

H12547

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H12547

LOCALITY

State(s): Alaska

General Locality: Krenitzin Islands

Sub-locality: Vicinity of Battery Point

2013

CHIEF OF PARTY
Dean Moyles

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H12547

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): **Alaska**

General Locality: **Krenitzin Islands**

Sub-Locality: **Vicinity of Battery Point**

Scale: **40000**

Dates of Survey: **07/03/2013 to 07/27/2013**

Instructions Dated: **05/15/2013**

Project Number: **OPR-Q191-KR-13**

Field Unit: **Fugro Pelagos, Inc.**

Chief of Party: **Dean Moyles**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter**

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. Revisions and notes in red were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.

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Descriptive Report to Accompany Survey H12547

Project: OPR-Q191-KR-13

Locality: Krenitzin Islands

Sublocality: Vicinity of Battery Point

Scale: 1:40000

July 2013 - July 2013

Fugro Pelagos, Inc.

Chief of Party: Dean Moyles

A. Area Surveyed

H12547 is located in the Vicinity of Battery Point.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
54° 6' 28.01" N 165° 47' 17.99" E	53° 58' 43" N 166° 1' 12" E

Table 1: Survey Limits

Survey Limits were acquired in accordance with the requirements in the Project Instructions and the HSSD.

A.2 Survey Purpose

The purpose of this work is to provide NOAA with modern and accurate hydrographic survey data for the area in the Vicinity of Battery Point. The survey covered 23.37 square nautical miles of critical survey area as designated in the NOAA Hydrographic Survey Priorities, 2012 edition.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

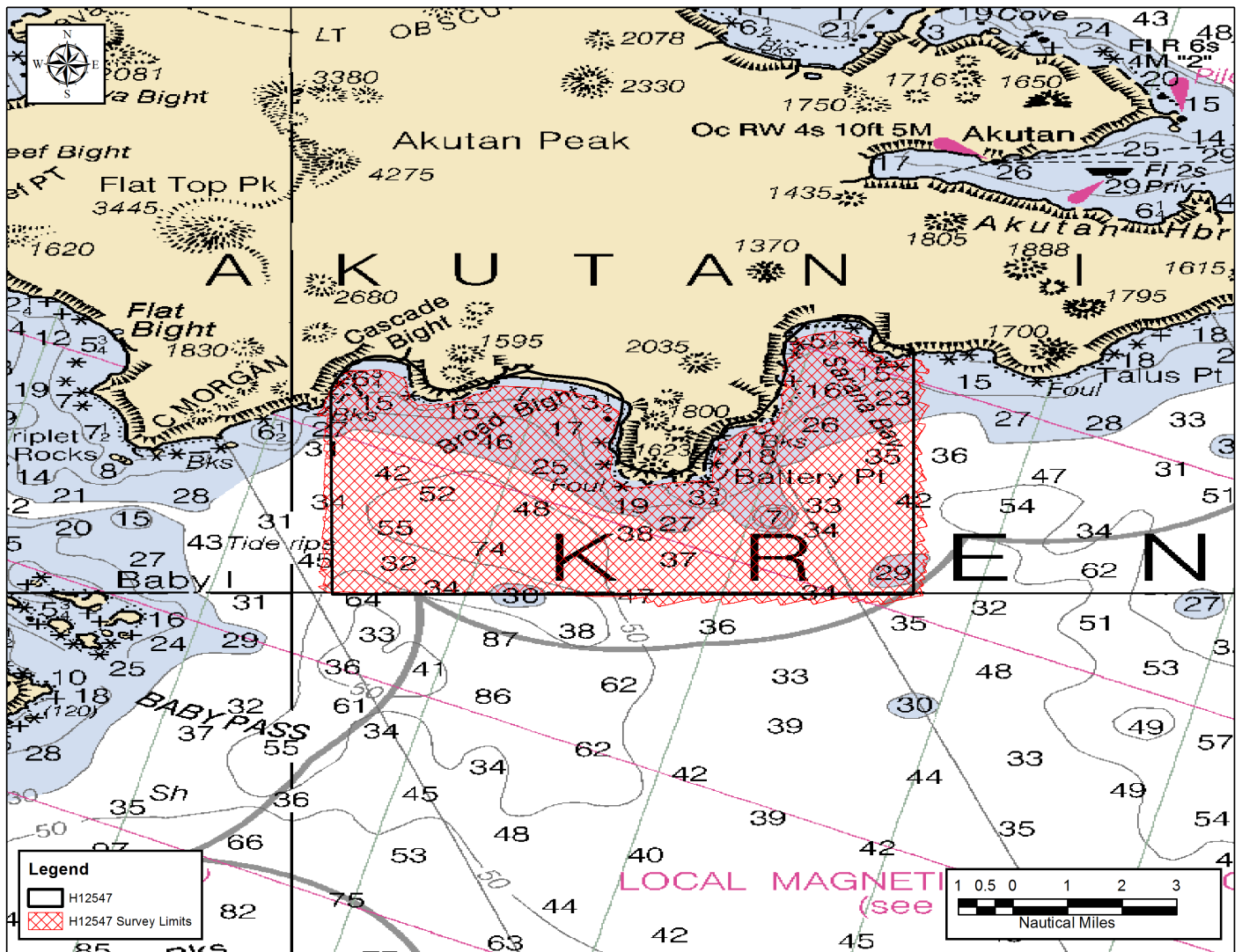


Figure 1: H12547 Survey Limits

Survey Coverage was in accordance with the requirements in the Project Instructions and the HSSD.

A.5 Survey Statistics

The following table lists the mainscheme and crossline acquisition mileage for this survey:

	HULL ID	<i>Ocean Pioneer</i>	<i>D2</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0	0
	MBES Mainscheme	236.12	244.28	480.4
	Lidar Mainscheme	0	0	0
	SSS Mainscheme	0	0	0
	SBES/SSS Mainscheme	0	0	0
	MBES/SSS Mainscheme	0	0	0
	SBES/MBES Crosslines	10.9	12.37	23.27
	Lidar Crosslines	0	0	0
Number of Bottom Samples				4
Number of AWOIS Items Investigated				0
Number Maritime Boundary Points Investigated				0
Number of DPs				0
Number of Items Investigated by Dive Ops				0
Total SNM				23.37

Table 2: Hydrographic Survey Statistics

The following table lists the specific dates of data acquisition for this survey:

Survey Dates	Day of the Year
07/03/2013	184
07/04/2013	185
07/05/2013	186
07/15/2013	196
07/16/2013	197
07/17/2013	198
07/21/2013	202
07/22/2013	203
07/23/2013	204
07/24/2013	205
07/27/2013	208

Table 3: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

B.1.1 Vessels

The following vessels were used for data acquisition during this survey:

Hull ID	<i>Ocean Pioneer</i>	<i>D2</i>
LOA	205 feet	29 feet
Draft	14 feet	3 feet

Table 4: Vessels Used

Due to an inoperable davit, production for vessel R2 was limited for the OPR-Q191-KLR-13 survey. The last day of survey for vessel R2 was JD 181.

B.1.2 Equipment

The following major systems were used for data acquisition during this survey:

Manufacturer	Model	Type
Applanix	POS M/V v4	Positioning and Attitude System
Applied Micro-Systems	SV&P	Sound Speed System
OceanScience	UCTD	Conductivity, Temperature and Depth Sensor
Reson	7101	MBES
Reson	7125	MBES
Reson	SVP70	Sound Speed System

Table 5: Major Systems Used

WaterLOG H3611 (Radar Water Level Sensors) were installed on the port and starboard gunwales of M/V Ocean Pioneer to obtain a more precise static draft measurement. Samples were taken over a 10 minute period and averaged to determine the vessel's draft. Traditional static draft measurement techniques were also employed as a substitute for the WaterLOG H3611 measurements when required.

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 5% of mainscheme acquisition.

Crosslines were planned and well distributed throughout the survey to ensure adequate quality control. Total crossline length surveyed was 23.24 nautical miles or 4.84 percent of the total mainscheme line length. Each crossline was compared to the entire mainscheme line plan through a 2m CUBE surface using the CARIS HIPS QC report routine. If the crossline covered an area with significantly rocky topography, the crossline was compared to a 1m CUBE surface of the entire mainscheme line plan.

The majority of the QC Reports fall well within the required accuracy specifications. However, several crosslines run by survey vessels Ocean Pioneer and D2 in the vicinity of Battery Point contain beams in the QC report that fall below the 95% confidence level due to significantly rocky topography as illustrated in the crossline profile from H12547. Good conformity was still seen between the mainscheme lines and the crosslines.

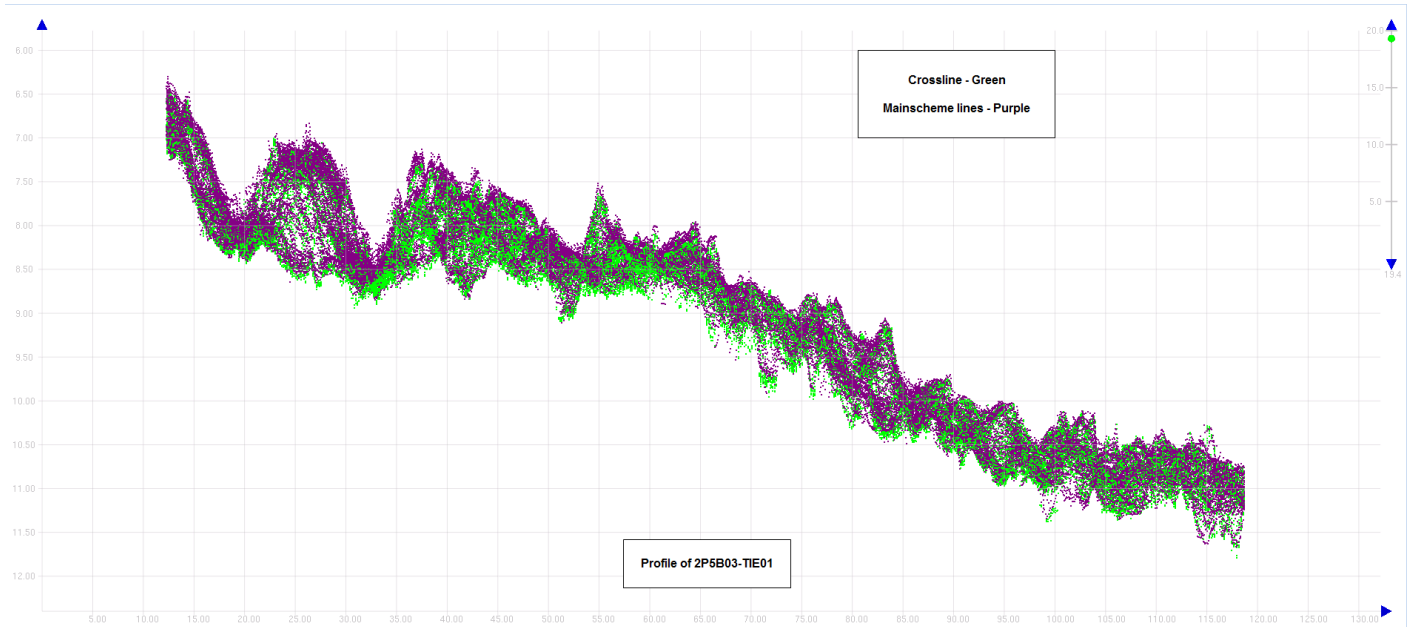


Figure 2: H12547 Crossline Profile

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0.1 meters	0.2 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
Ocean Pioneer	1.633 meters/second	0 meters/second	0.250 meters/second
D2	0 meters/second	2.509 meters/second	0.250 meters/second

Table 7: Survey Specific Sound Speed TPU Values

The majority of the data fell within IHO Order 1a accuracy specifications. Nodes that exceeded the allowable specifications were located in rough or rapidly changing topography or areas where the outer beams of the coverage boundaries were the single contributor to the surface. Despite the higher uncertainty values in these areas, agreement between adjacent lines and co-linearity between soundings was good.

Note: The percentage of nodes within IHO Oder 1a, were computed by CARIS using the Surface QC Report utility and are as follows:

CUBE Surface Uncertainty Report

Surface Depth Range (m) % of nodes within IHO Order 1a

H12547-1m_final	0 - 20	97.05%
H12547-2m_final	18 - 40	99.69%
H12547-4m_final	36 - 80	99.98%
H12547-8m_final	72 - 160	100.00%

As illustrated in the uncertainty errors graphic, the uncertainty is generally lowest near the sonar nadir beams and increases toward the outside of each swath. This is expected and primarily a result of the sonar's device model used within CARIS HIPS for TPU calculations. In general, total propagated uncertainty varies proportionally to water depth. Outer beams also have higher uncertainty values as a function of the bottom-detection algorithms within the sonar. Data met project specifications.



Figure 3: H12547 Uncertainty

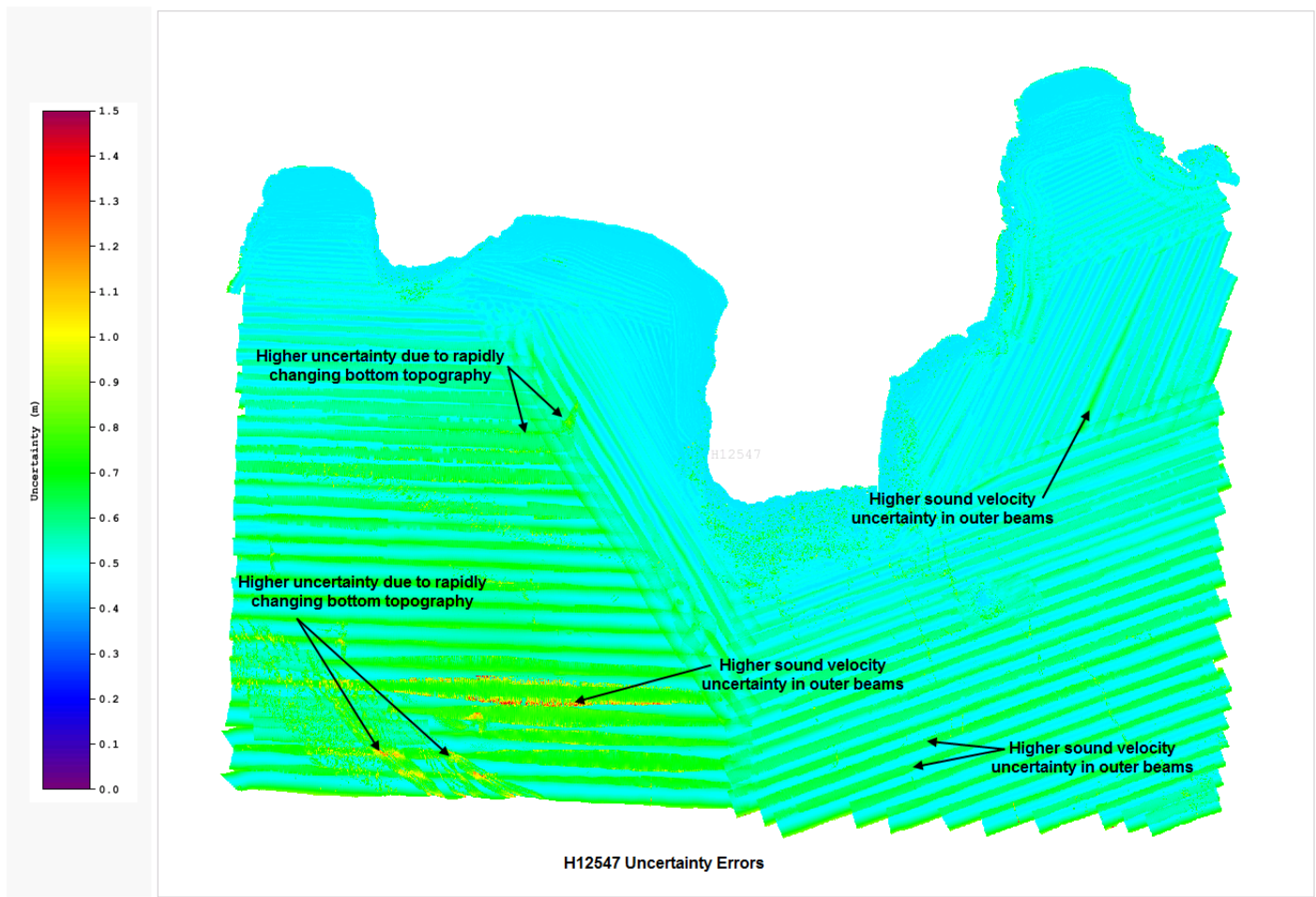


Figure 4: H12547 Uncertainty Errors

TVU values exceed IHO budgets in nearshore areas with higher frequency than usual. In the DAPR, section B, the surveyor indicates that the following values were entered into the CARIS 'Compute TPU' box: Measured Tidal Uncertainty: 0.1m and Tidal Zoning Uncertainty: 0.2m. It is also indicated that these values were based on the HSSD 2012 which itself states that "An estimate for a typical processing error is 0.10 m at the 95% confidence level...." and ... "Estimates for typical errors associated with tidal zoning are 0.20 m at the 95% confidence level." Since CARIS expects these values to be input at the 68% CI level, the surveyor has effectively doubled the TVU associated with tides. This doubling of the tidal constituent of TVU is consistent with frequency with which the TVU budget was exceeded in nearshore areas. In review - and without any re-evaluation of TVU values based on the above findings - the number of nodes in the 1m surface meeting IHO order 1a TVU budget was found to be 95.25%. This acceptable percentage disagrees with the documented uncertainty report.

