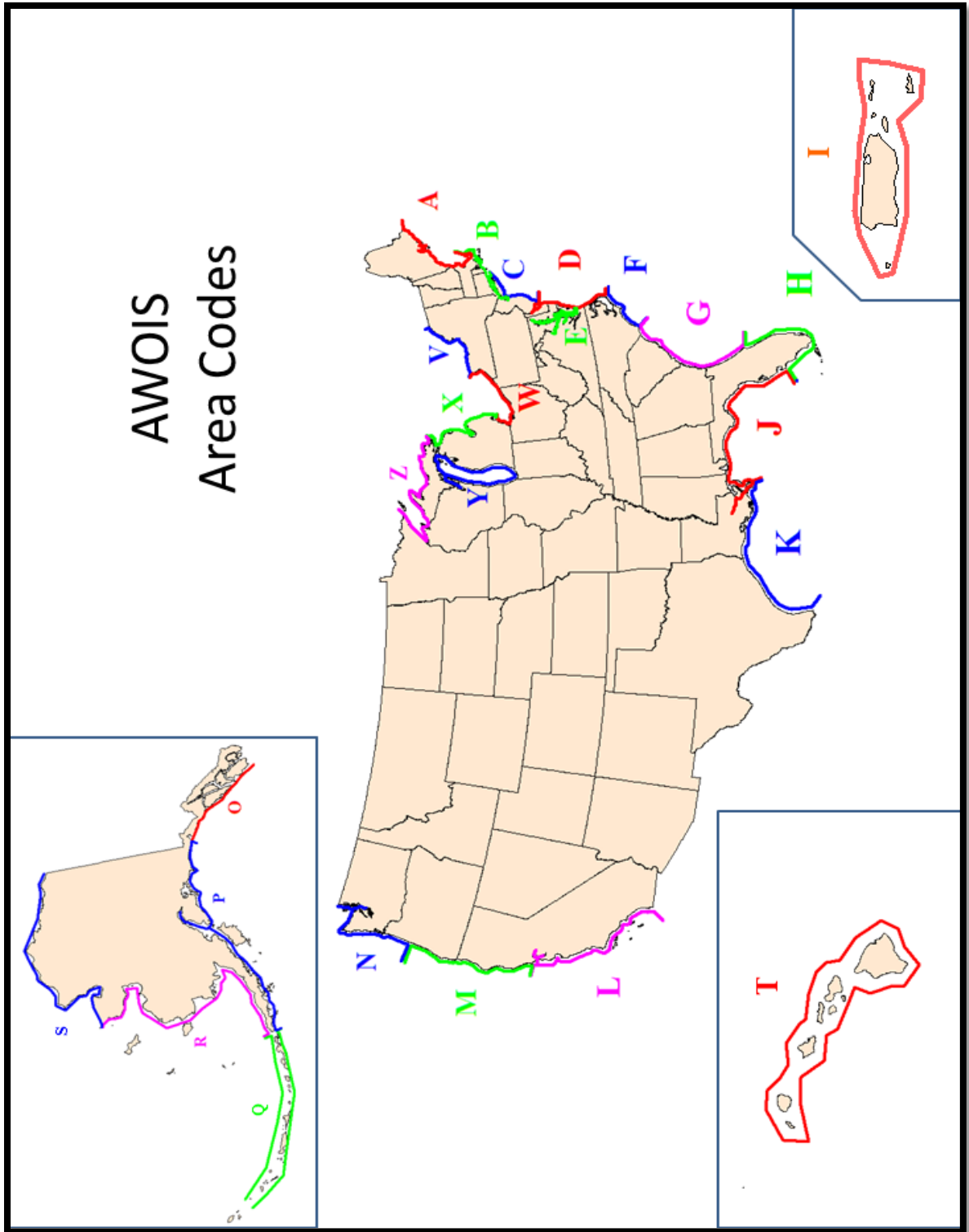


Figure 2: Approximate Geographic limits of AWOIS regions

## AWOIS RECORD ATTRIBUTES

Each AWOIS record has a series of attributes, which provides information about the wreck or obstruction. These attributes are listed in Table 1 – AWOIS Attributes, along with their descriptions. A sample feature record from Google Earth can be seen in Figure 3, while a sample record in the KML format can be seen in Figure 4.

