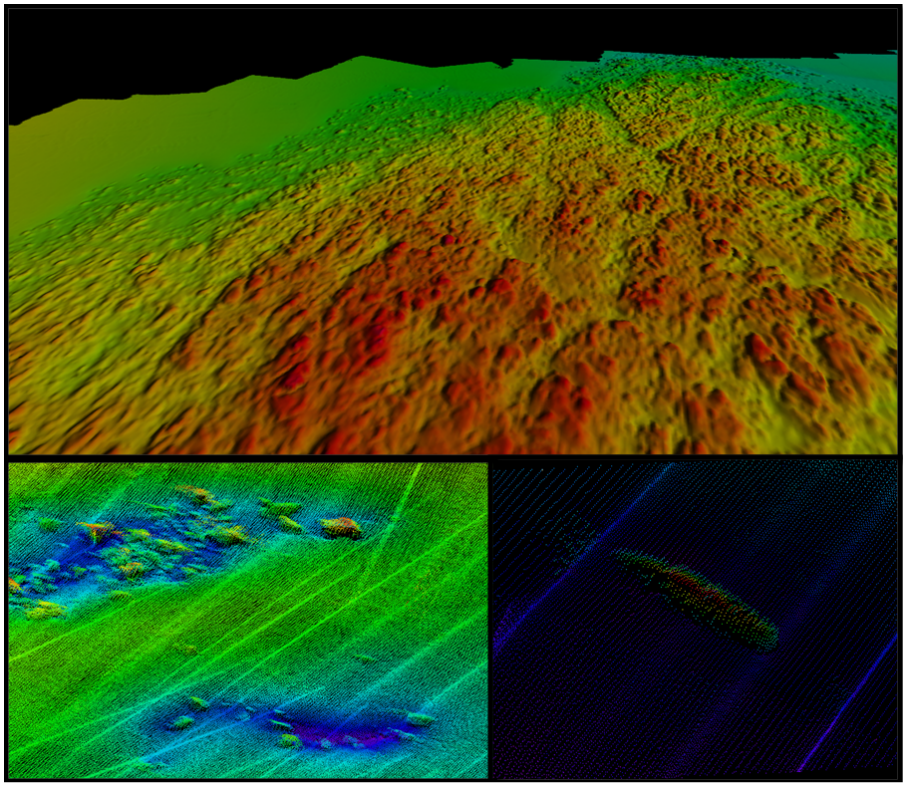
LONGITUDE 123, INC.
Marine Project Consulting
and Construction Management

eTrac

Hydrographic Survey

Dynegy Morro Bay, LLC. Morro Bay Power Plant Marine Terminal Decommissioning Project

Morro Bay, CA



Report of Survey

Pre Decommissioning
July 23, 2018

Contractor Document No: L123_2018_DYNEGY_REPORT_OF_SURVEY_A4.docx

07/23/2018	A4	Additional Survey Area Results	ALT	NPJG		
06/29/2018	A3	Client review	NPJG	EM		
06/27/2018	A2	Preliminary Survey Effort Report	NPJG	EM		
6/19/2018	A1		RPO	NPJG		
Date	Revision	Description of Revision	Prepared	Checked	Approved	Client

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ABBREVATIONS

ACSM/THSOA - American Congress on Surveying and Mapping/The Hydrographic Society of America
AML - AML Oceanographic Systems
CMR+ / CMR 94 – Compact Measurement Record
CORS - Continuously Operating Reference Stations
GAMS - GNSS Azimuth Measurement System, GAMS™
GLONASS - Global Navigation Satellite System
GNSS - Global Navigation Satellite System
GPS - Global Positing System (US System)
GRS - Geodetic Reference System
ID - Identification number
MBES - Multibeam Echo Sounder System
MLLW - Mean Lower Low Water
NAD83 - North American Datum 1983
NAVD88 - North America Vertical Datum 1988
NGS - National Geodetic Survey
PPK - Post Processed Kinematic
QINSy - Quality Integrated Navigation System
QC - Quality Control
QPS - Quality Positioning Systems
RTK - Real Time Kinematic
SBET - Smoothed Best Estimate of Trajectory
SVP - Sound Velocity Profile(r)
USM - Universal Sonar Mount
USACE - United State Army Corps of Engineers
WGS84 - World Geodetic System 1984

EXECUTIVE SUMMARY

On June 11-14 and June 25, 2018 eTrac Inc. completed a hydrographic survey of an area approximately 7,050ft from shore and 4,100ft wide, centered along the Dynergy Morro Bay, LLC. pipeline in Morro Bay, California. This survey is the pre-decommissioning survey for the Dynegy Morro Bay, LLC, Morro Bay Power Plant Marine Terminal Decommissioning Project.

On July 17-18, 2018 eTrac Inc. completed a second hydrographic survey of an additional area that extended from the previously survey area by 900ft to the north and west.

This report represents the details of both the preliminary survey effort, which covered the area up to 10ft below mean lower low water (MLLW), the follow up effort using low swell conditions to obtain shallow data up to 1ft below MLLW, and the additional survey requested by Longitude 123 on July 10, 2018.

The objectives of the survey were as follows:

1) Create a bathymetry grid of seabed depths across the area
2) Position and create pipeline alignment where pipe exposed
3) Locate debris objects on the seabed
4) Determine the extents of rock outcroppings
5) Determine the extents of Marine Vegetation

Detailed information on the seabed depths were recorded with full coverage multibeam up to 5ft below MLLW.

Small sections of both pipelines were detected in the multibeam at termination point of the pipelines where they are exposed. These sections of the pipelines are approximately 25ft. The pipelines are buried for the remainder of the alignment.

Rock outcroppings were able to be determined in the multibeam data with a clear transition from sand to rock substrate. The rock outcroppings were located in two (2) large (35 acres & 25 acres) and several smaller (0.5 - 2 acres) contiguous areas. The larger areas were located along the offshore border of the survey area and the southern end of the survey area near shore. Small rock outcropping areas are located in the north and south of the survey area away from the pipeline alignment.

One hundred seventeen (117) individual boulders were located. These ranged in size from 3 to 10 ft.

One (1) object was located within the additional survey area. It measures 22ftx7ftx3ft and is believed to be a skiff.

1. INTRODUCTION

a. Survey Area

This report is prepared for Longitude 123 Inc (L123) by eTrac Inc (eTrac) for the Dynegy Morro Bay Power Plant Marine Terminal Decommissioning Project.

Figure 1 shows the project area. The survey area was designated by Longitude 123 Inc. A second, larger survey area was created by eTrac inc. A third area was designated by Longitude 123 Inc. Coverage was obtained within all three borders offshore and then near shore as close as possible while maintaining safe survey conditions. This report represents the details of the preliminary survey effort, which covered the area up to 10ft below mean lower low water (MLLW), the follow up survey in better swell conditions where coverage was achieved up to 5ft below MLLW, and the latest survey effort which covered the Additional Survey Area.

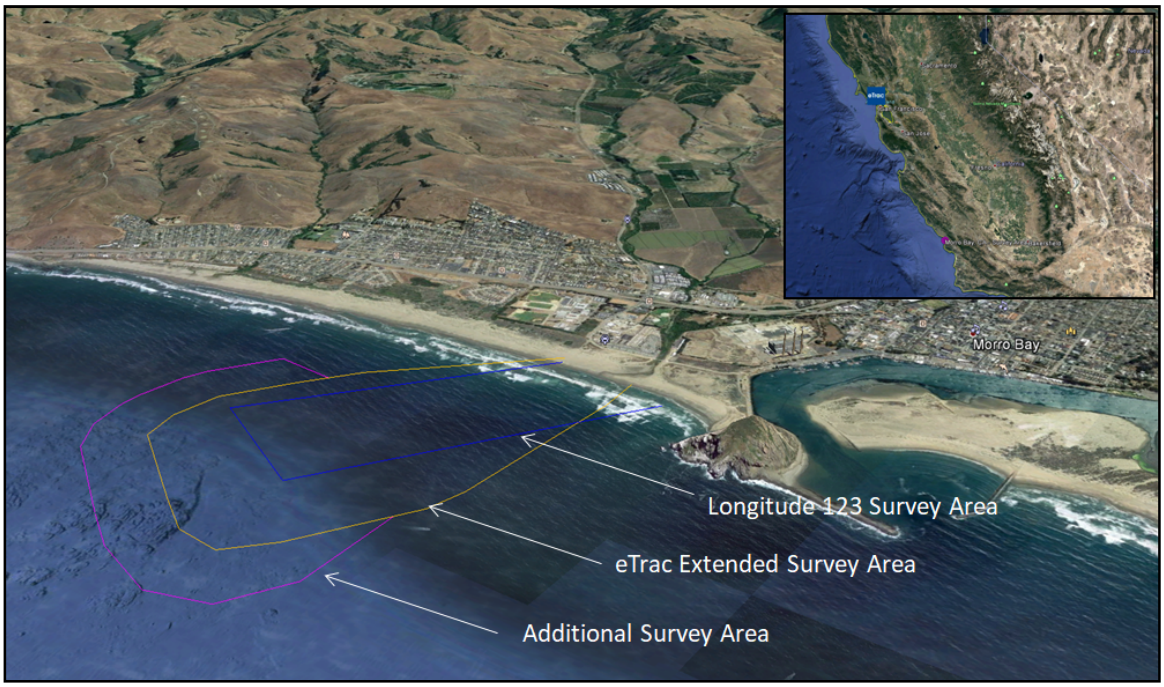

Figure 1 Survey area location

b. Company Overview

eTrac Inc. was established in 2003 as a hydrographic and geophysical surveys, vessel positioning and instrumentation firm. eTrac has several offices along the US West Coast including San Francisco, Seattle and Anchorage. The firm has earned a strong reputation among many sectors of the hydrographic industry, including government agencies and private industry.

Its equipment fleet has also grown to include 9 aluminum geophysical survey vessels as well as several ultraportable, shallow water survey craft. eTrac's role has grown over the years to include a strong group of full-time staff as well as several localized vessels to support the work required by USACE, marine construction, engineering firms and petroleum industry contractors on the west coast. eTrac is committed to continual re-investment in industry leading equipment and knowledgeable staff to complete multibeam, singlebeam, sidescan, mobile LiDAR and water-level surveys required by our clients. Staffed with professionally licensed land surveyors and ACSM/THSOA (American Congress on Surveying and Mapping/The Hydrographic Society of America) certified hydrographers, eTrac's projects are performed at the highest level of quality and detail that the industry demands.

eTrac confirms to all local survey standards when completing all hydrographic survey work. eTrac is a holder of the California State Lands Commission Geophysical Survey Permit. eTrac's Permit number is 9235.

2. OBJECTIVES

eTrac completed a hydrographic survey covering the designated survey area. The objectives of the survey were as follows;

1) Create a bathymetry grid of seabed depths across the area
2) Position and create pipeline alignment where pipe exposed
3) Locate obstruction objects on the seabed
4) Determine the extents of rock outcroppings
5) Determine the extents of marine vegetation

3. METHODOLOGY

a. Survey Vessels

All work was completed onboard survey vessel *S/V Tikaani*. *S/V Tikaani* is an aluminum monohull, hydrographic survey vessel of 24ft. *S/V Tikaani* is field proven, having conducted numerous hydrographic and geophysical surveys throughout Southern California with towed and mounted sensors. It is easily transported and can be mobilized for survey rapidly.

A positioning and motion detection system was installed on the vessel with a long antenna base allowing maximum heading accuracy and better results in areas with low GNSS coverage. Tikaani had all offsets on the vessel measured while on a trailer to ensure that measurements to and from the positioning equipment are accurate to less than 3cms. The vessel is equipped with a Universal Sonar Mount (USM) for side-mounted multibeam. The multibeam system was mounted on this specially engineered side mount. This mount positions the system with 100% repeatability and allows for surveying in shallow water due to a specifically designed break away block (see Figure 2 for Tikaani specifications)

Figure 2 SV Tikaani specifications

b. Equipment

Tikaani was mobilized with a high specification integrated positioning and motion system along with a high resolution multibeam echosounder.

i. Positioning and Motion System

An advanced position and motion system was mobilized on Tikaani to accurately position the vessel and account of all motion on the water. The POS MV5 Wavemaster is market leading system with highly accurate positioning down to 3cms uncertainty. During field operation, the system received differential corrections from the WAAS network to operated in DGPS mode. All position, timing, and motion data was also logged to allow the creation of a post-processed position for highly accurate results.

