

F00789

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: F00789

LOCALITY

State(s): California

General Locality: San Francisco Bay Vessel Traffic Services Area

Sub-locality: San Francisco Pier 80C

2019

CHIEF OF PARTY
CAPT Marc Moser

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

F00789

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: **San Francisco Bay Vessel Traffic Services Area**

Sub-Locality: **San Francisco Pier 80C**

Scale: **5000**

Dates of Survey: **10/25/2019 to 10/25/2019**

Instructions Dated: **08/20/2019**

Project Number: **S-L361-FA-19**

Field Unit: **NOAA Ship *Fairweather***

Chief of Party: **CAPT Marc Moser**

Soundings by: **Kongsberg Maritime EM 2040 (MBES)**

Imagery by: **Kongsberg Maritime EM 2040 (MBES Backscatter)**

Verification by: **Pacific Hydrographic Branch**

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

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 10N, MLLW. 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 OPR S-L361-FA-19. The survey area is located adjacent to Pier 80 near the mouth of Islais Creek Channel in the San Francisco Bay area. Coverage acquired in F00789 is shown in Figure 1 below.

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
37° 45' 39.72" N 122° 22' 31.06" W	37° 44' 22.57" N 122° 21' 43.49" W

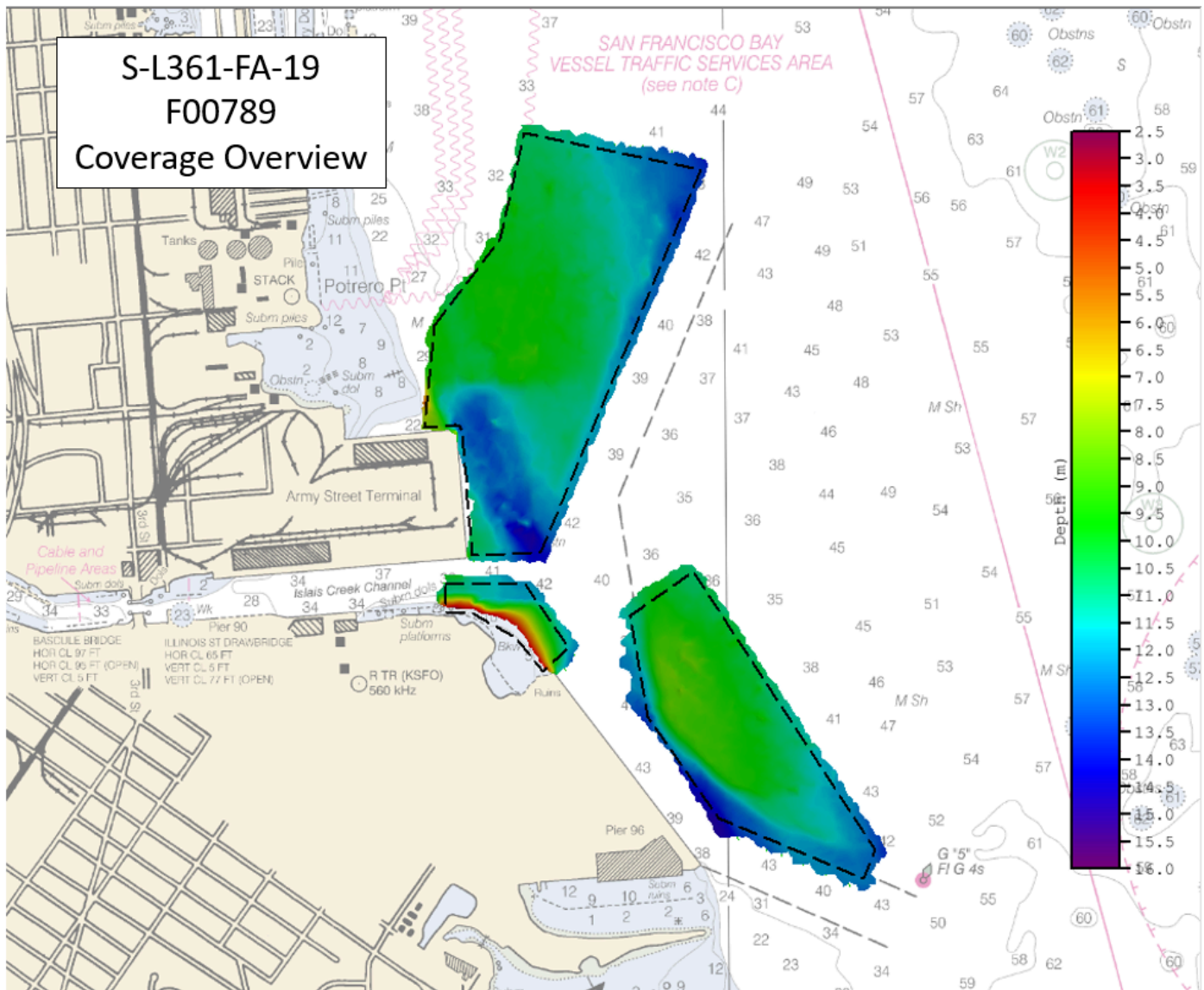


Figure 1: F00789 Coverage overlaid on chart 18650 with the sheet limits (in black)

B. Survey Purpose

Vessels carrying automobiles have recently started berthing at Pier 80C of in the Port of San Francisco. The survey area is an emerging request by the San Francisco Bay Pilots to verify the underkeel clearance for the approach to the pier. The new bathymetric data will enhance the safety of cargo traffic transiting to and from the pier.

