

D00267

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

DESCRIPTIVE REPORT

Type of Survey: Technological Development

Registry Number: D00267

LOCALITY

State(s): New York

General Locality: Burlington, Vermont to Plattsburgh, New York

Sub-locality: Lake Champlain

2018

CHIEF OF PARTY
Michael Annis

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

D00267

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): **New York**

General Locality: **Burlington, Vermont to Plattsburgh, New York**

Sub-Locality: **Lake Champlain**

Scale: **10000**

Dates of Survey: **05/16/2018 to 05/29/2018**

Instructions Dated: **08/14/2019**

Project Number: **S-A917-NRT5-18**

Field Unit: **NOAA Navigation Response Team - New London**

Chief of Party: **Michael Annis**

Soundings by: **Kongsberg Maritime EM 2040C (MBES)
 Picotech PicoMB-120SF (MBES)**

Imagery by: **N/A**

Verification by: **Pacific Hydrographic Branch**

Soundings Acquired in: **meters at Low Lake Level - Lake Champlain**

Remarks:

Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of survey data is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>. Products created during office processing were generated in NAD83 UTM 18N, Low Lake Level - Lake Champlain. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.

DESCRIPTIVE REPORT SUMMARY

A. Area Surveyed

This hydrographic survey was acquired in accordance with the requirements defined in the Project Instruction for S-A917-NRT5-18.

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
44° 58' 50.17" N 73° 22' 55.79" W	44° 33' 30.21" N 73° 12' 27.87" W

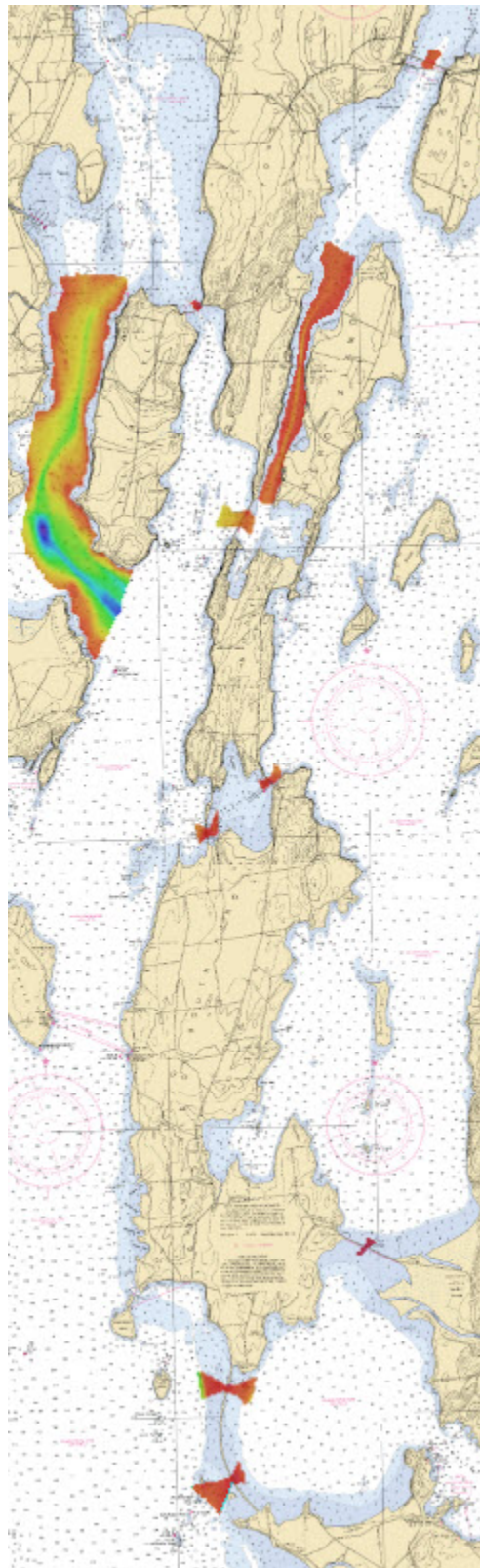


Figure 1: Overview of all areas surveyed on project.

