

H12130

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey Hydrographic Survey

Field No.

Registry No. H12130

LOCALITY

State Oregon

General Locality Pacific Ocean - Southern Oregon

Sublocality Crook Point to Cape Ferrelo

2009

CHIEF OF PARTY

Dean Moyles, Fugro Pelagos, Inc.

LIBRARY & ARCHIVES

DATE

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION HYDROGRAPHIC TITLE SHEET		REGISTRY No H12130
INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.		FIELD No: N/A
State <u>Oregon</u>		
General Locality <u>Pacific Ocean - Southern Oregon</u>		
Sub-Locality <u>Crook Point to Cape Ferrelo</u>		
Scale <u>1:20,000</u>	Date of Survey <u>September 21, 2009 - November 1, 2009</u>	
Instructions dated <u>7/29/2009</u>	Project No. <u>M-M928-KR-09</u>	
Vessel <u>F/V PACIFIC STAR (556510), R/V R2 (623241), R/V D2 (647782)</u>		
Chief of party <u>Dean Moyles, Fugro Pelagos, Inc.</u>		
Surveyed by <u>Fugro Pelagos, Inc. Personnel</u>		
Soundings by <u>Reson Seabat 7125 (R2, PACIFIC STAR, Hull Mount), Reson Seabat 8125 (D2, Hull Mount)</u>		
SAR by <u>Keith Toepfer</u>		Compilation by <u>Kay MacDonald</u>
Soundings compiled in <u>Fathoms</u>		
REMARKS: <u>All times are UTC. UTM Zone 10N.</u>		
<u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS)</u>		
<u>naautical charts. All separates are filed with the hydrographic data. Revisions and end notes in red were</u>		
<u>generated during office processing. Page numbering may be interrupted or non sequential.</u>		
<u>All pertinent records for this survey, including the Descriptive Report, are archived at the</u>		
<u>National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.</u>		

A. AREA SURVEYED

H12130 (Sheet A) is located in the area near Crook Point to Cape Ferrelo. It is bound by the coordinates listed in **Table 1** and shown in **Figure 1**.

Hydrographic data collection began on September 21, 2009 and ended on November 1, 2009.

Table 1 – Sheet Bounds

Point	Latitude (North)	Longitude (West)
1	42-07-03	124-29-18
2	42-07-06	124-20-41
3	42-16-12	124-20-55
4	42-15-58	124-29-29

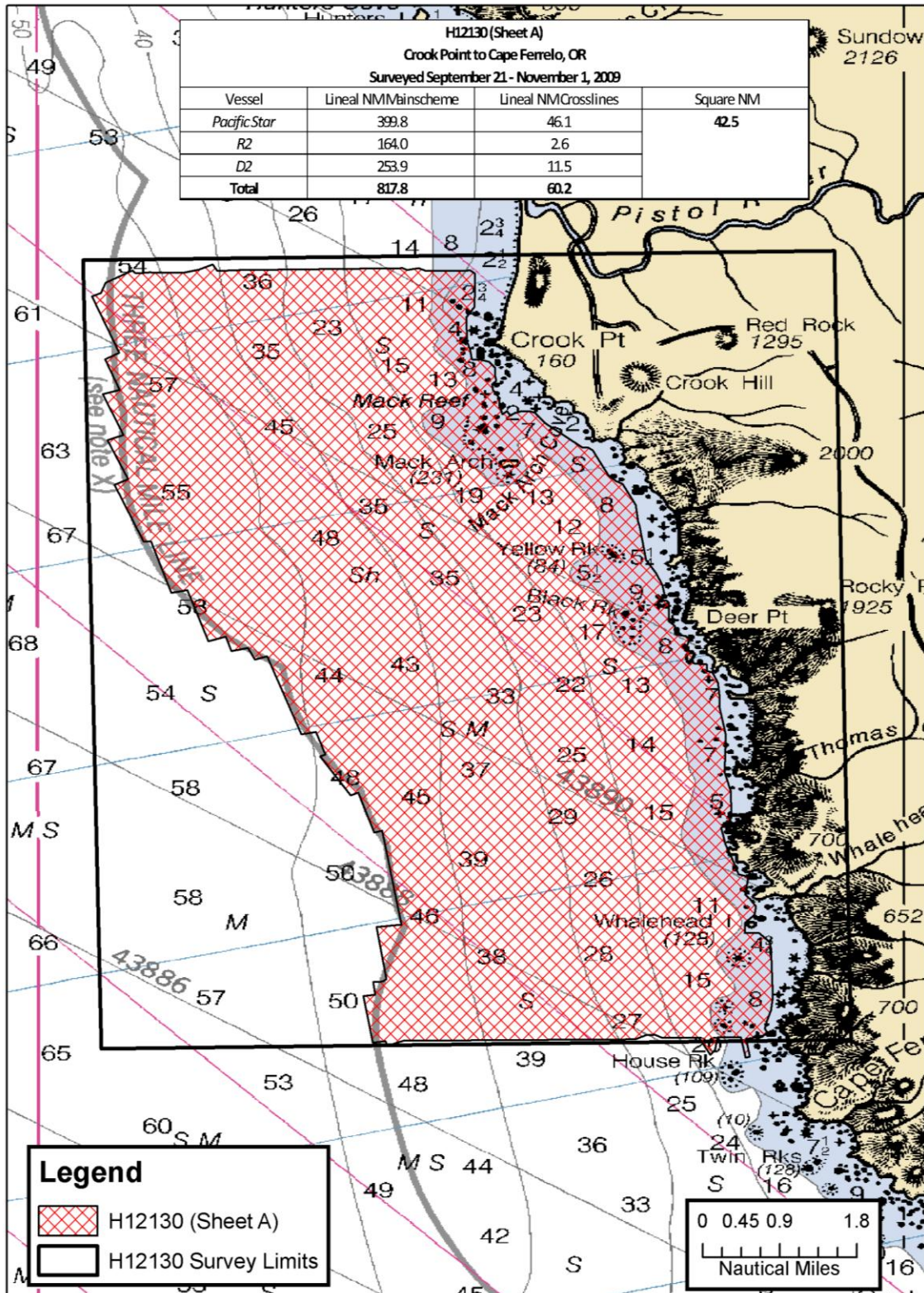


Figure 1 H12130 Area Surveyed

B. DATA ACQUISITION AND PROCESSING

Refer to the M-M928-KR-09 Data Acquisition and Processing Report for a detailed description of all equipment, survey vessels, processing procedures and quality control features. Items specific to this survey and any deviations from the Data Acquisition and Processing Report are discussed in the following sections.