B.2.3 Junctions

The surveys are in agreement along their common borders. The conformity between H12547 and the bordering survey areas (H12545 and H12546) was inspected during processing, using CARIS HIPS' Subset

Editor routine and finalized BASE Surfaces. A difference surfaces was also created to compare the 4-meter surface from H12547 and the junction with the 5-meter surface from H11712 (2007). The data were well within the IHO Order 1a allowable error.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H11712	1:10000	2007	Fugro Pelagos, Inc.	W

Table 8: Junctioning Surveys

H11712

A difference surface was created to compare the 4-meter surface from H12547 and the junction with the 5-meter surface from H11712 (2007), confirming that approximately 82.56% of the nodes agree to within +/-0.50m. The remaining 17.44% were in areas with irregular bottom topography, areas with dynamic sand waves, or were on the outer edges of the swath at the coverage boundaries. The data were well within the IHO Order 1a allowable error.

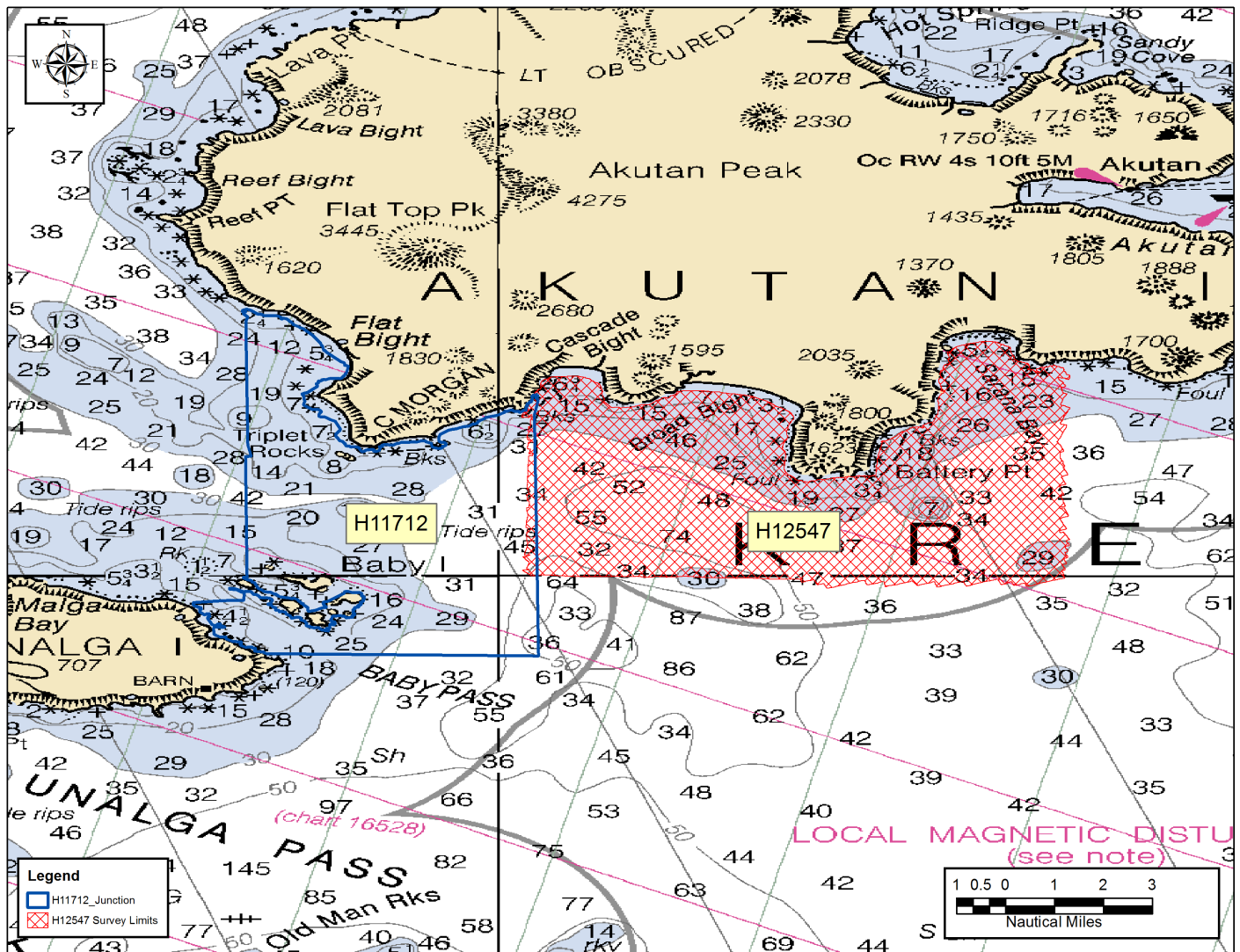


Figure 5: H12547 Junctions with H11712

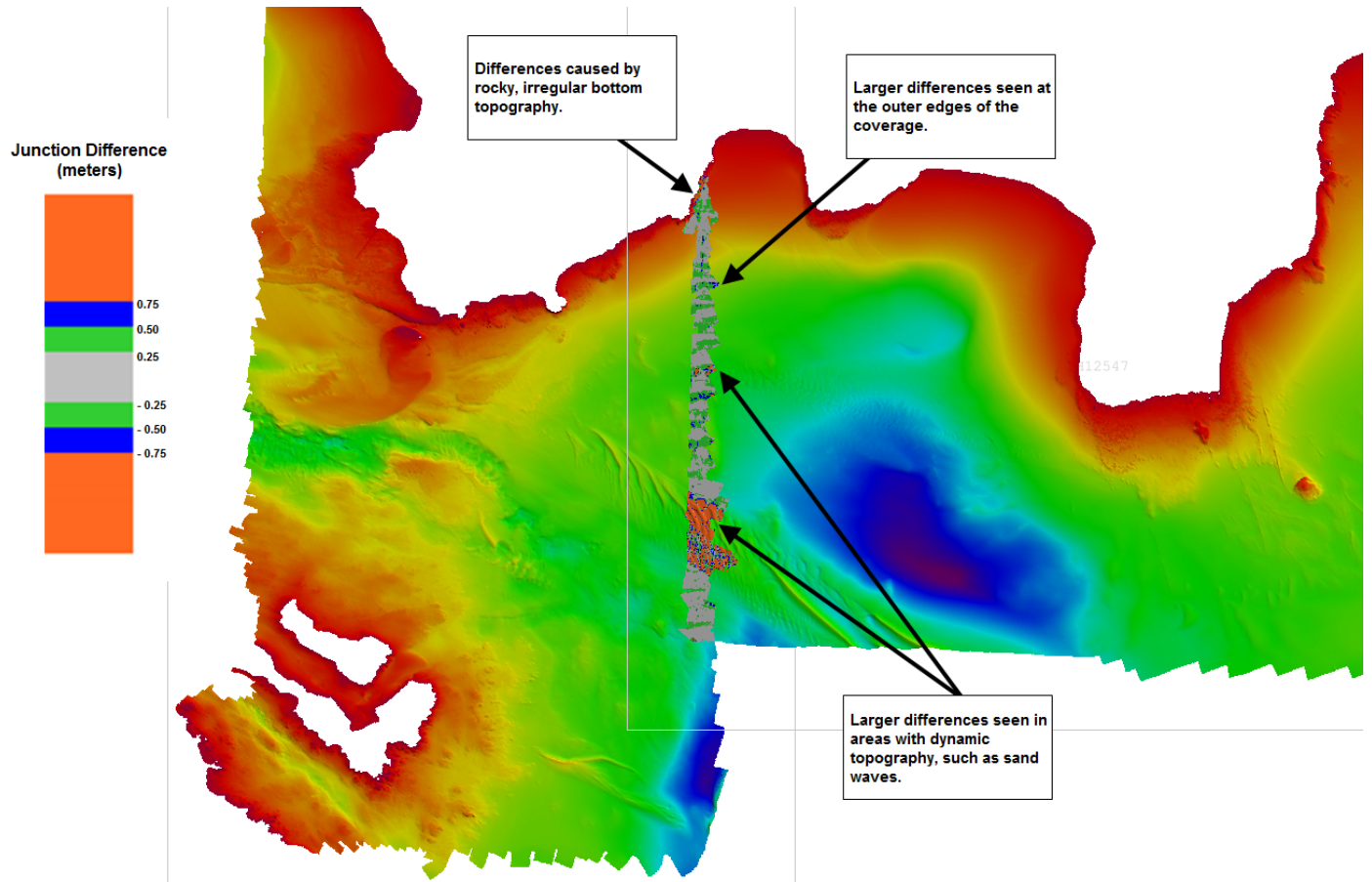


Figure 6: Difference Surface H12547 vs. H11712

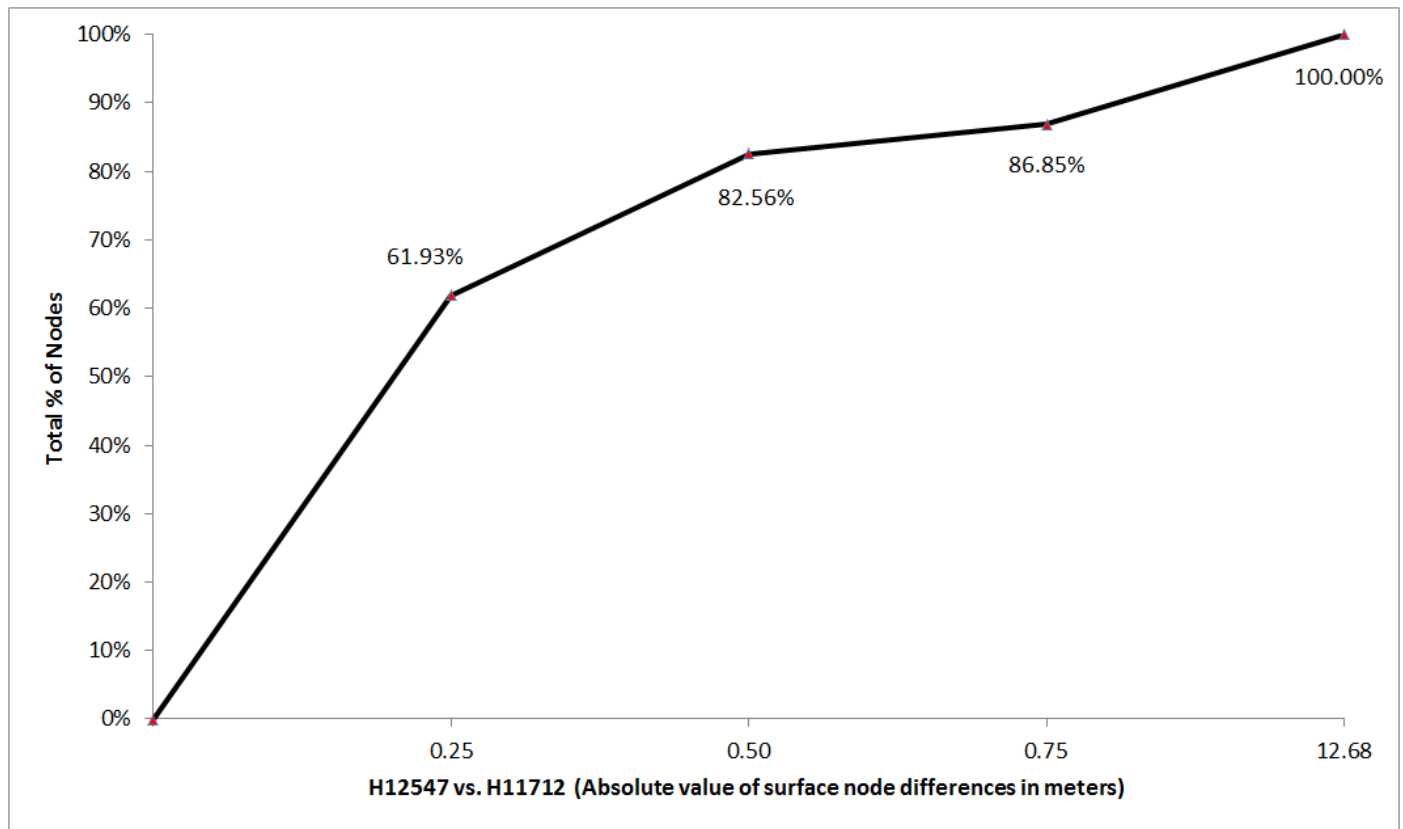


Figure 7: Difference Surface Statistics H12547 vs. H11712

In addition to junction H11712 given in Table 8, junctions with 1:40,000 2013 surveys H12545 (East) and H12546 (South) should also be listed. Despite their absence from Table 8, analysis was performed by the field for all junctioning surveys. However, note that the method used by the hydrographer for junction analysis was to review soundings and grids in subset mode and visually identify agreement. The office reviewer has used the standard NOAA junction review methodology of analyzing the mean and standard deviation of the vertical differences between overlapping, adjacent surfaces. The result of this analysis shows excellent agreement between survey areas. The mean difference and standard deviation between H12547 and H12545 was 0.07m (+/-0.41m @95%CI); the mean difference and standard deviation between H12547 and H12546 was 0.17m (+/-0.58m @95% CI).

B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

B.2.5 Equipment Effectiveness

Bottom-Detection Artifacts

Dependent on sediment type, at the 200kHz frequency, the Reson SeaBat 7125 sonar system sometimes displayed bottom-detection artifacts near nadir of the multibeam swath. The bottom detection algorithm

in the Reson 7125 may have been affected by the time spreading of the signal return due to sediment penetration close to nadir. To mitigate these effects, the sonar pulse length was kept at low settings during acquisition and the artifacts were monitored closely during data processing to ensure all data met IHO Order 1a specifications.

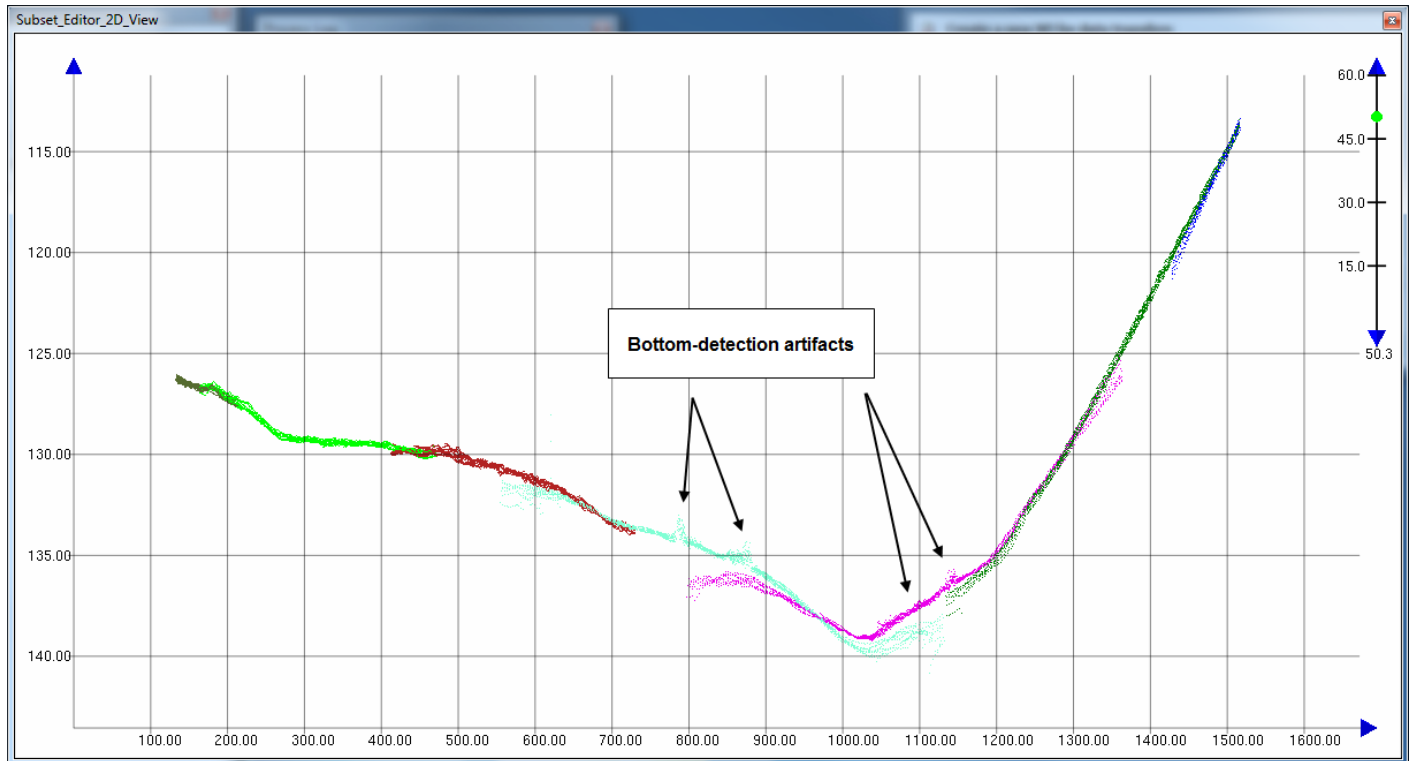


Figure 8: Bottom-Detection Artifacts

B.2.6 Factors Affecting Soundings

Kelp

Along coastal regions of the survey, an abundance of kelp was observed during data acquisition. Due to data quality and safety issues, there may be some areas where survey operations were halted, thus not achieving the 4 fathom survey limit. In addition to this, during data processing every effort was made to flag the kelp as rejected data wherever the CUBE BASE surface included the kelp as part of the seafloor.

