

W00485

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

DESCRIPTIVE REPORT

Type of Survey: Support USGS

Registry Number: W00485

LOCALITY

State(s): Massachusetts

General Locality: Massachusetts Coastline

Sub-locality: South Shore of Martha's Vineyard

2007

CHIEF OF PARTY
USGS

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

W00485

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: **South Shore of Martha's Vineyard**

Scale: **10000**

Dates of Survey: **08/09/2007 to 08/13/2007**

Instructions Dated: **N/A**

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

Field Unit: **USGS - M/V Megan T. Miller**

Chief of Party: **USGS**

Soundings by: **SEA SwathPlus (Interferometric)**

Imagery by: **Klein 3000 (SSS)**

Verification by: **Pacific Hydrographic Branch**

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

Remarks:

The purpose of the this survey was to support research on the Quaternary evolution of coastal Massachusetts, the influence of sea-level change and sediment supply on coastal evolution, and efforts to understand the type, distribution, and quality of subtidal marine habitats in the coastal ocean of Massachusetts. 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

December 17, 2019

MEMORANDUM FOR: Pacific Hydrographic Branch

FROM: Report prepared by PHB on behalf of field unit
Laura Pagano
Physical Scientist, Pacific Hydrographic Branch

SUBJECT: Submission of Survey W00485

The U.S. Geological Survey Woods Hole Science Center conducted a nearshore geophysical survey offshore of the southern coast of Martha's Vineyard, in the vicinity of the Martha's Vineyard Coastal Observatory in 2007. This mapping program was part of a larger research effort supporting the Office of Naval Research Ripples Directed-Research Initiative studies at Martha's Vineyard Coastal Observatory designed to improve our understanding of coastal sediment-transport processes. The study area covers 35 square kilometers from about 0.2 kilometers to 5 kilometers offshore of the south shore of Martha's Vineyard, and ranges in depth from ~6 to 24 meters. The geophysical mapping utilized the following suite of high-resolution instrumentation to map the surficial sediment distribution, bathymetry, and sub-surface geology: a dual-frequency 100/500 kilohertz sidescan-sonar system, 234 kilohertz interferometric sonar, and 500 hertz -12 kilohertz chirp subbottom profiler. These geophysical data will be used to provide initial conditions for wave and circulation modeling within the study area

The USGS survey party developed a chart-datum bathymetric grid (2m) from an interferometric sonar and acoustic backscatter mosaic (50cm) 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.

Two Differential Global Positioning System (DGPS) navigation was used to determine horizontal positioning. Swath bathymetric data were referenced to a local vertical datum at the Woods Hole Oceanographic Institute (WHOI) Martha's Vineyard Coastal Observatory (MVCO). MVCO maintains an instrumented node at a depth of 12m that records a variety of oceanographic data including water level heights above the node. Recorded oscillation of the water level above the node was used to reference the bathymetric data. These data are not tied into any chart datum (that is, Mean Lower Low Water) but, rather, represent a long-term mean water depth directly above the MVCO node. This local vertical reference system was chosen as the vertical datum because several datasets, all relative to the MVCO node, will be utilized in oceanographic modeling.

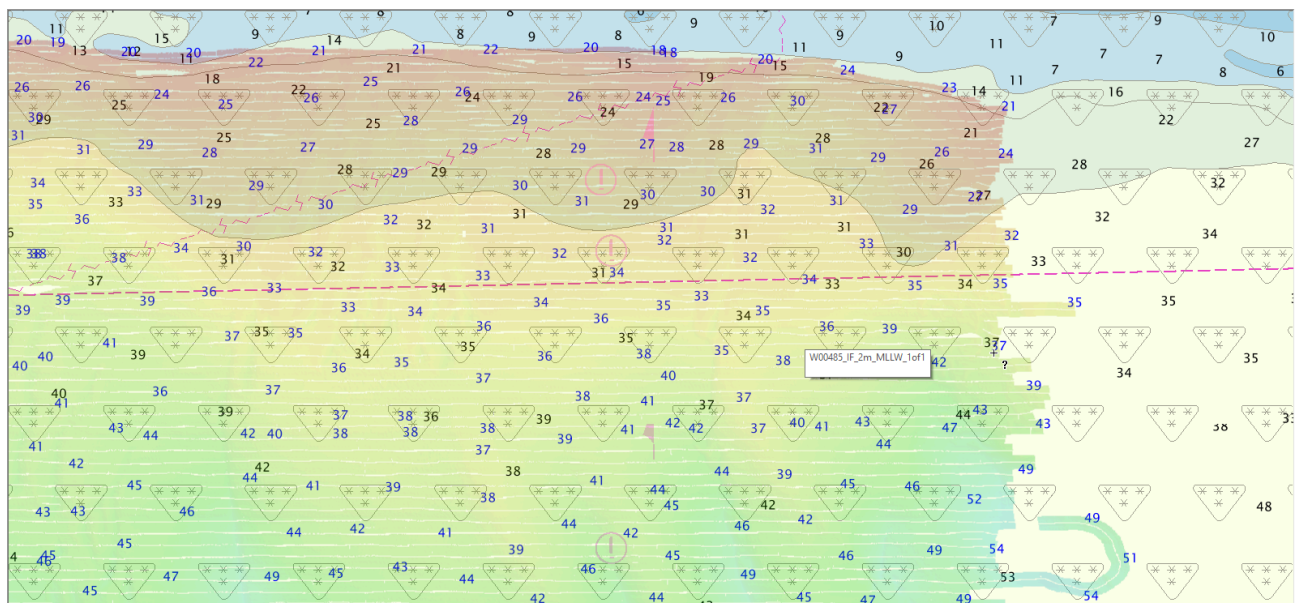
All survey systems and methods utilized during this survey were as described in U.S. Geological Survey Open-File Report 2008-1288, "Geophysical Data Collected off the South Shore of Martha's Vineyard, Massachusetts".