B.1 Equipment & Vessels

The F/V Pacific Star (with launches R2 and D2) acquired all sounding data for H12130.

F/V Pacific Star, 162 feet in length with a draft of 16 feet, was equipped with a hull mounted Reson SeaBat 7125 dual-frequency multibeam echosounder system for the M-M928-KR-09 survey. All 7125 multibeam data files were logged in the S7K format using WinFrog Multibeam v 3.08.44.04. The vessel was equipped with two AML sound velocity and pressure sensors (SV&P), and a Brooks Ocean Moving Vessel Profiler (MVP), for sound velocity profiles. Vessel attitude and position were measured using an Applanix Position and Orientation System for Marine Vessels (POS MV) 320 V4.

R/V R2, a Pacific Star launch, is 29 feet in length with a draft of 3 feet. For this survey, R2 was equipped with a hull mounted Reson SeaBat 7125 dual-frequency multibeam echosounder system. All 7125 multibeam data files were logged in the S7K format using WinFrog Multibeam v 3.08.44.04. R2 was equipped with with two AML sound velocity and pressure sensors (SV&P) for sound velocity profiles, and vessel attitude and position were measured using an Applanix Position and Orientation System for Marine Vessels (POS MV) 320 V4.

R/V D2, a Pacific Star launch, is 29 feet in length with a draft of 3 feet. D2 is outfitted and configured in a manner similar to R/V R2. For this survey, D2 was equipped with a Reson Seabat 8125 (455 kHz frequency) multibeam echosounder system. Multibeam data files were logged in the XTF format using WinFrog Multibeam v 3.08.44.04. D2 was equipped with with two AML sound velocity and pressure sensors (SV&P) for sound velocity profiles, and vessel attitude and position were measured using an Applanix Position and Orientation System for Marine Vessels (POS MV) 320 V4.

Refer to M-M928-KR-09 Data Acquisition and Processing Report for a complete listing of equipment and vessel descriptions.

B.2 Quality Control

Crosslines

Crosslines were planned and well distributed throughout the survey to ensure adequate quality control. Total crossline length surveyed was 60.2 nautical miles or 13.6 percent¹ of the total main scheme line length. Each crossline was compared to the entire main scheme line plan and CUBE surface it intersected, using the CARIS HIPS QC report routine.

The majority of QC Reports fall well within the required accuracy specifications. However, beams that fall below the 95 percent confidence level in the QC report are associated with areas and conditions illustrated below. It should be noted that these locations are in agreement with the surrounding adjacent lines and are considered well within the required specifications. Results are located in Separate IV.

The majority of beams that fall below the 95 percent confidence level are located in areas having extremely steep slopes and/or rocks. **Figures 2 and 3** below provide examples. Note: Main scheme lines are shown in green and crosslines in yellow.

