

**W00483**

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: W00483

**LOCALITY**

State(s): Massachusetts

General Locality: Massachusetts Coastline

Sub-locality: Nahant to Gloucester

**2003**

CHIEF OF PARTY  
USGS

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**W00483**

**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: **Nahant to Gloucester**

Scale: **10000**

Dates of Survey: **09/24/2003 to 05/08/2004**

Instructions Dated: **N/A**

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

Field Unit: **USGS**

Chief of Party: **USGS**

Soundings by: **SEA Submatrix 2000 (Interferometric)**

Imagery by: **N/A**

Verification by: **Pacific Hydrographic Branch**

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

**Remarks:**

*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 <http://www.ncei.noaa.gov/>.*

## DESCRIPTIVE REPORT MEMO

January 24, 2020

**MEMORANDUM FOR:** Pacific Hydrographic Branch

**FROM:** Report prepared by PHB on behalf of field unit  
Adam Argento  
Physical Scientist, Pacific Hydrographic Branch

**SUBJECT:** Submission of Survey W00483

The U.S. Geological Survey (USGS) and the Massachusetts Office of Coastal Zone Management (CZM) have cooperated to map approximately 480 km<sup>2</sup> of the inner continental shelf in northern Cape Cod Bay Massachusetts. This report contains geophysical and sampling data collected by the USGS during five research cruises between 2006 and 2008. The geophysical data include (1) swath bathymetry from interferometric sonar, (2) acoustic backscatter from interferometric and sidescan sonars, and (3) subsurface stratigraphy and structure from seismic-reflection profilers. The seafloor sampling data include sediment samples, photographs, and videos. These spatial data support research on the influence that sea-level change and sediment supply have on coastal evolution and help identify the type, distribution, and quality of subtidal marine habitats within the coastal zone of Massachusetts.

The USGS survey party developed chart-datum bathymetric grids (5m) from an interferometric 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.

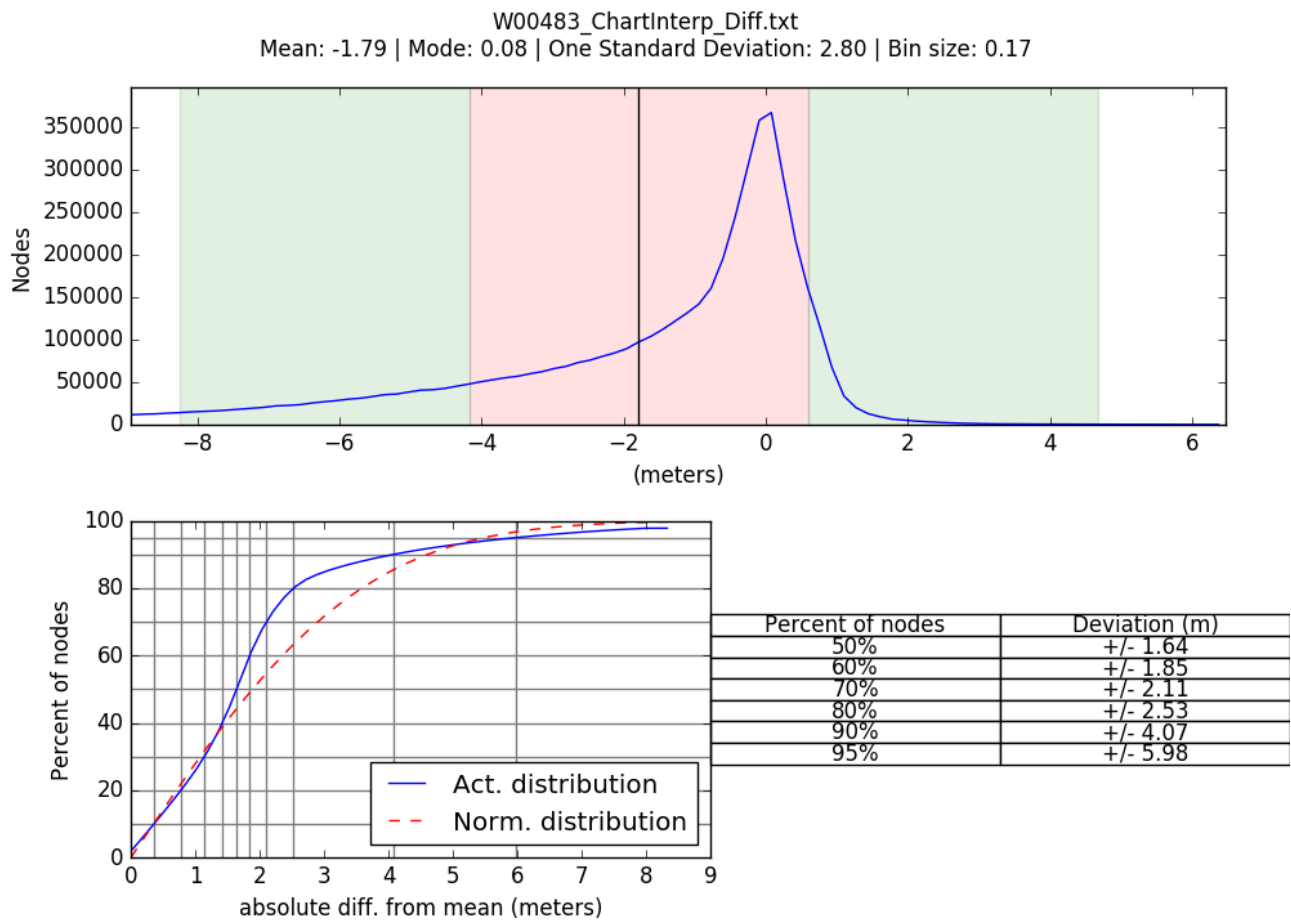
Survey soundings were collected to the Ellipse using realtime GNSS correctors, then reduced to MLLW based on the MTL-MLLW corrector value at the Gloucester Harbor, MA tide gauge (8441841)

All survey systems and methods utilized during this survey were as described in the Geophysical and Sampling Data from the Inner Continental Shelf: Nahant to Gloucester, Massachusetts document.

