

W00467

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: W00467

**LOCALITY**

State(s): California

General Locality: Channel Islands, California

Sub-locality: San Nicolas Island

**2012**

CHIEF OF PARTY  
Pat Iampietro

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**W00467**

**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): **California**

General Locality: **Channel Islands, California**

Sub-Locality: **San Nicolas Island**

Scale: **40000**

Dates of Survey: **08/14/2012 to 11/05/2012**

Instructions Dated: **09/27/2019**

Project Number: **ESD-PHB-18**

Field Unit: **Seafloor Mapping Lab, California State University Monterey Bay**

Chief of Party: **Pat Iampietro**

Soundings by: **Reson SeaBat 7125 (MBES) Reson SeaBat 7111 (MBES) SwathPlus 4**

Imagery by:

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

September 27, 2019

**MEMORANDUM FOR:** Pacific Hydrographic Branch

**FROM:** Report prepared by PHB on behalf of field unit  
Pat Iampietro  
Chief Hydrographer, Seafloor Mapping Lab at California State  
University Monterey Bay

**SUBJECT:** Submission of Survey W00467

Marine data offered here represent a mapping efforts providing the Range Sustainability Office of NAVAIR with a delineation of benthic habitats around San Nicolas Island (SNI). This information is intended to help meet the requirements of the 2010 Naval Base Ventura County SNI Integrated Natural Resources Management Plan and to support NAVAIR in its role as steward of natural resources in the Pt. Mugu Sea Range controlled by the U.S. Navy. Understanding the types, locations, and relative abundance of various hard and soft bottom habitats is necessary both to monitor and manage marine species in the Sea Range and to plan and execute key littoral training and testing events. To support this data products are developed specifically to provide information to NAVAIR on the distribution of SNI's benthic habitats necessary to the survival of a variety of marine species including fishes, invertebrates, and marine mammals, particularly the southern sea otter.

There were no products created for this survey.

All soundings were reduced to Mean Lower Low Water using VDatum. 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 11.

This material is based on high-frequency GPS CORS base station services provided by the UNAVCO Facility with support from the National Science Foundation and NASA under NSF Cooperative Agreement No. EAR-0735156. Real-time vessel navigation was via an Applanix POS/MV 320 v4 system with input from a Cnav® enabled NAVCON 2050 GPS. Vessel attitude (motion), delayed heave and position data were logged at 200 Hz using an Applanix POS/MV 320 v4 system enabled for dual frequency L1/L2 GPS.

Applanix POSPAC software (version 4.31) was used to process the logged POS M/V files and create a Smoothed Best Estimated Trajectory (SBET) composed of an integrated inertial/GPS solution for use in horizontal and vertical positioning of sounding data. Realtime navigation

and vertical motion information recorded in HDCS (Hydrographic Data Cleaning System) format survey data were replaced with post-processed IAPPK (Inertially Aided Post-Processed Kinematic) data imported from SBET files. Navigation data were imported at 10Hz, while heave/vertical position data were imported as GPSHeights at 50Hz. The 50Hz GPSHeight data, which incorporated vertical motion due to both high-frequency (heave) as well as lower-frequency (tidal) oscillations, was used to compute a GPSTide model that references all soundings to NAVD88 (Geoid03) orthometric heights using the appropriate g2003xxx.bin file acquired from the National Geodetic Survey ([http://www.ngs.noaa.gov/PC\\_PROD/GEOID03/index.shtml](http://www.ngs.noaa.gov/PC_PROD/GEOID03/index.shtml)).