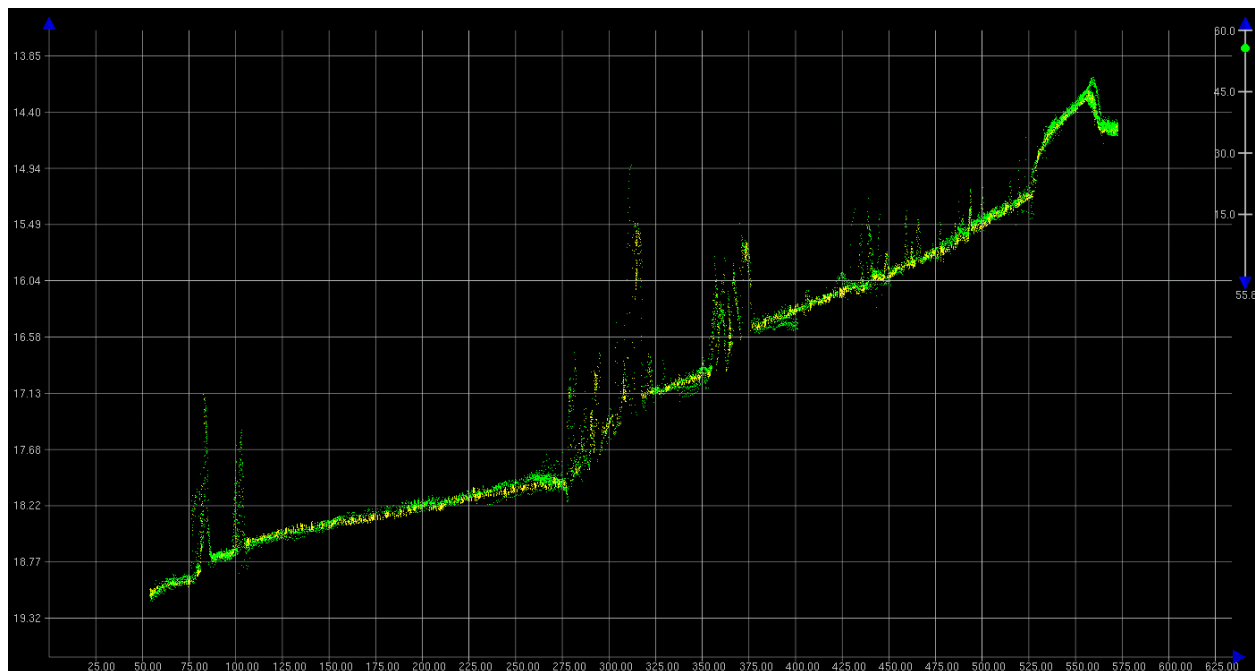


Figure 2 Profile of 4A03-TIE11

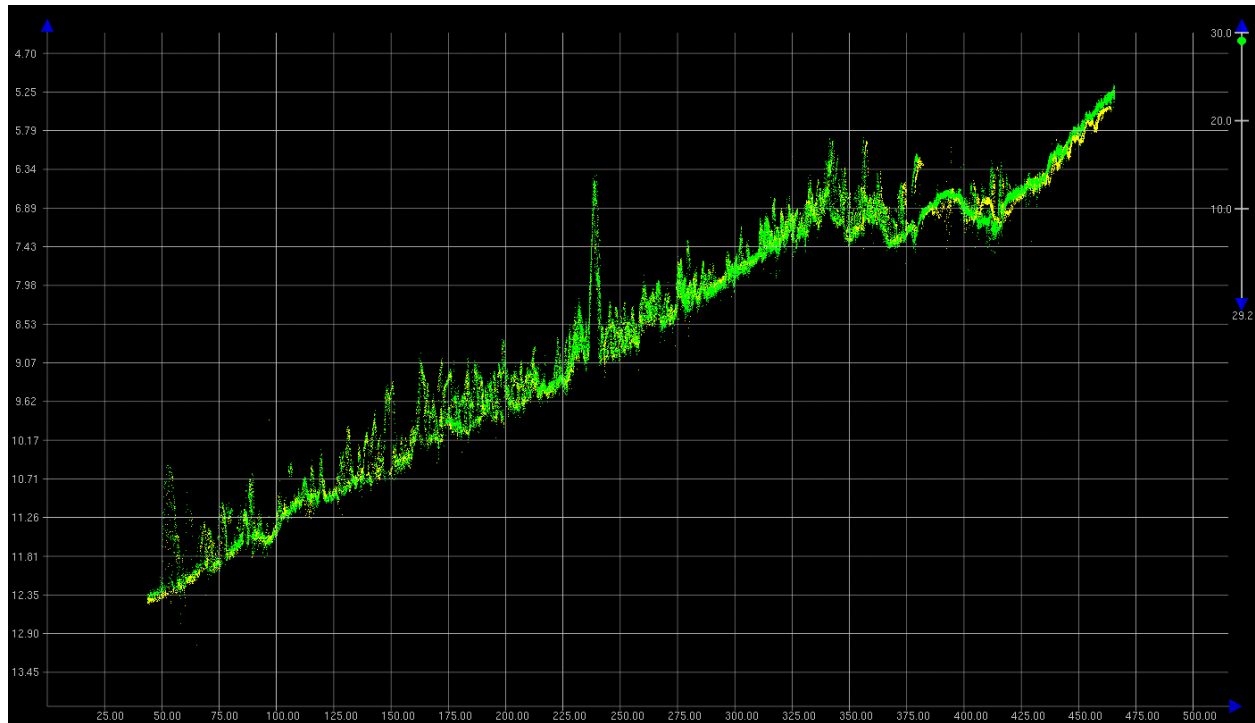


Figure 3 Profile of 4A01-TIE06

Note: The QC reports were generated based on the given accuracy specification of:

Where, $a=0.5$ and $b=0.013$, $d=\text{depth}$

Uncertainty Values

The majority of H12130 had uncertainty values of 0.31 m to 0.67 m, which met project specifications (**Figure 4**).²

As seen in the uncertainty surface graphic, 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 sound velocity error uncertainty and bottom detection.³

Other areas of higher uncertainty include rock outcrops and irregular bottom topography.⁴

Oscillations along track and port to starboard on the uncertainty surface are due to higher uncertainty computed due to vessel roll, again prevalent mostly in the outer beams.⁵