Attribute	Description	Example
RECRD	Unique numerical record identifier	14109
VESSLTERMS	Name of the vessel or the terms <i>UNKNOWN</i> , <i>OBSTRUCTION</i> , or <i>SOUNDING</i> .	OBSTRUCTION
FEATURE_TYPE	A three-digit cartographic code that identifies the characteristic of the item. A list of the Carto Codes used in AWOIS is contained in Appendix B - AWOIS Carto Codes.	Obstructions: Submerged
AREA_ID	A single capital letter designating a particular geographic zone will appear in this field.	C
CHART	Number of the largest scale National Ocean Service (NOS) chart on which the AWOIS item is located.	14114
LATDEC	Latitude in decimal degrees. This represents the most accurate position available found in documents at NOS.	41.829972
LONDEC	Longitude in decimal degrees. This represents the most accurate position available found in documents at NOS.	-70.143028
GPQUALITY	An indicator of the relative positional quality of the feature.	High
GP_SOURCE	An indicator of the method in which the position was derived from the source document. The two selections available are:  <u>Scaled</u> : Scaled from a hard copy or from a digital (vector / raster) image.  <u>Direct</u> : Transcribed directly as reported in the source document.	Direct
DEPTH	Actual least depth or wire drag cleared depth over a feature that has been determined by hydrographic or wire drag survey methods. This depth will not be a reported or unverified depth. These depths originate primarily from National Ocean Service (NOS) hydrographic surveys.	9.3
SOUNDING_TYPE	A three-digit cartographic code (Appendix 2) which indicates the units in which the least depth over the feature has been determined.	Feet and tenths
YEARSUNK	The year in which the vessel was sunk (if known).	1924

<p>HISTORY</p>	<p>Memo field contains information about the AWOIS item. Some of the entries in this category are unverified and may be unreliable. Common codes include hydrographic survey registry numbers (e.g., H-9872/79), shoreline manuscript registry numbers (e.g., TP-00278), miscellaneous document numbers (e.g., CL980/76 and BP100234), and U.S. Coast Guard Local Notices to Mariners (LNM).</p> <p>Any positions in the History memo field are for reference purposes only and will have generally been superseded by the positions in the LATDEC and LONDEC fields.</p>	<p>OPR-B301-RU-07-- 36 ft wreck; This wreck was submitted as a DTON by the field party on April 26th, 2004. This wreck is shown on chart 13223, 38th Edition, April 2005, and has been applied to the continual maintenance raster dated August 29th, 2006 (RES 10/26/07).</p>
<p>REFERENCE</p>	<p>A code of various publications that describes the AWOIS item (see appendix 4 for a list of references).</p> <p><b>Copyright information will not be included in database subsets or for the general public.</b></p>	<p>20</p>

Table 1 – AWOIS Attributes

<p><b>50124</b></p>	
<p style="text-align: center;"><i>Attributes</i></p>	
<p>RECRD</p>	<p>50124</p>
<p>VESSLTERMS</p>	<p>INDEPENDENCE</p>
<p>FEATURE_TYPE</p>	<p>Wreck - Submerged, nondangerous</p>
<p>AREA_ID</p>	<p>L</p>
<p>CHART</p>	<p>18680</p>
<p>LATDEC</p>	<p>37.338828</p>
<p>LONDEC</p>	<p>-123.067778</p>
<p>GP_QUALITY</p>	<p>Low</p>
<p>GP_SOURCE</p>	<p>Direct</p>
<p>DEPTH</p>	<p>0</p>
<p>SOUNDING_TYPE</p>	<p></p>
<p>HISTORY</p>	<p>50124 DESCRIPTION 24 NO.8584; AIRCRAFT CARRIER; SUNK 1/26/51; POSITION ACCURACY WITHIN 1 MILE; REPORTED DEMOLISHED (SOURCE UNK); REPORTED THRU H.O. FILES DATED 1957 SURVEY REQUIREMENTS INFORMATION</p>
<p>REFERENCE</p>	<p></p>

Figure 3 - Sample Record from Google Earth



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        DATED 1957
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








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Figure 4 - Sample Record in KML format