C. Intended Use of Survey

The entire survey is adequate to supersede previous data.

Data acquired in F00789 meet multibeam echo sounder (MBES) coverage requirements for object detection coverage, as required by the HSSD.

D. Data Acquisition and Processing

Please reference Data Acquisition and Processing Report S-L361-FA-19 for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods.

E. Uncertainty

The surface was analyzed using HydrOffice QC Tools Grid QA feature to determine compliance with the specifications. Overall, 99.5% of nodes within the surface meet the NOAA Allowable Uncertainty specifications for F00789 (Figure 2). Density requirements were not achieved for F00789 with 97% of surface nodes containing five or more soundings as required by the HSSD Section 5.2.2.2 (Figure 3).

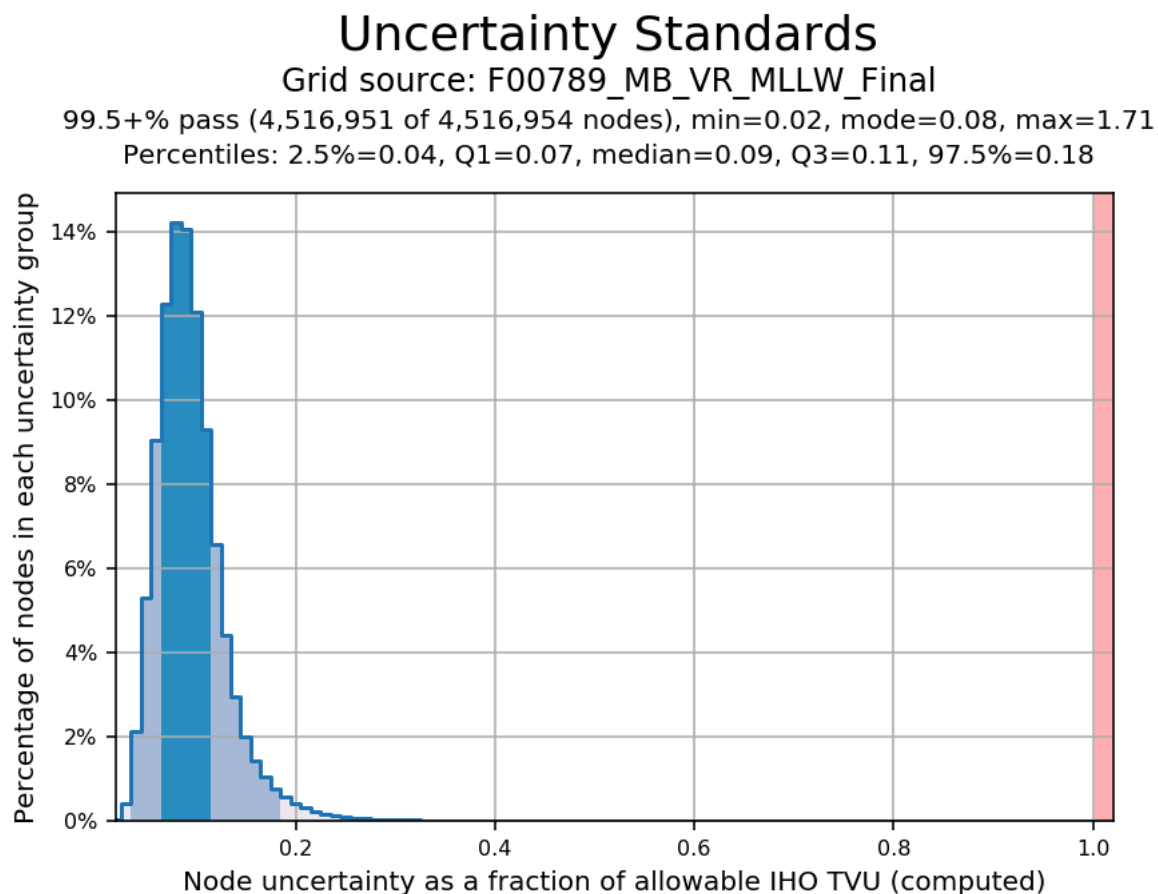


Figure 2: F00789 Allowable Uncertainty Statistics

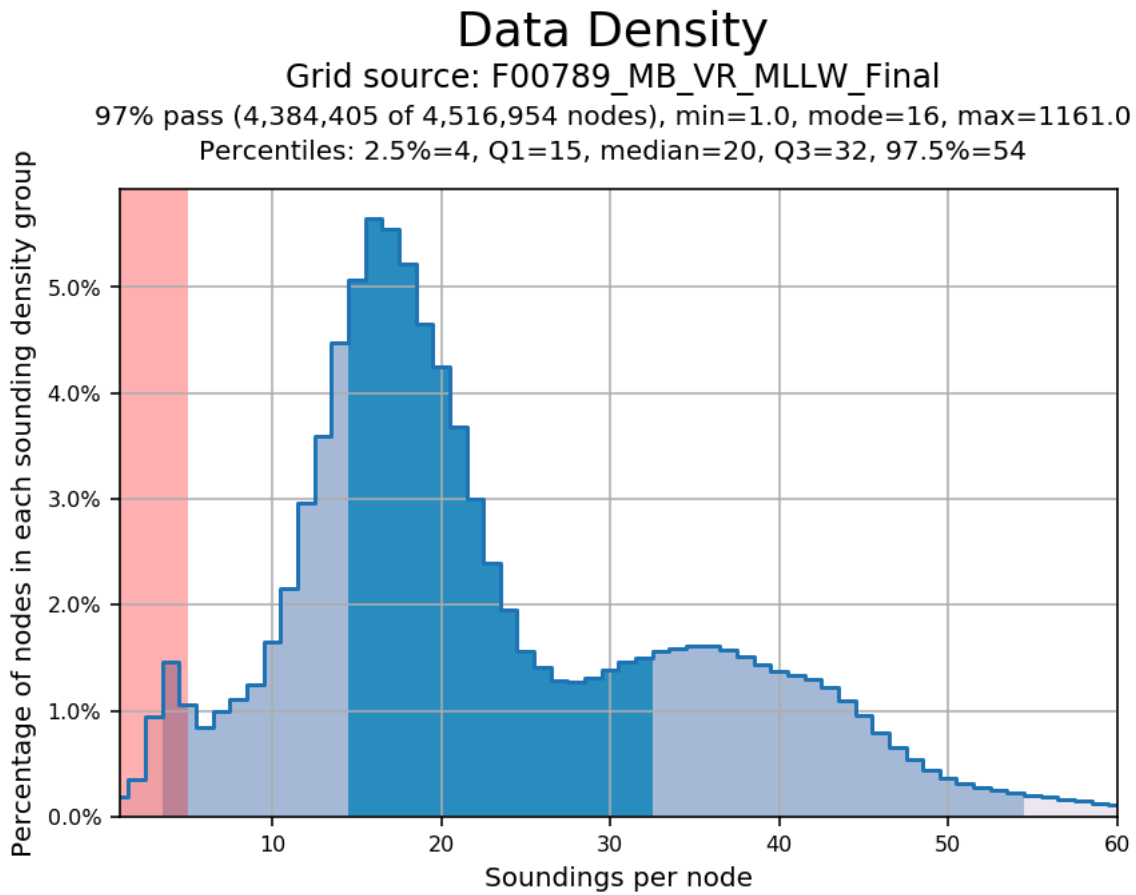


Figure 3: F00789 Data Density Statistics

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
US5CA13M	1:20000	89	01/16/2020	01/16/2020

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
F00789_MB_VR_MLLW	CARIS VR Surface (CUBE)	Variable Resolution m	2.579 m - 15.997 m	NOAA_VR	Object Detection
F00789_MB_VR_MLLW_Final	CARIS VR Surface (CUBE)	Variable Resolution m	2.579 m - 15.997 m	NOAA_VR	Object Detection

The NOAA CUBE parameters defined in the HSSD were used for the creation of all CUBE surfaces for F00789. The surfaces have been reviewed where noisy data, or "fliers" are incorporated into the gridded solutions causing the surface to be shoaler or deeper than the true seafloor. Where these spurious soundings cause the gridded surface to be shoaler or deeper than the reliably measured seabed by greater than the maximum allowable Total Vertical Uncertainty at that depth, the noisy data have been rejected by the hydrographer and the surface recomputed.

