

Paper for Consideration by DQWG

NOAA's internal guidance on the use of CATZOC on ENC's

Submitted by:	USA
Executive Summary:	Solicitation of feedback on NOAA's CATZOC encoding project.
Related Documents:	S-57
Related Projects:	S-101

Introduction / Background

NOAA is currently in the middle of a large project to populate CATZOC for all M_Quals for our entire suite of 1220 ENC's. The purpose of this paper is to share the standards and rules that we are using during this project in order to get feedback and guidance from the DQWG.

Analysis/Discussion

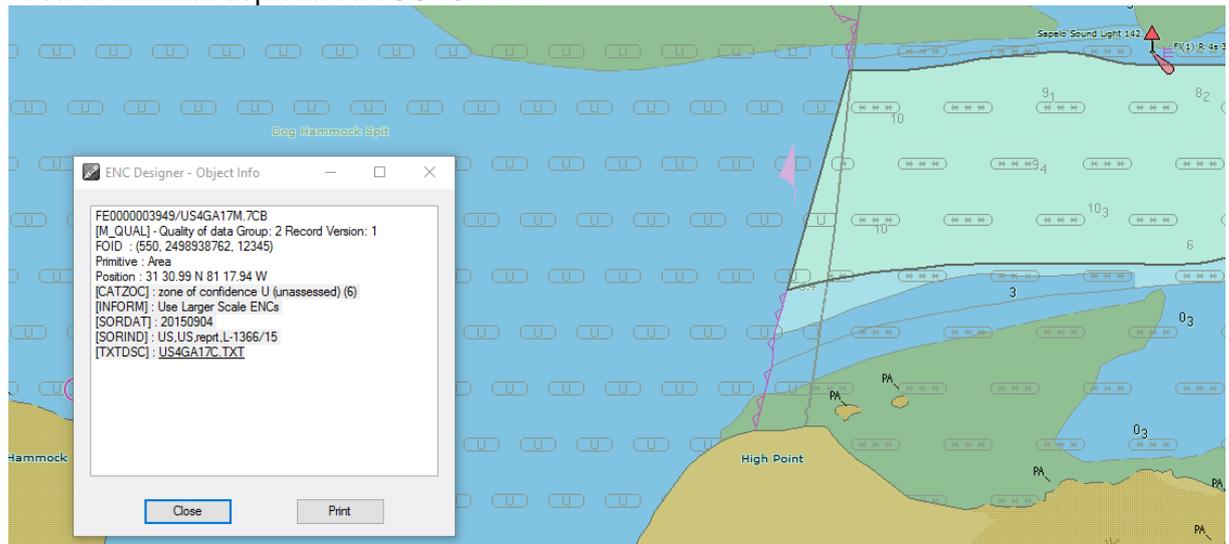
ENCs being encoded with CATZOC (CATZOC encoding other than U)

CATZOC is being populated on all ENC's regardless of usage band. Usage band 6, 5, and 4 will have complete CATZOC populations. Polygons will be generalized appropriately from usage band 6 to 4.

Usage bands 3 through 1 will have full CATZOC population with the exception of the areas that are covered by larger scale ENC's. These areas that are covered by larger scale ENC's will have an M_Qual object with the following attribution: CATZOC = zone of confidence U (unassessed) (6), INFORM = Use larger scale ENC's for data quality information.

Areas that have minimal depiction on usage band 4 ENC's will have the same attribution as above.

Area of minimal depiction on US4GA17M



TXTDSC on all M_Qual objects.