Sound Speed Refraction Errors

Sound speed refraction errors were seen in the outer beams of the swaths of survey lines that were run in deeper water. However, line overlap was sufficient, and the affected soundings were rejected in CARIS HIPS' Subset Editor routine to ensure the CUBE surface met IHO Order 1a specifications.

Note that in addition to the sound speed refraction errors noted by the field, during office review a number of irregularities were found with the field's compliance with the HSSD in terms of addressing sound speed sensor value differences, application of sound speed correction, and documentation of sound speed profiler confidence checks.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound speed measurements were conducted and applied as discussed in the Corrections to Echo Soundings section of the DAPR.

B.2.8 Coverage Equipment and Methods

All equipment and survey methods were used as detailed in the DAPR.

B.2.9 Data Density

The NOS Hydrographic Surveys Specifications and Deliverables, April 2012, requires 95% of all nodes to be populated with at least five soundings. Survey H12547 met these project specifications.

Density requirements for H12547 were achieved with at least 99.70% of finalized surface nodes containing five or more soundings. Nodes that failed to meet the allowable specifications were located in rough or rapidly changing topography or areas where the outer beams of the coverage boundaries were the single contributor to the surface.

CUBE Surface Density Report

Surface Depth Range (m) % of nodes within HSSD 2012

H12547-1m_final	0 - 20	99.71%
H12547-2m_final	18 - 40	99.97%
H12547-4m_final	36 - 80	99.94%
H12547-8m_final	72 - 160	99.94%

Detection requirements were met by minimizing vessel speed when necessary, using sonar range scales appropriate to the water depth to maximize ping rates, and maximizing swath overlap. These variables were adjusted in real-time by the online acquisition crew based on the WinFrog QC and coverage displays. The shipboard processing crew provided feedback after preliminary processing and coverage creation in CARIS HIPS and In-fills were run as necessary.

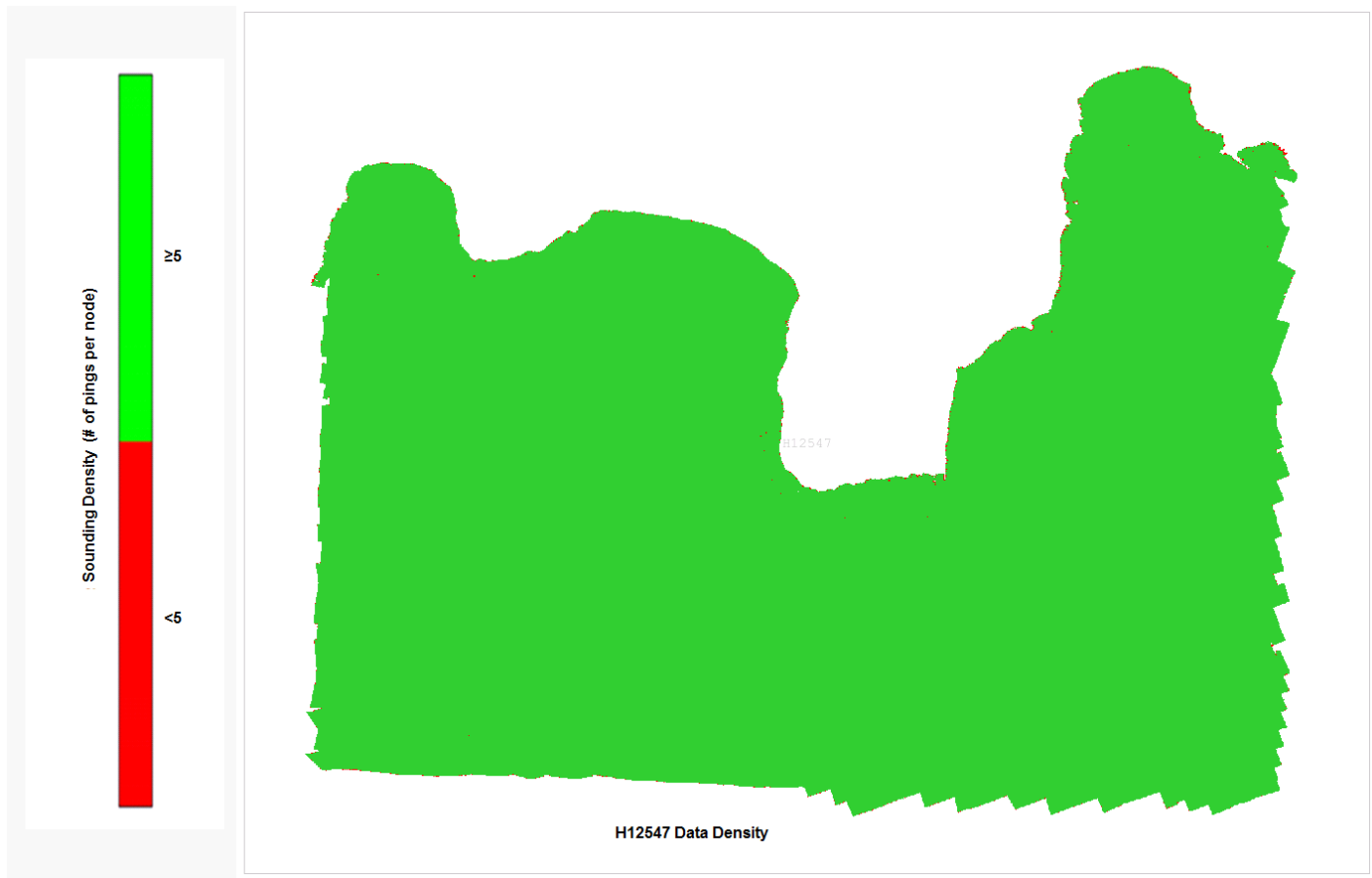


Figure 9: H12547 Data Density

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Towed Side Scan Sonar (SSS) operations were not required by this contract, but the backscatter and beam imagery snippet data from all multibeam systems were logged and are stored in the s7k files. All beam imagery snippet data was logged in the 7028 record of the s7k file for the project.

B.5 Data Processing

B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: Version 5.3.2

B.5.2 Surfaces

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12547_1m	CUBE	1 meters	0 meters - 143 meters	NOAA_1m	Complete MBES
H12547_1m_final	CUBE	1 meters	0 meters - 20 meters	NOAA_1m	Complete MBES
H12547_2m	CUBE	2 meters	0 meters - 143 meters	NOAA_2m	Complete MBES
H12547_2m_final	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Complete MBES
H12547_4m	CUBE	4 meters	0 meters - 143 meters	NOAA_4m	Complete MBES
H12547_4m_final	CUBE	4 meters	36 meters - 80 meters	NOAA_4m	Complete MBES
H12547_8m	CUBE	8 meters	0 meters - 143 meters	NOAA_8m	Complete MBES
H12547_8m_final	CUBE	8 meters	72 meters - 160 meters	NOAA_8m	Complete MBES

Table 9: Submitted Surfaces

The surfaces have been reviewed where noisy data, or 'fliers' are incorporated into the gridded solution causing the surface to be shoaler than the true seafloor. Where these spurious soundings cause the gridded surface to be shoaler than the reliably measured seabed by greater than the maximum allowable TVU at that depth, the noisy data have been rejected and the surface recomputed.

The NOAA CUBE parameters mandated in HSSD were used for the creation of all CUBE BASE surfaces in Survey H12547.

C. Vertical and Horizontal Control

Additional information discussing the vertical and horizontal control for this survey can be found in the accompanying HVCR.

C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

Standard Vertical Control Methods Used:

Discrete Zoning

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey:

Station Name	Station ID
Unalaska, Dutch Harbor	9462620
King Cove	9459881

Table 10: NWLON Tide Stations

The following subordinate water level stations were established for this survey:

Station Name	Station ID
Broad Bight	9462676
SE Tigalda Island	9462705
Green Bight	9462786

Table 11: Subordinate Tide Stations

File Name	Status
9462676.tid	Verified Observed
9462705.tid	Verified Observed
9462786.tid	Verified Observed

Table 12: Water Level Files (.tid)

File Name	Status
OPR-Q191-KR-13_Zoning_20131008.zfd	Preliminary

Table 13: Tide Correctors (.zdf or .tc)

On October 08, 2013, John Oswald and Associates (JOA) issued verified tidal data and zoning for OPR-Q191-KR-13. All sounding data was then re-merged using CARIS HIPS and SIPS tide routine. JOA verified tidal data were used for all final Navigation BASE surfaces and S-57 Feature files. It should be noted that the tidal data applied to OPR-Q191-KR-13 is JOA verified and not CO-OPs verified. JOA are currently in the WALI verification process, which is pending, awaiting CO-OPs approval. Since the timeframe for CO-OPs verification is unknown, FPI were given approval, by our COTR, to submit the data with the JOA verified tides and zoning applied.

JOA zoning model was approved as final by CO-OPS. Tide Note is appended to this report.

C.2 Horizontal Control

The horizontal datum for this project is NAD83.

The projection used for this project is 3N.

The following PPK methods were used for horizontal control:

Single Base

For real-time DGPS corrections, a CSI MBX-3 unit was tuned to the Cold Bay, Alaska USCG DGPS site. The unit output differentially corrected positions at 1 Hz to the (POS MV) 320 V4 where it was integrated with inertial data, and a position for the top-center of the IMU generated. This position was logged concurrently with the bathymetry from WinFrog and the POS file using Fugro Pelagos PosMvLogger. It was later corrected for offsets to the multibeam echosounder (MBES) by CARIS HIPS in post-processing.

Final positioning was done using post-processed kinematic (PPK) methods. Applanix POSPac MMS v5.4 software was used in conjunction with the POS files and local 1Hz base station data to generate a higher accuracy position, which was applied in processing to replace the real-time position records.

The following user installed stations were used for horizontal control:

HVCR Site ID	Base Station ID
Broad Bight	BB_E
SE Tigalda Island	TI_N

Table 14: User Installed Base Stations

The following DGPS Stations were used for horizontal control:

DGPS Stations
Cold Bay DGPS Station

Table 15: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

D.1.1 Raster Charts

The following are the largest scale raster charts, which cover the survey area:

Chart	Scale	Edition	Edition Date	LNМ Date	NM Date
16531	1:80000	7	02/2002	10/01/2013	09/28/2013

Table 16: Largest Scale Raster Charts

16531

The Raster chart was downloaded from NOAA's Office of Coast Survey website on October 9, 2013.

Given that the survey area was ensonified with 100% multibeam coverage, discrepancies were discovered between the charted and surveyed depths.

Sounding agreement between surveyed soundings on sheet H12547 and spot soundings displayed on Raster chart 16531 varied between 1 and 7 fathoms. Generally, the surveyed data in the vicinity of the charted spot soundings from Raster chart 16531 agree to within 1 to 2 fathoms. However, the largest discrepancy found was 7 fathoms.

The Hydrographer recommends that soundings within the survey limits of H12547 supersede all prior survey and charted depths.

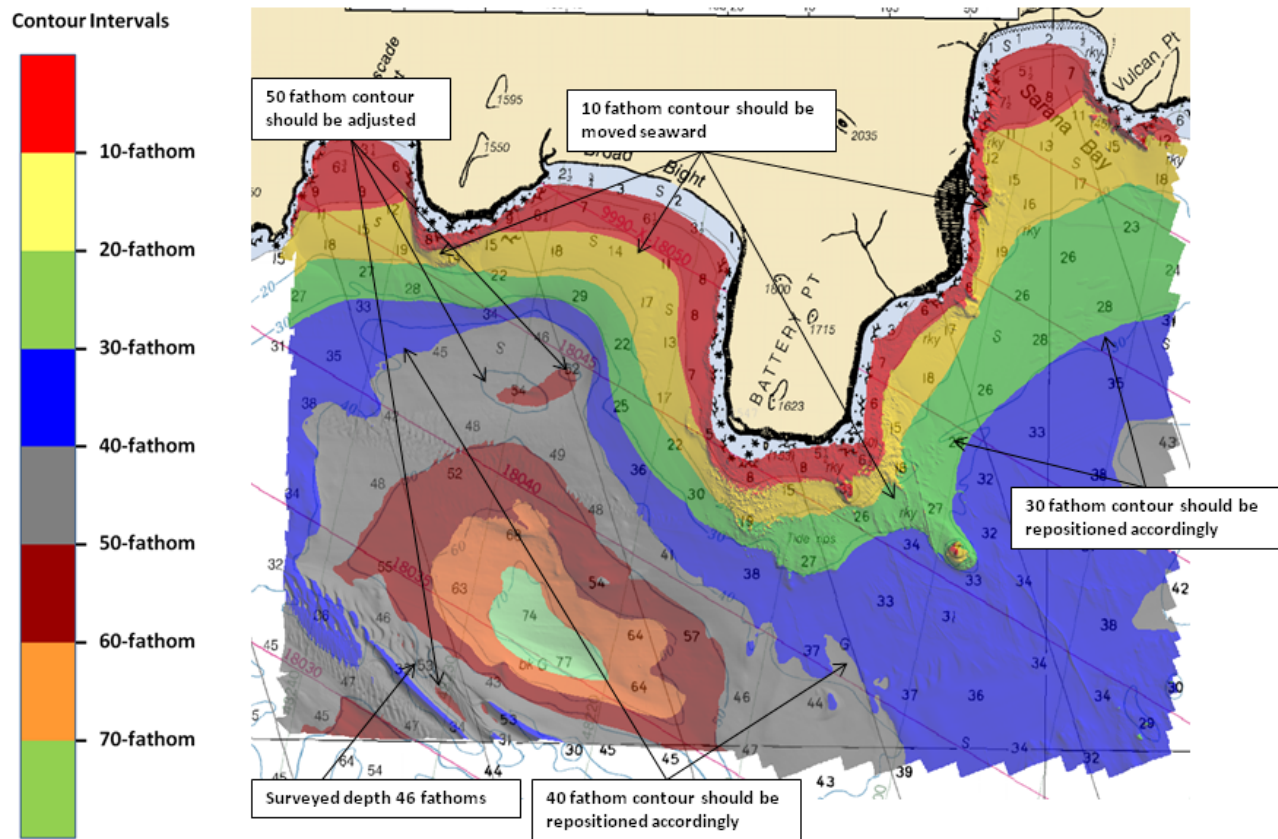


Figure 10: Chart Comparison H12547 vs. 16531

D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US3AK61M	1:300000	16	01/12/2011	06/24/2013	NO
US4AK6FM	1:80000	8	04/28/2011	05/02/2013	NO

Table 17: Largest Scale ENC's

US3AK61M

The ENC's were downloaded from NOAA's Office of Coast Survey website on October 9, 2013. Thus, the issue dates displayed in the table above are more recent than the dates in the Project Instructions.

Given that the survey area was ensonified with 100% multibeam coverage, discrepancies were discovered between the charted and surveyed depths.

Generally, the surveyed data in the vicinity of the charted spot soundings from the ENC US3AK61M agreed to within 1 to 5 meters.

Although the ENC displays the spot soundings in meters, the contours are displayed in fathoms. The surveyed data for sheet H12547 shows contours that generally agree with the contour trends from ENC US3AK61M.

The Hydrographer recommends that soundings within the survey limits of H12547 supersede all prior survey and charted depths.

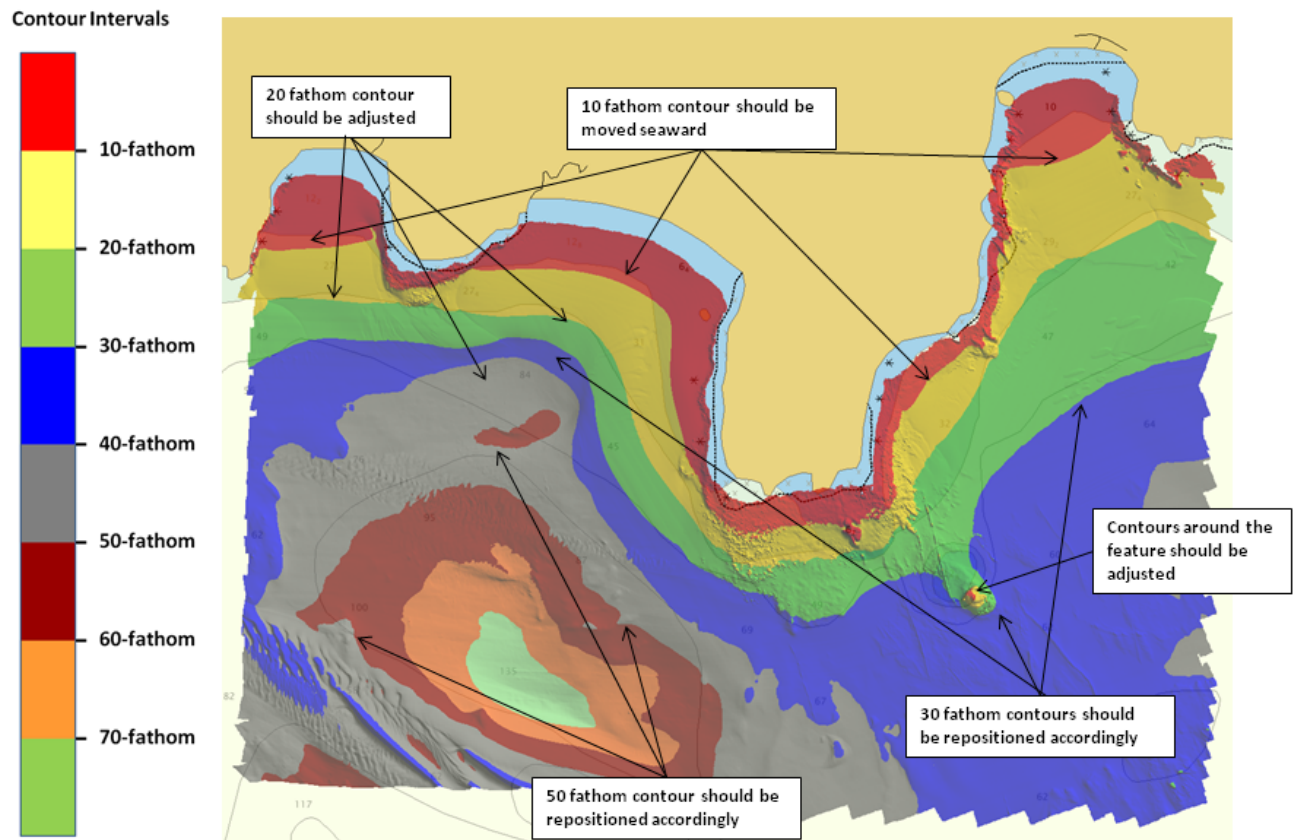


Figure 11: Chart Comparison H12547 vs. US3AK61M

Chart 18520 is a 1:300,000 scale chart that also contains the surveyed area, but was not used for chart comparison purposes.