Flier Finder, part of the QC Tools package within HydrOffice, was used to assist the search for spurious soundings following gross cleaning. Flier Finder was run iteratively until remaining flagged fliers were deemed to be valid aspects of the surface.

G. Vertical and Horizontal Control

The vertical datum for this project is Mean Lower Low Water. The vertical control method used was VDatum.

Per section 5.1.2.3 of the Field Procedures Manual (2014 ed), no Horizontal and Vertical Control Report has been generated for F00789.

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 10.

Vessel kinematic data were post-processed using Applanix POSPac processing software and RTX positioning methods described in the DAPR. Smoothed Best Estimate of Trajectory (SBET) and associated error (RMS) data were applied to all MBES data in CARIS HIPS and SIPS.

The Wide Area Augmentation system (WAAS) was used for real-time horizontal control during data acquisition.

H. Additional Results

Holidays

F00789 data were reviewed in CARIS HIPS and SIPS for holidays in accordance with Section 5.2.2.2 of the HSSD. Two holidays which meet the 3 by 3 node definition were identified via HydrOffice QC Tools Holiday Finder tool, and are shown in Figures 4 and 5. This tool automatically scans the surface for holidays as defined in the HSSD and was run in conjunction with a visual inspection of the surface by the hydrographer. Both holidays were caused by removing data from blowouts. The holidays were not addressed due to time constraints in the project area.

Fliers

Some of the pillars of the pier are visible in the multibeam data and are marked by flier finder (Figure 6).

