

W00486

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service

DESCRIPTIVE REPORT

Type of Survey: Support USCG

Registry Number: W00486

LOCALITY

State(s): Massachusetts

General Locality: Massachusetts Coastline

Sub-locality: Duxbury to Hull

2007

CHIEF OF PARTY
USGS

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

W00486

INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State(s): **Massachusetts**

General Locality: **Massachusetts Coastline**

Sub-Locality: **Duxbury to Hull**

Scale: **10000**

Dates of Survey: **08/04/2006 to 05/02/2007**

Instructions Dated: **N/A**

Project Number: **ESD-PHB-19**

Field Unit: **USGS - RV Megan T. Miller and RV Rafael**

Chief of Party: **USGS**

Soundings by: **(SEA) SwathPlus (interferometric sonar system)**

Imagery by: **Klein 3000 (dual-frequency sidescan sonar)**

Verification by: **Pacific Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

Remarks:

USGS survey record: Open-File Report 2009-1072

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>.

DESCRIPTIVE REPORT MEMO

January 21, 2020

MEMORANDUM FOR: Pacific Hydrographic Branch

FROM: Report prepared by PHB on behalf of field unit
Annie Raymond
Physical Scientist, NOAA/NOS/OCS

SUBJECT: Submission of Survey W00486

The U.S. Geological Survey (USGS) and the Massachusetts Office of Coastal Zone Management (CZM) have cooperated to map approximately 200 km² of the Massachusetts inner continental shelf between Duxbury and Hull. This report contains geophysical and geological data collected by the USGS on three cruises between 2006 and 2007. The geophysical data include (1) swath bathymetry from interferometric sonar and multibeam echosounders, (2) acoustic backscatter from sidescan sonar and multibeam echosounders, and (3) subsurface stratigraphy and structure from seismic-reflection profilers. These spatial data support research on the influence sea-level change and sediment supply have on coastal evolution, and on efforts to understand the type, distribution, and quality of subtidal marine habitats in the Massachusetts coastal ocean.

The USGS survey party developed chart-datum bathymetric grids (5m) from an interferometric sonar and acoustic backscatter mosaics from a SSS sonar.

All soundings were reduced to Mean Lower Low Water using Constant Separation. The horizontal datum for this project is North American Datum of 1983 (NAD 83). The projection used for this project is Universal Transverse Mercator (UTM) Zone 19.

Navigation was based on a Real-Time Kinematic Global Positioning System (RT-GPS). The RTcorrected GS signal was sent to the ship from a base station established by the USES on land. Soundings were referenced to MLLW using orthometric to chart datum offsets obtained from NOAA Tidal Station #8446009 at Brant Rock Harbor, MA.

All survey systems and methods utilized during this survey were as described in USGS Open-File Report 2009-1072, "Geophysical and Sampling Data from the Inner Continental Shelf: Duxbury to Hull, Massachusetts "

All data were reviewed for DTONs and none were identified in this survey.

USGS acquired the data outlined in this report acquired the data outlined in this report. Data are available at https://pubs.usgs.gov/of/2009/1072/title_page.html

USGS performed an iterative interpolation process in order to create a more seamless grid without visible data gaps. For charting purposes it is preferable to use un-interpolated surfaces that preserve data gaps, particularly over shoal areas. An un-interpolated surface (SouthShore_June23) was located in the data provided and was used as the basis for further review and to create archival and charting products under the W00486 label.

The USGS made surfaces originally included data from NOAA survey H10993. This data was removed from the bathymetric surfaces for archival but was utilized to review and evaluate the data for charting purposes. A surface comparison was performed between the un-interpolated USGS surface and the archived NCEI surface for H10993 which showed good agreement. See Surface comparison results below.