B. Survey Purpose

The purpose of this survey was to collect general bathymetry for data sets to be interpreted by Great Lakes Environmental Research Laboratory for flood inundation modeling.

C. Intended Use of Survey

The survey is partially adequate to supersede previous data.

The survey was taken as an opportunity for a technological demonstration, testing, and shakedown of the Seafloor System Echoboat and accompanying sonars. Data were collected on the basis of time efficiency and greatest area of lake floor to be covered in the allowed project time frame. Data collection was not conducted with full FPM, or HSSD, guidelines with regards to coverage specifications. No Side Scan Sonar data were acquired to supplement the MBES data. Processing was conducted per HSSD and FPM multibeam processing guidelines. Testing and documentation collected at the time of the survey were done prior to and in an effort for HSTB sonar and vessel acceptance. It is the field units' recommendation that this survey not be used to supersede all previous data. Specific areas may be extracted for minimal chart updates, but this is recommended to be addressed by the processing branch and Marine Charting Division. The field unit suggests a full navigable survey be considered if the request and need for chart updating exists.

D. Data Acquisition and Processing

Please reference Data Acquisition and Processing Report S-A917-ASV007-18_DAPR and S-A917-NRT5-18_DAPR for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods.

During review, due to excessive fliers found in the grid in the outer beams of the MBES lines, a filter was applied to eliminate numerous edge fliers.

E. Uncertainty

ASV007 Echoboat, at the time, had a known issue with maintaining constant and accurate Surface Sound Velocity sampling. The cause of this was due to the design of the mounting brackets for the sonar systems. The design was such that an air bubble would form aft of the receiver head where the Valeport Mini SSVS is mounted. This was general created at deployment when lowering the vessel onto the water's surface, trapping air in this area. Rocking the vessel to "burp" the air bubble was the only mitigation to this effect, but never quite dispersed the air completely. While the vessel is being propelled light cavitation, or remnants of the initial air pocket would move across the sensors cause erratic SSVS sampling, then leading to improper beam forming at the transducer. If this occurred underway in the vessel's autonomous mode, there was no way to correct the issue. See images below for examples of both situations. This issue has been fixed since this data was collected.

Differences in depths between crosslines, and the two vessels, were calculated using the Difference Surface Tool in HIPS & SIPS 10.4.16. Statistics were computed for these surfaces, compared each other, and were found to be in agreement and within the allowable vertical uncertainty specified in the HSSD 2019 edition. Products from this computation were placed in the appendices of this report at NRT 1.3 : \S-A917-NRT5-18_Submission\F00721\Processed\Reports\Survey\Descriptive_Report\Appendices.

Surface Quality Control Statistics were created using Pydro v19.4 (10121)'s QC Tools for data density, TVU, and depth distribution. Products from this computation were placed in the appendices of this report at NRT 1.3 : \S-A917-NRT5-18_Submission\F00721\Processed\Reports\Survey\Descriptive_Report\Appendices.