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://pubs.usgs.gov/of/2008/1288/index.html>

USGS Open-File Report 2008-1288 states that the data was not reduced to chart datum. All soundings used a LVRS (local vertical reference system) from MVCO and are approximately 80cm deeper than the soundings in junction survey W00488 (a USGS-MLLW survey). In accordance with the External Source Data Vertical Alignment Process, a static offset of -80cm (positive is down) was applied to the surface to bring data closer to MLLW.

Once the vertical transformation was applied to the surface, a comparison between charted soundings from ENC's US5MA21M and US5MA29M and survey soundings from W00485 was conducted. The comparison showed a general agreement within approximately one to two meters (1-2m). Although in the northern portion of the survey, closer to the shoreline, W00485 soundings trend a bit deeper than the charted soundings. Additionally W00485 depth grids were compared with the more recently acquired surveys from the USGS survey W00488 (2013) and the NOAA Ship Ferdinand Hassler (2015) and showed good agreement (+/-50cm) with those surveys south of Martha's Vineyard.



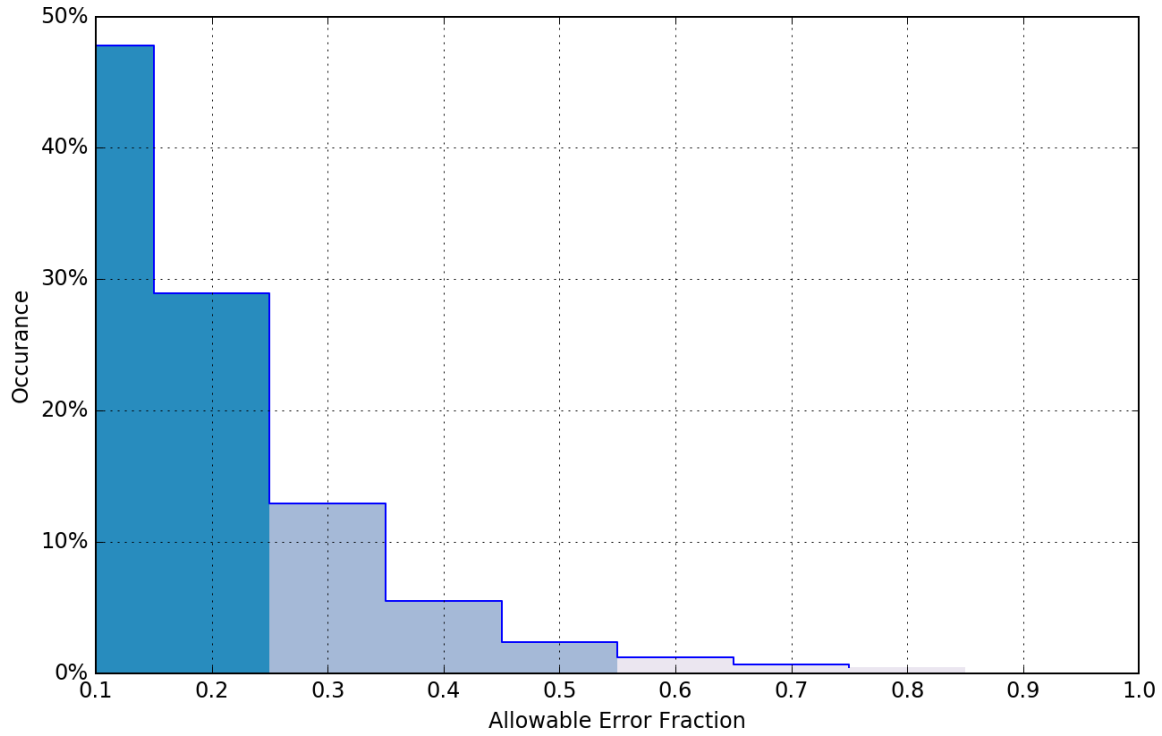
NE portion of survey area. 2007 surveyed soundings in blue compared with ENC's US5MA21M and US5MA29M charted soundings in black. More modern survey soundings trend deeper in the northern area that is closer to the shoreline. Soundings above are shown in feet.