US4AK6FM

Given that the survey area was ensounded with 100% multibeam coverage, discrepancies were discovered between the charted and surveyed depths.

Sounding agreement between surveyed soundings on sheet H12547 and spot soundings displayed on ENC US4AK6FM varied between 1 meter and 5 meters.

Although the ENC displays the spot soundings in meters, the contours are displayed in fathoms. The surveyed data for sheet H12547 shows contours that generally agree with the contour trends from ENC US4AK6FM.

The Hydrographer recommends that soundings within the survey limits of H12547 supersede all prior survey and charted depths.

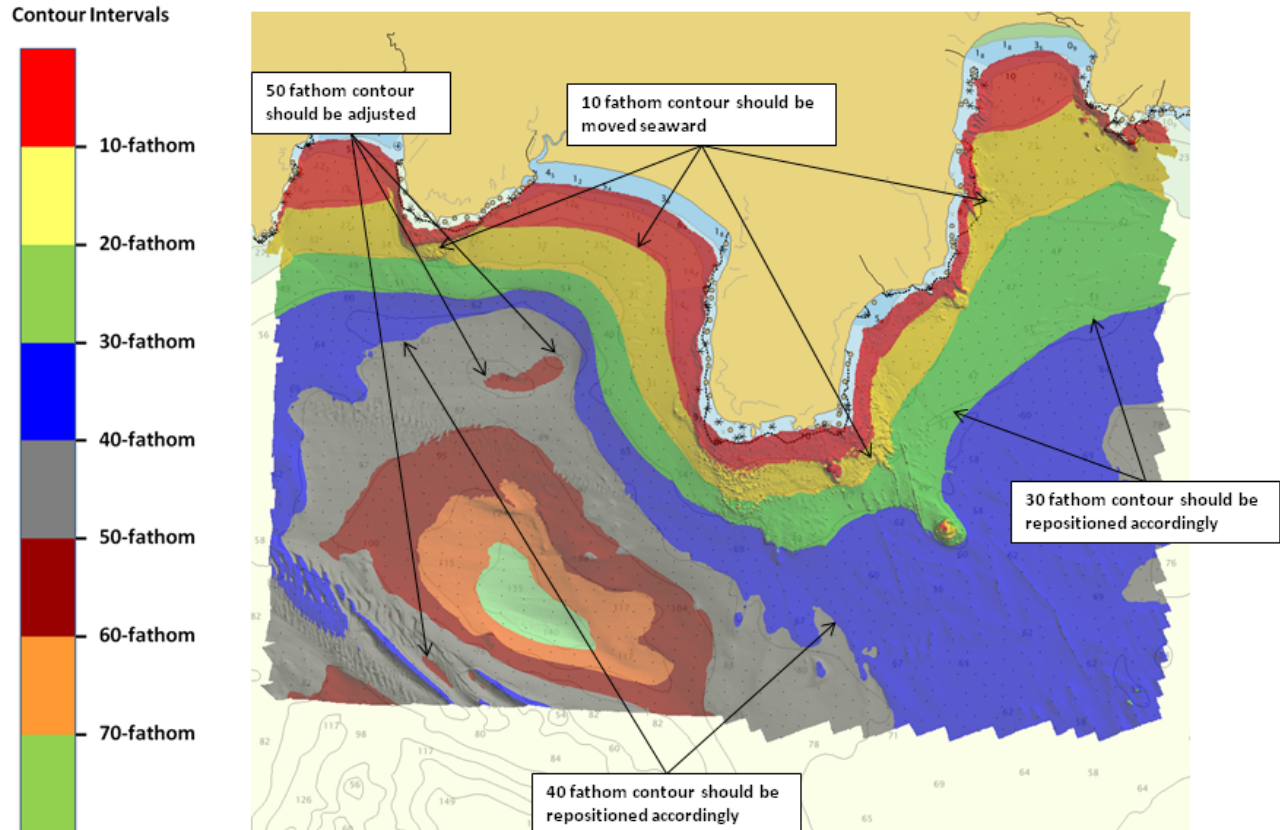


Figure 12: Chart Comparison H12547 vs. US4AK6FM

D.1.3 AWOIS Items

No AWOIS items exist for this survey.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

No charted features exist for this survey.

D.1.6 Uncharted Features

No uncharted features exist for this survey.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.9 Channels

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

D.1.10 Bottom Samples

Bottom Samples were acquired in accordance with the Project Instructions and the HSSD.

D.2 Additional Results

D.2.1 Shoreline

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work.

Limited shoreline verification was assigned in the Project Instructions, including the instruction to verify all features with asgmt attributed 'Assigned' regardless if it is located inshore of the Navigable Area Limit Line. In email with the COTR, this requirement was eased to allow the hydrographer discretion in selecting safe, navigationally significant features for field verification.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

Aids to navigation (ATONs) do not exist for this survey.

D.2.4 Overhead Features

Overhead features do not exist for this survey.

D.2.5 Submarine Features

Submarine features do not exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

There is no present or planned construction or dredging within the survey limits.

D.2.10 New Survey Recommendation

No new surveys or further investigations are recommended for this area.

D.2.11 Final Feature File

Charted features that fell inshore of the 4-fathom contour (NALL) were not investigated and have been noted with a “Not Addressed” comment in the “descrp” attribute of the final features file. Features that fell within the survey limits were addressed and attributed appropriately. This file contains the object and metadata with extended attributes as required in the Specifications and Deliverables (April 2012).

All features, including ones from the NOAA assigned feature file, that were within the geographical bounds of H12547 are included in the “H12547_Field_Features.000” file.

Note: Since CARIS Notebook and Bathy DataBase were unable to export to S-57 with the parameters outlined in section 8.2 of the HSSD 2012, an additional text file with the required meta information was sent to accompany the S-57 file.

The office reviewer added 18 features to the Final Feature File (FFF) that had been attributed 'Assigned' by the field, but not incorporated into the FFF. Also note that, though the Project Instructions indicate that the hydrographer is required to investigate all features whose asgmt attribute is 'Assigned,' there is guidance from the COTR allowing the hydrographer discretion to verify the navigational significance of these features, and that the safety of the vessel and crew would not be compromised by the investigation. See Branch Comment (note in red) under D.2.1.

D.2.12 Inset Recommendation

No new insets are recommended for this area.

E. Approval Sheet

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 Descriptive 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 and Specifications Deliverables Manual, 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 Descriptive Report.

Report Name	Report Date Sent
Data Acquisition and Processing Report	2013-11-04
Horizontal and Vertical Control Report	2013-11-04
Tides and Water Levels Package	2013-11-04
MAR-P-001-R2 MBES Acquisition Procedures	2013-11-04
DAC-P-010-R3 MBES Processing Procedures	2013-11-04

Approver Name	Approver Title	Approval Date	Signature
Dean Moyles	Senior Hydrographer (ACSM Cert. No. 226)	11/04/2013	Dean Moyles <small>Digitally signed by Dean Moyles DN: cn=Dean Moyles, o=Fugro Pelagos, Inc., ou, email=dmoyles@fugro.com, c=US Date: 2014.05.23 04:14:48 -07'00'</small>

F. Table of Acronyms

Acronym	Definition
AHB	Atlantic Hydrographic Branch
AST	Assistant Survey Technician
ATON	Aid to Navigation
AWOIS	Automated Wreck and Obstruction Information System
BAG	Bathymetric Attributed Grid
BASE	Bathymetry Associated with Statistical Error
CO	Commanding Officer
CO-OPS	Center for Operational Products and Services
CORS	Continually Operating Reference Station
CTD	Conductivity Temperature Depth
CEF	Chart Evaluation File
CSF	Composite Source File
CST	Chief Survey Technician
CUBE	Combined Uncertainty and Bathymetry Estimator
DAPR	Data Acquisition and Processing Report
DGPS	Differential Global Positioning System
DP	Detached Position
DR	Descriptive Report
DTON	Danger to Navigation
ENC	Electronic Navigational Chart
ERS	Ellipsoidal Referenced Survey
ERZT	Ellipsoidally Referenced Zoned Tides
FFF	Final Feature File
FOO	Field Operations Officer
FPM	Field Procedures Manual
GAMS	GPS Azimuth Measurement Subsystem
GC	Geographic Cell
GPS	Global Positioning System
HIPS	Hydrographic Information Processing System
HSD	Hydrographic Surveys Division
HSSD	Hydrographic Survey Specifications and Deliverables

Acronym	Definition
HSTP	Hydrographic Systems Technology Programs
HSX	Hypack Hysweep File Format
HTD	Hydrographic Surveys Technical Directive
HVCR	Horizontal and Vertical Control Report
HVF	HIPS Vessel File
IHO	International Hydrographic Organization
IMU	Inertial Motion Unit
ITRF	International Terrestrial Reference Frame
LNM	Local Notice to Mariners
LNM	Linear Nautical Miles
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NAIP	National Agriculture and Imagery Program
NALL	Navigable Area Limit Line
NM	Notice to Mariners
NMEA	National Marine Electronics Association
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NRT	Navigation Response Team
NSD	Navigation Services Division
OCS	Office of Coast Survey
OMAO	Office of Marine and Aviation Operations (NOAA)
OPS	Operations Branch
MBES	Multibeam Echosounder
NWLON	National Water Level Observation Network
PDBS	Phase Differencing Bathymetric Sonar
PHB	Pacific Hydrographic Branch
POS/MV	Position and Orientation System for Marine Vessels
PPK	Post Processed Kinematic
PPP	Precise Point Positioning
PPS	Pulse per second

Acronym	Definition
PRF	Project Reference File
PS	Physical Scientist
PST	Physical Science Technician
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPE	Total Propagated Error
TPU	Topside Processing Unit
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positioning System timing message
ZDF	Zone Definition File



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Center for Operational Oceanographic Products and Services
Silver Spring, MD 20910

Date: January 30, 2014

TO: LCDR Michael Gonsalves
Chief, Operations Branch
Hydrographic Services Division
Office of Coast Survey

FROM: Gerald Hovis
Chief, Products and Services Branch
Oceanographic Division
CO-OPS

RE: Validation of Zoning supplied in support of OPR-Q191-KR-2013 Krenitzin Islands, AK

John Oswald & Associates (JOA) submitted discrete tidal zoning for validation by CO-OPS based on subordinate water level data collected at Broad Bight 9462676, Green Bight 9462705, and SE Tigalda Island 9462786. CO-OPS finds the water level data as well as discrete zoning submitted in support of OPR-Q191-KR-2013 to be valid and meet the requirements under NOS Specifications and Deliverables.

CO-OPS bases its validation of the contractor supplied zoning on the following reasons:

1. JOA's method to develop final zoning geometry and tide correctors is reasonable
2. The 2-sigma standard deviation of the difference between JOA's final tidal zoning and CO-OPS generated TCARI grid in the survey area are within 0.15 meters.
3. The 2-sigma standard deviation of the difference between JOA's final tidal zoning and provided zoning station water level data (BMPG) are within 0.11 meters.

CO-OPS offers the following recommendations:

1. When using mathematical interpolative methods to develop co-range and co-phase lines, only water level data from within relatively close proximity to a survey area should be used. Although unlikely in this particular instance, use of water level data for interpolation from as far away as the DART buoys and NWLON station at King Cove could introduce significant error because the mathematical interpolation does not account for oceanographic or hydrodynamic behaviors in the water levels.

CC:
Jeff Ferguson
Peter Stone
Michael Brown
LT Abigail Higgins
Castle "Gene" Parker
CDR David Zezula
Laura Rear McLaughlin
Corey Allen
Cristina Urizar



Zoning Validation Report for OPR-Q191-KR-2013, Krenitzin Islands, AK

1. Summary

The final tidal zoning created by JOA for OPR-Q191-KR-2013 meets the error requirements of hydrographic survey operations outlined in NOS Hydrographic Specifications and Deliverables, dated April 2013. Indeed the zoning created by JOA improves upon the initial zoning provided by the Center for Operational Oceanographic Products and Services (CO-OPS) due to new tidal information collected at 3 tertiary stations and 2 Bottom Mounted Pressure Gauges (BMPG) and is nearly equivalent with CO-OPS updated zoning. The 2RMS difference within the survey area of JOA generated zoning does not exceed 0.15 meters when compared to TCARI generated tidal interpolation. CO-OPS updated zoning for the region 2RMS difference ranges from 0.01 meters to 0.18 meters when compared to TCARI water levels.

JOA installed 3 tertiary tide gauges (Broad Bight, Green Bight, and SE Tigalda Island) near the survey area but used only two as of these stations (Broad Bight and SE Tigalda Island) to calculate zoning time and range correctors. The use of only two of the three available stations is sufficient to extrapolate water levels in the area since the two stations used are located within the survey area. The additional use of Green Bight as another control station would not appreciably improve the error within the survey area.

It is recommended that the JOA generated zoning for OPR-Q191-KR-2013 be accepted as valid for the survey area on the Pacific Ocean side of the Krenitzin Islands, AK. It is further recommended that JOA only use data from within relatively close proximity to a given survey area when using interpolative methods to determine co-phase or co-range contours for future zoning projects.

2. Survey Area and JOA gauge deployments

The survey area for OPR-Q191-KR-2013 can be described as three separate regions. Region 1 is south of Tigalda Island, Region 2 is south of Akutan Island, and Region 3 is Northwest of Akutan Island on the Bering Sea side.

Region 3 of the survey area is dominated by mixed, mainly diurnal tide types. The NWLON tide gauge at Unalaska (9462660) has very similar tidal characteristics to the historical station at Reef Bight (9462662) and Unalaska is used as the control station for Region 3. JOA did not develop new zoning for Region 3 since CO-OPS provided zoning agreed with observations.

The tides in survey regions 1 and 2 are mixed, mainly semidiurnal with small range and phase changes. These tidal characteristics allow for linear interpolation methods to work well. Region 2 borders areas of changing tide type. In the Akutan Pass as well as in the Akun Strait the tides

begin transitioning to mixed, mainly diurnal. As both of these areas are outside the survey area and JOA did not develop zoning for these areas, the entire region, for the purpose of this report, can be considered to be dominated by mixed, mainly semidiurnal tides. The JOA control stations of Broad Bight and SE Tigalda represent the a mixed, mainly semidiurnal region well and thus are used as the control stations for Regions 2 and 3, respectively. Figure 1 shows the survey region as well as the Defant Ratio, F, for the three tertiary stations installed by JOA and the Defant Ratio for Rootok Island and Reef Bight.

$$F = \frac{K_1 + O_1}{M_2 + S_2}, \quad (1)$$

where K_1 , O_1 , M_2 , and S_2 are the normal harmonic tidal constituents. The Defant Ratios were all calculated from CO-OPS accepted harmonic constituents at each station in order to determine the tide type at each station.