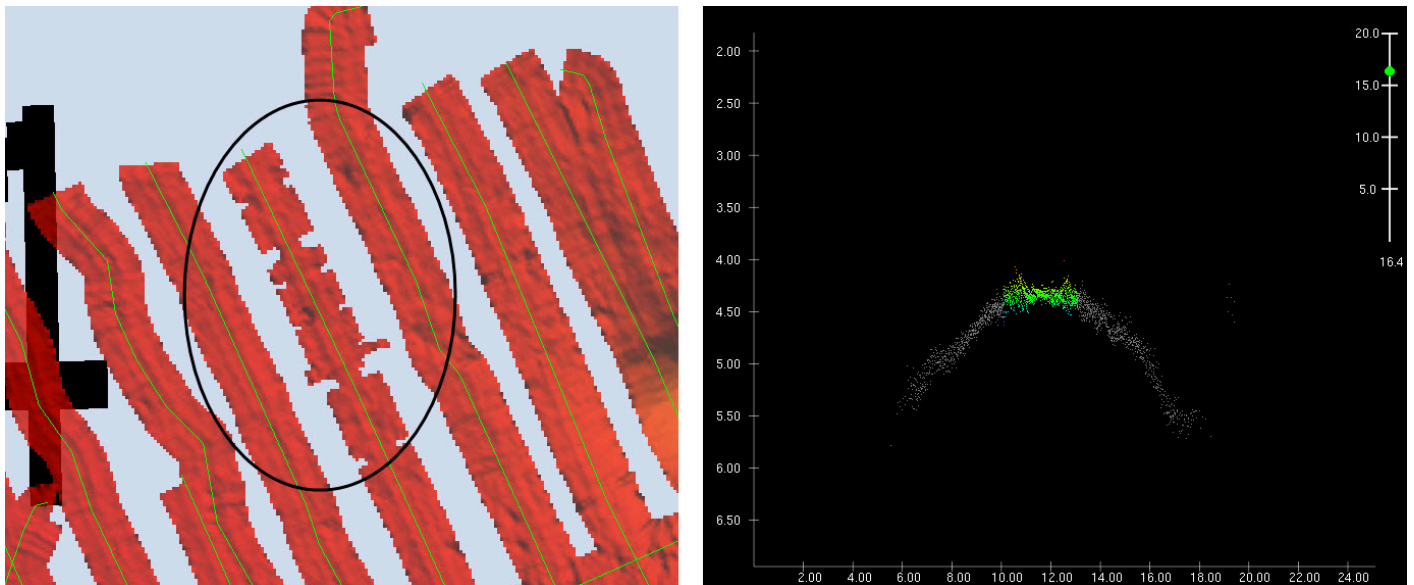


Figure 2: Bathymetry artifacts due to erratic surface sound velocity readings.

F. Results and Recommendations

The following are the largest scale ENC's, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date
US5VT01M	1:40000	10	10/17/2018	10/17/2018
US5VT02M	1:40000	5	12/10/2018	12/10/2018

The following surfaces and/or BAGs were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
F00721_MB_50cm_LLL_Final	CARIS Raster Surface (CUBE)	0.5 m	-1.3 m - 33.1 m	NOAA_0.5m	MBES Trackline

Large areas of lake floor were surveyed by S3007 alone, with MBES line spacing in Alburg Pass set at 100 meters, and the passage west of Isle Le Motte set at 200 meters. Line spacing was chosen at this range for time efficiency to cover as much of the lake floor in these two areas. The data collected at these sites are not recommended to be used for charting, but may be used as indicators for areas to be addressed in the future.

Small inlet points, or causeways, were surveyed by ASV007 and S3007 with MBES. The line spacing set for each of these locations was 25m. In some areas full MBES was achieved. In most, significant holidays do exist. It is in these areas data may be extracted for charting updates.