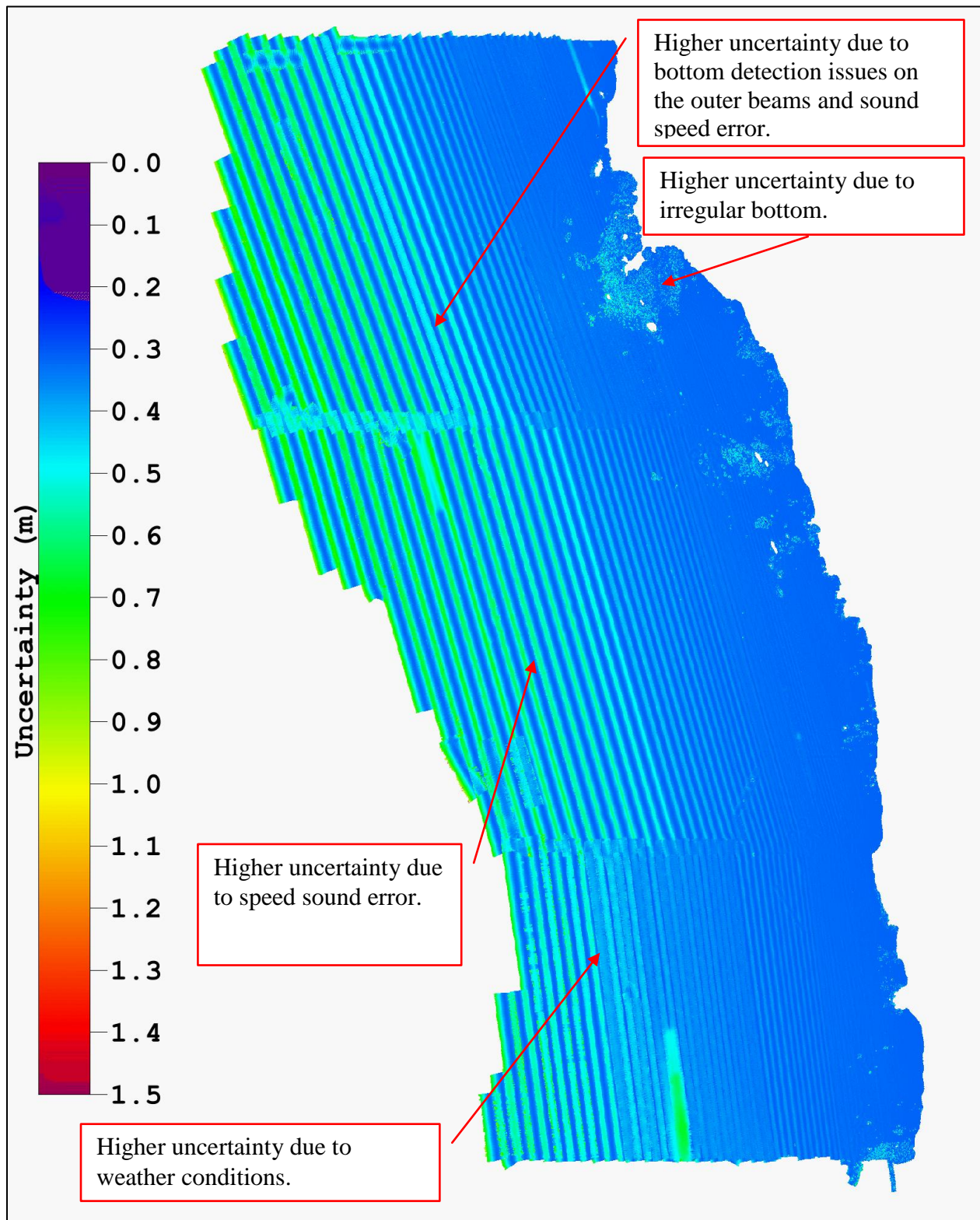


Figure 4 Uncertainty DTM

Survey Junctions

H12130 (Sheet A) junctions with: ⁶

Registry #	Date	Junction Side
H12131	2009	South

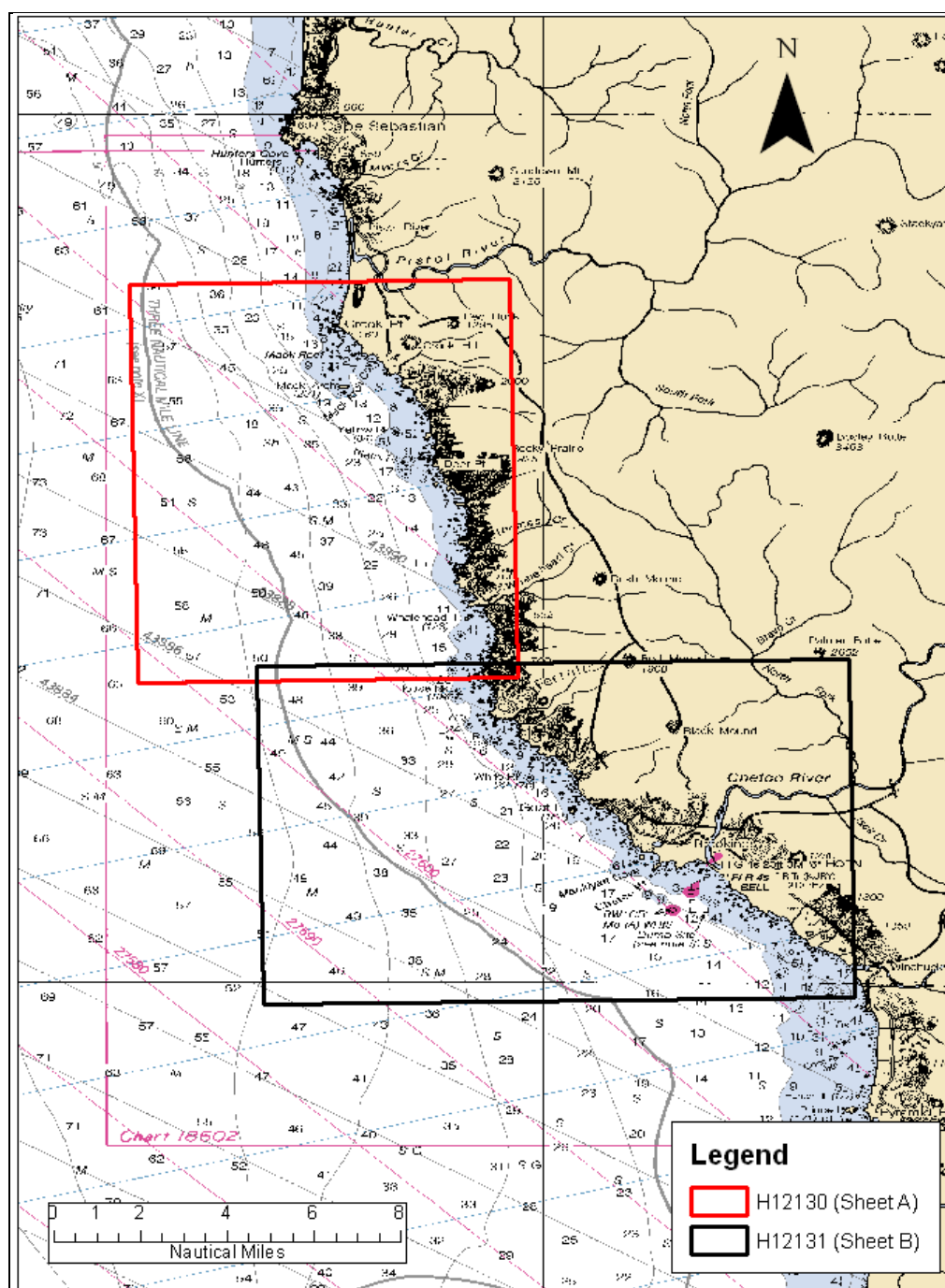


Figure 5 H12130 Survey Junctions

The surveys are in agreement along their common borders. The agreement was noted in the field using the CUBE surfaces during subset cleaning. The conformity is also apparent in the Final Combined BASE Surfaces.⁷

Quality Control Checks

Positioning system confidence checks were conducted on a daily basis using the (POS MV) controller software. The controller software had numerous real-time displays that were monitored throughout the survey to ensure the positional accuracies specified in the NOS Hydrographic Surveys Specifications and Deliverables were achieved. These include, but are not limited to the following: GPS Status, Position Accuracy, Receiver Status (which included HDOP), and Satellite Status. During periods of high HDOP and/or low number of available satellites, survey operations were suspended.

Sonar system confidence checks were performed weekly by comparing post processed depth information collected by multiple vessels surveying over a common area. In addition, bar checks were performed to maintain a high confidence level. Sound Velocity Probe confidence checks were conducted weekly by producing comparative sound velocity data between all vessels. This was conducted by having all sound velocity profiling equipment (MVP and SVPs) perform a cast in close proximity to each other in a near simultaneous time period.