GPS base stations used in POSPAC post-processing are as follows:

Reference Station Name Source UNAVCO

Website <http://facility.unavco.org/data/data.html> Base data file name 4819188p.08o

Base data file date JD188 2008

Solution source NOAA NGS OPUS

Website <http://www.ngs.noaa.gov/OPUS/> Reference Frame NAD\_83(CORS96)  
(EPOCH:2002.0000)

Solution reference point antenna phase center Antenna height (m) 0 Latitude 33 26 48.05038

Longitude 118 28 45.18043 Ellipsoid height (m) 36.979(m)

Reference Station Name Source UNAVCO

Website <http://facility.unavco.org/data/data.html>

Base data file name 48191890.08o

Base data file date JD189 2008

Solution source NOAA NGS OPUS

Website <http://www.ngs.noaa.gov/OPUS/> Reference Frame NAD\_83(CORS96)  
(EPOCH:2002.0000)

Solution reference point antenna phase center Antenna height (m) 0 Latitude 33 26 48.05023

Longitude 118 28 45.18016 Ellipsoid height (m) 36.999(m)  $\pm 2$  m horizontal, but varies with depth.

Upon delivery to the Pacific Hydrographic Branch, ASCII files were reduced to MLLW via VDatum.

MBES data were acquired using a combination of sonars (200 KHz/ 400 KHz Reson 7125-SV2, 100 KHz Reson Seabat 7111) collected aboard the RV Harold Heath by the Seafloor Mapping Lab at California State University Monterey Bay. Prior to data collection, a series of planned survey lines were created using the survey navigation and planning software HYPACK (Hypack, Inc). An Applanix Position and Orientation System, Marine Vessel (POS MV 320 v4) system was used to provide position and attitude data during data collection and accounted for vessel motion such as heave, pitch, and roll (position accuracy  $\pm 2$ m, pitch, roll and heading accuracy  $\pm 0.02^\circ$ , heave accuracy  $\pm 5\%$  or 5cm). KGPS altitude data were used to account for tide cycle fluctuations and sound velocity profiles were collected with an AML Oceanographics SV+ sound velocimeter.

Onboard the RV KelpFly, the SwathPlus interferometric sidescan is capable of achieving a swath width to water depth ratio of up to 15:1 in water depths as shallow as 0.05m. This system is coupled with an Applanix WaveMaster POS MV for logging vessel and sensor position and attitude at 100 hz with attitude accuracies to  $\pm 0.02^\circ$ . Data are logged to the onboard SwathPlus Splash computer

with SwathProc software which is also used for survey navigation and sonar control. Sound velocity profiles are collected at intervals of 2 h or less using a YSI Castaway CTD.

Data acquisition, post-processing, and final products derived from multibeam bathymetry data were handled by the Seafloor Mapping Lab at CSUMB.

Bathymetric data were post-processed using CARIS HIPS hydrographic data cleaning system software. Applanix POSPAC software (v 5.3) was used to process the logged POS MV files and create a Smoothed Best Estimated Trajectory (SBET) composed of an integrated inertial/GPS solution for use in horizontal and vertical positioning of sounding data. Correction for vertical oscillation due to heave and tide was accomplished using these SBET files.

Final x,y,z soundings, surface models, and derived products are relative to the NAVD88 Geoid09 vertical datum. Raw Reson s7k survey data were converted to HDCS format within CARIS HIPS. Erroneous soundings were removed via basic filtering and detailed swath and subset cleaning; the remaining high-confidence soundings were used in surface model creation and final product generation. Cleaned soundings were used to create Combined Uncertainty and Bathymetry Estimator (CUBE) Surfaces at 2m, 5m, and 10m resolutions, depending on depth range. A 2m resolution surface was created for depths from 0-85m, 5m for depths 80-250m, and 10m for depths 230-maximum depth. Gridded cell values from the CUBE surfaces were exported as x,y,z ASCII text files, which were imported into Fledermaus AverageGridder as digital elevation model (DEM) grid(s).

The Fledermaus grids were exported as an ArcInfo ASCII raster files (.asc), which were imported into ArcGIS Spatial Analyst to generate 2m, 5m, and 10m bathymetry ArcInfo grids. The Spatial Analyst Surface Analysis tools were then used to produce hillshade and slope grids from the 2m (5m, 10m) bathymetry grid. Post-survey data cleaning, CUBE surface creation, and final products derived from post-processed multibeam bathymetry data were applied by the Seafloor Mapping Lab at CSUMB.