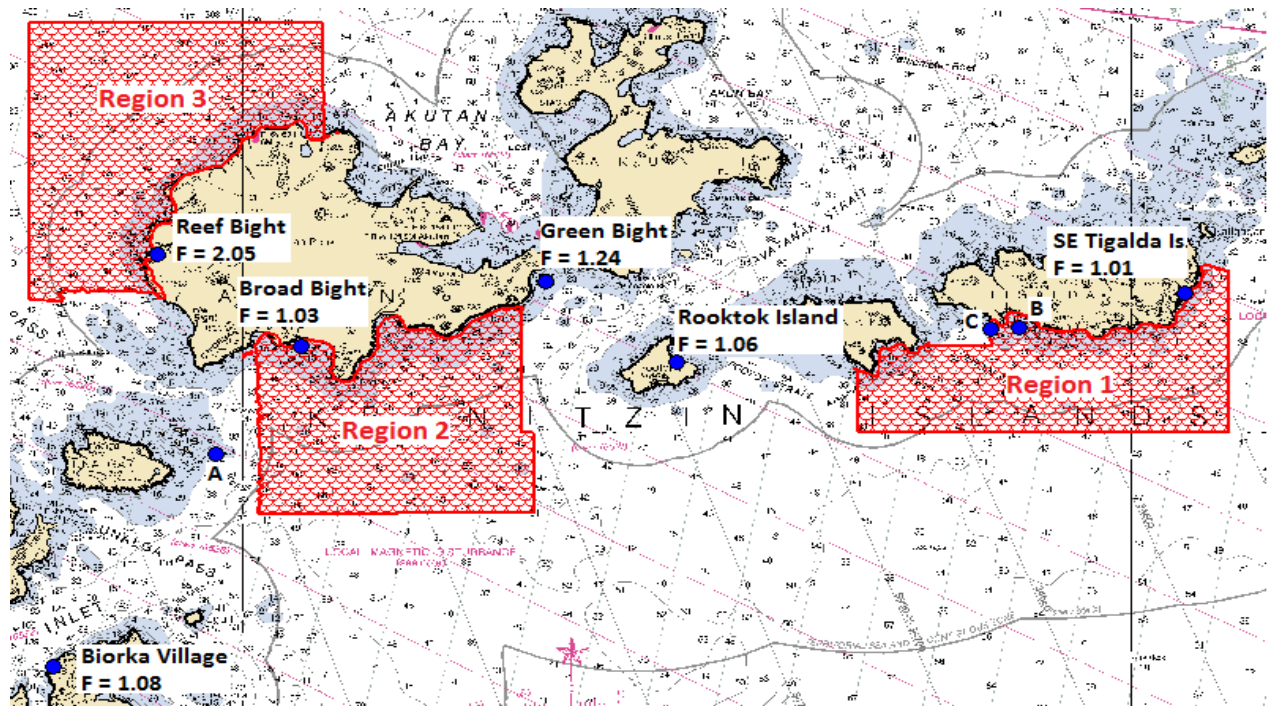


Figure 1: The survey area and Defant Ratios, F, of selected stations in the area as well as locations of other gauges used for zoning purposes. (A) is Akutan Pass south of Baby Islands (BMPG), (B) is Durbin Bay and (C) is Durbin Strait South 2012 (BMPG). Note the transition from mixed, mainly semidiurnal in Region 2 to mixed, mainly diurnal in Region 3.

In addition to the water level gauges deployed at Broad Bight, Green Bight, and SE Tigalda Is., JOA also deployed two bottom mounted pressure gauges (BMPG), labeled A and C in Figure 1, and used historical data from a third BMPG, labeled B in Figure 1, to develop tidal zoning in the survey area. Additionally, NOAA published data from the tide gauge at Rootok Island was used. The locations of the deployed BMPG were in Akutan Pass, south of the Baby Islands and in

Durbin Bay (on the south side of Tigalda Island). The historical BMPG data was collected in 2012 in Durbin Strait South in support of OPR-Q191-KR-2012. High Water Intervals (HWI), Low Water Intervals (LWI), and Great Diurnal Ranges (Gt) were calculated for all of these stations and these values were used in the creation of co-tidal zones.

3. Validation

a. JOA Zoning Method

JOA used linear Kriging interpolation to determine the most likely – as opposed to other interpolation techniques which find the smoothest – value of the HWI, LWI and Gt within the survey area. Three NOAA DART buoys, the NWLON station at King Cove, and historical data from the Biorka Village tide gauge (9462645) were used to bound the survey area to the south, east, and west, respectively. In total, water level data from 12 stations were used to interpolate across the survey area.

The NOAA DART buoys and the King Cove NWLON station are very far (several hundred kilometers) from the survey area. As a result the influence of these stations on the co-phase and co-range lines in the survey area is minimal since the weighting influence is determined by distance. JOA correctly noted this in the Tidal Zoning Development Report submitted to CO-OPS.

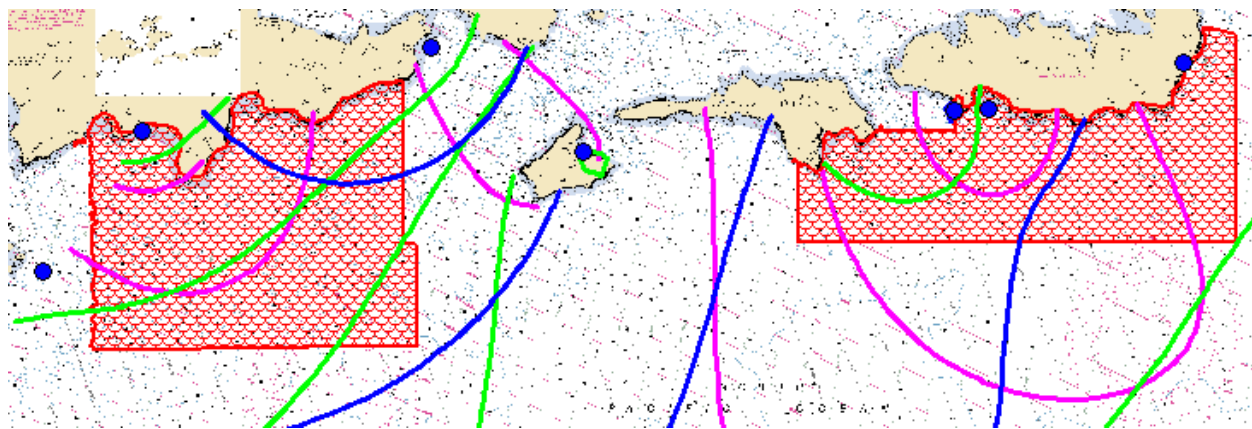


Figure 2: HWI(Bright Green), LWI (Blue), and Gt (Pink) contours developed by JOA.

Final co-tidal zones were developed by following HWI, LWI, and Gt contour lines in the survey area. Figure 2 shows the JOA generated HWI and LWI co-phase lines and Gt co-range lines. The co-tidal zones developed by JOA are shown in Figure 3. A total of 13 co-tidal zones were created. SE Tigalda Island is used as the control station for zones covering Region 1 of the survey area and Broad Bight is used as the control station for zones covering Region 2 of the survey area. The time and range correctors for each zone are summarized in Table 1.

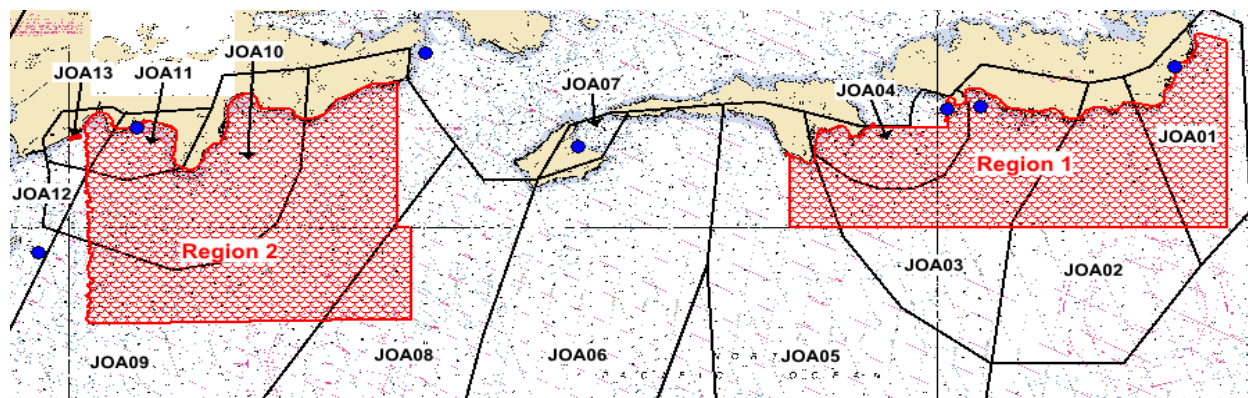


Figure 3: JOA generated zoning for Region 1 and Region 2 of the survey area.

Zone Name	Control Station	Time Corrector (mins)	Range Ratio
JOA01	SE Tigalda Island	0	1.00
JOA02	SE Tigalda Island	0	1.04
JOA03	SE Tigalda Island	0	1.04
JOA04	SE Tigalda Island	+6	1.05
JOA05	SE Tigalda Island	0	1.00
JOA06	SE Tigalda Island	+6	0.98
JOA07	SE Tigalda Island	+6	0.95
JOA08	Broad Bight	-12	0.93
JOA09	Broad Bight	-6	0.93
JOA10	Broad Bight	-6	0.96
JOA11	Broad Bight	0	1.00
JOA12	Broad Bight	-6	0.96
JOA13	Broad Bight	0	1.00

Table 1: Summary of time and range correctors for JOA generated zoning

Although the use of the DART buoys and the King Cove NWLON station has a minimal effect on the co-phase and co-range lines in the survey area, it is not recommended that the use of data points so far from the region of interest be used in future zoning development. The primary reason for this recommendation is that the use of linear interpolation methods does not take into account oceanographic or hydrodynamic principles. The presence of a continental shelf between the survey area and the DART buoys is not reflected by any strictly mathematical interpolation method. In the event that a survey area is near any major bathymetric features or regions of unique hydrodynamic characteristics (e.g. an amphidromic point) linear interpolation over large distances could be a source of significant error.

b. CO-OPS updated zoning

CO-OPS updated its own regional zoning using the data collected by JOA. Co-phase and co-range lines were regenerated to take into account the new data. Figure 4 shows the CO-OPS generated HWI, LWI, and MN contours.

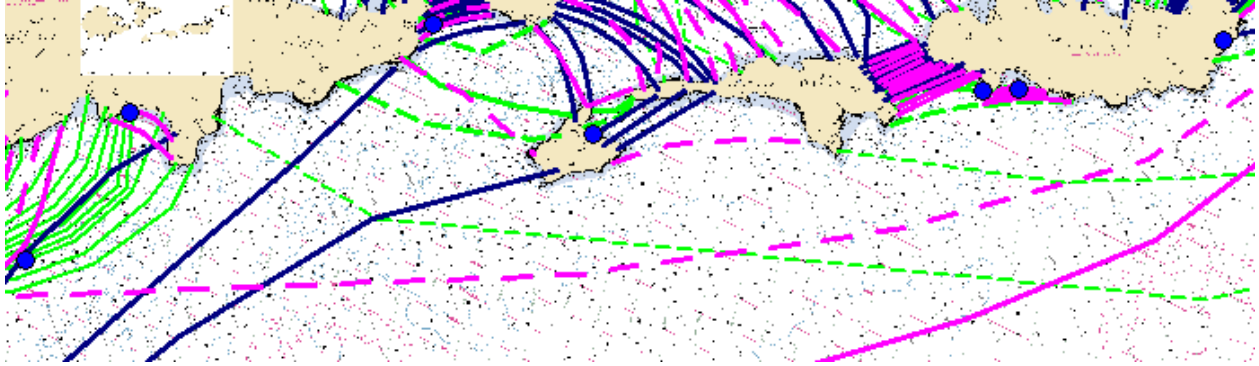


Figure 4: CO-OPS updated HWI (Bright Green), LWI (Blue), and MN (Pink) contours. Note the increased complexity of the regions south of Broad Bight and north of Avatanak Island where tide types are changing from mixed, mainly diurnal (south and east) to mixed mainly diurnal (north and west).

Regional zoning was generated using the updated co-phase and co-range contours. Figure 5 shows the CO-OPS updated zoning for the survey region. A total of 26 zones were created, though not all of the zones are applicable to the specific survey regions.

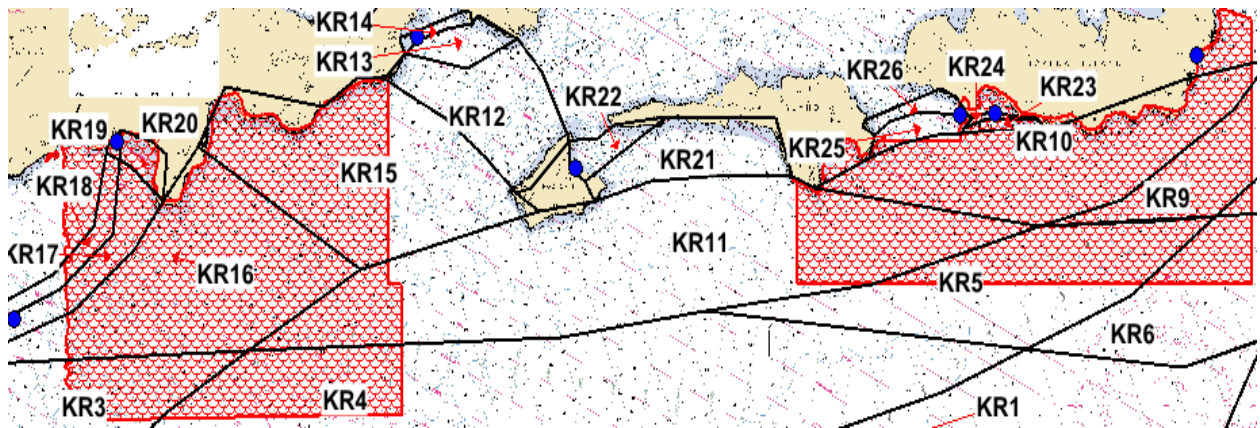


Figure 5: Updated CO-OPS zoning for Region 1 and Region 2 of the survey area.

The tertiary stations of SE Tigalda Is. and Broad Bight are used as control for all but three of the updated zones. Green Bight is used to control zones KR12, KR13, and KR14. These zones do not cover any part of the survey area. Table 2 lists the time correctors, range correctors, and control stations for each of the zones.

Zone Name	Control Station	Time Corrector (mins)	Range Ratio
KR1	Se Tigalda Is.	0	1.05
KR2	Se Tigalda Is.	-6	1.09
KR3	Broad Bight	-18	0.96
KR4	Se Tigalda Is.	0	1.02
KR5	Se Tigalda Is.	-6	1.02
KR6	Se Tigalda Is.	-6	1.06
KR7	Se Tigalda Is.	-6	1.04
KR8	Se Tigalda Is.	-24	1.06
KR9	Se Tigalda Is.	-6	1.02
KR10	Se Tigalda Is.	-6	1.02
KR11	Se Tigalda Is.	0	0.99
KR12	Green Bight	-6	0.95
KR13	Green Bight	-6	0.95
KR14	Green Bight	0	1.00
KR15	Broad Bight	-18	0.93
KR16	Broad Bight	-18	0.95
KR17	Broad Bight	-6	0.93
KR18	Broad Bight	0	0.93
KR19	Broad Bight	0	0.99
KR20	Broad Bight	0	1
KR21	Se Tigalda Is.	0	0.96
KR22	Se Tigalda Is.	+6	0.96
KR23	Se Tigalda Is.	0	1.03
KR24	Se Tigalda Is.	0	1.09
KR25	Se Tigalda Is.	0	0.94
KR26	Se Tigalda Is.	+6	0.95

Table 2: Summary of time and range correctors for CO-OPS generated zoning

c. CO-OPS generated TCARI tide reduction

In addition to updating regional zoning, CO-OPS generated a TCARI tide solution covering Regions 1 & 2 of the survey area. The solution was generated using the accepted harmonic constituents at Broad Bight, Green Bight, SE Tigalda Island, and Rootok Island (historical) using Broad Bight, Green Bight, and SE Tigalda Island stations as the control stations. The estimated interpolation error of the TCARI solution is shown in Figure 6.

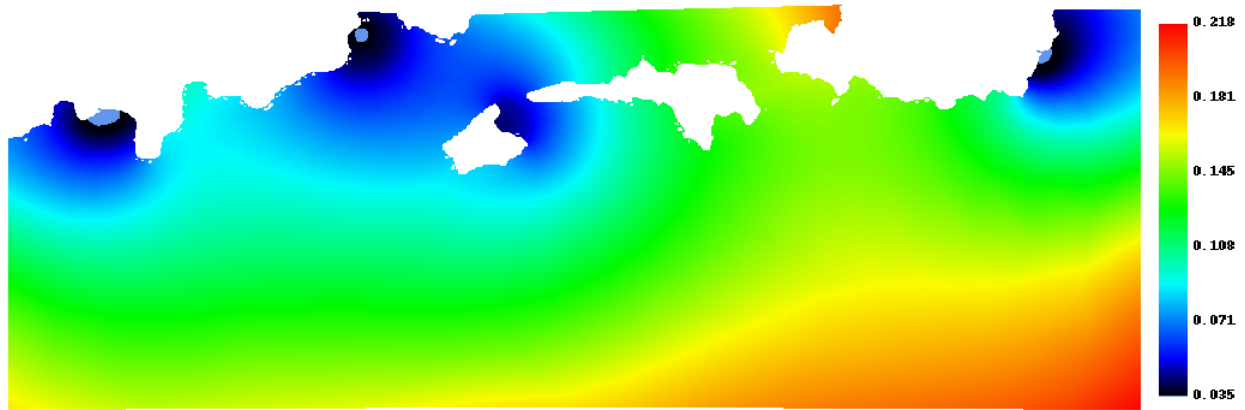


Figure 6: TCARI interpolation error (meters) measured in meters. Note that within Regions 1 & 2 the error does not exceed 0.15m.

The observed data captured by the control stations for the period of July 1st – July 31st, 2013 was used to compare the TCARI tide reduction solution to tide reducers generated by JOA tidal zoning. The large number of data points near the survey area used to generate co-phase and co-range contours help to create co-tidal zones with lower 2RMS difference.

d. Comparison among TCARI, JOA zoning, and CO-OPS updated zoning

Figure 7 shows the 2RMS difference associated with JOA zoning in the survey area as compared to TCARI interpolation. The regions of higher error are indicative of regions of changing tide type. These areas are not within the survey area so their impact on the accuracy of the JOA survey area is minimal.