All M_Qual objects will be linked to an external text description with the following text:

CAUTION - QUALITY OF BATHYMETRIC DATA

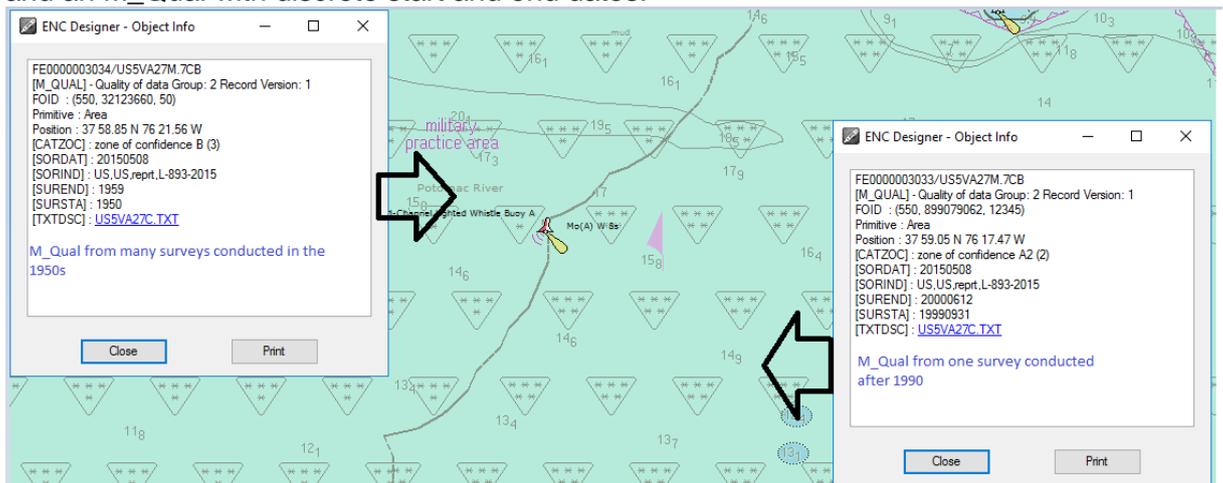
The areas represented by the object M_QUAL (Quality of Data) are approximate due to generalizing for clarity. Caution is advised, particularly for nearshore navigation or voyage planning. M_QUAL represents areas of uniform quality of bathymetric data. The CATZOC (Category of Zone of Confidence in Data) attribute of M_QUAL provides an assessment of the overall zone of confidence.

NOAA is having discussions on whether to move this note from being linked to each individual M_Qual object to linking it only to the M_NPUB object for the ENC.

General rules for charting M_Qual object from surveys and the rules on classifying surveys into a CATZOC values.

Surveys conducted in the same decade will be grouped together if they share a common geometry and have the same CATZOC value. For example, two surveys that are adjoining with one conducted in 1954 and the other conducted in 1956 will be grouped together into one M_Qual object and be given a survey start date of 1950 and a survey end date of 1959. Surveys conducted after 1990 will generally be given one M_Qual object and given discrete start and end dates.

An Area on ENC US5VA27M with M_Qual objects with grouped start and end dates and an M_Qual with discrete start and end dates.



The following are general rules for classifying surveys conducted by NOAA and its predecessor The Office of Coast and Geodetic survey:

Type Survey or Dates of Survey	CATZOC
Complete multibeam coverage	1 (A1)
200% side scan with concurrent "skunk stripe" multibeam bathymetry and developments	1 (A1)
100% side scan with complete multibeam coverage	1 (A1)
Side scan sonar surveys with no multibeam developments	2 (A2)
Bathymetric Lidar surveys	3 (B)
Single beam nearshore surveys (1:40,000 scale or larger) since 1940	3 (B)
Offshore single beam surveys since	4 (C)

1940	
1920-1940 surveys on known horizontal and vertical datums	4 (C)
Pre-1940 surveys with unknown horizontal or vertical datums	5 (D)
All surveys pre-1920	5 (D)