ENC Comparison

A comparison was performed between survey F00789 and ENC US5CA13M using CARIS HIPS and SIPS. Sounding and contour layers were overlaid on the ENC to assess differences between the surveyed soundings and charted depths. The ENC was compared to the surface by extracting all soundings from the chart and creating an interpolated TIN surface which could be differenced with the surface from F00789 as shown in Figure 7. The mean difference between surveyed soundings from F00789 and the charted depths on ENC US5CA13M is 0.66 meters, with 95% of nodes having a deviation of +/- 1.30 meters as shown in Figure 8.

All data from F00789 should supersede charted data. In general, surveyed soundings agree with the majority of charted depths on ENC US5CA13M to 1 fathom. Contours from F00789 are in general agreement with the charted contours on ENC US5CA13M.

Backscatter

Raw backscatter data were stored in the .all file for Kongsberg systems. All backscatter were processed to GSF files and a floating point mosaic was created by the field unit via Fledermaus FMGT 7.8.10. See Figure 9 for a greyscale representation of the complete mosaic.

Crosslines

Crosslines were not required in project instructions and were not collected.

Features

The charted PIPSOL feature was not visible in the MBES data nor the backscatter mosaic as elevated or exposed and was marked with the description as retain. The OBSTRN feature has an updated least depth value of sounding attribute. The CBLSUB feature was not visible in either the MBES data nor the backscatter mosaic and was not included in the FFF, as specified in the investigation requirements of the composite source file. Part of the pillars of the pier are visible in the surface and are marked by flier finder.

S-L361-FA-19
F00789 Holidays

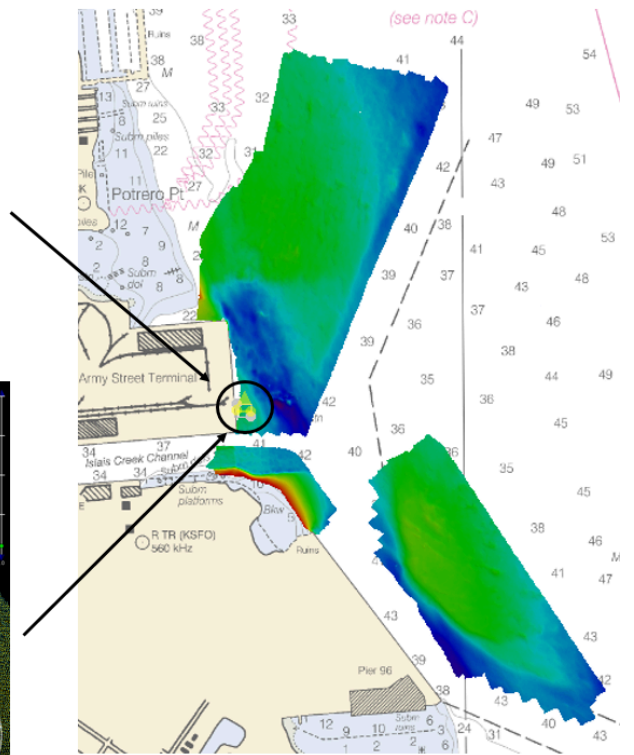
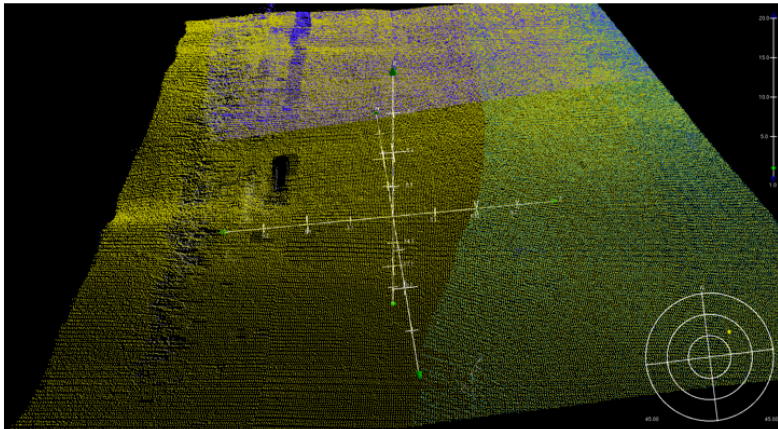
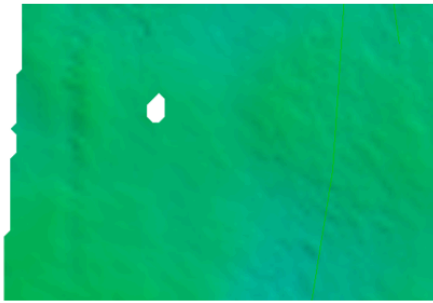