Applanix POS MV V5 Wavemaster

- Position Accuracies PPK: Horizontal: +/- (8 mm + 1 ppm x baseline length)3 Vertical: +/- (15 mm + 1 ppm x baseline length)
- Motion Accuracies, Roll and Pitch: 0.015° in PPK
- Heading Accuracies: 0.03° (2 m baseline)
- Real time Heave 5cms and Trueheave Solutions available increasing to 3cms
- With POSPac Processing allows PPK solution with GLONASS AND GPS satellites.

Figure 3 Applanix POS MV Oceanmaster

ii. Multibeam Sonar

R2Sonic 2024 Multibeam Echo sounder

- 400 kHz high resolution
- 256 discrete 0.5° x 1.0° beams
- 1 to 500 meter minimum/maximum range
- 1.25 cm range resolution

An R2 Sonic 2024 multibeam system was used for all data. The system was run at high resolution 400khz mode. The system was run with no gates or filters to enable imagery of all potential objects in the entire water column.

The last survey utilized R2Sonic's Ultra High Density mode. This mode increases the number of bottom samples from 256 soundings to 1,024 soundings per pass. This mode, which increases bottom sampling density, was used in conjunction with narrow swath passes over the previously mapped objects to determine whether they were objects or boulders. This is further discussed in section 5.b.

For all multibeam data the sound speed both that the sonar head and through the water column was accounted for with two sound velocity probes. An AML Micro X and AML Base X were used.

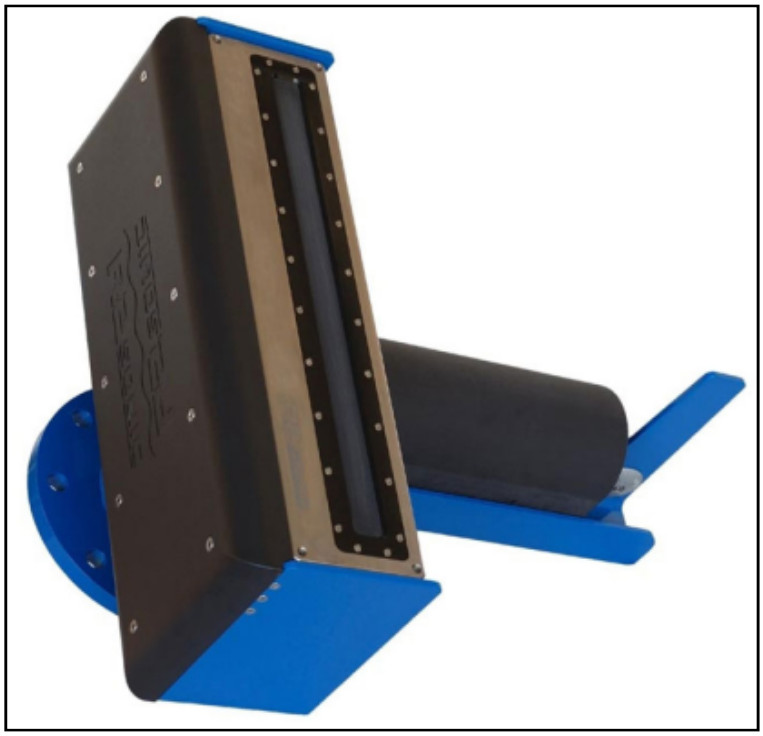

Figure 4 R2 Sonic 2024 Multibeam Echosounder System

c. Geodesy

i. Project Coordinates

The project coordinates used for the survey were NAD83 U.S. State Plane California Zone 5 in US Survey feet.

Spheroid Parameters

Geodetic Datum	NAD 1983 (2011) 2010.00
Ellipsoid	GRS 1980
Semi-major Axis	20925604.474 ftUS
Inverse Flattening (1/f)	298.257222101

Projection Parameters

Description	US State Plane California Zone 5
Unit	US survey Feet
Projection	Lambert Conic Conformal (Two Standard Parallels)
Latitude of Origin	33° 30 00.00 North
Longitude of Origin	118° 00 00.00 West
Scale Factor	1.0
Grid Easting at Origin	6561666.667
Grid Northing at Origin	1640416.667
Scale Factor at longitude of Origin	1.0

ii. Vertical Datum

The vertical datum for all work was MLLW.

iii. Horizontal and Vertical Control

The horizontal and vertical control for the project is the NGS Benchmark "LOSOSOS_CS2006" NGS CORS Station P523 (see Figure 4 for location and Figure 5 for coordinates). The benchmark is approximately 6 miles from the furthest extent of the survey area. Corrections from the CORS station were applied to logged vessel data to compute a Post Processed Kinematic position and motion for the vessel.

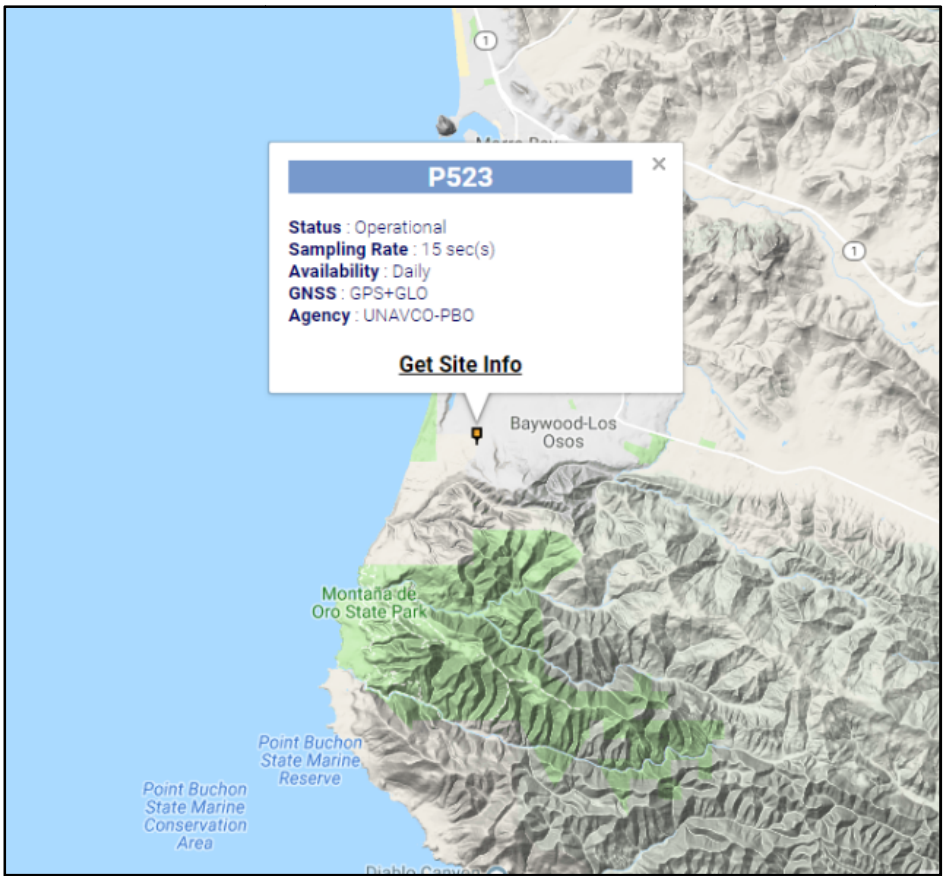

Figure 4 CORS Station P523 location

```
                          ***IGS 08***
              LOSOSOS___CS2006 (P523),  CALIFORNIA

 Retrieved from NGS DataBase on 05/15/17 at 12:52:18.
 ____________________________________________________________________________
|
|         Antenna Reference Point(ARP): LOSOSOS___CS2006 CORS ARP
|         ------------------------------------------------------
|                         PID = DN5659
|
|
| IGS08 POSITION (EPOCH 2005.0)
| Computed in Jan 2012 using 88 days of data.
|     X =  -2672969.413 m     latitude    =  35 18 16.01458 N
|     Y =  -4473242.552 m     longitude   = 120 51 36.97531 W
|     Z =   3665507.341 m     ellipsoid height =   41.376   m
|
| IGS08 VELOCITY
| Transformed from ITRF00 velocity in Jan 2012.
|     VX =  -0.0274 m/yr      northward =   0.0237 m/yr
|     VY =   0.0324 m/yr      eastward  =  -0.0401 m/yr
|     VZ =   0.0193 m/yr      upward    =  -0.0001 m/yr
|
|
| NAD_83 (2011) POSITION (EPOCH 2010.0)
| Transformed from IGS08 (epoch 2005.0) position in Jan 2012.
|     X =  -2672968.777 m     latitude    =  35 18 16.00616 N
|     Y =  -4473243.685 m     longitude   = 120 51 36.93070 W
|     Z =   3665507.481 m     ellipsoid height =   41.984   m
|
| NAD_83 (2011) VELOCITY
| Transformed from IGS08 velocity in Jan 2012.
|     VX =  -0.0118 m/yr      northward =   0.0363 m/yr
|     VY =   0.0328 m/yr      eastward  =  -0.0270 m/yr
|     VZ =   0.0288 m/yr      upward    =  -0.0014 m/yr
|____________________________________________________________________________
```

Figure 5 Details of point LOSOSOS_CS2006 CORS Station P523

Data was reduced from ellipsoidal to orthometric height (NAVD88) using Geoid 2012A. To further reduce the data from NAVD88 to MLLW the datum transformation values from NOAA tidal station 9412110 Port San Luis, CA were used. This station is 14 miles from the survey area. Using this station and associated benchmarks, NAVD88 + 0.08ft gives MLLW. This correction was checked against NOAA VDatum at the survey site which gave values of -0.01ft. The correction at Port San Luis was deemed appropriate to use. The location of Port San Luis is shown below in Figure 6 and the datum height values at the tide gauge are shown in Figure 7.