Degradation of CATZOC value due to the passage of time

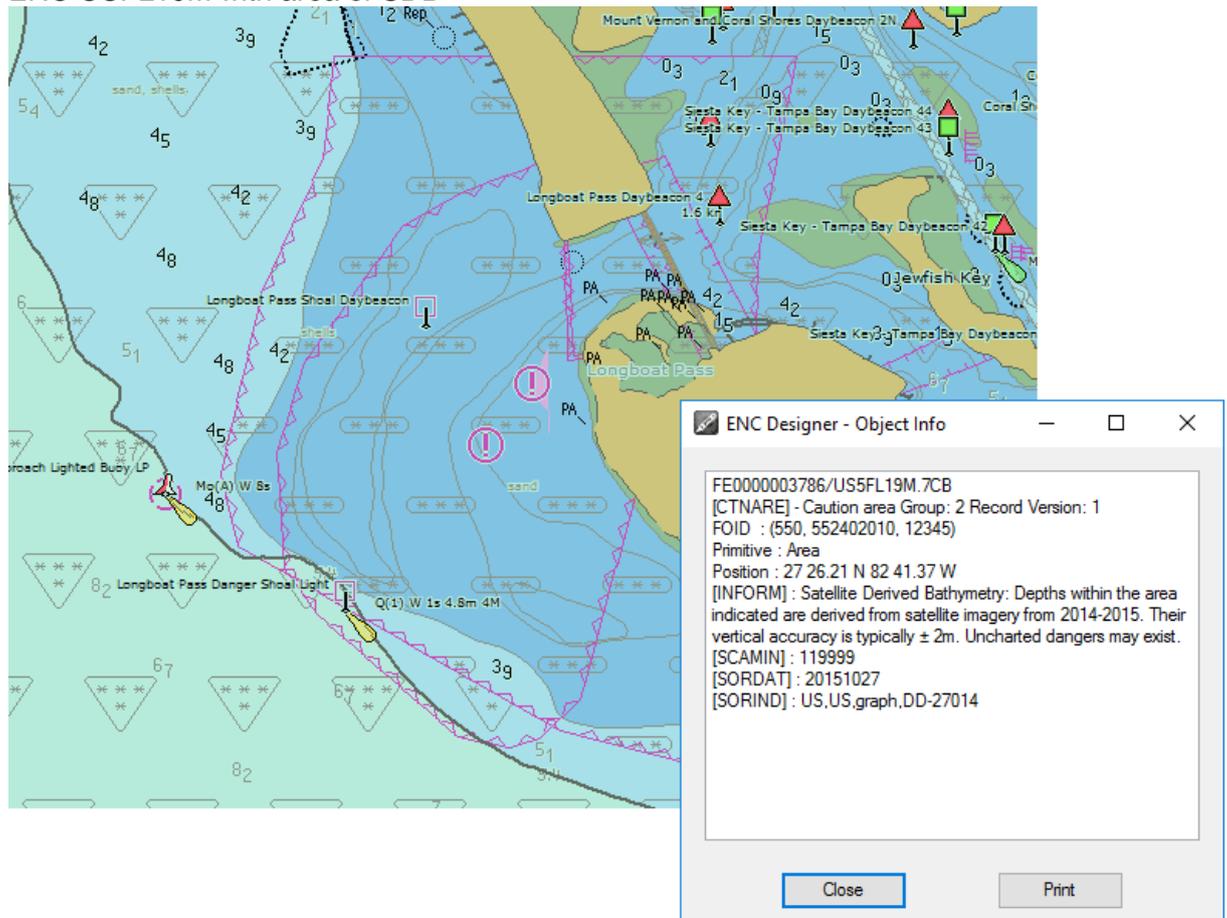
At this time, we do not downgrade our CATZOC values due to the passage of time. There are some cases of ENC's on our east coast that have M_Qual objects with CATZOC = A1 and with survey dates of the 1990s.