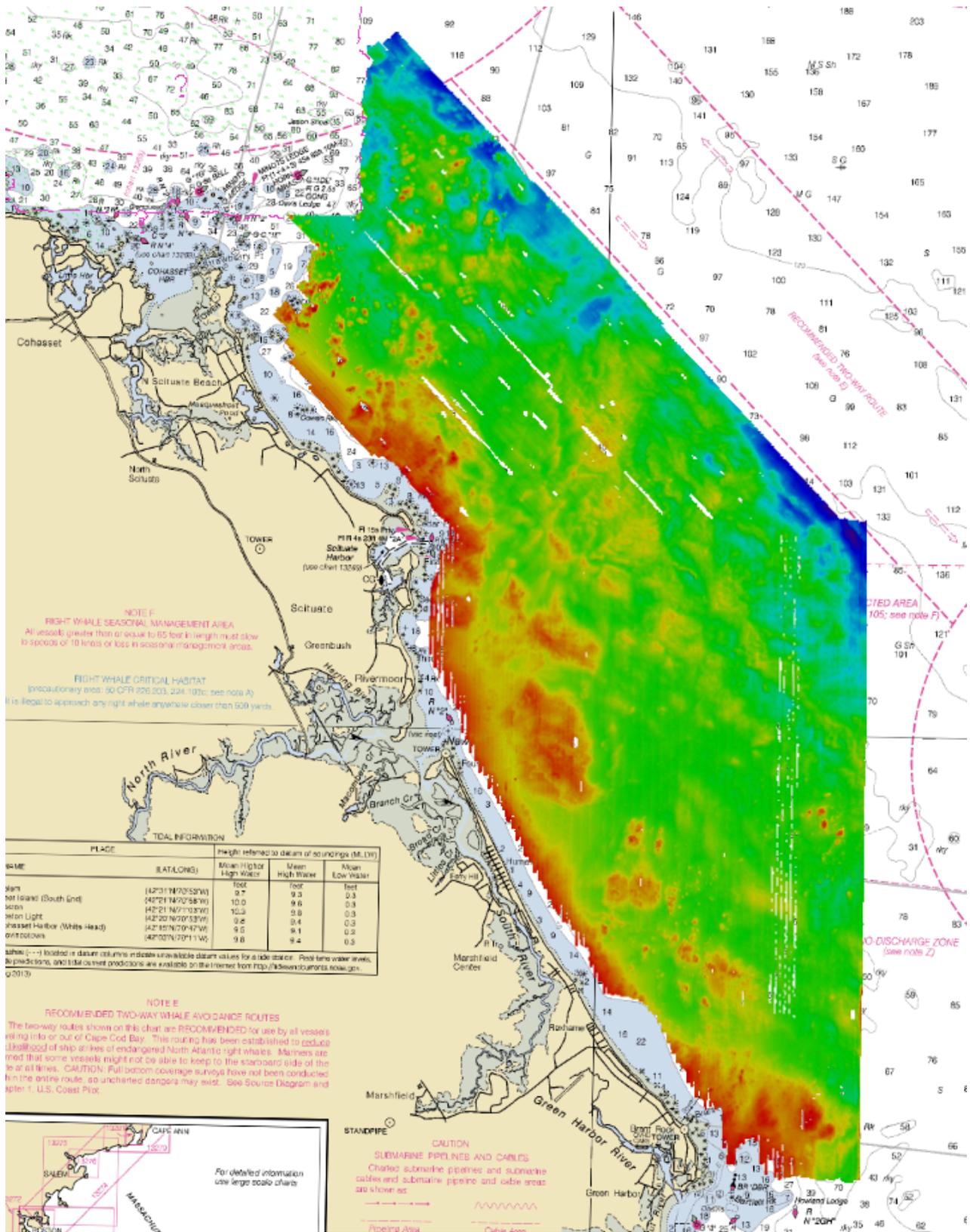


Figure 1: USGS Survey Coverage excluding data from NOAA survey H10993.

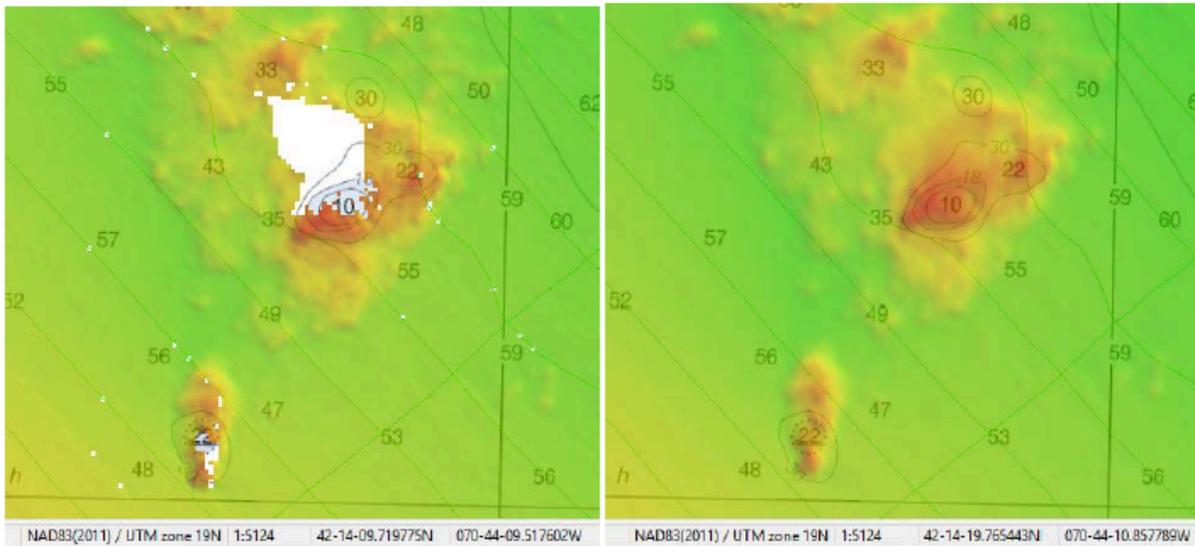


Figure 2: Data gap over shoal features in the Uninterpolated surface (L) and interpolated surface (R)