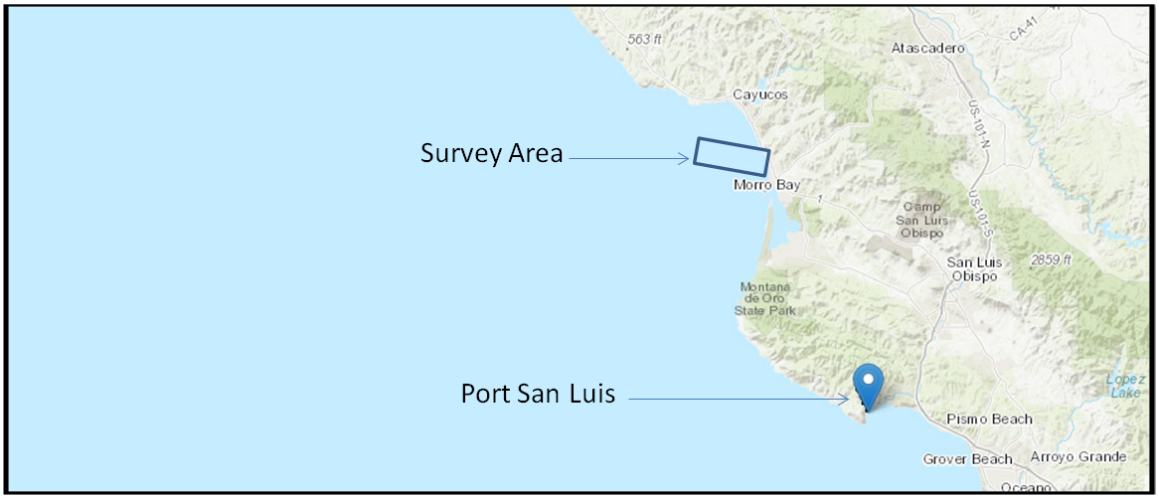

Figure 6 Location of Port San Luis

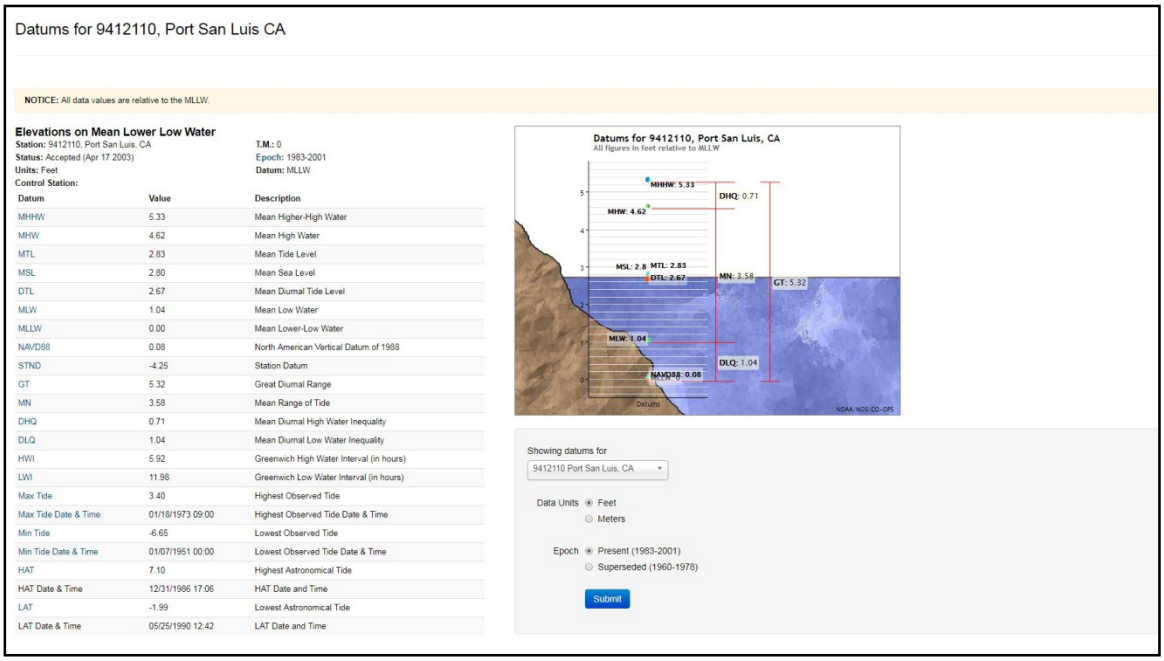

Figure 7 Datums for 9412110 Port San Luis, CA

d. Acquisition and Safety

All data was collected in three survey efforts. The first was from June 11-14, 2018, the second survey effort was on June 25, 2018, and the third was July 17-18, 2018. Data was collected in a safe and efficient manner. Data was collected in daylight hours and in swell conditions less than 4ft. On the 13th the survey was delayed due to weather conditions. The fog was too thick to safely survey and therefore the Surveyor and Captain were on standby until approximately 11 am. All personnel involved with the project are OSHA certified and at the start of the day and before any activity change a full toolbox

talk was completed. The main risk involved was deploying and retrieving the sonar head. Two people were always on deck during these operations and retrieval and it was always done at periods during which ample time could be allowed for the process to be done in a safe manner. Due to the suboptimal conditions producing high swell, data in the littoral zone of the survey area was unable to be collected between the preliminary survey activities between June 11-14.

e. Processing & Software

All multibeam data acquisition was completed in QPS QINSy hydrographic data acquisition, navigation and processing software package. Fixed RTK data was quality controlled online using a real time standard deviation error grid. Change in the sound speed environment were monitored and appropriate actions in terms of further measuring of the water column sound speed were taken. Position data was post processed in Applanix POS Pac Inertial post position processing software. This allowed the creation of a more accurate and robust Smoothed Best Estimate of Trajectory (SBET) solution. This was especially useful under the bridge during periods of GNSS outage. This refined, highly accurate post processed position and motion was applied to the multibeam data in QPS QIMERA software. Data was then analyzed, further processed for positional errors and cleaned in QIMERA.

f. Analysis

The multibeam data was analyzed as both 3D gridded surfaces and 3D point cloud visualization environments. This allowed a detailed understanding of the feature geometries. This data was interpreted in order to determine the existence of debris objects, rocks, rock outcroppings, and marine vegetation.

Debris objects were determined as features that were anomalous to the surrounding seabed. Anything that protruded from the seabed or created a relief that was not in common with the prevailing bathymetry in the area. A further distinction of being a debris object as opposed to a rock or boulder was made based on the geometry of the feature. A rounded, smaller (less than 5ft wide or long), singular feature was considered a rock or boulder. An irregular shaped feature (a linear feature, non-circular or rectangular feature) was considered a debris object. The image below in Figure 8 shows the detail from the high resolution multibeam, that allows objects to be discerned.

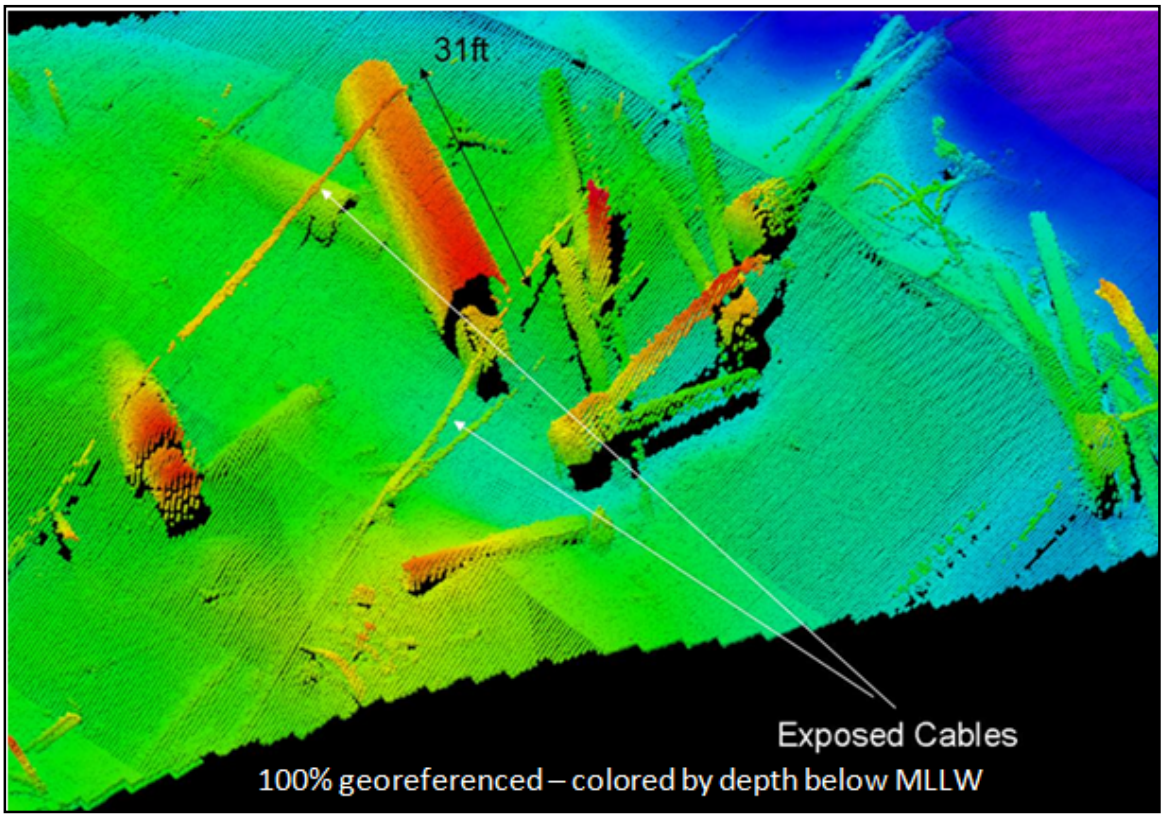

Figure 8 3D point cloud of multibeam data showing objects clearly and able to be determined based on geometry

The extents of rock outcroppings were determined by looking for a change in rugosity as compared to the surrounding sand or mud environment. A rock outcropping was assumed to be an area with high rugosity distinct from smooth sand or mud. The intensity or the acoustic reflectance was also analyzed to confirm the delineation of rock outcroppings. An example of rock outcropping detection using multibeam data is shown below in Figure 9.

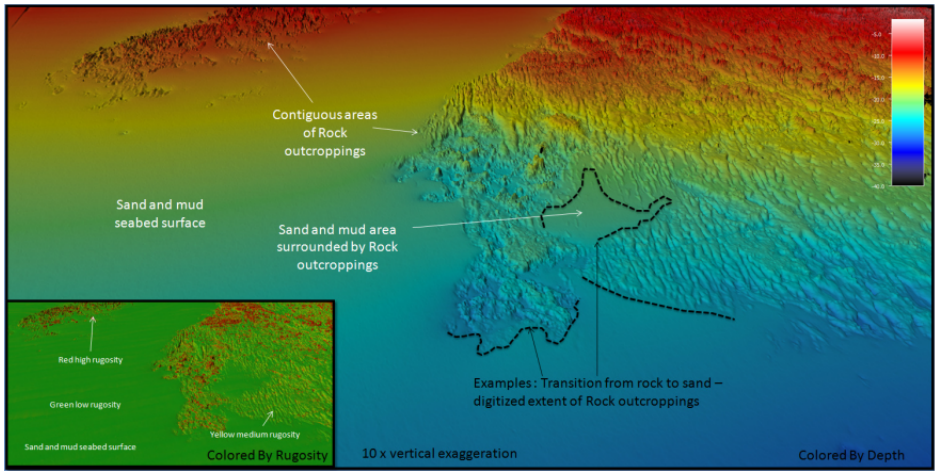

Figure 9 Analysis of extents of rock outcroppings using multibeam data gridding techniques

Marine Vegetation was determined by the existence of disturbance in the sonar data. eTrac has experience mapping vegetation along the California coast using multibeam echosounders. eTrac analyze both the 3D point cloud data of the multibeam as well as the surface created by the soundings. This allows in depth analysis of the data to be performed to determine the existence of vegetation. Marine vegetation that can be identified includes, kelp, eel grass, surf grass and large algae.

The point cloud data can be analyzed for disturbance and geometry to determine the existence of marine vegetation. The image in Figure 10 shows the marine vegetation as imaged in the multibeam and analyzed in the 3D point cloud environment.

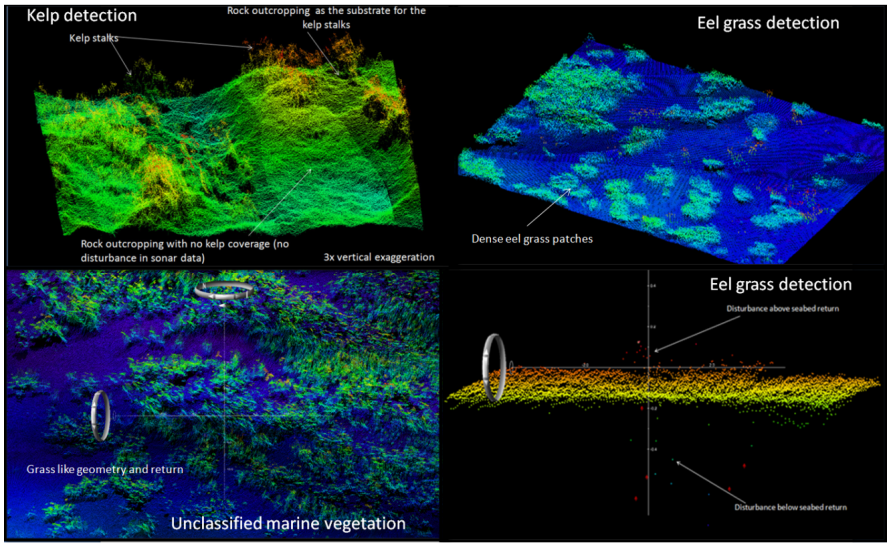

Figure 10 3D point cloud analysis for detection of marine vegetation

The image below in Figure 11 shows the use of gridding techniques and coloring to determine the extents of marine vegetation.