Comparison Distribution

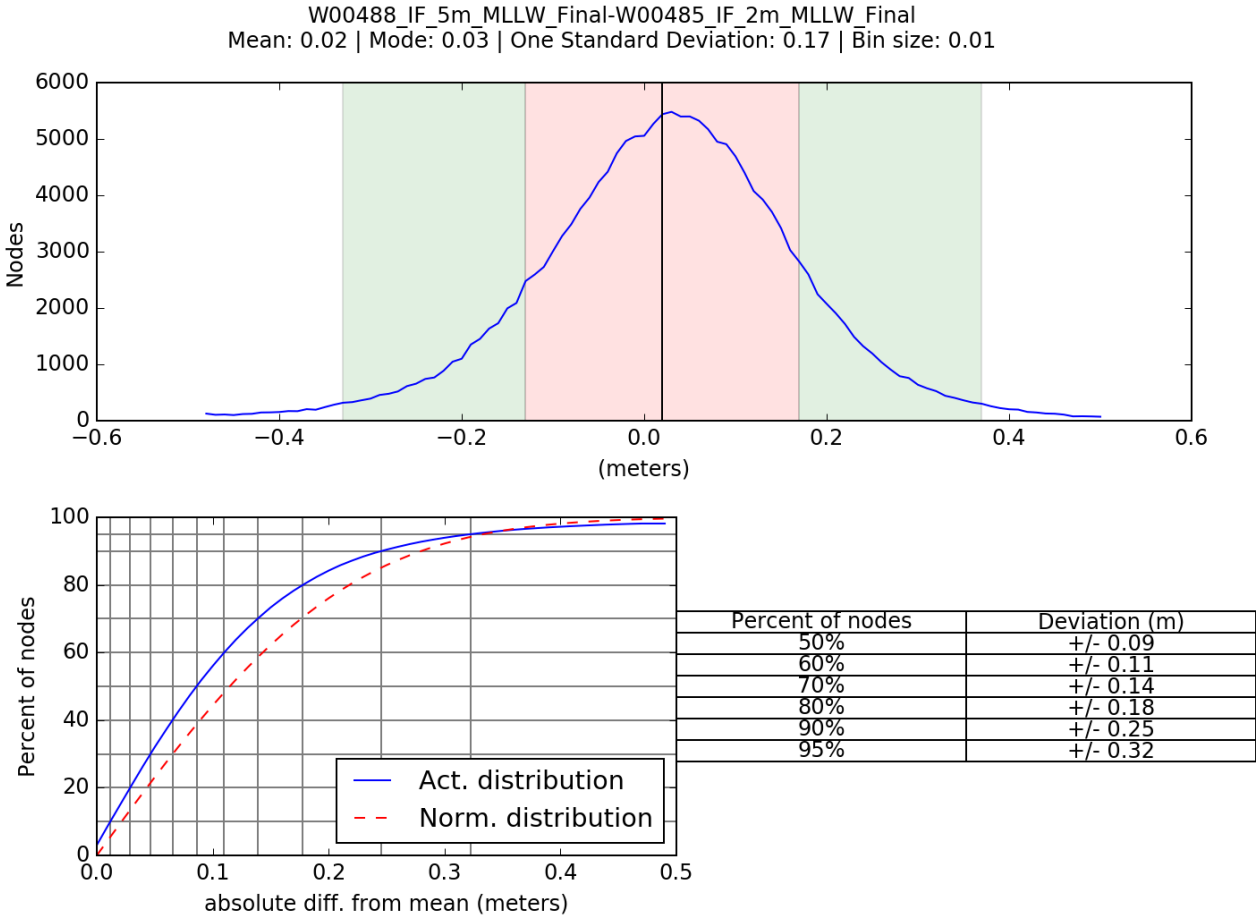
Per Grid: W00488_IF_5m_MLLW_Final-W00485_IF_2m_MLLW_Final_fracAllowErr.csar

99.5+% nodes pass (178300), min=0.0, mode=0.1 mean=0.2 max=2.4

Percentiles: 2.5%=0.0, Q1=0.1, median=0.1, Q3=0.2, 97.5%=0.6



W00485 comparison with USGS survey W00488 (2013).



W00485 comparison with USGS survey W00488 (2013).

The survey is partially adequate to supersede previous data. Sounding data from W00485 should be considered better than soundings from partial bottom NOS surveys from between 1900 and 1965. Sounding data from W00485 should not be considered better than soundings from modern, full-coverage. The reviewer recommends that all charted features be retained.

Since the W00485 gridded surface was normalized against authoritative bathymetry, W00485 bathymetry is no longer eligible to be used as authoritative bathymetry for normalization.

APPROVAL PAGE

W00485

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
- Collection of Bathymetric Attributed Grids (BAGs)
- Collection of backscatter mosaics
- 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