Figure 4: Holiday due to removing data from a blowout

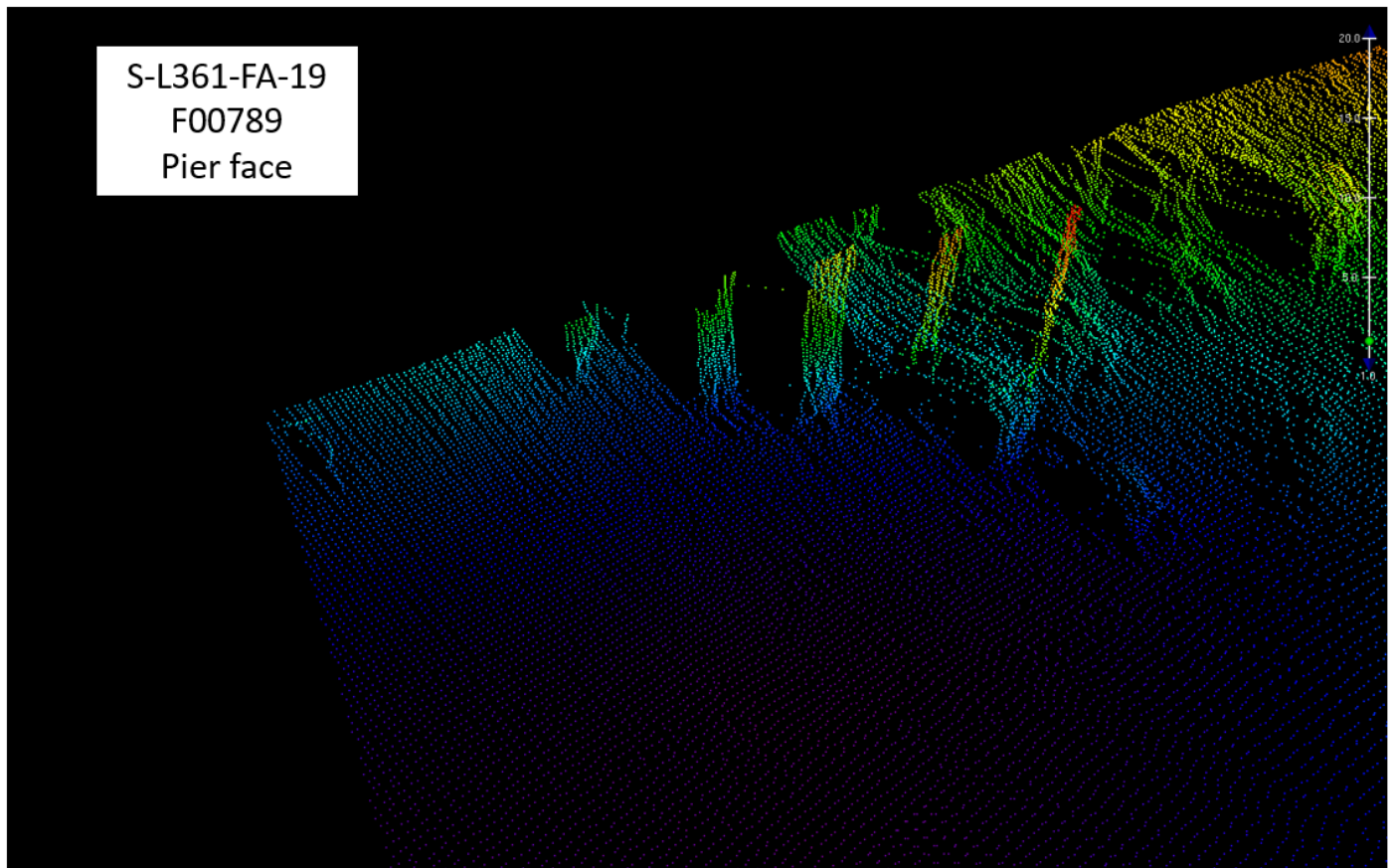


Figure 5: Pier face flagged in flier finder

S-L361-FA-19
F00789 Holidays