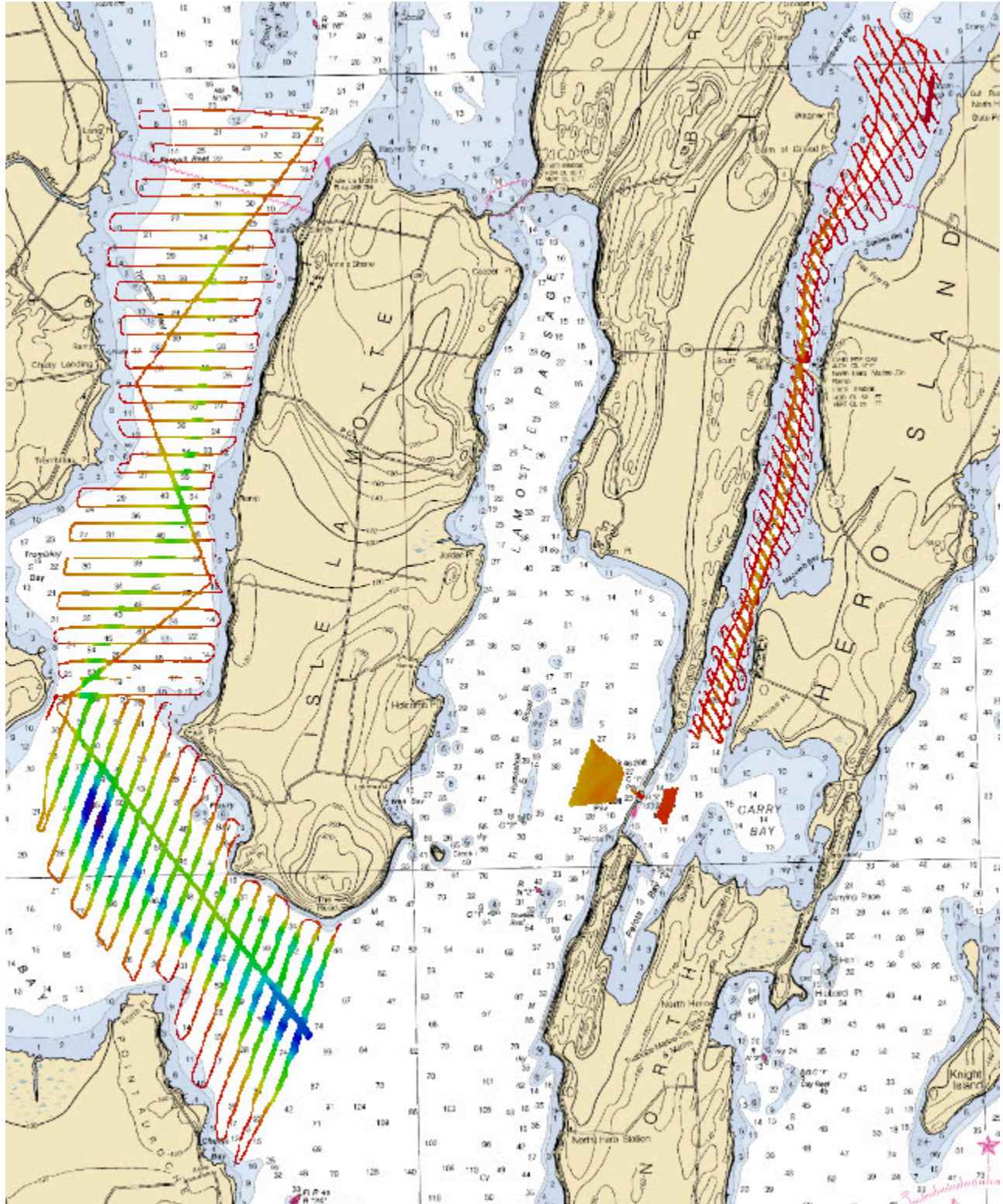


Figure 3: Overview of S3007 MBES data collected west of Isle La Motte and Alburg Passage. Line spacing ranging from 100m - 200m. XLs collected opportunistically.