Encoding a Satellite Derived Bathymetry (SDB)

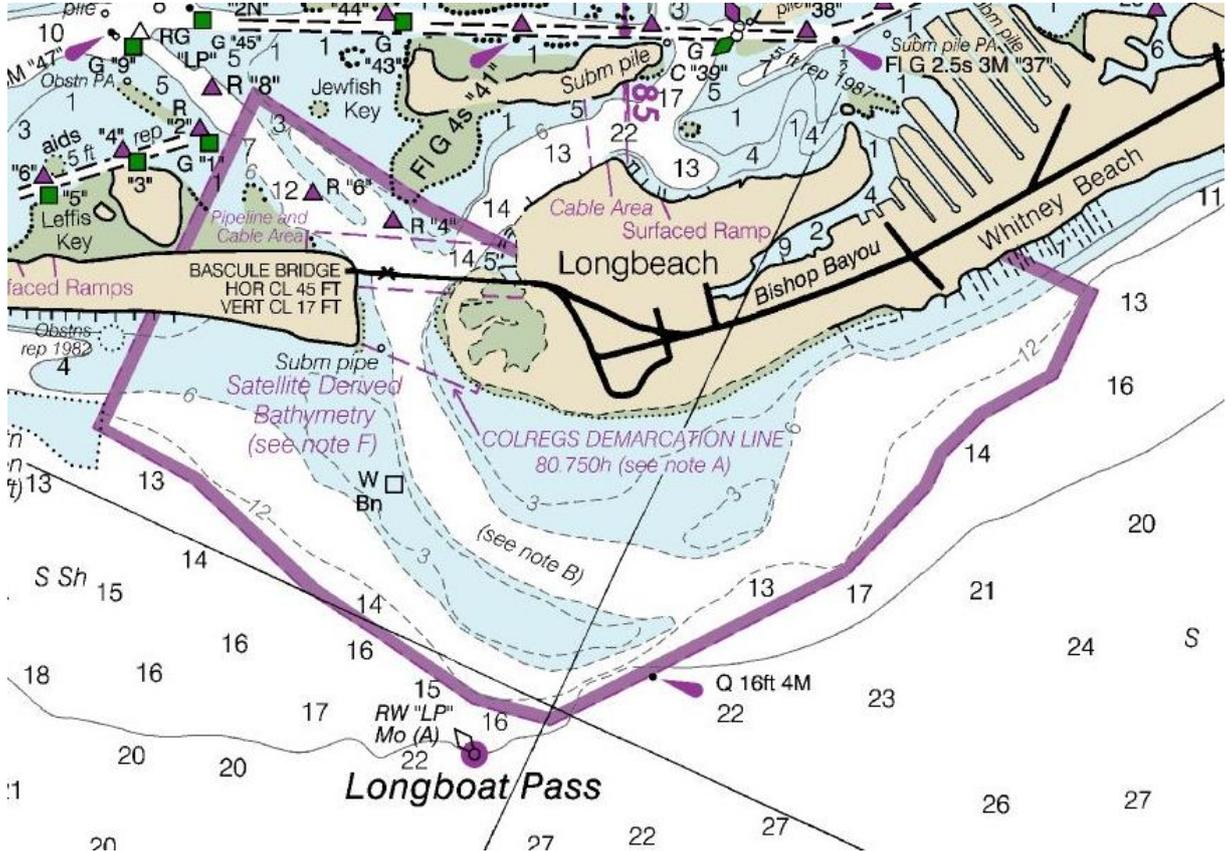
Satellite Derived Bathymetry is categorized as CATZOC = C, technique of sounding encoded as satellite imagery and survey start and end dates are simply given as years. A caution area object is also encoded coincidentally with the M_Qual object with the INFORM = *Satellite Derived Bathymetry: Depths within the area indicated are derived from satellite imagery from 2014-2015. Their vertical accuracy is typically ± 2m. Uncharted dangers may exist.*

Soundings are typically not charted and approximate depth contours are used.

ENC USFL19M with area of SDB



RNC 11425 of same area with SDB



Encoding of LIDAR

Bathymetric LIDAR is encoded with a CATZOC = B.