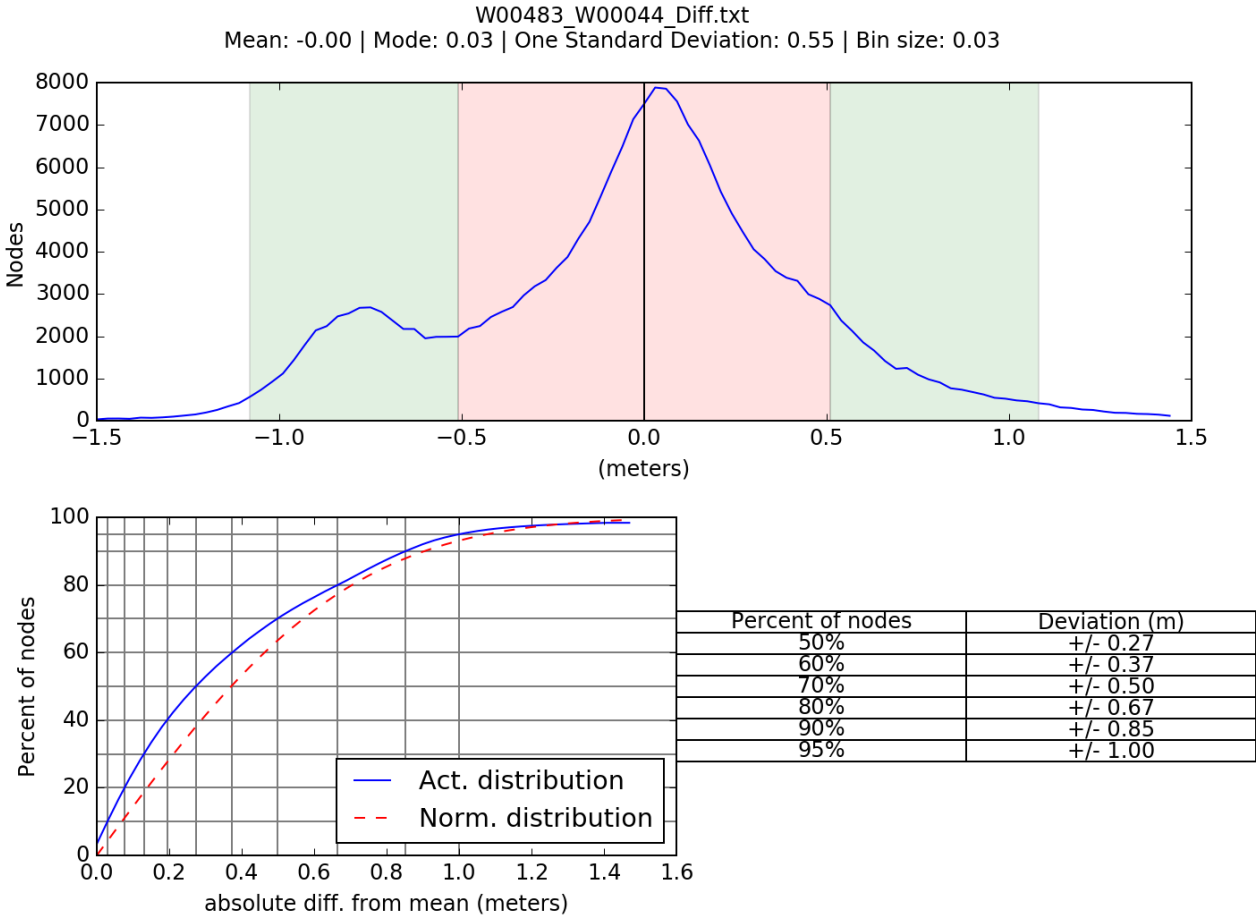
All data were reviewed for DTONs and none were identified in this survey.

USGS acquired the data outlined in this report. Data are available at <https://cmgds.marine.usgs.gov/publications/of2005-1293/html/appendix1.html>

The coverage and technology of the USGS survey is superior to what is charted, but the surveyed depths average 3m deeper than what is charted. A junction comparison with TJ survey W00044 (2003) shows that W00483 (2003) depths are 1.4m deeper, on average, than W00044. As a result of changing policies, the surface of W00483 was normalized - shifted vertically by 1.4m - to best match overlapping TJ data. The W00483 bathymetric surface can no longer be used as a reference surface for normalizing other bathymetry.



*Charted depths agree, by mode, with normalized W00483 depths*



*W00044 TJ depths agree, by mode and mean, with normalized W00483 depths*

The survey is partially adequate to supersede previous data. This is an area of critical under keel clearance, and depth accuracy is a matter of mariner safety. The surveyed area encompasses all approaches to Salem harbor, is rocky, and contains numerous shallow soundings. At a grid resolution of 5m and in waters shallower than 20m, this survey is rated CATZOC C. Using this survey's data as a source of chart soundings will likely improve charted soundings, but uncertainty remains as to whether least depth soundings were adequately captured on seabed features.

Crosslines from a supporting survey should cover the extents to verify W00483's bathymetry, or a full survey capable of CATZOC A1 vertical uncertainty should be conducted.

APPROVAL PAGE

W00483

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
- One Bathymetric Attributed Grid (BAGs)
- 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