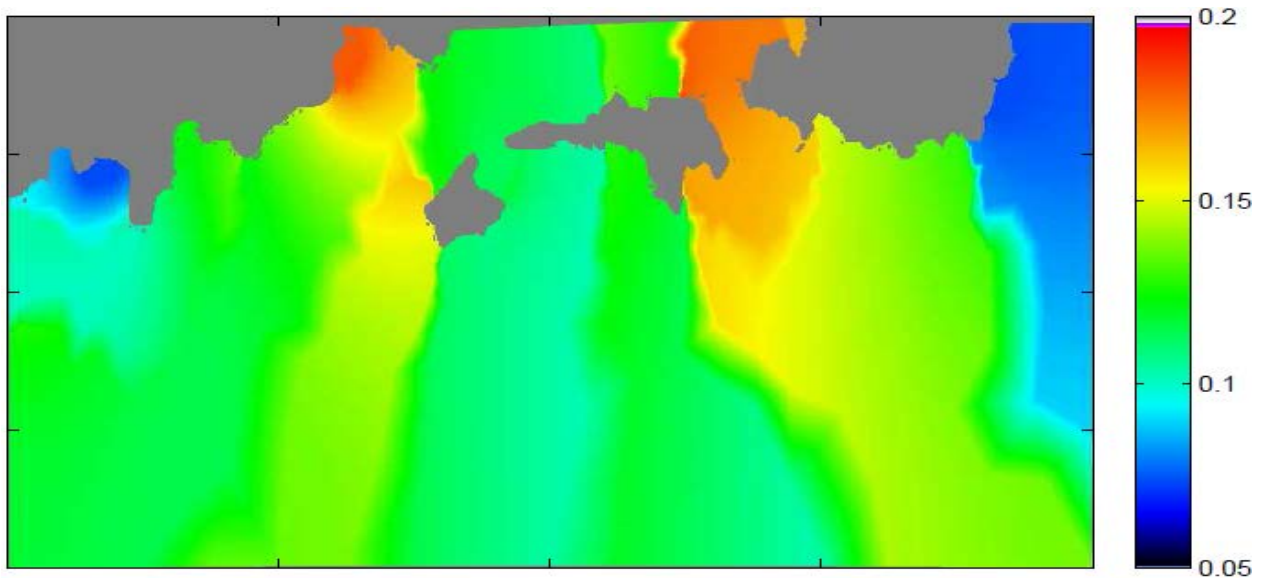


Figure 7: 2RMS difference (meters) generated by PYDRO for JOA co-tidal zones as compared to TCARI interpolation.

Figure 8 shows the 2RMS difference associated with CO-OPS updated zoning in the survey area as compared to TCARI interpolation. The differences between JOA and CO-OPS updated zoning are comparable.

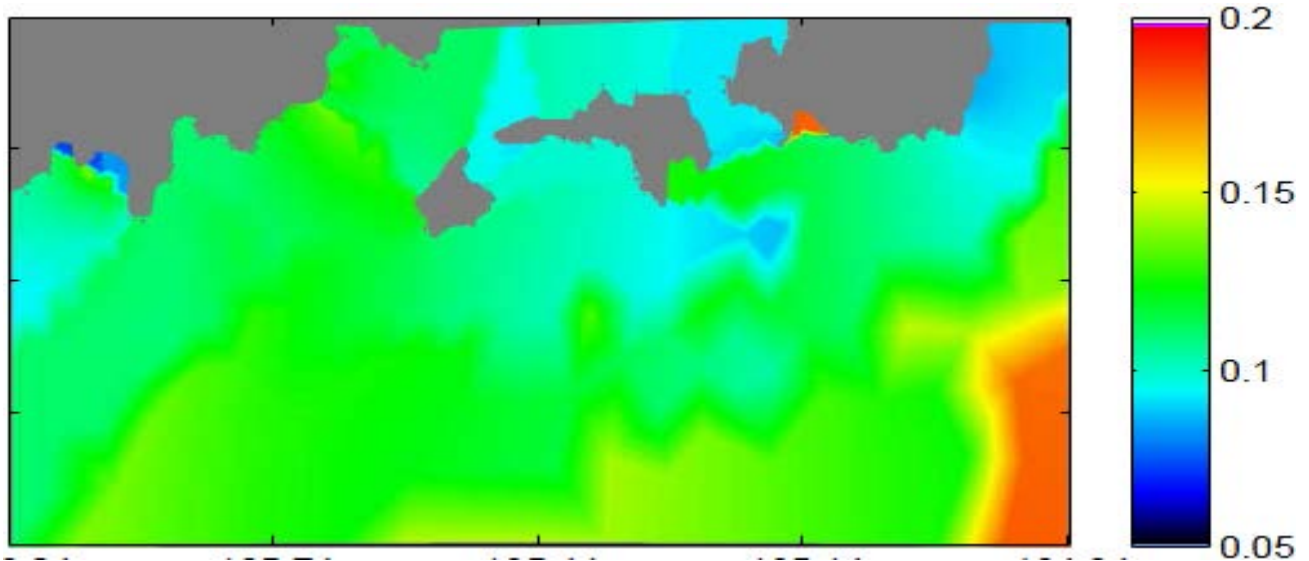


Figure 8: 2RMS difference (meters) generated by PYDRO for CO-OPS updated co-tidal zones as compared to TCARI interpolation.

Additionally, zoned water level comparisons between the control stations of SE Tigalda and Broad Bight and BMPG installations were performed using both the JOA generated zoning and CO-OPS updated zoning. The 2RMS differences were calculated and are shown in figures 9-12. Finally, a comparison between TCARI generated tide reduction curves and the available data for the BMPGs at Akun Pass and Durbin Bay was performed. The results of this comparison can be seen in figures 13 and 14.

All three comparison methods yield 2RMS differences that are very close to each other indicating only small differences between the three methodologies. In light of the similarities among all three methods it is recommended that CO-OPS accept the JOA generated zoning as valid for OPR-Q191-KR-2014.

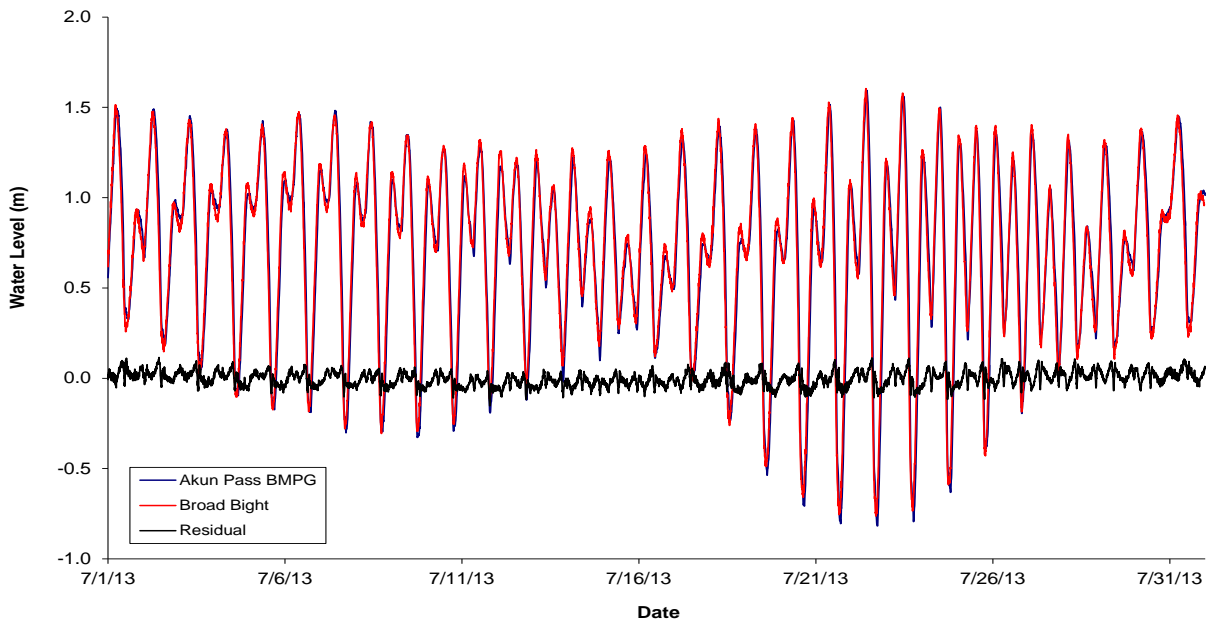


Figure 9: JOA zoned water level (red) from Broad Bight compared to BMPG data (blue) from Akun Pass, South of Baby Islands and the residual difference (black). The 2RMS difference is 0.082 meters.

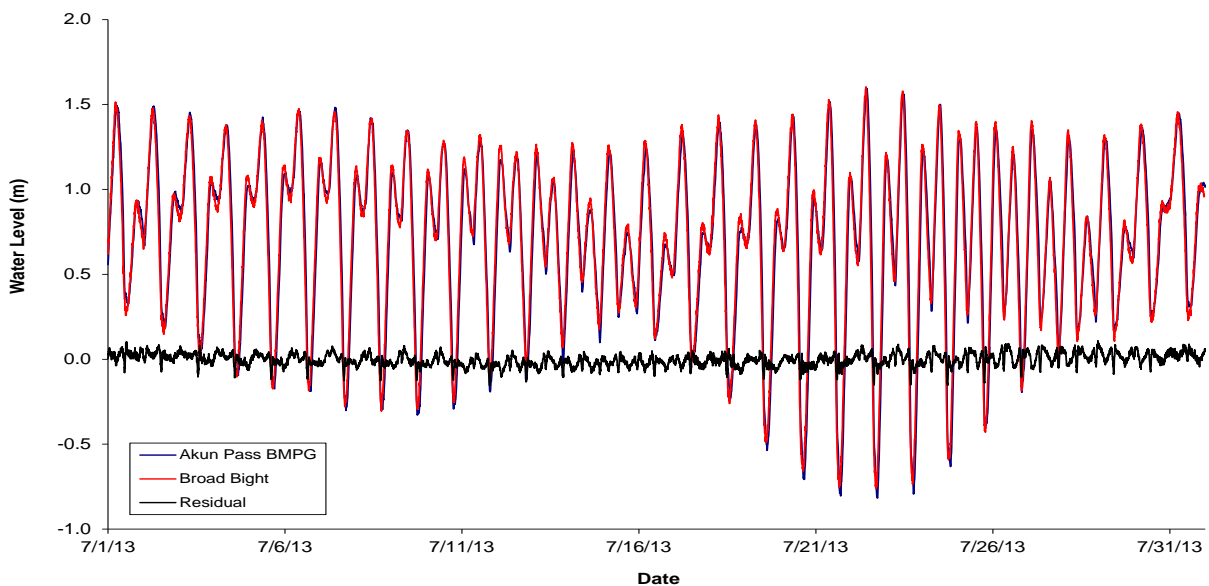


Figure 10: CO-OPS updated zoned water level (red) from Broad Bight compared to BMPG data (blue) from Akun Pass, South of Baby Islands and the residual difference (black). The 2RMS difference is 0.077 meters.

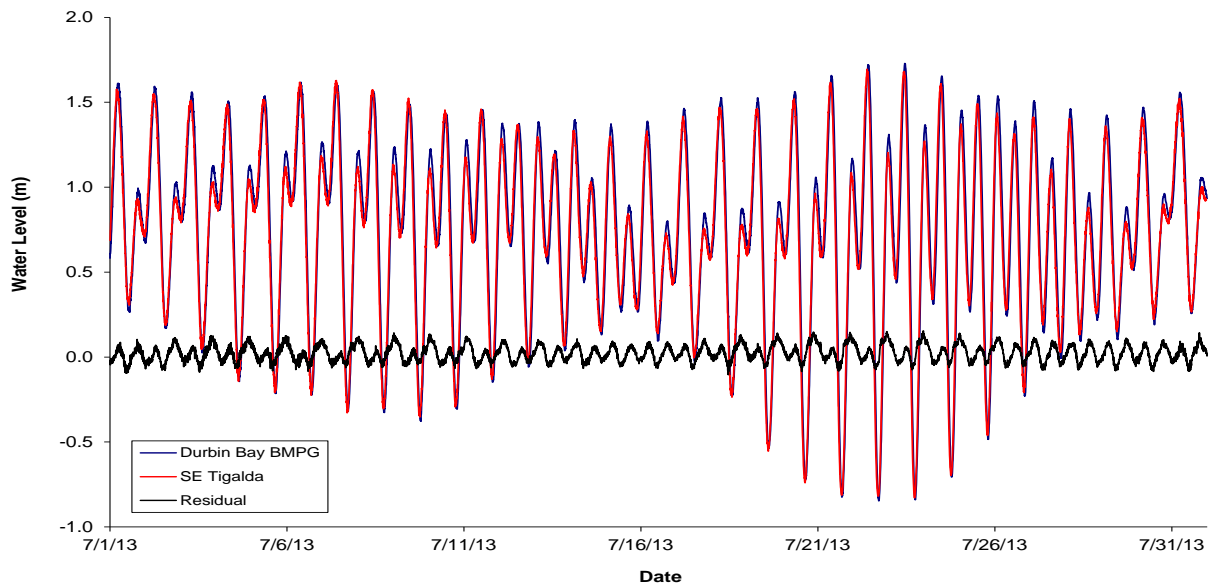


Figure 11: JOA zoned water level (red) from SE Tigalda compared to BMPG data (blue) from Durbin Bay and the residual difference (black). The 2RMS difference is 0.106 meters.

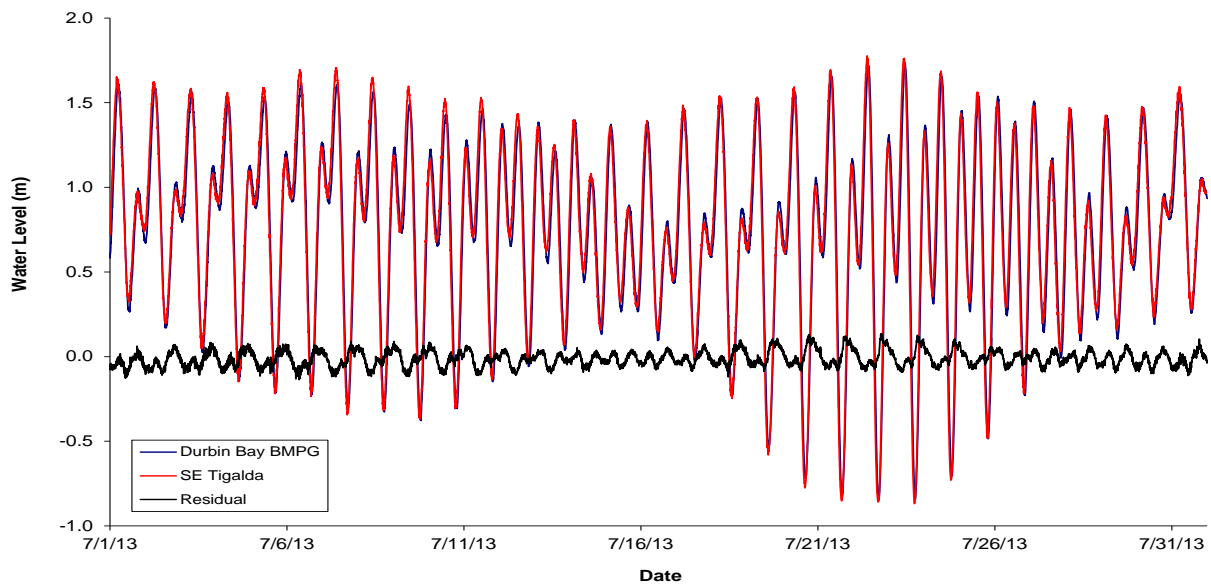


Figure 12: CO-OPS updated zoned water level (red) from SE Tigalda compared to BMPG data (blue) from Durbin Bay and the residual difference (black). The 2RMS difference is 0.096 meters.

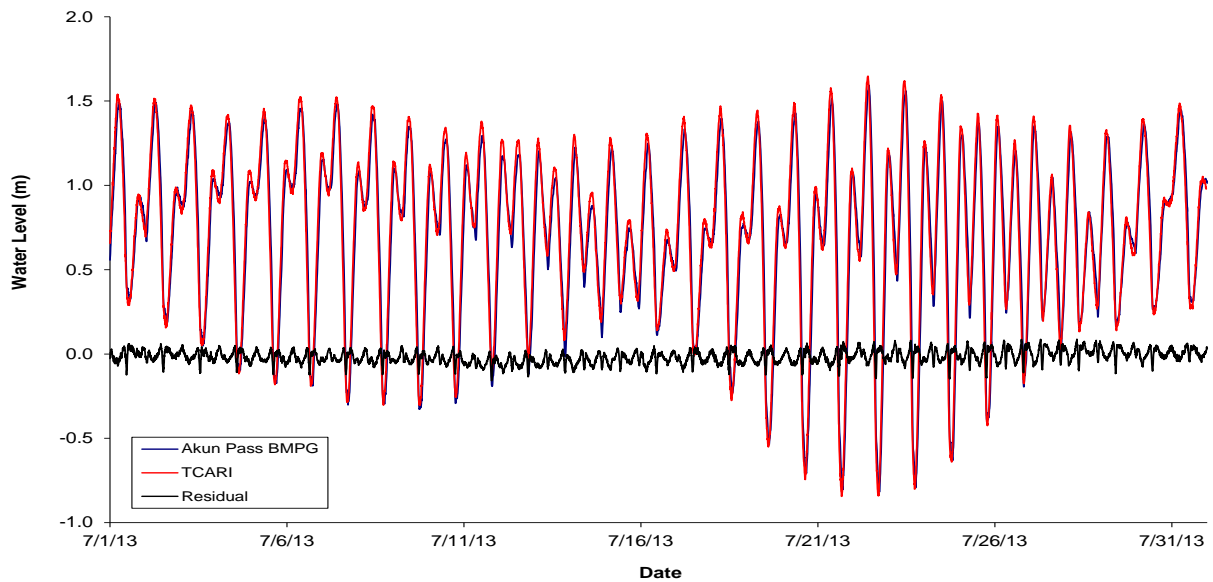


Figure 13: TCARI generated water levels (red) compared to BMPG data (blue) from Akun Pass, South of Baby Islands and the residual difference (black). The 2RMS difference is 0.085 meters.