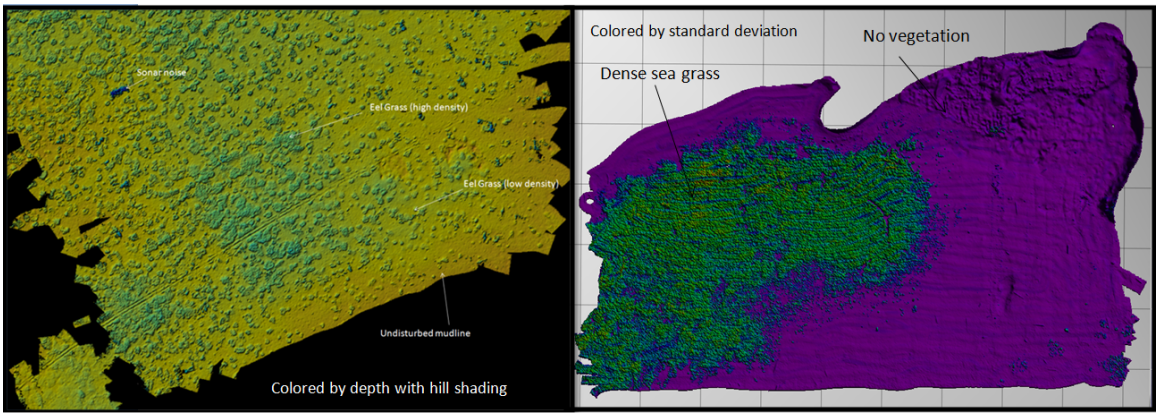

Figure 11 Multibeam data gridding techniques to analyze for the present and extents of marine vegetation. Left: Data colored by depth with hill shading Right: Data colored by standard deviation of each cell

The pipeline alignment was analyzed by using a shallow gridded surface and 3D point cloud. The top of the pipe was considered the shallowest point across the pipeline as detected in the multibeam sonar data.

g. Geodatabase

A geodatabase was made to store all the findings. These are referenced by year and type of object or cable found in order that if there are any further developments change can be noted. Each feature is given a unique id code. Where the cable or pipe name was used this was included with the year of survey and client surveyed for see Figure 12.

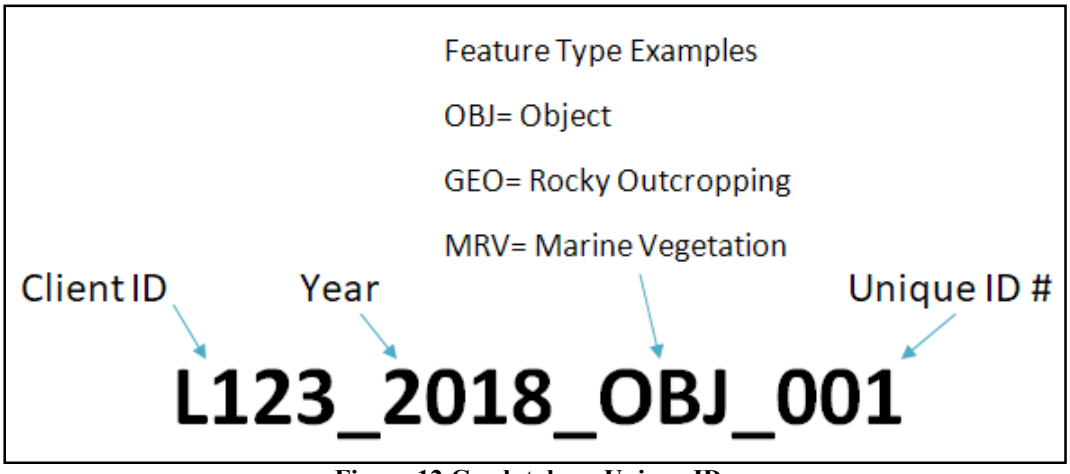

Figure 12 Geodatabase Unique IDs

4. RESULTS

a. Multibeam

Multibeam coverage was achieved to a minimum of 5 feet. All the position data available was successfully post processed so that up to 100% of the data was post processed kinematic where accuracies of 0.1ft were achieved.

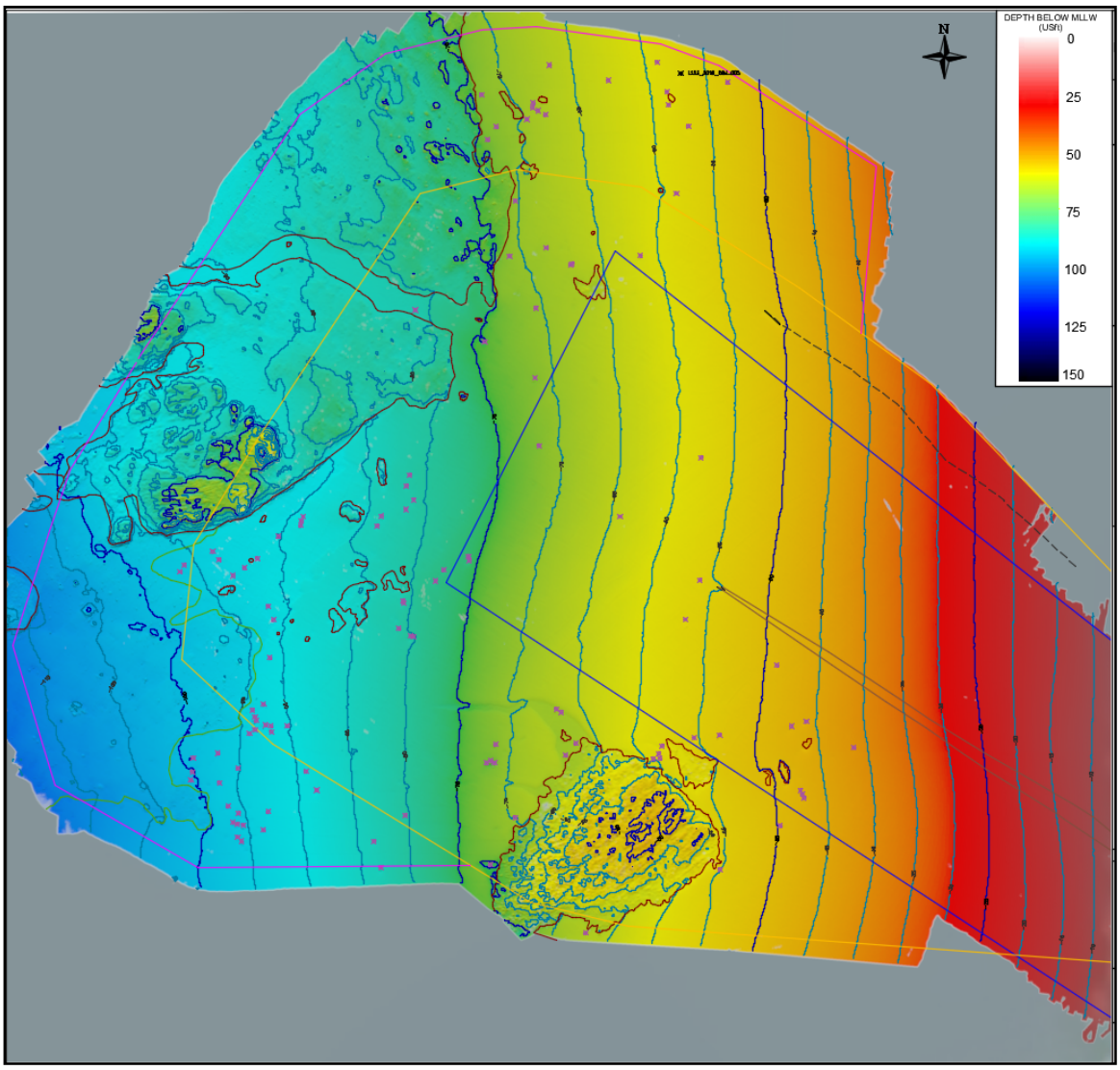

Figure 13 Multibeam coverage

b. Overview

i. Pipe Detection

The pipeline was able to be identified when exposed above the seabed. The point definition on the pipeline was such that the top of the pipe was able to be determined for an accurate determination of alignment. Figure 14 shows the pipeline in the sounding data and the gridded data.

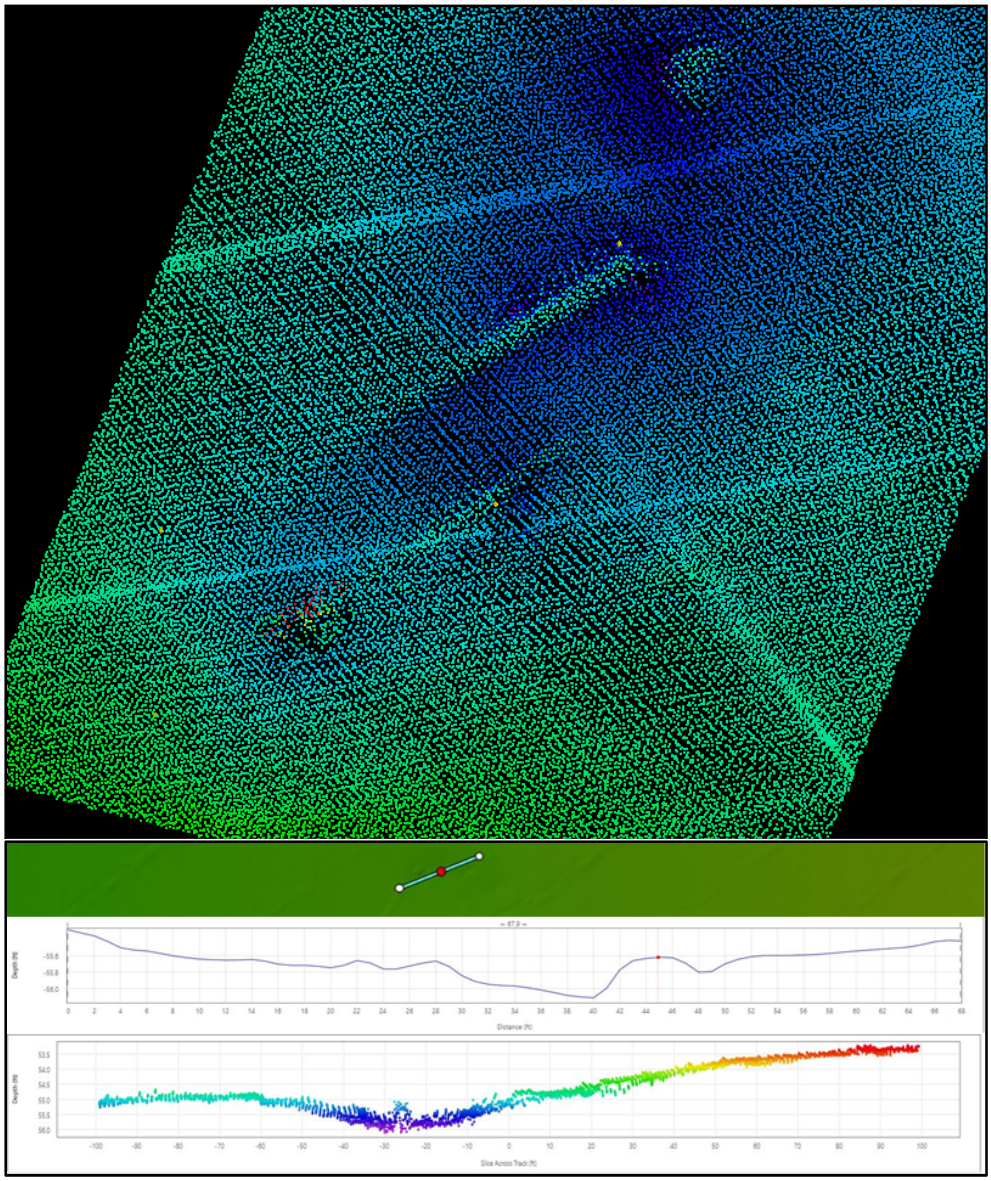

Figure 14 Pipeline as visible in the gridded multibeam data, profile data and 2D slide of sounding data

ii. Object detection

The last survey utilized Ultra High Density mode. This mode increases the number of bottom samples from 256 soundings to 1,024 soundings per pass. With the increased bottom sampling density, in conjunction with dedicated narrow swath passes over the previously mapped objects, a more accurate description was obtained.