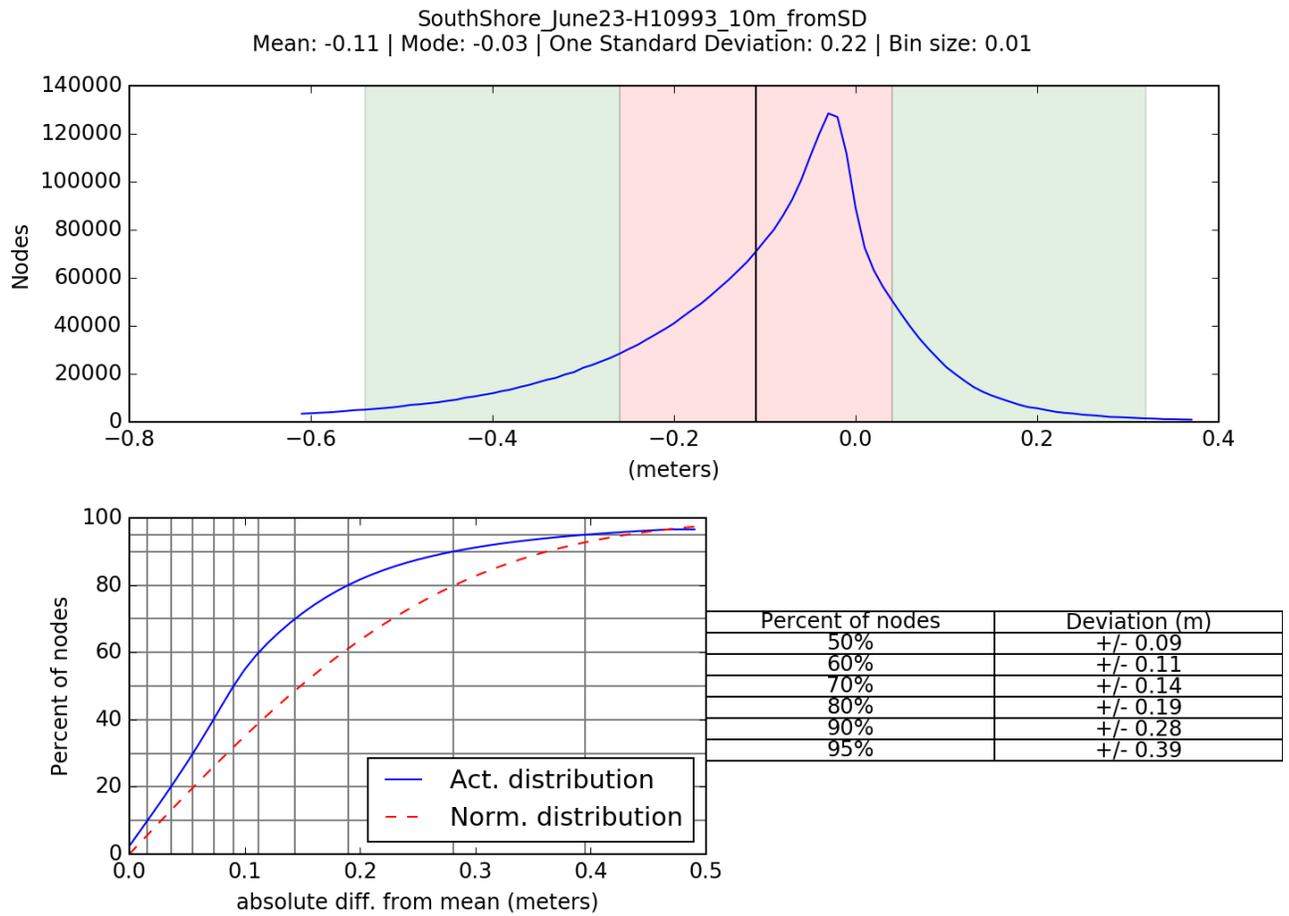


Figure 3: QC Tools surface comparison results between un-interpolated USGS surface 'SouthShore_Jun23' and archived H10993 10m surface.

The survey is partially adequate to supersede previous data. Sounding data from W00486 should be considered better than soundings from partial bottom NOS surveys from between 1940 and 1990. Sounding data from W00486 should not be considered better than soundings from modern, full-coverage. The reviewer recommends that all charted features not specifically addressed in the feature file be retained.

APPROVAL PAGE

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Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NCEI for archive

- Descriptive Report
- Bathymetric Attributed Grid
- Processed survey data and records
- GeoPDF of survey products

The survey evaluation and verification has been conducted according current OCS Specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: _____

Commander Olivia Hauser, NOAA
Chief, Pacific Hydrographic Branch