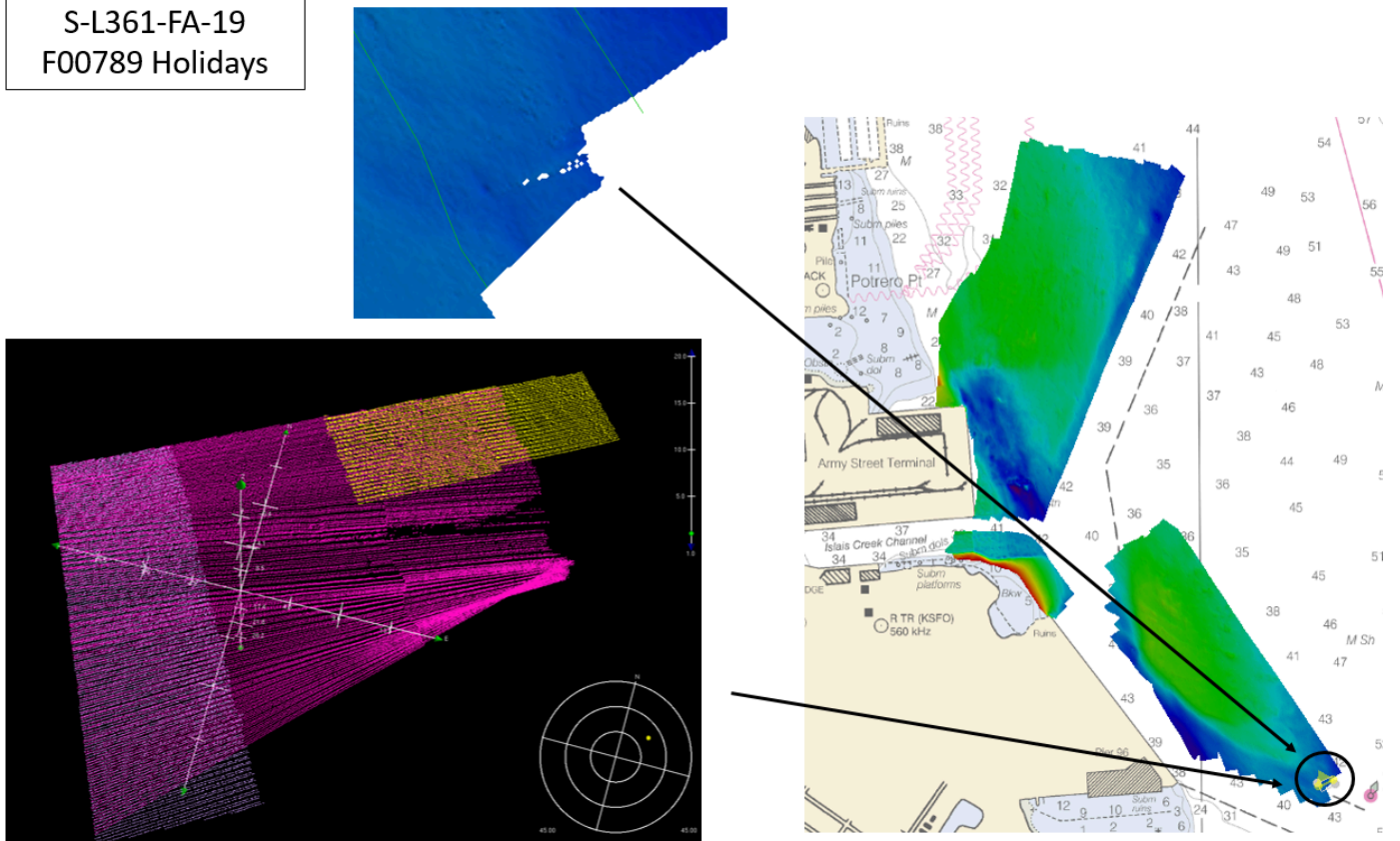


Figure 6: Holiday due to removing data from a blowout

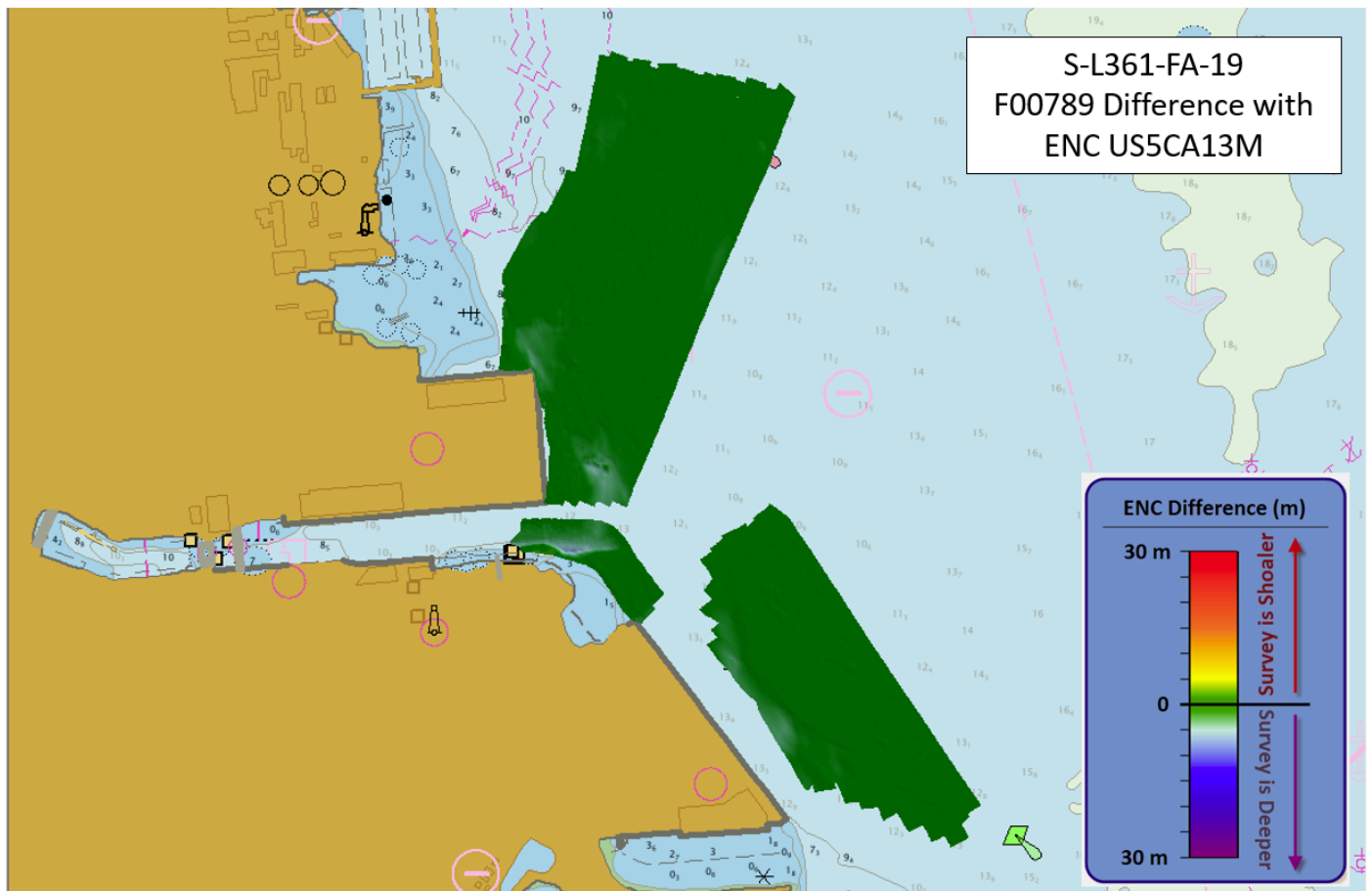


Figure 7: Difference surface between F00789 and interpolated