Data resolution and density was such that objects 5ft wide were detected at 100ft. The smallest noteworthy object detected was 4x4x3ft.

Due to the high quality of the data collected we were able to distinguish between rocks and unidentified objects. In Figure 15 an object at 57ft depth with dimensions measuring 22ft x 7ft x 3ft is shown. Based on the geometry, and alternate bathymetry this was classified as an object and is believed to be a small skiff.

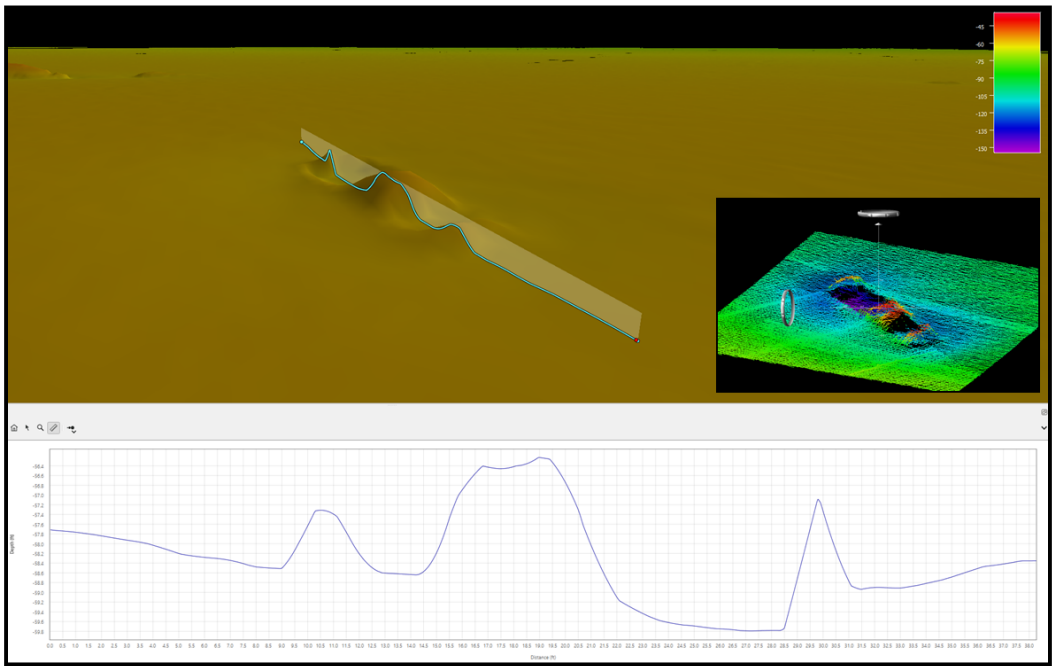

Figure 15 object at 50ft depth

iii. Substrate mapping

Rock outcroppings were well defined in the multibeam data and evident and distinctly different to the surrounding sand. This allowed extents to be accurately located. Rock outcroppings viewed in a 3D gridded surface colored by depth and colored by rugosity is shown below Figure 16 with an overview of the entire area colored by Rugosity in . These images show the ability for these

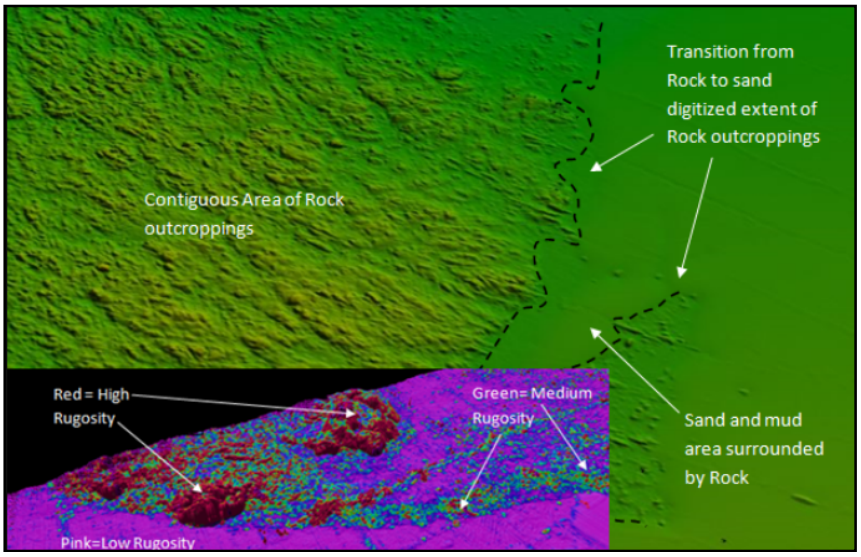

Figure 16 Rock outcroppings in 3D gridded surface colored by Height and colored by rugosity

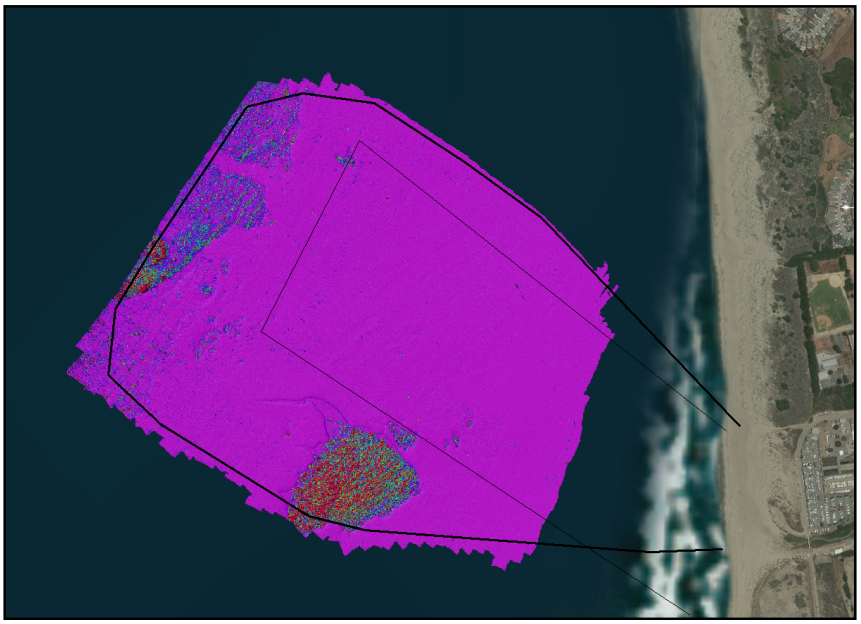

Figure 17 Overview of the multibeam data colored by rugosity highlighting the rock outcroppings and boulders

iv. Vegetation mapping

Data was of high enough quality to detect marine vegetation. The data clearly showed the differentiation between rock outcropping and the surrounding flat, homogonous seabed, but no vegetation was detected. No marine vegetation was detected within the survey area.

5. ANALYSIS

This section will describe the As Surveyed positions of surface objects, the charted cables each dealt with separately and then the uncharted utilities located across the survey area.

a. Pipeline Alignment

The Dynegy pipelines were identified as exposed only at the marine termination point. Each exposure section was only a maximum 28ft long. Figure 18 shows an overview of the survey area with the small sections of exposure annotated.

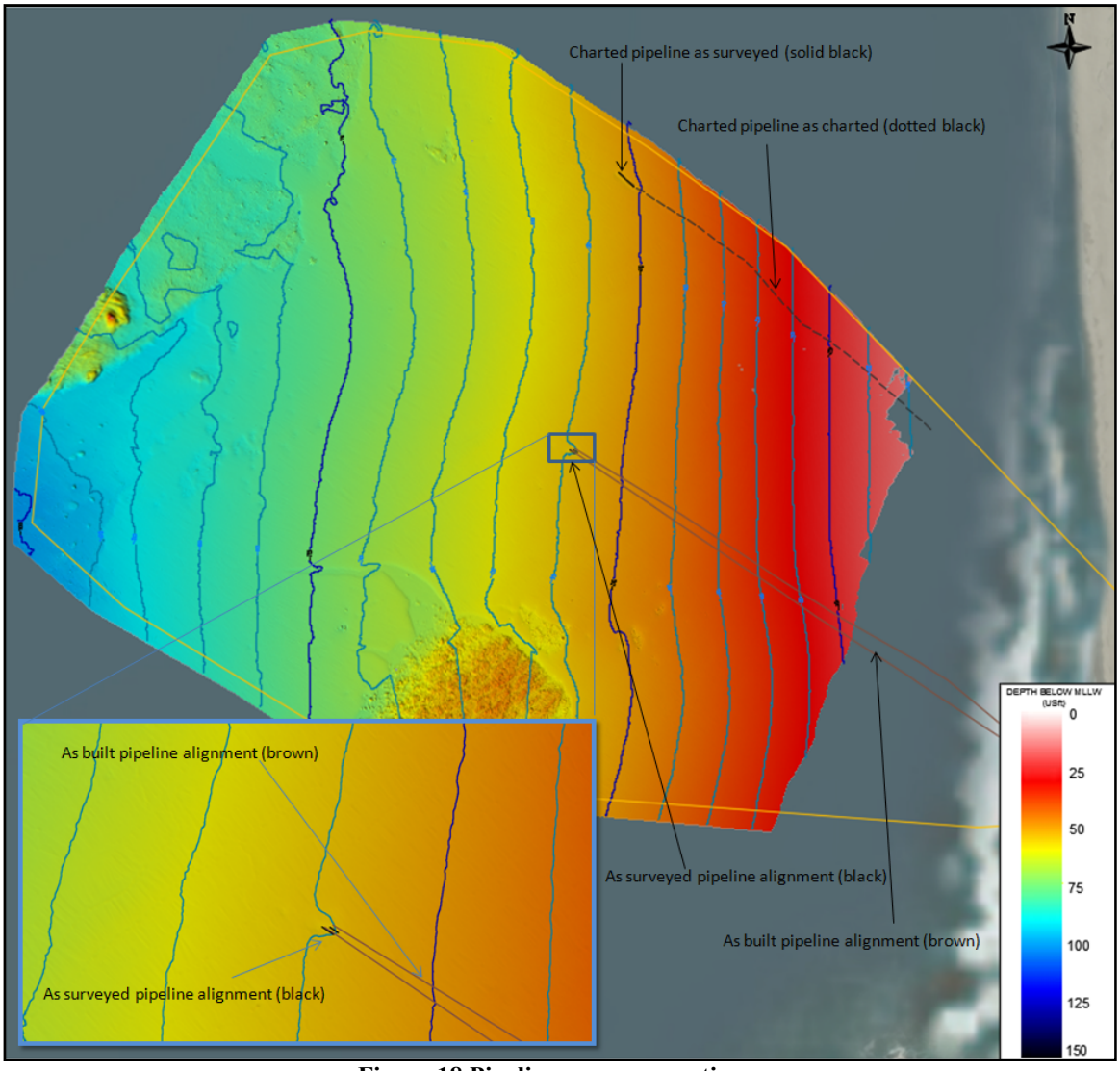

Figure 18 Pipeline exposure sections

The southern pipe line of the pair of pipelines is exposed for 28ft while the northern pipeline is exposed for 26ft. The pipeline exposure sections as imaged in the multibeam are shown below in Figure 19.