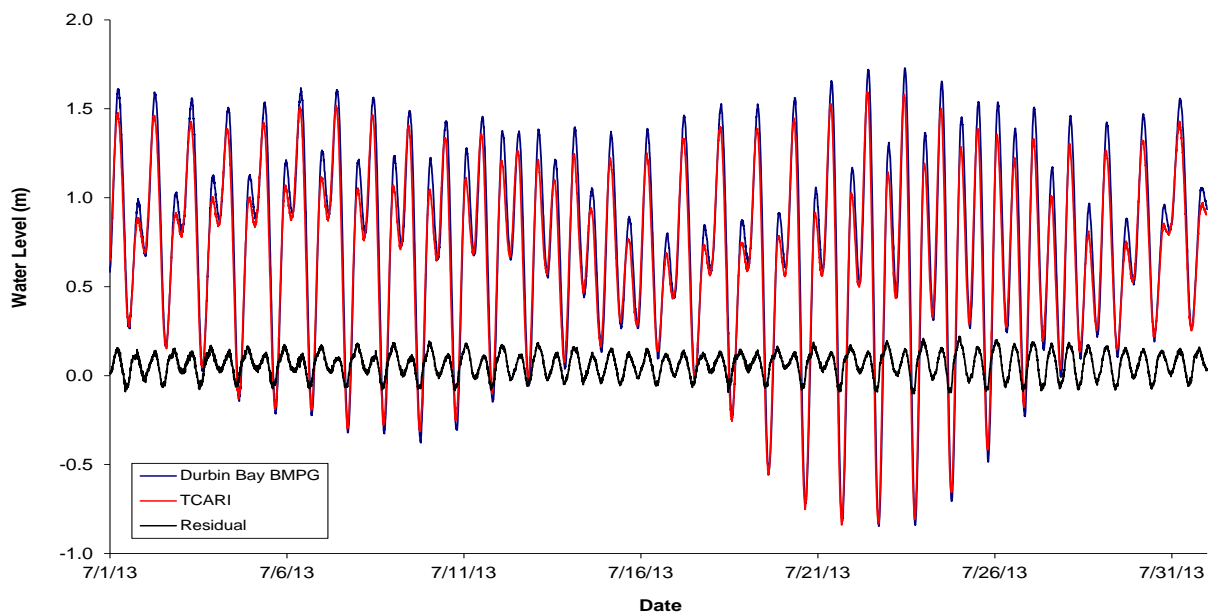


Figure 14: TCARI generated water levels (red) compared to BMPG data (blue) from Durbin Bay and the residual difference (black). The 2RMS difference is 0.18 meters.

Moyles, Dean

From: Gerald Hovis - NOAA Federal [gerald.hovis@noaa.gov]
Sent: Wednesday, September 25, 2013 4:11 AM
To: Mike Zieserl
Cc: David.Scharff; Moyles, Dean; Nathan Wardwell; _NOS CO-OPS OET Team; psb
Subject: Fwd: Hydro Project OPR-Q191-KR-13 Removal Documentation Evaluations
Attachments: 9462676 Broad Bight, AK FY13 Hydro Removal Evaluation.doc; 9462705 Green Bight, AK FY13 Hydro Removal Evaluation.doc; 9462786 SE Tigalda Island, AK FY13 Hydro Removal Evaluation.doc

Mike,

The removal documentation for the three tertiary stations (9462676 Broad Bight, AK, 9462705 Green Bight, AK, and 9462786 SE Tigalda Island, AK) installed for project OPR-Q191-KR-2013 have been accepted as FINAL. Attached are the final records evaluations for the water level stations' metadata.

The stations have been configured in WALI and we have added them to your processing group. This group has permissions to load, edit, and complete the processing of six minute, hourly heights, highs / lows, and monthly means (if applicable) water level data for these stations. To expedite final deliverables to OCS please notify me (gerald.hovis@noaa.gov) and OET (nos.coops.oetteam@noaa.gov) and PSB (nos.co-ops.psb@noaa.gov) as soon as you have completed this work so CO-OPS may verify the products. Once the data have been verified we will notify JOA so the products may be utilized for final tide reduction.

NOTE: Several steps in the flow of using WALI to process data by external contractors are still being worked out so please do not hesitate to contact me or the hydro planning team if you need clarification. Notable here are: First, to the extent that it is practicable please include information about the station parameters below in the read me file that is submitted with the initial station package to OET. These parameters are required to process a station. Second, currently WALI does not process harmonic constituents once datums have been computed and we have been notified to verify the data CO-OPS will have to use this data to compute harmonics and notify JOA should that information be needed for contractor tide reduction analysis. WALI version 2 (currently under production) will include this function. The HSSD will be updated to reflect any needed changes as soon as the process is documented and finalized.

Required Station Parameters: (Note: Control station parameters may be substituted if values are not available from subordinate station. Please note proposed Control station in read me file.)

1. WL_MAX - Maximum historical observed water level for a station with date.
2. WL_MIN - Minimum historical observed water level for a station with date.
3. WL_ROFC - Rate of Change or Third Difference for a station. Use the value from the control or reference station.
4. TIDE_TYPE - 1 Semidiurnal, 2 Mixed Semidiurnal, 3 Mixed Diurnal, 4 Diurnal and 5 Great Lakes.
5. MAX_RANGE - Maximum range between two tides at a station. WL_MAX minus WL_MIN or use the value from the control or reference station.
6. MAX_TIME - Maximum time between two tides at a station. May use the value from the control or reference station.
7. MIN_RANGE - Minimum range between two tides at a station. Value should always be 0.030 m.
8. MIN_TIME - Minimum time between two tides at a station. Value should always be 2.0 hours.
9. DEPLOYMENT_DESIGNATION - For Contract Hydro deployment designation should always be 4.

Please do not hesitate to contact us if you have any issues.

And as always.....Have a great day!

Moyles, Dean FPI

From: Mark Lathrop [mark.t.lathrop@noaa.gov]
Sent: Thursday, October 31, 2013 8:19 AM
To: Moyles, Dean FPI
Subject: Re: Delivery

Dean,

Go ahead and make your delivery to PHB. We'll sort out the WALI when we can.

Mark

Sent from my iPhone

On Oct 31, 2013, at 11:03 AM, "Moyles, Dean FPI" <dmoyles@fugro.com> wrote:

I left you a voice mail, was wondering if you heard back from CO-Ops or PHB on our delivery?

Dean Moyles

Project Manager/Senior Hydrographer (ACSM cert. No. 226)

Fugro Pelagos, Inc.

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Effective January 1st 2013, Fugro's offshore survey companies in California will be joining forces and collectively operating under the name Fugro Pelagos, Inc. (FPI). This change unifies Fugro's survey resources and broadens our range of survey services within the state as well as globally. Fugro Pelagos, Inc. now has offices in San Diego, Ventura & Oakland CA, Bay St. Louis MS, Seattle WA and Anchorage AK.

Our same staff look forward to continuing to work with you and will provide the same quality and effectiveness that you have counted on us for in the past.

Moyles, Dean FPI

From: David Scharff - NOAA Federal [david.scharff@noaa.gov]
Sent: Wednesday, September 18, 2013 6:55 AM
To: Moyles, Dean
Subject: Re: Krenitzin Islands

Hi Dean, give me a call when you get a chance.

301-713-2780 x107

On Mon, Sep 16, 2013 at 4:58 PM, Moyles, Dean <dmoyles@fugro.com> wrote:

We are currently working on the data set from this past field season, we are working with JOA to revised the zoning to alleviate minor tide issues; I'm not sure how long this process will take. Once this is completed we will be doing a final check before we deliver to data and reports, do we need to wait for CO-OPS to complete their final review or can we go ahead and send it to PHB?

Also, in our proposal we state that the delivery date will be 120 days from the last day of acquisition, which would be November 24, 2013. When you came out to the vessel you also mentioned a date was it the same or did it differ from this?

One final note, we did do a little extra work in Priority 1 with the Ocean Pioneer, can I include the data in that sheet or do you want it separated?

Dean Moyles

Project Manager/Senior Hydrographer (ACSM cert. No. 226)

Fugro Pelagos, Inc.

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Moyles, Dean FPI

From: Crescent Moegling - NOAA Federal [crescent.moegling@noaa.gov]
Sent: Tuesday, September 17, 2013 11:13 AM
To: Moyles, Dean
Subject: Re: H12457 D_to_N's

Yes, that's correct I've received everything for this project unless anything comes up as you continue processing.

Have you not received the SARs for the 2012 project? I can't submit them to you directly - you'll need to get with Scharff on that unfortunately.

When do you hope to deliver the 2013 project?

On Tue, Sep 17, 2013 at 11:03 AM, Moyles, Dean <dmoyles@fugro.com> wrote:

Thanks, from your records, have I submitted everything regarding the DtoN's for this past season, just want to make sure I didn't miss one? If we come across additional DtoN's during our final reviews I will submit to you for review.

Have you completed the review on last year's data, s57 and reports, if you have any comments let me know so I can make changes to ease the process for this year's submission.

From: Crescent Moegling - NOAA Federal [mailto:crescent.moegling@noaa.gov]
Sent: Tuesday, September 17, 2013 10:58 AM
To: Moyles, Dean
Subject: Re: H12457 D_to_N's

Don't submit any of these.

On Thu, Aug 8, 2013 at 11:34 AM, Dean Moyles <dmoyles@fugro.com> wrote:

I had one of the leads do a D_to_N search for this priority on the transit from Kodiak to Seattle, I filtered a few out already, can you review these and let me know what ones I can submit.

Dean Moyles

Project Manager/Senior Hydrographer (ACSM cert. No. 226)

Moyles, Dean

From: David Scharff - NOAA Federal [david.scharff@noaa.gov]
Sent: Tuesday, July 16, 2013 8:02 AM
To: Dean Moyles
Subject: Re: Question

I would say too much - as per the project instructions you are not required to address any feature that falls inshore of the 4 fathom contour regardless of whether it was assigned or not. However, that being said those assigned features you believe to be a navigational hazard close to the limit (e.g. features marked with green ellipse) and can be addressed in some way safely I personally might at the very least make a note in the DR. Let me know if that makes sense to you. I will discuss this with Crescent later today.

On Mon, Jul 15, 2013 at 8:55 PM, Dean Moyles <dmoyles@fugro.com> wrote:

I need some guidance on our shoreline feature methodology, I was hoping to be further along here so we could review during your trip, but that was not the case. In the attached graphic I have outlined the features with either a red, orange or green ellipse. The red represents features that we will not be address, orange we will make an attempt and green which will be verified. The green/magenta interface on the DTM represents the 4 fathom contour, so they most all lie outside our survey limit.

Does this look like a good approach, too much or too little?

Dean Moyles

Project Manager/Senior Hydrographer (ACSM cert. No. 226)

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Moyles, Dean FPI

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Dean Moyles

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Mike,

You need to finalize the processing package before I can see it. It clears the individual files and makes one large pdf on our server.

~Colleen

--

Colleen Fanelli

Oceanographer

NOAA/National Ocean Service

Center for Operational Oceanographic Products and Services

Station 7142

1305 East-West Highway N/OPS3

Silver Spring, MD 20910

Colleen.Fanelli@noaa.gov

Phone: (301) 713 – 2877 x 167

On Fri, Oct 25, 2013 at 4:44 PM, Mike Zieserl <mike@joasurveys.com> wrote:

Thanks Colleen, that worked.

I've made the edits you pointed out and added a couple more graphs to the analysis package. I reviewed the July W3 against King Cove and it looks like they agree so I didn't change anything there. I've marked the June and July W3 for Green Bight as complete.

Do I need to "Finalize" the analysis package? Figured I'd leave as is for now until you review since it sounds like it clears it out when I finalize it.

I'll try to keep a tally of my questions and get something written up early next week. I think most of them will be answered as I get more practice in with WALI.

Thanks again for your help, Mike

Mike Zieserl, PLS

JOA Surveys, LLC

www.joasurveys.com

2000 E. Dowling Rd, #10

Anchorage, AK 99507

(907) 230-5789 cell

(907) 561-0136 phone

On 10/25/2013 11:12 AM, Colleen Fanelli - NOAA Federal wrote:

- > Mike,
- >
- > I only unmarked (returned to Working status) June and July. Change the end date to June 30 at 2354. This should allow you to edit the W3 data. It won't let you Edit right now because I did not unmark August.
- >
- > ~Colleen

Good afternoon Mike...

Please try to load the water level data files again except for 94626761.W1.DAT. I got this file to load successfully. I found the sensors were configured in our database as N1 sensors but the proper configuration is Z1 sensors. Please accept OETs apologies for this time consuming mistake. Please try loading again via WALI (making no changes to your files or the file name) and let us know if you continue to receive the loading failed message.

Tara

On Thu, Oct 24, 2013 at 2:44 PM, Mike Zieserl <mike@joasurveys.com> wrote:

Colleen, no worries, I'd expect the first few times through there will be some hiccups, I'm sure many from my end.

I just tried 9462676 Broad Bight and 9462705 Green Bight again, validation fails, blank error report (attached, along with BWL).

Mike

Mike Zieserl, PLS

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>>>

>

>

Artara,

The removal reports for the 3 tide stations installed to support OCS hydro project OPR-Q191-KR-13 have been completed and posted to the JOA FTP site.

Water level data on station datum in BWL format is included for each station. Data tabulations and datum computations will be performed directly in CO-OPS WALI after the removal reports are approved. A final tidal zoning report for this project will be submitted separately after WALI processing is completed.

FTP download instructions are included in the attached transmittal letters.

Regards, Mike

--

Mike Zieserl, PLS

JOA Surveys, LLC

www.joasurveys.com

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Anchorage, AK 99507

(907) 230-5789 cell

(907) 561-0136 phone

Good afternoon Mike...

Attached are the records evaluations for the installation documentation submitted for the three subordinate stations installed for OPR-Q191-KR-13 in the Krenitzin Islands, AK. There are no concerns that need to be addressed with the installation documentation.

Have a great day!

Tara

----- Forwarded message -----

From: Mike Zieserl <mike@joasurveys.com>

Date: Tue, Jul 16, 2013 at 9:09 PM

Subject: 2 Tide Station Reports for OPR-Q191-KR-13

To: Artara Johnson <Artara.Johnson@noaa.gov>

Cc: Dean Moyles <DMoyles@fugro.com>, David Scharff <david.scharff@noaa.gov>, OET Team <nos.coops.oetteam@noaa.gov>, Nathan Wardwell <nathan@joasurveys.com>

Artara,

The installation reports for the Broad Bight and SE Tigalda Island tide stations for OPR-Q191-KR-13 in the Krenitzin Islands, AK have been posted to the JOA FTP site for download. FTP instructions are in the attached transmittal letters.

The third station report for Green Bight will be posted as soon as the OPUS-DB datasheet is published. Please let me know if you have any questions.

Sincerely,

Mike Zieserl

--

Mike Zieserl, PLS

JOA Surveys, LLC

www.joasurveys.com

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Anchorage, AK 99507

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Thanks for the update, we discussed this yesterday and if it's not approved we might try putting a request in to CO-OPS to re-position Broad Bight slightly to the east, outside of the 3nm buffer.

On Wed, May 15, 2013 at 4:08 PM, nathan <nathan@joasurveys.com> wrote:

I have not received a response from her so I'm not sure. I'll follow up and let you know.

Moyles, Dean

From: David Scharff - NOAA Federal [david.scharff@noaa.gov]
Sent: Wednesday, May 22, 2013 2:08 PM
To: Dean Moyles
Cc: corey.allen@noaa.gov; marc.s.moser@noaa.gov
Subject: Re: No Transit Zone

Corey,

Here is the background on our attempt to establish permissions to operate near the rookeries and no transit zones in the Krenitzin Islands.

In the beginning of 2011 Kathleen provided our NEPA assessment to NMFS which included our plans to survey the Krenitzin Islands - we never received feedback and assumed there were no issues with HSD's plan.

7/25/2011 - Fugro established contact with Lisa Rotterman, NMFS's Steller Sea Lion Coordinator requesting permission to enter the sea lion critical habitat. Her response was that she would review their project.

7/27/2011 - Given the project was about to begin Kathleen and I contacted Lisa, she responded with a series of questions which Fugro, Kathleen and I responded to. In addition we provided the PIs, NEPA report, Fugro's Health, Safety and Environmental (HSE) policy which address operation in protected habitats, along with various other documents.