TIN surfaces from ENC US5CA13M

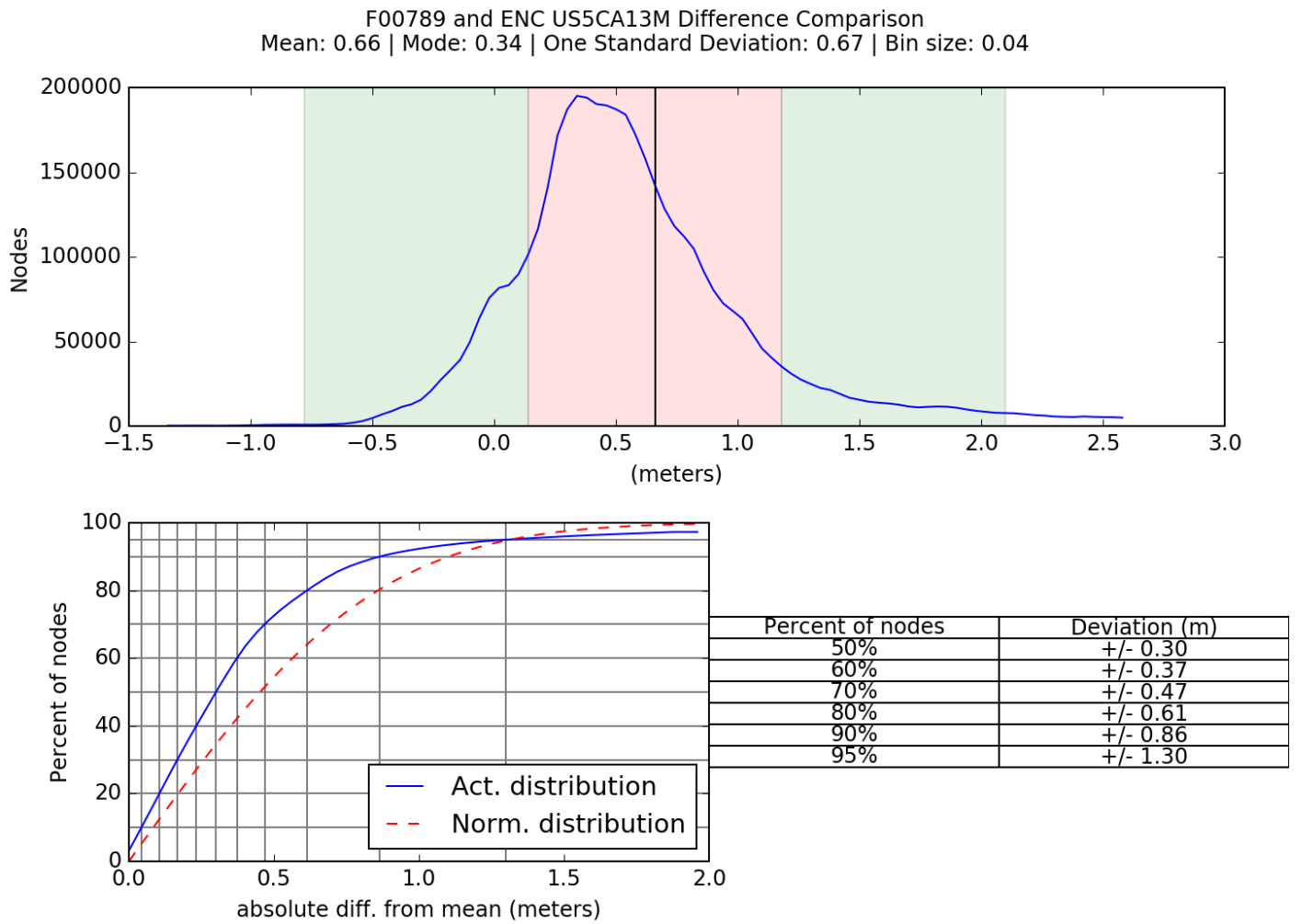


Figure 8: Difference surface statistics between F00789 and interpolated TIN surface from ENC US5CA13M