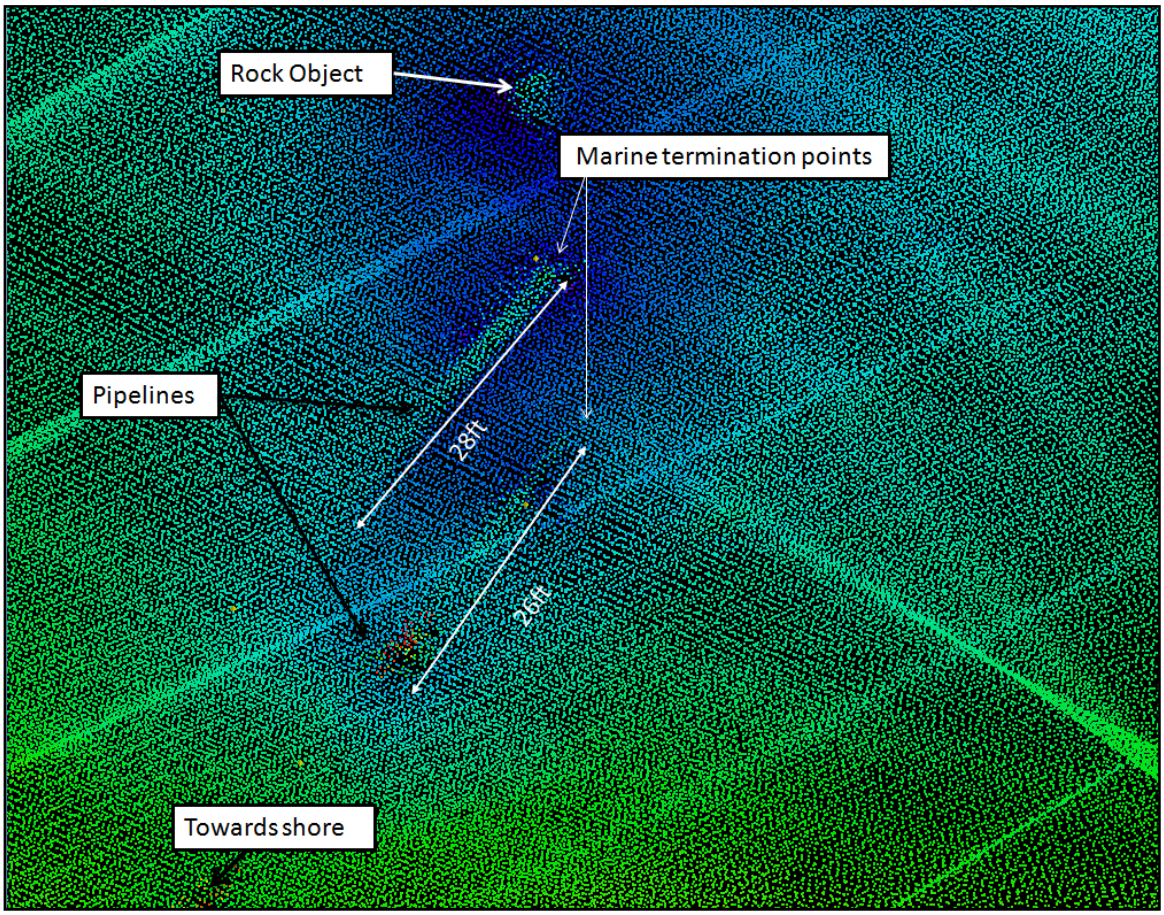

Figure 19 The exposed sections of the pair of Dynegy pipelines

A comparison with the as built and the as surveyed pipeline alignment shows a difference horizontally of maximum 10ft. The northern pipeline was located 10ft south of the as built alignment while the southern pipeline was identified 2ft south of the as built location.

A charted pipeline was noted in the northern part of the survey area. The multibeam data located the pipeline as exposed for 129ft, ending at the marine termination point. The pipeline was not observed in the data aside from this one exposure section. The pipeline exposure section as seen in the multibeam data is shown in

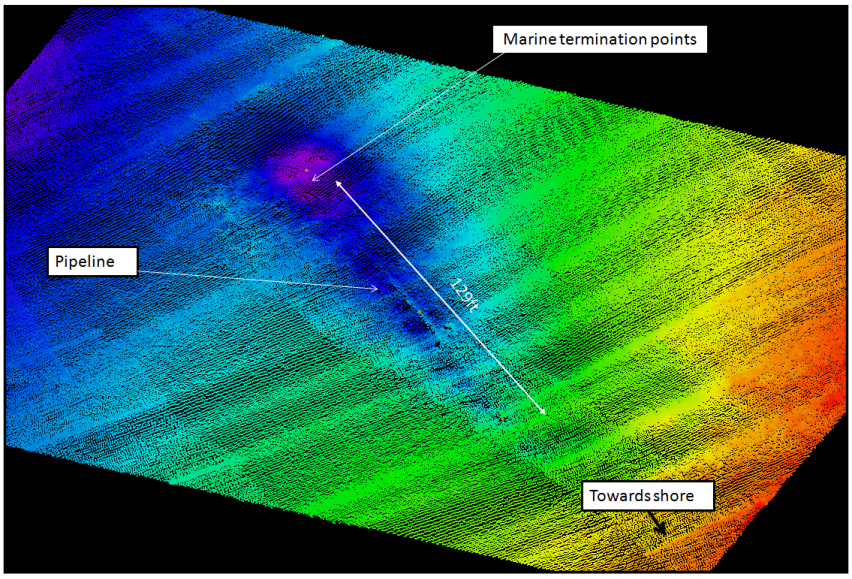

Figure 20 Charted pipeline as imaged in the multibeam data

b. Debris Objects

Four (4) objects were located in the previous survey. However with the increased bottom sampling density obtained through the UHD mode along with dedicated narrow swath passes over the previously mapped objects; these objects were reclassified as boulders. Images of these objects can be seen below as well as a comparison of Point Cloud data from June 25 and July 17 (Figure 21) for L123_2018_OBJ_002.

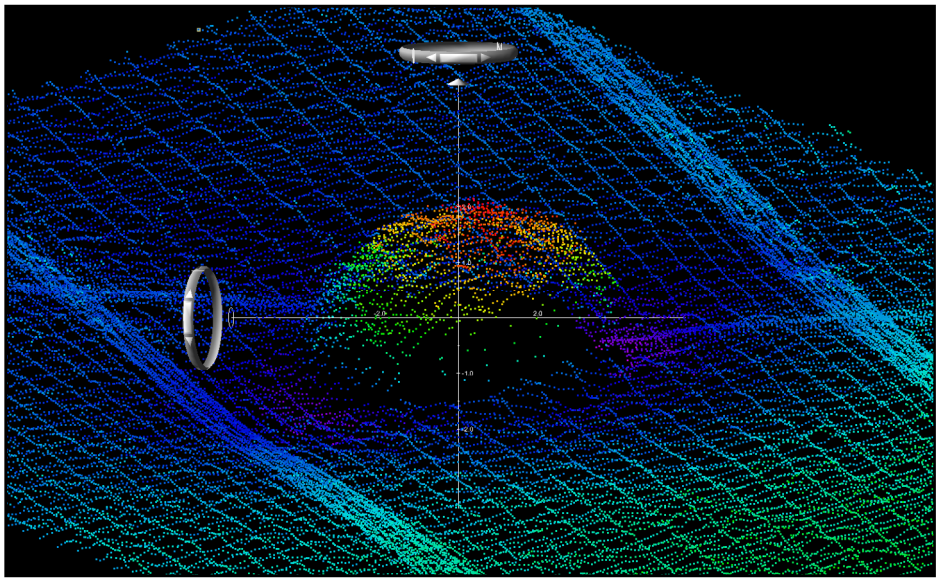

Figure 21 L123_2018_OBJ_001 as seen in July 17 MBES Data

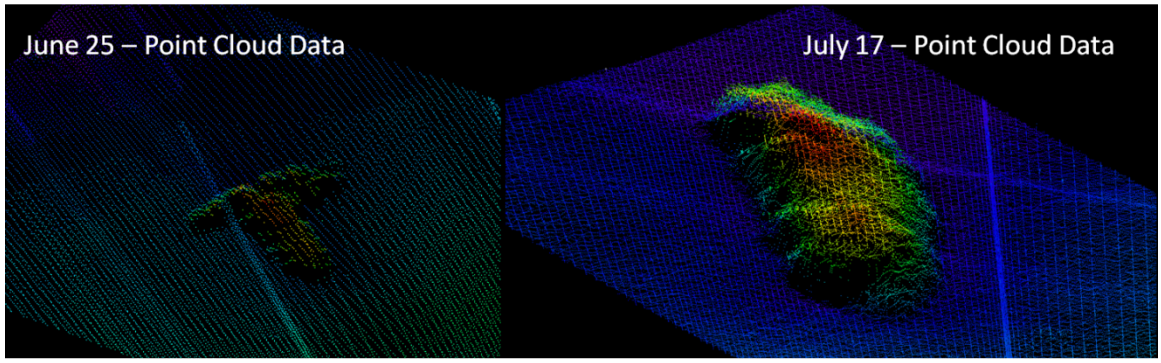

Figure 22 L123_2018_OBJ_002 Point Cloud Data

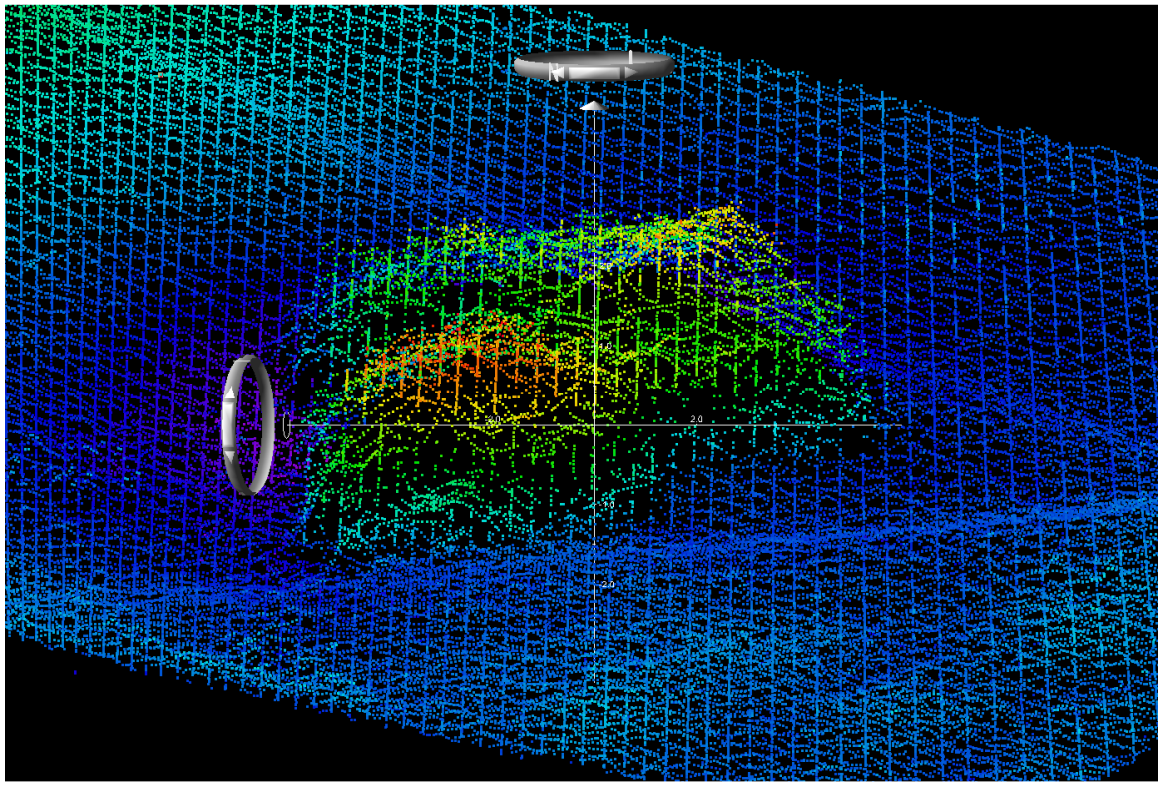

Figure 23 L123_2018_OBJ_003 as seen in July 17 MBES data

One (1) object was located in the survey area. This object measures 22ftx7ftx3ft and has a shoalest depth of 55.9ft. The object (L123_2018_OBJ_005; Figure 25) is believed to be a small skiff.