Data Quality

In general, the multibeam data quality for H12130 was good. Three notable problems follow:

1. A general downward and/or upward cupping is noticeable in the across track sounding profiles for certain areas. This is possibly due to a high volume of thermal layering and strong undercurrents in the water column. This problem was addressed by conducting SVP casts more frequently and reducing the line spacing interval. Even though this SVP error is noticeable in the data, it is within required specifications.⁸

R2 and D2 collected sound velocity profiles every two hours (or less) to compensate for velocity changes over time. Profiles were collected on alternate ends of lines, or often in the middle of lines, to minimize the spatial aspect of sound velocity changes.

The MVP system on the Pacific Star was also used at an interval of every two hours, except that the system was used to collect as many as five profiles along the course of a single line. Two hours later, another set of profiles would be collected, with the net result being the creation of a grid of sound velocity profiles that kept differences in time and distance to a minimum between the survey data and the in-use sound velocity profile.

2. Some small holidays over submerged features exist in the data. The least depth was not obtained on some submerged features, in cases such as these, several attempts are made to

obtain complete coverage, but may not be achieved due to safety concerns.⁹

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 office-based processing crew provided feedback after preliminary processing and coverage creation in CARIS HIPS, and reported re-runs or in-fills as necessary to the acquisition crew.

3. During subset cleaning it became apparent in areas of H12130 that minor dynamic bottom issues were present, on the order of 0.05 to 0.10 meters. It should be noted that this survey was conducted in multiple phases, since it was conducted in conjunction with the M-L906-KR-08 (California State Mapping Project). Due to weather conditions and logistical considerations, survey operations were not confined to a particular sheet or area.

Since there is no way to rectify this issue (because this is a dynamic bottom), the data was edited to reflect the shoalest depth and all other data points were marked as rejected in subset editor.¹⁰

Refer to the M-M928-KR-09 Data Acquisition and Processing Report for a detailed description of the survey equipment and methodology used over the course of this survey.

B.3 Corrections to Echo Soundings

Refer to the M-M928-KR-09 Data Acquisition and Processing Report for a detailed description of all corrections to echo soundings. No deviations from the report occurred.

B.4 Data Processing

Refer to the M-M928-KR-09 Data Acquisition and Processing Report for a detailed description of the processing flow.

The final fieldsheet for H12130 is called “H12130_(Sheet_A)” and it contains three BASE surfaces.¹¹ The following parameters were used:

0-23 meters: 1 m resolution, name “H12130_1m_Final”
20-52 meters: 2 m resolution, name “H12130_2m_Final”
46-115 meters: 4 m resolution, name “H12130_4m_Final”

Notes:

- Maximum depth was approximately 115 m; therefore resolutions coarser than 4m were not computed.
- Due to the quantity of data, final CUBE BASE surfaces were created with CARIS v 7.0 in the CARIS Spatial Archive (CSAR) format. These surfaces are located under the “H12130\CARIS\Fieldsheets\” directory.

The final S57 file for this project is called “H12130_S57_Features.000”.¹² This file contains the object and metadata S57 objects as required in the Specifications and Deliverables.

C. VERTICAL AND HORIZONTAL CONTROL

Refer to the M-M928-KR-09 Horizontal and Vertical Control Report for a detailed description of the horizontal and vertical control used on this survey. No deviations from the report occurred. A summary of the project’s horizontal and vertical control follows.

Horizontal Control

The horizontal control datum for this survey was the North American Datum of 1983 (NAD83).

For real-time DGPS corrections, a CSI MBX-3 unit was tuned to the Cape Mendocino, CA. 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 was generated. This position was logged concurrently with the bathymetry from WinFrog and the POS file by WinFrog PosMvLogger. It was later corrected for offsets to the multibeam echosounder (MBES) by CARIS HIPS in processing.

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

See M-M928-KR-09 Horizontal and Vertical Control Report for a more detailed description of PPK positioning methods used.

Vertical Control

All sounding data were initially reduced to mean lower low water (MLLW) using predicted tidal data. Predicted tidal data for a month long period, was assembled (for gauges 9419750 & 9431647) from the National Water Level Observation Program accessed through the NOAA tides and currents website (<http://tidesandcurrents.noaa.gov/>). A cumulative file for the gauges was updated monthly by appending the new data. It should be noted that predicted tides were used in the field for preliminary processing only.

On March 1, 2010, verified tide data was acquired from the National Water Level Observation Program accessed through the NOAA tides and currents website (<http://tidesandcurrents.noaa.gov/>). Tidal zoning file was developed and provided by NOAA. From March 1, 2010 to March 2, 2010, all sounding data were re-merged using CARIS HIPS and SIPS tide routine. Verified tidal data from the Crescent City, CA. (9419750), and the Port

Orford, OR. (9431647) tidal stations were used for the final Navigation Base Surfaces and S-57 Feature files.¹³ Tidal Stations were owned and operated by the NOAA's National Ocean Service through the National Water Level Observation Program.

Table 2 – Tide Gauge

Gauge	Location	Latitude	Longitude
9419750	Crescent City, CA	41° 44.7' N	124° 10.9' W
9431647	Port Orford, OR	42° 44.4' N	124° 29.8' W

D. RESULTS AND RECOMMENDATIONS

D.1 Chart Comparison

H12130 survey was compared with charts shown in **Table 3.**¹⁴

Table 3 – Chart Comparisons

Chart Number	Type	Cell Name	Scale	Edition	Edition Date
18007	Raster	n/a	1:811,980	33	February-2009
18010	Raster	n/a	1:196,948	21	March-2007
18600	Raster	n/a	1:207,840	14	January-2002
18602	Raster	n/a	1:40,000	12	April-2003
18600	ENC	US30R03M	n/a	9	September-2009

Comparison of Soundings

A comparison of soundings was accomplished by overlaying the latest edition of NOAA charts and ENC's onto the final BASE surfaces in CARIS HIPS & SIPS. The general agreement between the charted soundings and H12130 soundings is noted. A more detailed comparison was undertaken for any charted shoals or other dangerous features.