## Appendix A – AWOIS Area Codes

AREA CODE	GENERAL	SPECIFIC	
A	Atlantic Coast	Canadian Border to Cape Cod	
B		Cape Cod to Sandy Hook (Includes Long Island Sound, New York Harbor, and the Hudson River below Troy)	
C		Sandy Hook to Cape May (Includes south shore of Long Island)	
D		Cape May to Cape Hatteras (Includes Delaware Bay)	
E		Chesapeake Bay (Includes all charted tributary waters)	
F		Cape Hatteras to Cape Fear	
G		Cape Fear to Cape Canaveral (Including St. Johns River)	
H		Cape Canaveral to Fort Myers	
I		Puerto Rico and Virgin Islands	
J		Gulf of Mexico	Fort Myers to Mississippi River
K	Mississippi River to Mexican Border		
L	Pacific Coast	Mexican Border to Point Reyes	
M		Point Reyes to Yaquina Head	
N		Yaquina Head to Canadian Border	
O	Alaska	Canadian Border to Point Manby	
P		Point Manby to Unimak Pass	
Q		Aleutian Islands	
R		Unimak Pass to Seward Peninsula	
S		Seward Peninsula to Canadian Border	
T		Pacific Ocean	Pacific Islands (Hawaii, Samoa, Guam, Marianas, etc.)
U		Inland Waters	Lake Champlain & New York State Barge Canal System
V	St. Lawrence River, Lake Ontario, & Lower Niagara River		
W	Upper Niagara River, Lake Erie, Detroit River, Lake St. Clair, & St. Clair River		
X	Lake Huron & St. Marys River		
Y	Lake Michigan, Lower Fox River, & Lake Winnebago		
Z	Lake Superior, Lake of the Woods, Rainy Lake, & Minnesota-Ontario Border Lakes		

## Appendix B - AWOIS Carto Codes

CODE	SYMBOL	DESCRIPTION
		<u>Wrecks</u>
098		Visible
100		Submerged, dangerous to surface navigation
102		Submerged, nondangerous
		<u>Obstructions</u>
085		Visible at high water
284		Covers/uncovers (awash)
067		Submerged
		<u>Rocks</u>
094		Awash
104		Covered at low water
		<u>Soundings</u>
127		Feet and tenths
130		Fathoms and tenths
711		Meters and tenths
370		Wire-drag clearance, feet
372		Wire-drag clearance, fathoms

## Appendix C – GPQUALITY\_ID Codes

High: A high quality position originating from a survey source or whenever there is a high level of confidence that the wreck or obstruction may be relocated without unreasonable difficulty. Although most positions in this category originate with NOS surveys, other sources may qualify, as long as the originating authority has the capability to do high quality work. Authorities such as the U.S. Army Corps of Engineers and private surveyors are selected examples.

Med: A probable high quality position, such as that originating with a survey but lacking supporting documentation. Positions originating from non-agency sources may also be in this category if the location is tightly controlled by adjacent features such as pier lines or fixed aids to navigation. A report that the wreck or obstruction has been actually located by the Coast Guard or Corps of Engineers will usually qualify a position for this category. In some cases, the item may be charted with an approximate position (PA) notation.

Low: A position of questionable or unverified quality. Most reports from Local Notice to Mariners and private observers are of this type. If the reported position is expressed a range and bearing from an identifiable fixed feature and is near shore relative to the position fixing method, it will probably be included in this category. If the position fixing method is unknown, it is assumed to be visual. The nautical chart may indicate an approximate position (PA) for this item.

Poor: A position of doubtful quality usually referenced to some general shoreline feature or portion of shoreline. The nautical chart may indicate an approximate position (PA) or a position doubtful (PD) for this item.

## Appendix D – AWOIS References

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## Appendix E - AWOIS Abbreviations

Ad.Wk.	Additional Work
AHB	Atlantic Hydrographic Branch
AMC	Atlantic Marine Center
AOML	Atlantic Oceanographic and Meteorological Laboratory
APR	Air Photo Revision/Correction
AWOIS	Automated Wreck and Obstruction Information System
BNM	Broadcast Notice to Mariners
BD	Bottom Drag
BH	NOAA R/V <i>Bay Hydrographer</i>
BH2	NOAA R/V <i>Bay Hydro II</i>
BP	Blueprint
BGE	Barge
BS <sup>3</sup>	Bathymetric Swath Survey System
BW	Sinkings before World War II
BWF	British Wreck File
CAS	Chart Adequacy Survey (Chart Number)
CES	Chart Evaluation Survey (Chart Number)
CG	U.S. Coast Guard
CGO	Cargo
CHS	Canadian Hydrographic Service
CGS	U.S. Coast and Geodetic Survey
CMP	Chart Maintenance Print
CL	Chart Letter
COE	U.S. Army Corps of Engineers
CPR	Coast Pilot Report (Chart number, if given)
CPS	Canadian Power Squadron
CT	Constant Tension Wire Drag
D	Special Purpose Hydrographic, Reconnaissance, or Evaluation/Test Surveys (followed by survey number)
DA	NOAA Ship <i>Davidson</i>
BN	Daybeacon
DEG	Degrees
DI	Diver Investigation
DM	Daily Memorandum
DM	Digital Maps (Shoreline)
DP	Detached Position
DPH	Depth
DR	Descriptive Report
D/R	Drilling Rig