Table 1 below lists the debris objects.

Unique ID	June 11-14, 25: Desc.	July17-18: Desc.	Easting	Northing	Shoalest Depth	Dimensions (WxLxH)
L123_2018_OBJ_001	Unknown Object	Boulder	5701632.6	2337179.7	89.24	8x8x2
L123_2018_OBJ_002	Unknown Object	Rocky Outcrop	5702941.1	2339280.2	72.39	29x11x3
L123_2018_OBJ_003	Unknown Object	Rocky Outcrop	5703658.8	2339822.1	64.04	17x13x1
L123_2018_OBJ_004	Unknown Object	Removed from Database	*N/A*	*N/A*	*N/A*	*N/A*
L123_2018_OBJ_005	Not in Coverage Area	Skiff	5704211.4	2340813.6	55.90	22x7x3

Table 1 Debris Objects in survey area

Below in Figure 24the location of all the objects relative to the pipeline can be seen.

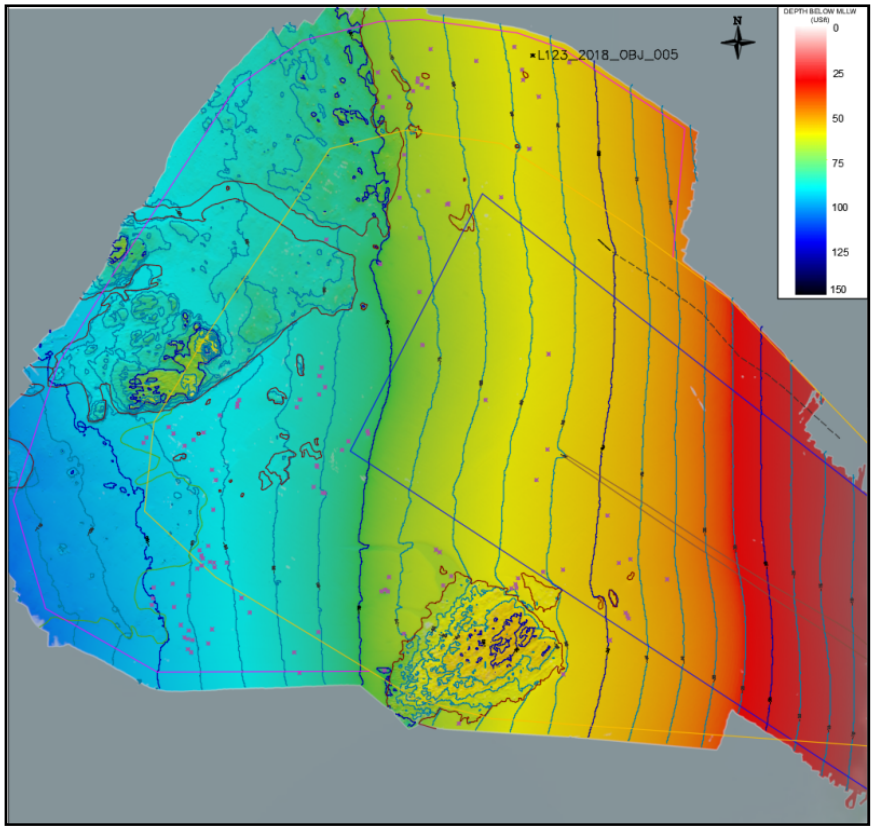

Figure 24 Location of debris object in the survey area (labeled point)

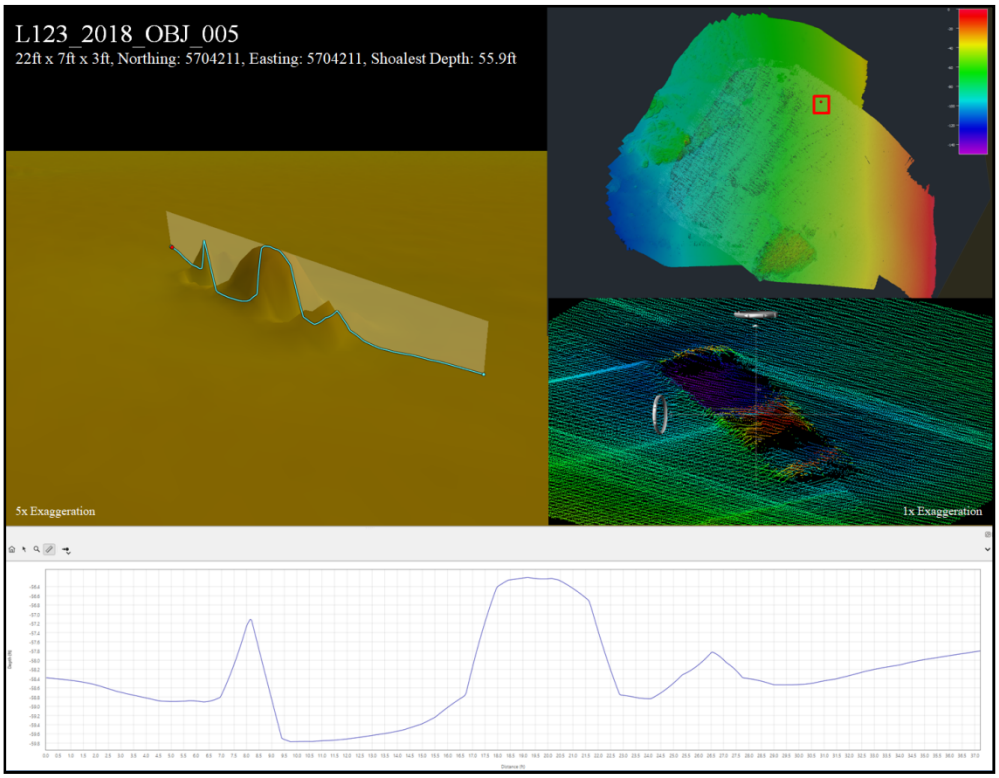

Figure 25 Possible Skiff; object L123_2018_OBJ_005

c. Boulders

One hundred seventeen (117) boulders were located across the survey area outside of the identified boulder field. These are listed with unique IDs in Table 2. Sporadic, isolated rocks were located across the survey area. Several rocks were adjacent to the rock outcroppings. The map in Figure 26 shows the location of the rocks across the survey area.

	US State Plane California Zone 5 Usft		Usft (MLLW)
Unique ID	Easting	Northing	Shoalest Depth
L123_2018_ROCK_001	5701270.721	2337839.61	-93.7582
L123_2018_ROCK_002	5701309.719	2337786.761	-93.0916
L123_2018_ROCK_003	5701425.632	2336202.663	-96.6962
L123_2018_ROCK_004	5701397.995	2337687.753	-92.2633
L123_2018_ROCK_005	5701611.391	2336211.833	-93.4771
L123_2018_ROCK_006	5701306.644	2336392.847	-97.6478
L123_2018_ROCK_007	5701470.238	2337736.553	-92.351
L123_2018_ROCK_008	5701530.295	2336804.038	-93.5173

L123_2018_ROCK_009	5701539.323	2336781.652	-92.9341
L123_2018_ROCK_010	5701549.736	2337793.504	-91.9339
L123_2018_ROCK_011	5701584.688	2336882.564	-92.217
L123_2018_ROCK_012	5701596.403	2336753.138	-92.785
L123_2018_ROCK_013	5701616.9	2337494.402	-91.9218
L123_2018_ROCK_014	5701629.87	2336747.071	-92.0628
L123_2018_ROCK_015	5701649.33	2337410.793	-91.9666
L123_2018_ROCK_016	5701681.631	2337932.716	-89.7523
L123_2018_ROCK_017	5701822.262	2337999.765	-88.3463
L123_2018_ROCK_018	5701825.366	2338027.584	-88.8158
L123_2018_ROCK_019	5701837.783	2338054.83	-88.8113
L123_2018_ROCK_020	5701849.982	2336463.285	-89.6085
L123_2018_ROCK_021	5702300.735	2337992.967	-84.1095
L123_2018_ROCK_022	5702326.534	2338055.58	-83.5865
L123_2018_ROCK_023	5702433.488	2337352.427	-81.2876
L123_2018_ROCK_024	5702459.444	2337525.725	-81.9846
L123_2018_ROCK_025	5702463.268	2337512.502	-81.7559
L123_2018_ROCK_026	5702467.257	2336185.483	-80.7015
L123_2018_ROCK_027	5702481.184	2338096.474	-81.9129
L123_2018_ROCK_028	5702483.951	2338243.947	-81.8808
L123_2018_ROCK_029	5702504.059	2338311.62	-81.2272
L123_2018_ROCK_030	5702507.375	2337304.916	-80.8974
L123_2018_ROCK_031	5702523.347	2337302.091	-80.5667
L123_2018_ROCK_032	5702529.135	2338155.083	-81.3186
L123_2018_ROCK_033	5702544.942	2339341.787	-81.5892
L123_2018_ROCK_034	5702663.365	2337648.72	-78.4899
L123_2018_ROCK_035	5702715.149	2337718.204	-77.8613
L123_2018_ROCK_036	5702869.491	2337802.351	-76.9091
L123_2018_ROCK_037	5702875.244	2337775.887	-77.0107
L123_2018_ROCK_038	5702976.214	2336511.767	-73.1817
L123_2018_ROCK_039	5702977.372	2339142.132	-75.0211
L123_2018_ROCK_040	5702997.714	2335874.177	-75.3192
L123_2018_ROCK_041	5703005.925	2336523.813	-73.2438
L123_2018_ROCK_042	5703027.312	2336510.521	-72.5557
L123_2018_ROCK_043	5703036.532	2336626.34	-71.7735
L123_2018_ROCK_044	5703135.939	2339675.976	-71.4824
L123_2018_ROCK_045	5703154.723	2336168.711	-69.9829
L123_2018_ROCK_046	5703173.594	2340020.041	-70.6902
L123_2018_ROCK_047	5703291.357	2338915.244	-72.1031