7/28/2011 - Given the need to proceed I provided Fugro with the following email:

"James,

Re: Hydrographic survey operations in the vicinity of the Steller sea lion critical habitat near Akun Island.

At this time NOAA does not have any established protocols in place for hydrographic survey operations in or near marine protected areas. Kathleen Jamison and I are in contact with NOAA's Office of Protected Resources in Silver Spring and the regional office in Anchorage and will provided you further guidance as it becomes available.

You are authorized to commence survey operations as described in the Project Instructions for OPR-Q191-KR-11 providing the following guidance is adhere to: (1) the field parties should exercise extra diligence while surveying in the established sea lion critical habitat and avoid any actions that may lead to contact or impose undue stress on marine mammals, (2) adhere to the mammal impact mitigation procedures outlined in Section-3 of Fugro's Marine Project HSE Plan and (3) if in the course of conducting the survey avoidance with marine mammals is not possible for any reason contact me so we may discuss alternatives.

Regards,
Dave"

8/2/2011 - Kathleen and I received more questions from Lisa that were promptly answered. She never responded back.

Summer of 2012 - Fugro attempted to contact Lisa regarding permissions into the Steller sea lion critical habitat again. They never received a response.

Bottom line - Fisheries does know Fugro has been working in the Krenitzin Islands, they know they are working there this year as JOA requested a permit, and our NEPA assessment clearly outlines our intent to

survey the area. However, for some reason we have never been able to provide permissions or guidance with regards to survey operations in or near critical habitats.

I can either provide Fugro another authorization letter, or give Dean a can-opener. Let me know.

Dave

On Wed, May 22, 2013 at 1:48 PM, Dean Moyles <dmoyles@fugro.com> wrote:
Thanks.

From: Corey Allen - NOAA Federal [mailto:corey.allen@noaa.gov]
Sent: Wednesday, May 22, 2013 10:46 AM
To: Dean Moyles
Cc: David Scharff - NOAA Federal <david.scharff@noaa.gov>; Marc Moser - NOAA Federal <marc.s.moser@noaa.gov>
Subject: Re: No Transit Zone

Dean,

Fully understand walking the line between CYA and opening a can of worms. I was able to track down some of the 2011 documents and need to consult with OCS' NEPA person (Kathleen Jamison) and Jeff before deciding on a course of action (ie asking for 2013 approval or hanging our hat on the 2011 approval). I won't be able to get all the players together until tomorrow morning, but will touch base with you immediately following that meeting to provide additional guidance.

Cheers, Corey

On Wed, May 22, 2013 at 1:28 PM, Dean Moyles <dmoyles@fugro.com> wrote:

I don't want to open up a can of worms here, but I need to cover us, in the past we have dealt with :

NOAA/NMFS

Lisa Rotterman

NMFS/AKR PROTECTED RESOURCES DIVISION

Steller Sea Lion Coordinator

[907-271-1692](tel:907-271-1692)

lisa.rotterman@noaa.gov

She is currently working with JOA on gaining permission for the Broad Bight tide gauge. To give you a little history here; in 2011 we were in a Sea Lion haul out zone as well, and got approval by sending here our HSE plan and procedures. In 2012 we tried the same but never heard back from her after I sent the HSE plan and procedures. Not sure if I should contact her again or if someone from NOAA do it first, what are your thoughts?

From: Corey Allen - NOAA Federal [mailto:corey.allen@noaa.gov]
Sent: Wednesday, May 22, 2013 10:21 AM
To: Dean Moyles

Cc: David Scharff - NOAA Federal
Subject: Re: No Transit Zone

Dean,

Got your message. I'm not having much luck looking back in our archives to find the approval/waiver for these "No Transit Zones." I'll keep looking and asking around, but any documentation, POCs, etc you could pass along for background would be greatly appreciated.

Cheers, Corey

On Wed, May 22, 2013 at 12:39 PM, Dean Moyles <dmoyles@fugro.com> wrote:

In David's absence, you have been appointed my POC; as you know JOA have been working with Lisa Rotterman to gain permission to this area for the tide gauge installation. From the graphic below, a portion of our survey area is within this "No transit Zone" as well. I have talked to David briefly about this, he mentioned that we have received approval sometime ago to enter these areas, it was for the entire project not year by year. Is there any way you can verify this, since we are a private contractor, I need to make sure we cover our behinds.

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Our same staff look forward to continuing to work with you and will provide the same quality and effectiveness that you have counted on us for in the past.

--

J. Corey Allen

Operations Branch Team Lead
Hydrographic Surveys Division

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Corey.Allen@noaa.gov
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[301.717.7271](tel:301.717.7271) (Cell)

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Moyles, Dean

From: Corey Allen - NOAA Federal [corey.allen@noaa.gov]
Sent: Thursday, May 23, 2013 6:05 AM
To: Dean Moyles
Cc: marc.s.moser@noaa.gov; David Scharff - NOAA Federal
Subject: Re: No Transit Zone

Dean,

After further discussion with Jeff and LCDR Moser, we would like you to proceed as follows:

OCS has vet and provided opportunity for comment to the 2013 update of our NEPA documentation. No comments were received regarding our planned survey activities in the Krenitzin Islands. We do not feel it is necessary for you to contact NMSF (Lisa Rotterman) at this time, and would like you to operate, until further notice, under similar guidance provided for the area in 2011.

You are authorized to commence survey operations as described in the Project Instructions for OPR-Q191-KR-13 providing the following guidance is strictly adhered to: (1) the field parties should exercise extra diligence while surveying in the established sea lion critical habitat and avoid any actions that may lead to contact or impose undue stress on marine mammals, (2) adhere to the mammal impact mitigation procedures outlined in Fugro's Marine Project HSE Plan and (3) if in the course of conducting the survey avoidance with marine mammals is not possible for any reason contact the COR so that alternatives may be discussed.

Please let your COR or I know if you have any additional questions. Also, please let us know if you would like this guidance documented in a more formal letter or if this email correspondence is sufficient.

Best of luck as you begin survey operations.

Cheers, Corey

On Wed, May 22, 2013 at 5:07 PM, David Scharff - NOAA Federal <david.scharff@noaa.gov> wrote:
Corey,

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Lisa Rotterman

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Sent: Wednesday, May 22, 2013 10:21 AM

To: Dean Moyles

Cc: David Scharff - NOAA Federal

Subject: Re: No Transit Zone

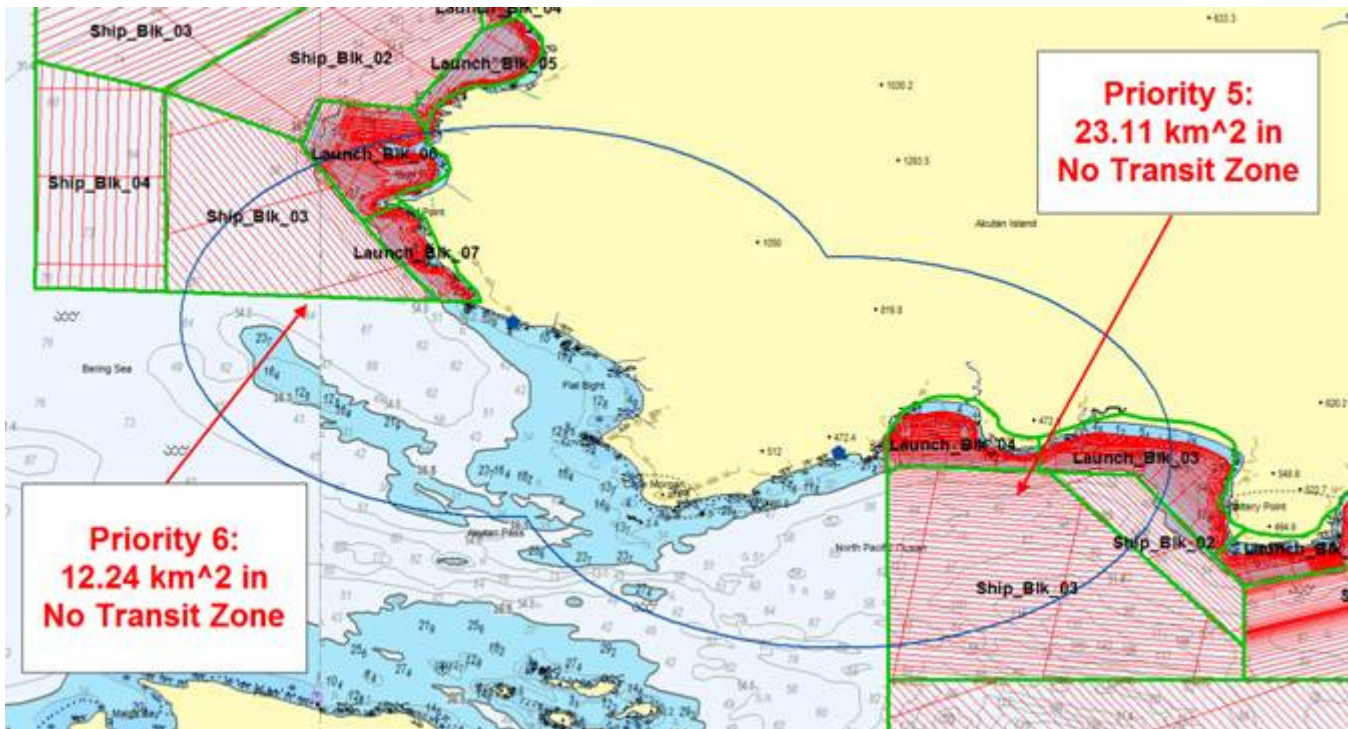
Dean,

Got your message. I'm not having much luck looking back in our archives to find the approval/waiver for these "No Transit Zones." I'll keep looking and asking around, but any documentation, POCs, etc you could pass along for background would be greatly appreciated.

Cheers, Corey

On Wed, May 22, 2013 at 12:39 PM, Dean Moyles <dmoyles@fugro.com> wrote:

In David's absence, you have been appointed my POC; as you know JOA have been working with Lisa Rotterman to gain permission to this area for the tide gauge installation. From the graphic below, a portion of our survey area is within this "No transit Zone" as well. I have talked to David briefly about this, he mentioned that we have received approval sometime ago to enter these areas, it was for the entire project not year by year. Is there any way you can verify this, since we are a private contractor, I need to make sure we cover our behinds.



Dean Moyles

Project Manager/Senior Hydrographer (ACSM cert. No. 226)

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Moyles, Dean

From: David Scharff - NOAA Federal [david.scharff@noaa.gov]
Sent: Tuesday, May 14, 2013 5:01 AM
To: Dean Moyles
Subject: Re: Staff Shot Requirement

This deviation from the staff shot requirements has been approved under the conditions stated below. If a required staff observation is not conducted please note the reason in the vertical control report.

On Thu, May 2, 2013 at 4:29 PM, Dean Moyles <dmoyles@fugro.com> wrote:

As per our discussions, we will perform staff shots on a weekly basis. During bad or marginal weather, an attempt will be made, but if deemed unsafe no staff shots will be conducted. In addition to this, when the survey spread is not in the vicinity of the tide station, the staff shot requirement will be relaxed and no staff shots conducted.

Let me know if you have any questions or comments.

Dean Moyles

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Effective January 1st 2013, Fugro's offshore survey companies in California will be joining forces and collectively operating under the name Fugro Pelagos, Inc. (FPI). This change unifies Fugro's survey resources and broadens

Moyles, Dean

From: David Scharff - NOAA Federal [david.scharff@noaa.gov]
Sent: Monday, May 06, 2013 6:04 AM
To: Dean Moyles
Subject: Fwd: Fw: Tide station numbers

Please forward to JOA. Thanks.

----- Forwarded message -----

From: **Artara Johnson - NOAA Federal** <artara.johnson@noaa.gov>
Date: Fri, May 3, 2013 at 5:32 PM
Subject: Re: Fw: Tide station numbers
To: Corey Allen - NOAA Federal <corey.allen@noaa.gov>
Cc: _NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>, Marc Moser - NOAA Federal <marc.s.moser@noaa.gov>, David Scharff - NOAA Federal <david.scharff@noaa.gov>, Manoj Samant - NOAA Federal <manoj.samant@noaa.gov>

Good afternoon Corey...

CO-OPS recommends the calculation of a new station id if the position used to derive the station id is changed to a position outside of a 1 km radius. JOA can feel free to send OET new station positions if there is any concern the station id will change once they are onsite. We will calculate a station id and provide further guidance.

Also, please be aware there was a typo in my previous email. All of the station ids calculated for this project should begin with the AK state identifier 946 not 945 as listed below. The station ids are as follows:

9462676 Broad Bight, AK
9462705 Green Bight, AK
9462786 SE Tigalda, AK

Feel free to contact me with any questions or concerns.

Have a great day...Tara

On Tue, Apr 30, 2013 at 2:32 PM, Corey Allen - NOAA Federal <corey.allen@noaa.gov> wrote:
Thanks Tara. Any guidance on how far they may deviate from these preliminary positions before prompting a new station id? 50m radius?

Corey

On Tue, Apr 30, 2013 at 2:03 PM, Artara Johnson - NOAA Federal <artara.johnson@noaa.gov> wrote:
Good afternoon Corey...

The following station ids were calculated from the positions provided to OET:

9452676 Broad Bight, AK
9452705 Green Bight, AK
9462786 SE Tigalda, AK

Have a great day...Tara

Have a great day!

Tara

On Mon, Apr 29, 2013 at 10:57 AM, Artara Johnson - NOAA Federal <artara.johnson@noaa.gov> wrote:
Good morning Corey...

I will provide the station ids by 5pm Friday May 3rd.

Have a great day...Tara

Have a great day!

Tara

On Mon, Apr 29, 2013 at 10:45 AM, Corey Allen - NOAA Federal <corey.allen@noaa.gov> wrote:
OET,
Didn't want to let this slip through the cracks. Any thoughts on providing prelim station numbers?

Cheers, Corey

On Tue, Apr 23, 2013 at 11:14 AM, Corey Allen - NOAA Federal <corey.allen@noaa.gov> wrote:
OET,
JOA, a sub under our prime contractor Fugro, is requesting preliminary gauge numbers for the tertiary gauges supporting OPR-Q191-KR-13 Krenitzin Islands, AK. See the estimated positions below. Based on the remoteness of this project area and to mitigate any delays in the field, can OET provide preliminary numbers and guidance for how far they may deviate from these positions before requiring new numbers?

> Broad Bight N 54-03.85 W 165-56.2
> Green Bight N 54-06.5 W 165-40.3
> SE Tigalda Island N 54-06.1 W 164-56.3

Cheers, Corey

----- Original Message -----

From: Mike Zieserl [mailto:mike@joasurveys.com]
Sent: Monday, April 22, 2013 02:26 PM
To: Dean Moyles
Subject: Re: Tide station numbers

Dean,

In the past CO-OPS has provided station numbers ahead of time due to the remoteness and difficulty of communication. Otherwise we would potentially need someone in OET to contact 7 days/week so we can obtain the number in a timely fashion. Any chance you could ask again? It would be very helpful for us.

Thanks, Mike

Mike Zieserl, PLS
JOA Surveys, LLC
www.joasurveys.com
2000 E. Dowling Rd, #10
Anchorage, AK 99507
[\(907\) 230-5789](tel:9072305789) cell
[\(907\) 561-0136](tel:9075610136) phone

On 4/22/2013 8:30 PM, Dean Moyles wrote:

> I talk to noaa they would prefer to give you these once they are installed.

>

> ----- Original Message -----

> From: Mike Zieserl [mailto:mike@joasurveys.com]

> Sent: Friday, April 19, 2013 05:46 PM

> To: Dean Moyles

> Subject: Tide station numbers

>

> Dean,

>

> Could you please request preliminary tide station numbers for the 3

> tertiary tide stations for this project, based on the following coordinates:

>

> Broad Bight N 54-03.85 W 165-56.2

> Green Bight N 54-06.5 W 165-40.3

> SE Tigalda Island N 54-06.1 W 164-56.3

>

> If the installation location changes by more than a 1/4 mile I will

> contact CO-OPS by satellite phone to request a revised station number.

>

> Thanks,

>

> Mike

>

--

J. Corey Allen
Operations Branch Team Lead
Hydrographic Surveys Division

Moyles, Dean FPI

From: Crescent Moegling - NOAA Federal [crescent.moegling@noaa.gov]
Sent: Friday, November 01, 2013 1:45 PM
To: Moyles, Dean FPI
Cc: Mark Lathrop; Corey Allen
Subject: Clarification on XML DR

Hi Dean,

I spoke with Lucy Hick regarding the schemas and she indicated these are available [here](#). But you won't need to worry about updating them for a couple reasons. 1. You're on the older 2012 HSSD which doesn't require you to use the new schema and 2. My current version of Pydro will allow us to ingest and validate the older schema you are using.

I've sent her the sample DR you shared with me in case there are any more questions from her. I think at this point you can go ahead and submit Monday and if there are any lingering XML DR questions, we can address those without delaying your delivery.

--

Crescent Moegling
Hydrographic Team Lead
Northwest Navigation Manager
Pacific Hydrographic Branch
206.526.6840



APPROVAL PAGE

H12547

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 NGDC for archive

- H12547_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12547_GeoImage.pdf

The survey evaluation and verification has been conducted according current OCS Specifications.

Approved: _____

Peter Holmberg

Cartographic Team Lead, Pacific Hydrographic Branch

The survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: _____

CDR Benjamin K. Evans, NOAA

Chief, Pacific Hydrographic Branch