DTD	Dated
ED	Existence Doubtful
ENT	Entered
ES	Echo Sounder
ESF	Eastern Sea Frontier Anti-Submarine Warfare Unit
EVAL	Marine Center Evaluation (evaluation and analysis of hydrographic surveys)
FA	NOAA Ship <i>Fairweather</i>
F/B	Fireboat
FD	Effective Depth (Used in conjunction with wire drag)
FE	Field Examination (followed by a number) - usually item investigations
FH	NOAA Ship <i>Ferdinand R. Hassler</i>
FM	Fathom
FS	Field Sheet
FT	Feet
F/V	Fishing Vessel
GCLWD	Gulf Coast Low Water Datum
GLWD	Great Lakes Water Datum
GP	Geographic Position
GT	Gross Tonnage
H	Hydrographic (Followed by Survey Number)
HE	NOAA Ship <i>Heck</i>
HYDRO	Hydrographer
H/B	House Boat
HDAPS	Hydrographic Data Acquisition and Processing System
HQ	Headquarters
HSD	Hydrographic Surveys Division
HW	High Water
HWL	High Water Line
IWW	Intracoastal Waterway
L	Length
LAT	Latitude
LD	Least Depth
LHNM	Lighthouse Notice to Mariners
LL	Leadline
LLW	Lower Low Water
LNM	Local Notice to Mariners
LOA	Length Overall
LONG	Longitude
LST	Landing Ship (Any Type)
LT	Light
LTR	Letter

LW	Low Water
LWD	Low Water Datum
LWL	Low Water Line
M	Meters; Miles
MAR	Monthly Activities Report
MCD	Marine Chart Division
MI	NOAA Ship <i>Mt. Mitchell</i>
MIN	Minutes or Minimum
MHW	Mean High Water Datum
MLW	Mean Low Water Datum
MLLW	Mean Lower Low Water Datum
M/V	Motor Vessel
NAD	North American Datum (followed by year)
NANCI	New Aeronautical and Nautical Charting Information
NAS	Navigable Area Survey
NAVOCEANO	U.S. Naval Oceanographic Office
ND-HQ	Naval District Headquarters
NF	NOAA Ship <i>Nancy Foster</i>
NM	Notice to Mariners; Nautical Miles
NMFS	National Marine Fisheries Service
NMR	Restricted Notice to Mariners,
NORDA	U.S. Naval Ocean Research and Development Activity
NOS	National Ocean Service
NRT	Navigation Response Team
NT	Net Tonnage
NTH	Notes to Hydrographer
OBSTR	Obstruction
O/B	Outboard
OCGR	Old Coast Guard Records
OPR	Operation (Followed by Project No.)
OTEC	Ocean Thermal Energy Conversion
PA	Position Approximate
P/C	Pleasure Craft
PD	Position Doubtful
PE	NOAA Ship Peirce
PHB	Pacific Hydrographic Branch
PIDC	Pleasure Island Dive Center (Gulf Shores, AL)
PMC	Pacific Marine Center
PMEL	Pacific Marine Environmental Laboratory
PR	Preprocessing Report
PROJ	Project
PSR	Presurvey Review(Followed by Project No.)



QC	Quality Control Inspection
RA	NOAA Ship <i>Rainier</i>
RCNWL	Royal Canadian Navy Wreck List
RECON	Reconnaissance
REG NO	Registry Number of Survey
REP	Report or Reported
RS	Revisory Survey (followed by year)
R/V	Research Vessel
REV	Review; Reviewed; Revised; Revision
RU	NOAA Ship <i>Rude</i>
S	Special Project (followed by Project Number)
SCH	Schooner
SD	Sounding Datum; Salvage Documentation
SEC	Seconds
SHL	Shoal
SHL SNDG	Shoal Sounding
SPOR	Shoreline Plane of Reference (High Water Line)
SR	Survivor Reports
SS	Smooth Hydrographic Sheet
SSS	Side Scan Sonar
S2	200 percent Side Scan Sonar Coverage
S4	400 percent Side Scan Sonar Coverage
SUBM	Submarine or Submerged
S/V	Sailing Vessel
T	Topographic (followed by survey number, photo date, and field edit date)
TP	Shoreline Map (followed by number, photo date, and field edit date)
T/B	Tugboat
TELECON	Telephone Conversation
TJ	NOAA Ship <i>Thomas Jefferson</i>
TNK	Tanker
TWR	Trawler
UP	Updated
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USC&GS	U.S. Coast and Geodetic Survey
USCGAUX	U.S. Coast Guard Auxiliary
USGS	U.S. Geological Survey
USN	U.S. Navy
USPS	U.S. Power Squadrons
VIS	Visible
VS	Visual Search
W	Wide

WD	Wire Drag
WH	NOAA Ship <i>Whiting</i>
WK	Wreck
YCT	Yacht