Agreement between the H12130 BASE surface depths and the charted soundings for all applicable ENC and Raster charts was within +/- 1 to 2 fathoms.¹⁵ Since the survey area was ensonified with 100% multibeam coverage, shoaler depths were discovered between the charted soundings. In these areas, when necessary, the sounding was designated to ensure its inclusion in the finalized BASE surface. Exceptions follow:

1. Some discrepancy exists at the exact position of charted soundings on steep slopes, likely due to the charted soundings being slightly out of position, making a large difference in

depths apparent.¹⁶

2. Charted rocks and islets on ENC US30R03M, fall within the multibeam coverage and should be modified to agree with the H12130 survey.¹⁷

The Hydrographer recommends that soundings within the survey limits of H12130 supersede all prior survey and charted depths.¹⁸

Automated Wreck and Observation Information System (AWOIS)

There were two AWOIS items assigned to H12130, 16141 and 16143.¹⁹ Due to their nature, only a visual inspection was conducted, refer to Appendix II for a detailed description.

Charted Features

There were no charted features labeled ED, PD, or PA within the limits of H12130.²⁰

Dangers to Navigation

No dangers to navigation were found or reported for this survey.²¹

D.2 Additional Results

None to note.

Bottom Samples

None were assigned for this sheet.²²

Aids to Navigation

There were no charted aids to navigation in the survey area.²³ No uncharted aids to navigation were found in the survey area.²⁴

E. APPROVAL SHEET

Approval Sheet

For

H12130

Standard field surveying and processing procedures were followed in producing this survey in accordance with the following documents:

M-M928-KR-09 Statement of Work

NOS Hydrographic Surveys Specifications and Deliverables, April 2009 Edition

Fugro Pelagos, Inc. Acquisition Procedures (2009-MBES_Acquisition_Procedures_R0);

Fugro Pelagos, Inc. Processing Procedures (2009-MBES_Processing_Procedures_R0)

The data were reviewed daily during acquisition and processing, and the survey is complete and adequate for its intended purpose.

This report has been reviewed and approved. All records are forwarded for final review and processing to the Chief, Pacific Hydrographic Branch.

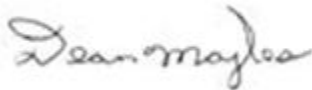
Approved and forwarded,

Dean Moyles (ACSM Certificate N0. 226),

Senior Hydrographer

Fugro Pelagos, Inc.

July 6, 2010

A handwritten signature in cursive script that reads "Dean Moyles".

Dean Moyles (ACSM Certificate N0. 226),
Senior Hydrographer

Revisions Compiled During Office Processing and Certification

¹ The crossline percentage of mainscheme was 7.4% according to statistics in Figure 1.

² Concur.

³ Concur.

⁴ Higher uncertainty values are expected in these cases and have been determined to be acceptable.

⁵ Concur.

⁶ A common junction was made with H12131 which was being compiled concurrently with H12130.

⁷ Concur.

⁸ Concur.

⁹ Concur with clarification. Navigationally significant holidays have been preserved in the HCell coverage.

¹⁰ Concur. The data is adequate for charting.

¹¹ A 4-meter combined surface was created during the survey acceptance review and was used as the basis for compilation.

¹² H12130_S57_Features.000 was used in the compilation of H12130_CS.000.

¹³ Concur.

¹⁴ The HCell was compiled to Chart 18602, 12th Ed., April 2003, Notice Date 03/26/11.

¹⁵ Concur.

¹⁶ Concur. Chart depths as depicted in the HCell.

¹⁷ Concur. Chart features as depicted in the HCell.

¹⁸ Concur.

¹⁹ AWOIS item 16141 (53810) was disproven at its charted location. The rock was located and positioned by visual observation during the survey and is included in the submitted S-57 Features File named H12130_S57_Features_Office.hob. The feature has the AWOIS Item number annotated in the NINFOM field. AWOIS 16141 (53810) 42-07-20.711 N, 124-22-04.305 W, Chart feature as depicted in the HCell. AWOIS 16143 (53811) was compiled with Survey 12131. This is stated incorrectly in the AWOIS report.

²⁰ Concur.

²¹ Do not concur. Nine of eleven Designated soundings submitted by the contractor were noted by the SAR reviewer and following consultation with the Hydrographic Team Lead and Branch Chief were submitted to MCD in a DTON report. Seven of the nine DTONs have been applied to the charts and all nine are included in the HCell. Additionally, during preparation of the DTON report, the SAR reviewer discovered a previously submitted DTON report for the survey from October 2009 for two soundings that were not included among the Designated soundings. The HCell Compiler located this DTON report and noted that the above mentioned two designated soundings were part of Survey H12131. The soundings have been addressed by the H12131 compiler.

²² Concur with clarification. There is a general blue note in the HCell indicating that all charted bottom samples are to be retained unless specifically noted otherwise.

²³ Concur.

²⁴ Concur.

H12130 Danger to Navigation Report

Registry Number: H12130
State: Oregon
Locality: Pacific Ocean - Southern Oregon
Sub-locality: Crook Point to Cape Ferrelo
Project Number: M-M928-KR-09
Survey Dates: September 21, 2009 - November 01, 2009

DTONs found during QA review in addition to those submitted on 10/9/2009.