At the Pacific Hydrographic Branch, the ArcInfo ASCII raster files were imported into a .csar raster file and gridded at the stated resolutions (2m, 5m, 10m). These surfaces were then used for evaluation. In instances where fliers or erroneous data were discovered, the surface extract tool was used to remove the data from the surface.

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

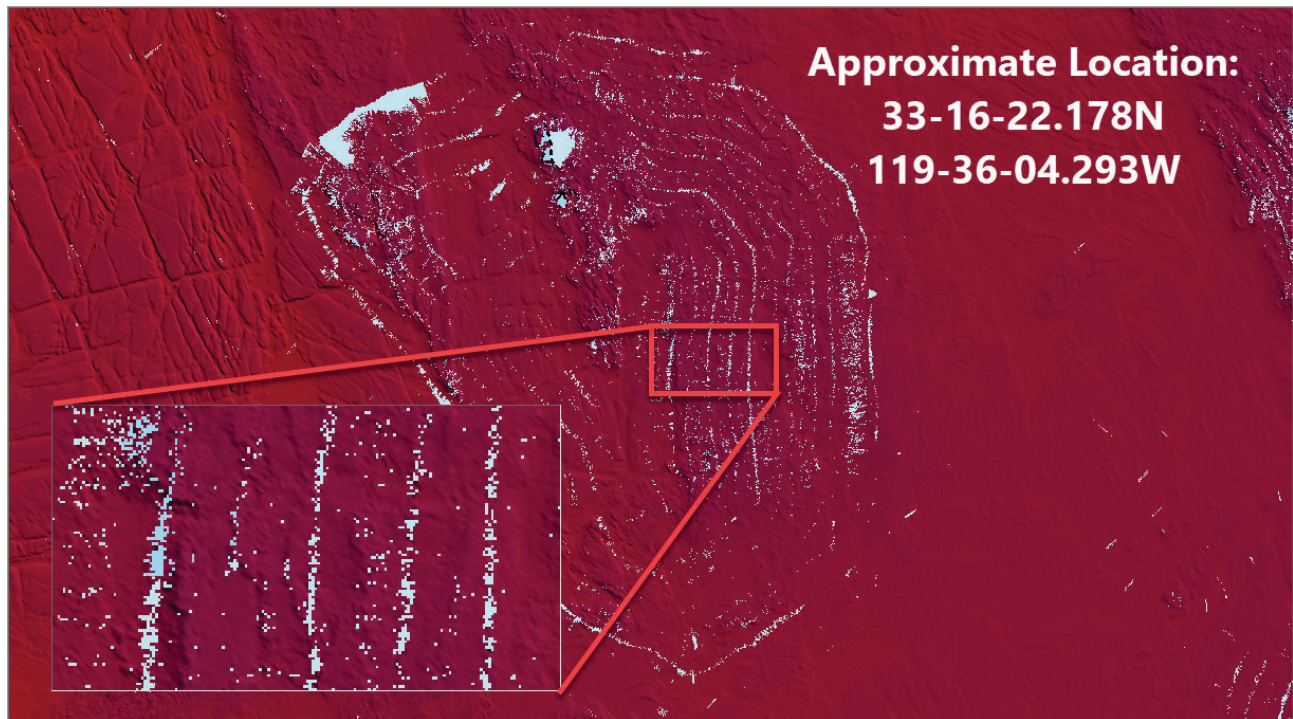
Seafloor Mapping Lab at California State University Monterey Bay acquired the data outlined in this report. Data are available at <https://seafloor.otterlabs.org/>

Gaps in data occur throughout the dataset. In areas in less than 15 meters of water depth, data gaps are due to a lack of density of the data collected by the sonar. This sparsity of the data makes it difficult to verify and update charted features.