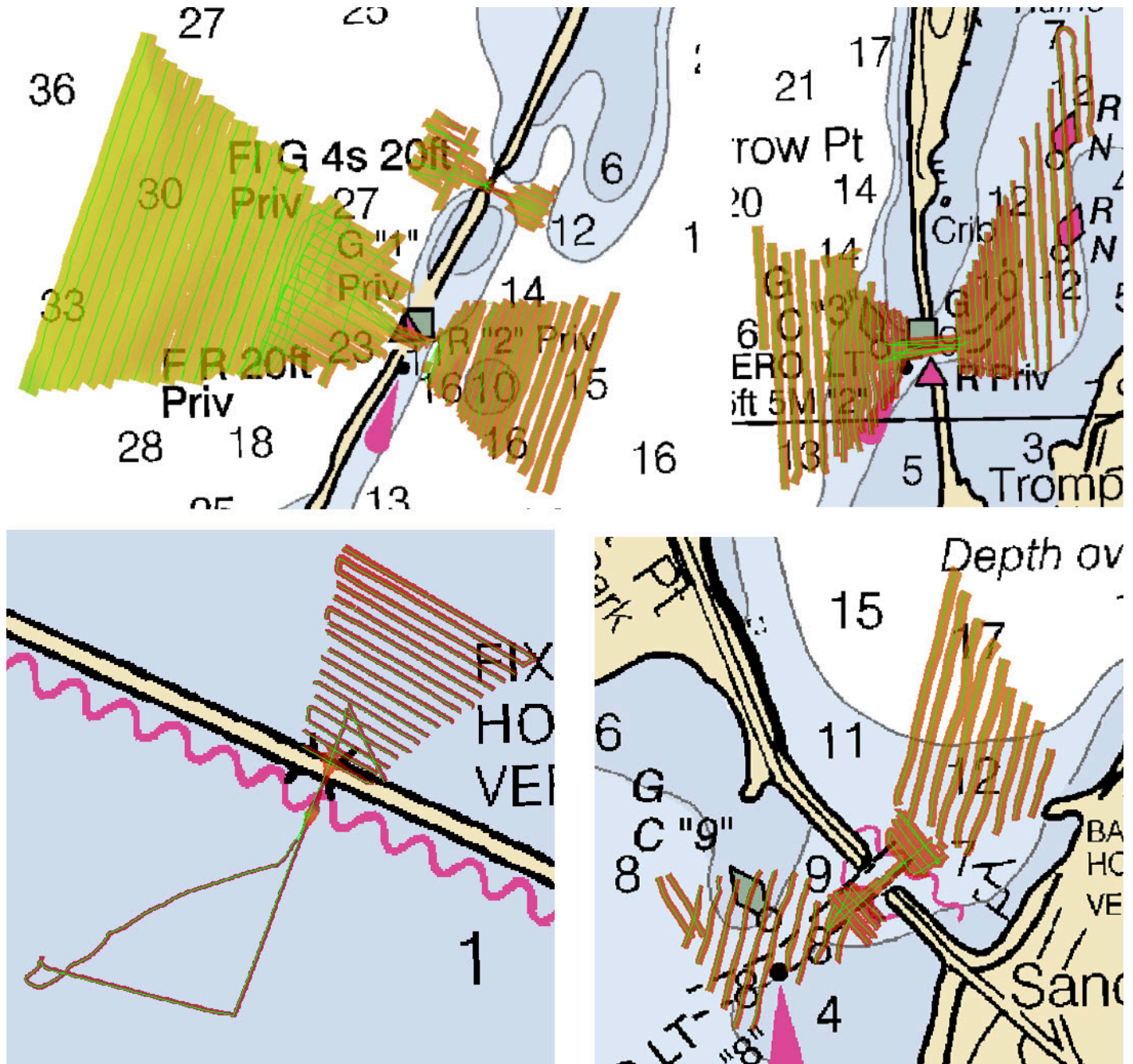


Figure 4: Areas displaying data collected by both ASV007 and S3007 at various causeways. Line spacing was kept at a static value. Note variations in coverage.

G. Vertical and Horizontal Control

The vertical datum for this project is Low Lake Level - Lake Champlain. The vertical control method used was 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 18.

H. Additional Results

Features


There were no features investigated or recorded.

I. Approval

As Chief of Party, field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Survey Summary Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

It is the field unit's recommendation that this survey not be used to supersede all previous data. Specific areas may be extracted for minimal chart updates, but this is recommended to be addressed by the processing branch and Marine Charting Division. The field unit suggests a Basic Hydrographic or Navigable Area Survey be considered.

Approver Name	Title	Date	Signature
Michael Annis	Physical Scientist	09/16/2019	 Digitally signed by ANNIS.MICHAEL.J.1021922974 Date: 2019.09.18 09:46:32 -04'00'
Alex Ligon	Physical Science Technician	09/16/2019	LIGON.ALEX.C.1061008507 Digitally signed by LIGON.ALEX.C.1061008507 Date: 2019.09.18 08:37:26 -05'00'

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)
- 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: _____

Peter Holmberg

Products Team Lead, Pacific Hydrographic Branch