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18602	12th	04/01/2003	1:40,000 (18602_1)	[L]NTM: ?
18600	14th	01/26/2002	1:196,948 (18600_1)	[L]NTM: ?
18010	21st	03/01/2007	1:811,980 (18010_1)	[L]NTM: ?
18007	33rd	02/01/2009	1:1,200,000 (18007_1)	[L]NTM: ?
501	12th	11/01/2002	1:3,500,000 (501_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Rock	3.98 m	42° 08' 26.4" N	124° 21' 54.4" W	---
1.2	Rock	7.52 m	42° 12' 08.2" N	124° 23' 17.0" W	---
1.3	Rock	3.22 m	42° 12' 43.6" N	124° 23' 04.4" W	---
1.4	Rock	2.59 m	42° 12' 52.8" N	124° 23' 08.8" W	---
1.5	Rock	4.52 m	42° 13' 35.5" N	124° 23' 35.7" W	---
1.6	Rock	4.93 m	42° 14' 05.3" N	124° 24' 05.4" W	---
1.7	Rock	6.00 m	42° 14' 27.0" N	124° 25' 02.8" W	---
1.8	Rock	3.09 m	42° 14' 42.3" N	124° 24' 58.4" W	---
1.9	Rock	1.31 m	42° 15' 11.8" N	124° 25' 09.4" W	---

1 - Danger To Navigation

1.1) GP No. - 1 from H12130_DtoNs.xls**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 42° 08' 26.4" N, 124° 21' 54.4" W
Least Depth: 3.98 m (= 13.05 ft = 2.176 fm = 2 fm 1.05 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-303.20:57:29.000 (10/30/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 1
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

2fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)

4.0m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 3.979 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.2) GP No. - 2 from H12130_DtoNs.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position: 42° 12' 08.2" N, 124° 23' 17.0" W
Least Depth: 7.52 m (= 24.68 ft = 4.113 fm = 4 fm 0.68 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-303.19:37:27.000 (10/30/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 2
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	2	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

4fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)

7.5m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 7.521 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.3) GP No. - 3 from H12130_DtoNs.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position: 42° 12' 43.6" N, 124° 23' 04.4" W
Least Depth: 3.22 m (= 10.55 ft = 1.759 fm = 1 fm 4.55 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-266.00:47:52.000 (09/23/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 3
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	3	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

1 ¾fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)
 3.2m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 3.217 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.4) GP No. - 4 from H12130_DtoNs.xls**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 42° 12' 52.8" N, 124° 23' 08.8" W
Least Depth: 2.59 m (= 8.50 ft = 1.417 fm = 1 fm 2.50 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-266.00:49:39.000 (09/23/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 4
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	4	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

1 ¼fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)

2.6m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 2.592 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.5) GP No. - 5 from H12130_DtoNs.xls**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 42° 13' 35.5" N, 124° 23' 35.7" W
Least Depth: 4.52 m (= 14.82 ft = 2.470 fm = 2 fm 2.82 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-305.15:21:46.000 (11/01/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 5
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	5	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

2 ½fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)

4.5m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 4.518 m

VERDAT - 12:Mean lower low water

WATLEV - 1:partly submerged at high water

1.6) GP No. - 6 from H12130_DtoNs.xls**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 42° 14' 05.3" N, 124° 24' 05.4" W
Least Depth: 4.93 m (= 16.18 ft = 2.697 fm = 2 fm 4.18 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-305.16:11:38.000 (11/01/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 6
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	6	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

2 ¾fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)

4.9m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 4.932 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.7) GP No. - 7 from H12130_DtoNs.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position: 42° 14' 27.0" N, 124° 25' 02.8" W
Least Depth: 6.00 m (= 19.67 ft = 3.279 fm = 3 fm 1.67 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-265.00:40:24.000 (09/22/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 7
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	7	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

3 ¼fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)

6.0m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 5.996 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.8) GP No. - 8 from H12130_DtoNs.xls**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 42° 14' 42.3" N, 124° 24' 58.4" W
Least Depth: 3.09 m (= 10.13 ft = 1.689 fm = 1 fm 4.13 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-303.17:23:10.000 (10/30/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 8
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	8	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

1 ¾fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)

3.1m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 3.088 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.9) GP No. - 9 from H12130_DtoNs.xls**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 42° 15' 11.8" N, 124° 25' 09.4" W
Least Depth: 1.31 m (= 4.30 ft = 0.717 fm = 0 fm 4.30 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2009-302.16:05:05.000 (10/29/2009)
GP Dataset: H12130_DtoNs.xls
GP No.: 9
Charts Affected: 18602_1, 18600_1, 18010_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

The shoalest depth on this rock was found using multibeam during hydrographic operations conducted by Fugro Pelagos. The sounding was reduced to Mean Lower Low Water using verified tides and positioned using NAD83.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12130_DtoNs.xls	9	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

0 $\frac{3}{4}$ fm (18602_1, 18600_1, 18010_1, 18007_1, 530_1)

1.3m (501_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091101
 SORIND - US,US,graph,H12130
 TECSOU - 3:found by multi-beam
 VALSOU - 1.311 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

APPENDIX II – SURVEY FEATURE REPORT

There were two AWOIS items assigned to H12130, items 16141 and 16143.

Item 16141:

This item was investigated and a detached position (DP) acquired on October 30, 2009 by R/V D2. Due to safety reasons, an acoustic or lead line sounding could not be obtained, therefore only a visual determination of its depth was undertaken. This item is included in the final S57 file for this project, called “H12130_S57_Features.000”.



Figure 1 H12130 AWOIS Item 16141 (Rock Awash)

Item 16143:

This item was investigated and a detached position (DP) acquired on October 30, 2009 by R/V D2. The height of the feature was again determined visually. This item is included in the final S57 file for this sheet, called "H12130_S57_Features.000".



Figure 2 H12130 AWOIS Item 16143 (Islet)



APPENDIX V – SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

The following email is included since they are recommendations or directives from NOAA that affected the survey.



Dean Moyles

From: David.Scharff [David.Scharff@noaa.gov]
Sent: Monday, September 28, 2009 11:55 AM
To: James Hailstones
Subject: Re: Oregon Project a
Attachments: David_Scharff.vcf

Hi James,

Sorry for the delay I was on travel.

- POC for OCU: Chris Goldfinger (gold@coas.oregonstate.edu)
- No need to compile the BS mosaic, I think they just needed the HDCS files.
- Regarding the AWOIS item - you can stay inside the survey limits.