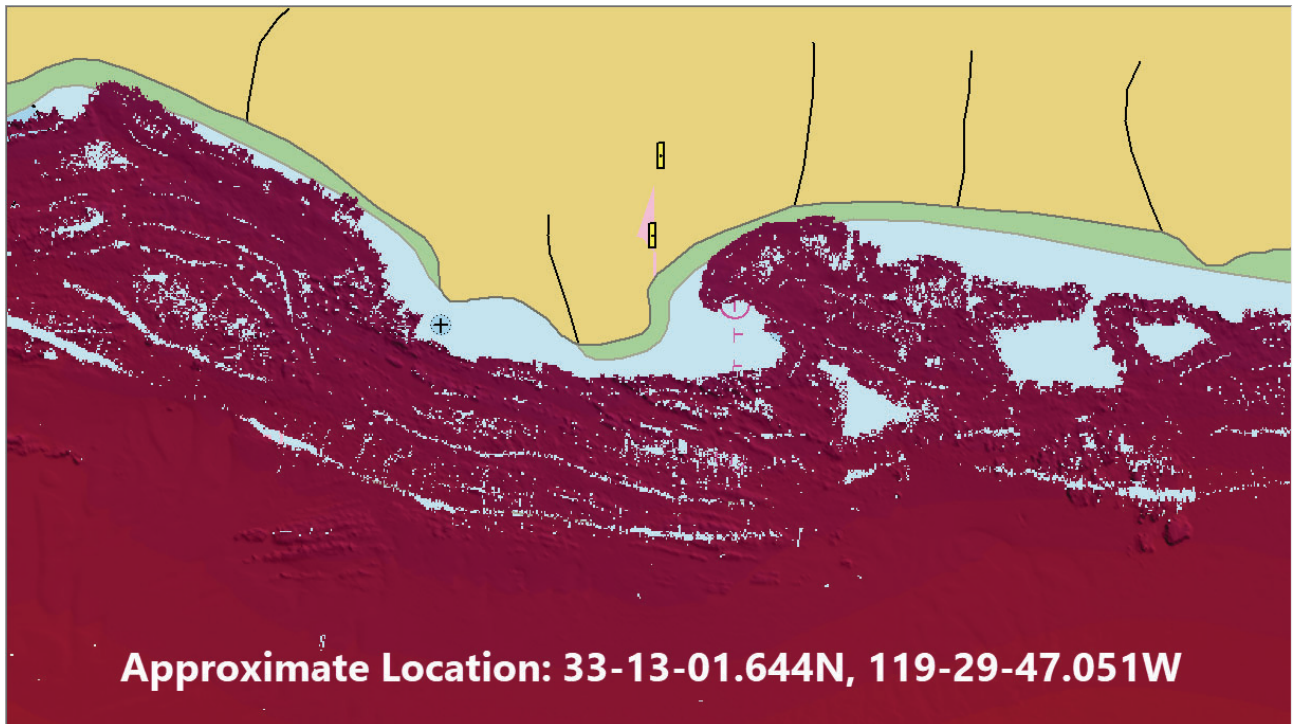
In general, the data shows very good internal consistency. It appears that the surface is free of fliers, though without the underlying HDCS data it is difficult to determine.

Flier finder and visual inspection of the surfaces were performed to search for fliers.

Many features were unaddressed. Due to the coarse resolution and low density of soundings in the shallow areas of this survey, and the lack of HDCS data, the reviewer was unable to disprove charted features. It is highly recommended to resurvey areas shallower than 20 meters and to perform feature disprovals.



*Example of sparse data in areas less than 15 meters water depth.*



*Example of sparse data in areas less than 15 meters.*

The survey is partially adequate to supersede previous data.

Due to the resolution of the data, it is recommended that this survey not supersede areas which that chart is shallower and where features exist.

APPROVAL PAGE

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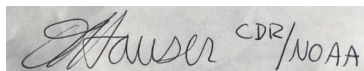
Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NCEI for archive

- Descriptive Report
- Collection of Bathymetric Attributed Grids (BAGs)
- 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.

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Handwritten signature of Olivia Hauser in cursive, with "CDR/NOAA" written in small text to the right of the signature.

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Approved: \_\_\_\_\_

**Commander Olivia Hauser, NOAA**

Chief, Pacific Hydrographic Branch