Technique of Sounding

With the exception of satellite derived bathymetry we do not encode the attribute technique of sounding on any of our M_Qual objects.

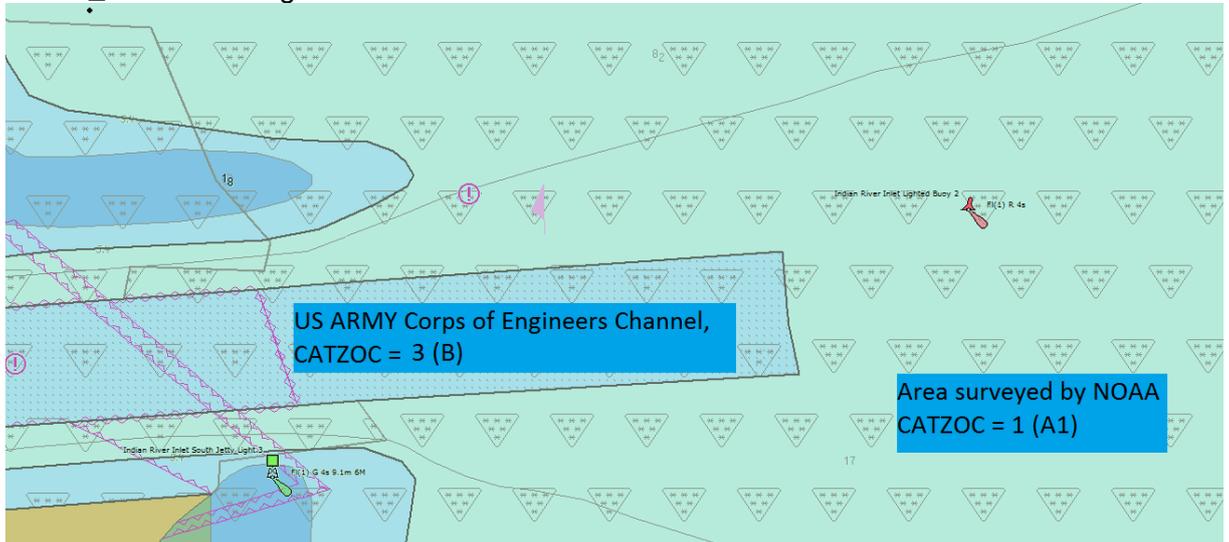
Encoding of Maintained Channels (Dredged Areas)

The United States Army Corps of Engineers is responsible for maintaining channels in the United States. They are also responsible for surveying these channels. NOAA periodically surveys these channels as a byproduct of a survey being geographically close to a channel. The NOAA survey information in these cases is only ever used when depths found in the channels are above the maintained depth.

The surveys conducted by the US Army Corps of Engineers of the channels are conducted to confirm that they are maintaining the authorized depth for the channel. The surveys are also used to show sediment movement as well as set up dredging operations. The surveys do not accomplish any type of full bottom coverage or object detection.

Because of this NOAA encodes all channels in the United States with CATZOC = B. This often creates a unique situation where a ship will leave an area of CATZOC = A1 and enter an area with CATZOC = B simply by entering the channel.

The M_Qual encoding of the Indian River inlet channel on ENC US5DE10M



Unsurveyed areas

When NOAA started this project unsurveyed areas were encoded as CATZOC = U. Recently we have changed that policy to have unsurveyed areas encoded CATZOC = D.

Areas with soundings but no record of any hydrographic survey

In a few occasions, we will have no record of any hydrographic survey but soundings exist on the chart. In these cases we encoding CATZOC = D.

Conclusions

The CATZOC project is well underway at NOAA and we anticipate having all ENCs encoded with meaningful CATZOC within two years. Any feedback or criticism would be greatly appreciated.

Recommendations

Please provide feedback, criticisms and any recommendations you feel are appropriate.

Action Required of DQWG

The DQWG is invited to:

- note and discuss on this paper
- provide feedback