Thanks,
Dave

James Hailstones wrote:

>
> Afternoon Dave
>
> Still looking to clarify the questions below.
>
> - Contact at OSU re backscatter data?
>
> - Do we need to compile BS mosaic if OSU is doing it?
>
> - 1 x AWOIS target has boundary outside survey limit (see attached).
> Survey AWOIS boundary or keep to survey limits?
>
> Look forward to hearing from you.
>
> Regards
>
> James
>
> *From:* James Hailstones
> *Sent:* Saturday, September 12, 2009 10:48 AM
> *To:* 'David.Scharff'
> *Subject:* Oregon Project
>
> Morning Dave
>
> It is our intention to transit to the worksite Thursday next week and
> commence this project. To facilitate can you please have Port Orford
> and Crescent City tide gauges added to the hot list?
>
> A couple of questions also:
>
> Project instructions say that we will provide data to the Oregon State
> University for them to generate Backscatter Mosaic. Does that mean we
> don't need to? Further to this, can you provide contact details for
> the person at OSU who we will liaise with?
>

H12130 HCell Report
Kay MacDonald, ERT
Pacific Hydrographic Branch

1.0 Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H12130 used:

Office of Coast Survey HCell Specifications: Version: 4.0, 9 March, 2011.
HCell Reference Guide: Version 4.0, 11 March, 2011.

2.0 Compilation Scale

Depths and features for HCell H12130 were compiled to the largest scale raster chart shown below:

Chart	Scale	Edition	Edition Date	NTM Date
18602	1:40,000	12th	April 2003	3-26-2011

The following ENC's were also used during compilation:

Chart	Scale
US3OR03M	1:196,948

3.0 Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 4-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	200	5

In CARIS BASE Editor, soundings were manually selected from the high density sounding layers (SS) and imported into a new layer (CS) created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that closely represents the seafloor morphology.

4.0 Depth Contours

Depth contours at the intervals on the largest scale chart are included in the *_SS HCell for MCD raster charting division to use for guidance in creating chart contours. The metric and fathom equivalent contour values are shown in the table below.

Chart Contour Intervals in Fathoms from Chart 18602	Metric Equivalent to Chart Fathoms, Arithmetically Rounded	Metric Equivalent of Chart Fathoms, with NOAA Rounding Applied	Fathoms with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on H12130_SS.000
3	5.486	5.715	3.125	3
5	9.144	9.373	5.125	5
10	18.288	18.517	10.125	10
20	36.576	37.948	20.750	20
30	54.864	56.236	30.750	30
40	73.152	74.524	40.750	40
50	91.44	92.812	50.750	50

Contours have not been deconflicted against shoreline features, soundings and hydrography, as all other features in the *_CS file and soundings in the *_SS have been. This may result in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_QUAL, COALNE and SBDARE objects should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

5.0 Meta Areas

The following Meta object areas are included in HCell H12130:

M_QUAL

The Meta area objects were constructed on the basis of the limits of the hydrography.

6.0 Features

Features addressed by the field units are delivered to PHB where they are deconflicted against the hydrography and the largest scale chart. These features and features digitized from the Base Surface, are included in the HCell. The geometry of these features may be modified to emulate chart scale per the HCell Reference Guide on compiling features to the chart scale HCell.

7.0 Spatial Framework

7.1 Coordinate System

All spatial map and base cell file deliverables are in an LLDG geographic coordinate system, with WGS84 horizontal, MHW vertical, and MLLW (1983-2001 NTDE) sounding datums.

7.2 Horizontal and Vertical Units

DUNI, HUNI and PUNI are used to define units for depth, height and horizontal position in the chart units HCell, as shown below.

Chart Unit Base Cell Units:

Depth Units (DUNI):	Fathoms and feet
Height Units (HUNI):	Feet
Positional Units (PUNI):	Meters

During creation of the HCell in CARIS BASE Editor and CARIS S-57 Composer, all soundings and features are maintained in metric units with as high precision as possible. Depth units for soundings measured with sonar maintain millimeter precision. Depths on rocks above MLLW and heights on islets above MHW are typically measured with range finder, so precision is less. Units and precision are shown below.

BASE Editor and S-57 Composer Units:

Sounding Units:	Meters rounded to the nearest millimeter
Spot Height Units:	Meters rounded to the nearest decimeter

See the HCell Reference Guide for details of conversion from metric to charting units, and application of NOAA rounding.

7.3 S-57 Object Classes

The CS HCell contains the following Object Classes:

\$CSYMB	Blue Notes (points) —Notes to the MCD chart Compiler
COALNE	Coastline
LNDARE	Land Area
M_QUAL	Data quality Meta object
SBDARE	Rocky seabed areas
SOUNDG	Soundings at chart scale density
* UWTROC	Rock features

* The M_QUAL is adequate for NDB product searches except for features in these object classes which reside outside the M_QUAL limits.

The SS HCell contains the following Object Classes:

DEPCNT	Generalized contours at chart scale intervals (See table under section 4.)
SOUNDG	Soundings at the survey scale density (See table under section 3.)

8.0 Data Processing Notes

There were no significant deviations from the standards and protocols given in the HCell Specification and HCell Reference Guide.

9.0 QA/QC and ENC Validation Checks

H12130 was subjected to QA checks in S-57 Composer prior to exporting to the metric HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to chart units and NOAA rounding applied. dKart Inspector was then used to further check the data set for conformity with the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and warnings and errors investigated and corrected unless they are MCD approved as inherent to and acceptable for HCells.

10.0 Products

10.1 HSD, MCD and CGTP Deliverables

H12130_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000
H12130_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000
H12130_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H12130_outline.gml	Survey outline
H12130_outline.xsd	Survey outline

11.0 Software

CARIS HIPS Ver. 7.0 SP2	Inspection of Combined BASE Surfaces
CARIS Bathy DataBase Ver. 3.1	Creation of soundings and bathy-derived features, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.2	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1, SP 1	Validation of the base cell file.
Northport Systems, Inc., Fugawi View ENC Ver.1.0.0.3	Independent inspection of final HCells using a COTS viewer.

12.0 Contacts

Inquiries regarding this HCell content or construction should be directed to:

Kay MacDonald
ERT
Pacific Hydrographic Branch, Seattle, WA
206-526-6841
kay.macdonald@noaa.gov.

APPROVAL SHEET
H12130

Initial Approvals:

The survey evaluation and verification has been conducted according to branch processing procedures and the HCell compiled per the latest OCS HCell Specifications.

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or disproof of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

I have reviewed the HCell, accompanying data, and reports. This survey and accompanying digital data meet or exceed OCS requirements and standards for products in support of nautical charting except where noted in the Descriptive Report.