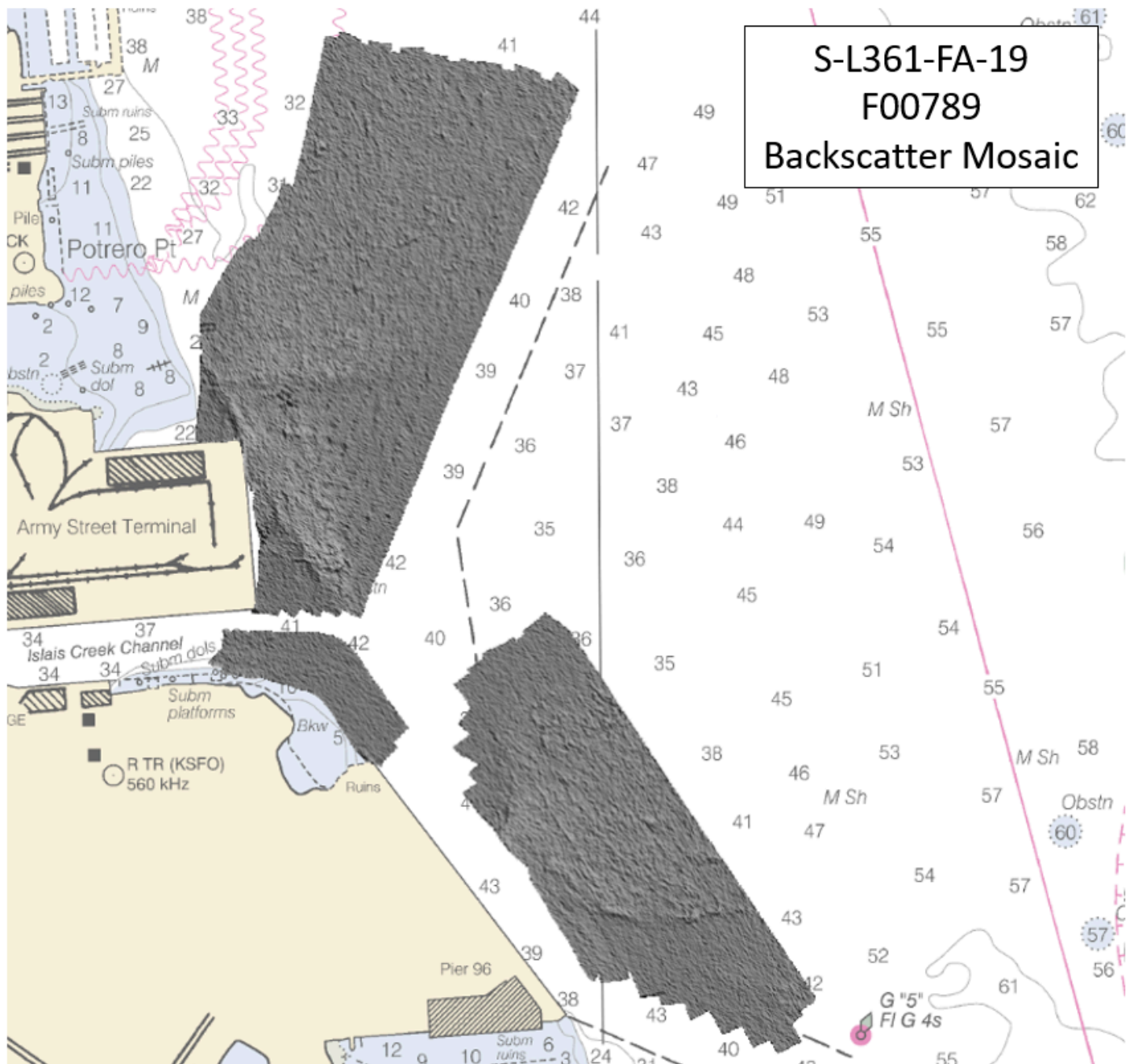


Figure 9: Backscatter mosaic for F00789

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.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys Specifications and Deliverables, Field Procedures Manual, Standing and Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Survey Summary Report.

Approver Name	Title	Date	Signature
CAPT Marc Moser	Chief of Party	02/20/2020	MOSER.MARC.STANTON.1163193902 MOSER.MARC.STANTON.1163193902 2020.02.24 09:07:47 -08'00'
LT Stephen Moulton	Operations Officer	02/20/2020	MOULTON.STEPHEN.F.1282116835 MOULTON.STEPHEN.F.1282116835 Date: 2020.02.21 15:20:09 -08'00'
CST Alissa Johnson	Chief Survey Technician	02/20/2020	JOHNSON.ALISSA.JEAN.1537531165 JOHNSON.ALISSA.JEAN.1537531165 Date: 2020.02.21 14:32:31 -08'00'
HST Joseph Allman	Sheet Manager	02/20/2020	ALLMAN.JOSEPH.PATRICK.1043983390 ALLMAN.JOSEPH.PATRICK.1043983390 Date: 2020.02.20 15:12:34 -08'00'

APPROVAL PAGE

F00789

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: _____

James Miller

Acting Chief, Pacific Hydrographic Branch