L123_2018_ROCK_048	5703299.793	2339350.295	-70.8223
L123_2018_ROCK_049	5703314.742	2338490.357	-72.108
L123_2018_ROCK_050	5703363.679	2339727.633	-69.1712
L123_2018_ROCK_051	5703415.731	2336843.746	-69.0518
L123_2018_ROCK_052	5703445.078	2336823.229	-69.2559
L123_2018_ROCK_053	5703472.656	2336556.08	-69.2529
L123_2018_ROCK_054	5703517.896	2339619.131	-68.2367
L123_2018_ROCK_055	5703527.455	2339626.608	-67.8764
L123_2018_ROCK_056	5703536.468	2336630.375	-69.0069
L123_2018_ROCK_057	5703593.002	2335446.458	-67.2877
L123_2018_ROCK_058	5703819.678	2338046.118	-64.5819
L123_2018_ROCK_059	5703952.762	2339675.388	-62.1285
L123_2018_ROCK_060	5704019.765	2336530.141	-59.5108
L123_2018_ROCK_061	5704054.449	2336563.459	-58.8863
L123_2018_ROCK_062	5704061.621	2336533.077	-59.1224
L123_2018_ROCK_063	5704075.929	2336611.446	-58.6842
L123_2018_ROCK_065	5704225.859	2337401.159	-57.1204
L123_2018_ROCK_066	5704276.673	2336662.455	-55.8382
L123_2018_ROCK_067	5704316.268	2337646.328	-56.3575
L123_2018_ROCK_068	5704328.013	2338411.853	-57.89
L123_2018_ROCK_069	5704434.784	2335838.537	-55.2855
L123_2018_ROCK_070	5704436.311	2336677.691	-52.9408
L123_2018_ROCK_071	5704795.396	2337112.097	-49.0719
L123_2018_ROCK_072	5704812.491	2336109.808	-49.7921
L123_2018_ROCK_073	5704885.029	2336731.464	-47.4335
L123_2018_ROCK_074	5704939.994	2336329.123	-47.9958
L123_2018_ROCK_075	5704953.37	2336306.631	-48.0196
L123_2018_ROCK_076	5704962.624	2336282.939	-47.4779
L123_2018_ROCK_077	5704979.071	2336760.937	-46.9906
L123_2018_ROCK_078	5705274.175	2336597.191	-41.661
L123_2018_ROCK_079	5704180.578	2340062.9	-58.8297
L123_2018_ROCK_080	5704258.129	2340482.208	-57.6011
L123_2018_ROCK_081	5704132.504	2340617.391	-59.3835
L123_2018_ROCK_082	5704125.47	2340698.779	-59.4499
L123_2018_ROCK_083	5704505.128	2340755.908	-53.6119
L123_2018_ROCK_084	5703757.551	2340771.499	-63.2935
L123_2018_ROCK_085	5703390.149	2340867.91	-66.6736
L123_2018_ROCK_086	5703286.576	2340633.6	-68.5091
L123_2018_ROCK_087	5703056.432	2340485.527	-71.5292

L123_2018_ROCK_088	5701359.935	2336247.442	-96.5818
L123_2018_ROCK_089	5701389.445	2336146.469	-96.9738
L123_2018_ROCK_090	5701417.768	2336134.528	-97.5224
L123_2018_ROCK_091	5701453.993	2336127.279	-95.0309
L123_2018_ROCK_092	5701443.313	2336028.057	-97.7449
L123_2018_ROCK_093	5701579.977	2336098.365	-93.729
L123_2018_ROCK_094	5701915.246	2336344.283	-89.1371
L123_2018_ROCK_095	5701418.678	2336053.08	-97.1628
L123_2018_ROCK_096	5702313.645	2335859.66	-83.7056
L123_2018_ROCK_097	5702270.91	2336022.507	-84.2744
L123_2018_ROCK_098	5703317.128	2340583.897	-68.3711
L123_2018_ROCK_099	5703364.148	2340558.145	-67.8364
L123_2018_ROCK_100	5703282.869	2340604.804	-68.6459
L123_2018_ROCK_101	5703002.504	2340404.704	-73.0903
L123_2018_ROCK_102	5702965.295	2340684.168	-71.8615
L123_2018_ROCK_103	5703247.251	2340530.88	-69.2862
L123_2018_ROCK_104	5704063.206	2340883.12	-59.5801
L123_2018_ROCK_105	5701732.891	2336748.196	-90.3922
L123_2018_ROCK_106	5701530.942	2336724.681	-94.208
L123_2018_ROCK_107	5701297.475	2336578.372	-97.285
L123_2018_ROCK_108	5701143.381	2336549.016	-99.7826
L123_2018_ROCK_109	5701128.673	2336409.911	-100.5068
L123_2018_ROCK_110	5701137.352	2336462.424	-100.5728
L123_2018_ROCK_111	5701423.785	2336483.693	-95.53
L123_2018_ROCK_112	5701514.38	2336846.587	-93.6161
L123_2018_ROCK_113	5701633.894	2336710.708	-92.0726
L123_2018_ROCK_114	5701496.074	2336699.54	-94.3215
L123_2018_ROCK_115	5701625.355	2337172.909	-91.3439
L123_2018_ROCK_116	5701066.527	2337712.917	-96.7484
L123_2018_ROCK_117	5701092.014	2337755.601	-95.8665

Table 2 Rock/Boulder objects in survey area

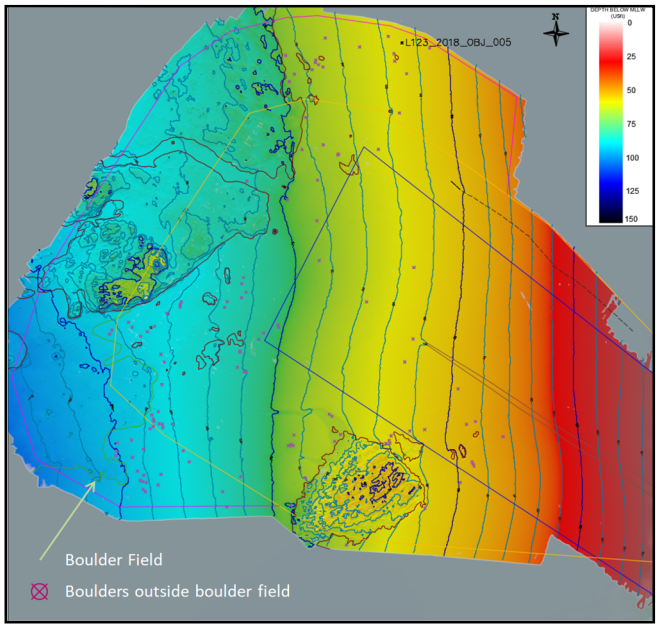

Figure 26 Location of the 117 rocks in the survey area

The rock objects were all similar dimensions (2-10ft diameter). An example of a rock in the survey area is below.

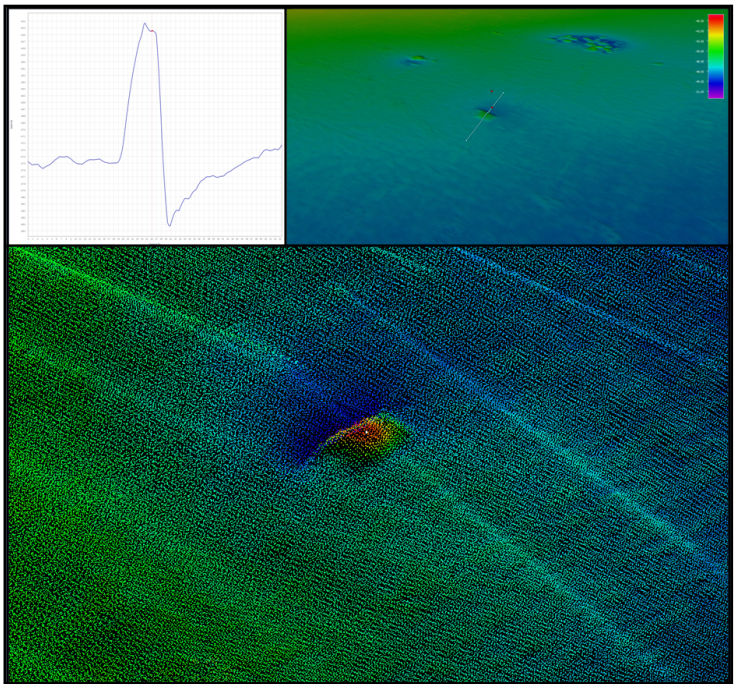

Figure 27 Rock objects

d. Rock Outcropping

Rock outcroppings are located in three main areas. Firstly, along the offshore extents of the survey area is a near contiguous region of rock outcroppings. The total extents offshore of these rocky outcroppings are beyond the limits of this survey. The area mapped is 42 acres. Within this area, exposed bedrock can be seen. The shoalest depth of this exposed bedrock is 35ft MLLW (Figure 28). Both the rocky outcroppings and exposed bedrock can be seen below in Figure 26.

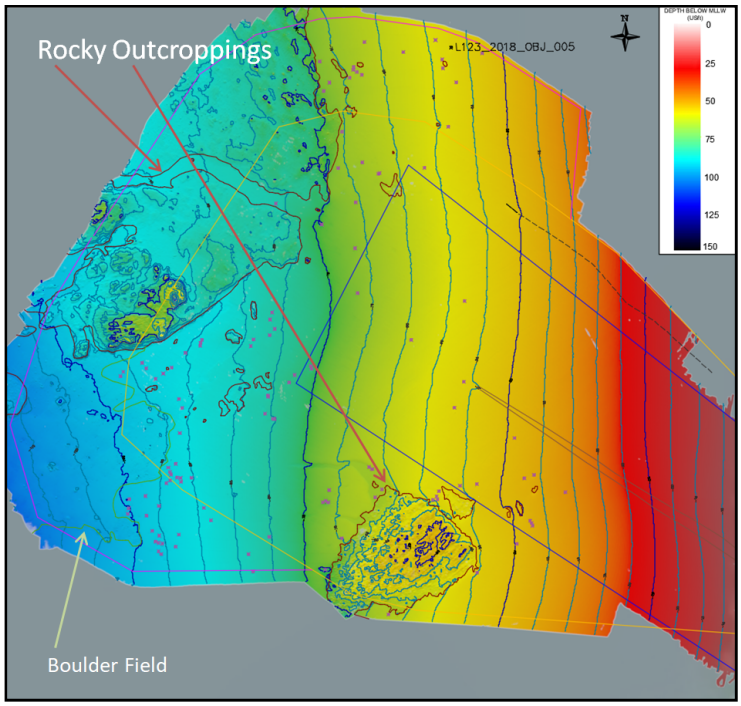

Figure 28 Rock outcroppings and Boulder Field in the survey area

Another large rocky outcropping area is in the southern corner of the survey area. This is made up of one larger section (25 acres) and a smaller area (1 acre). This area can be seen below in Figure 27.

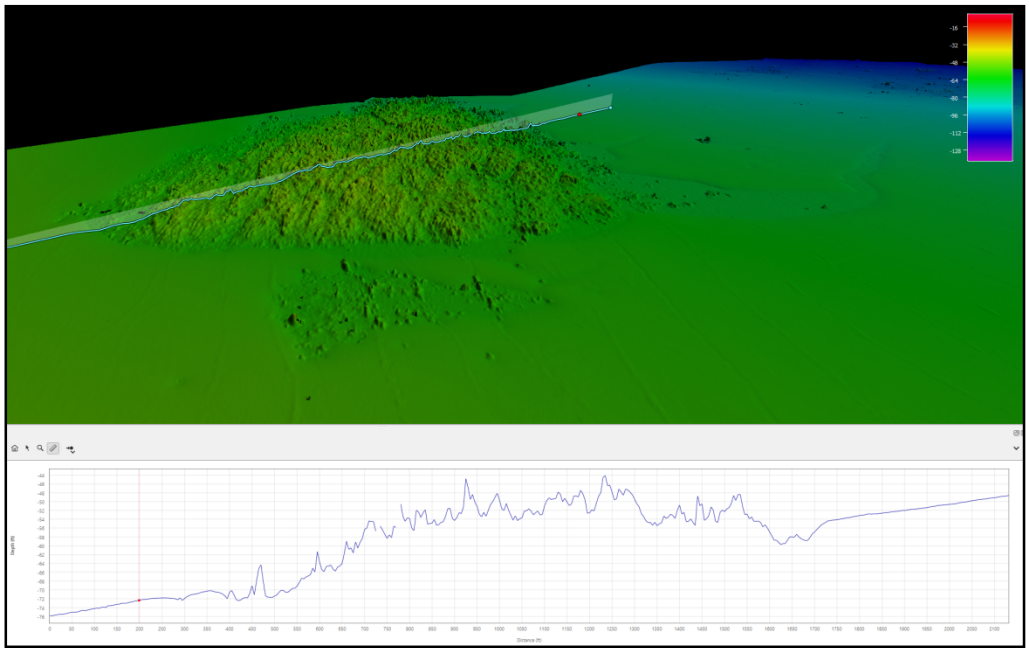

Figure 29 Southern Rocky Outcropping

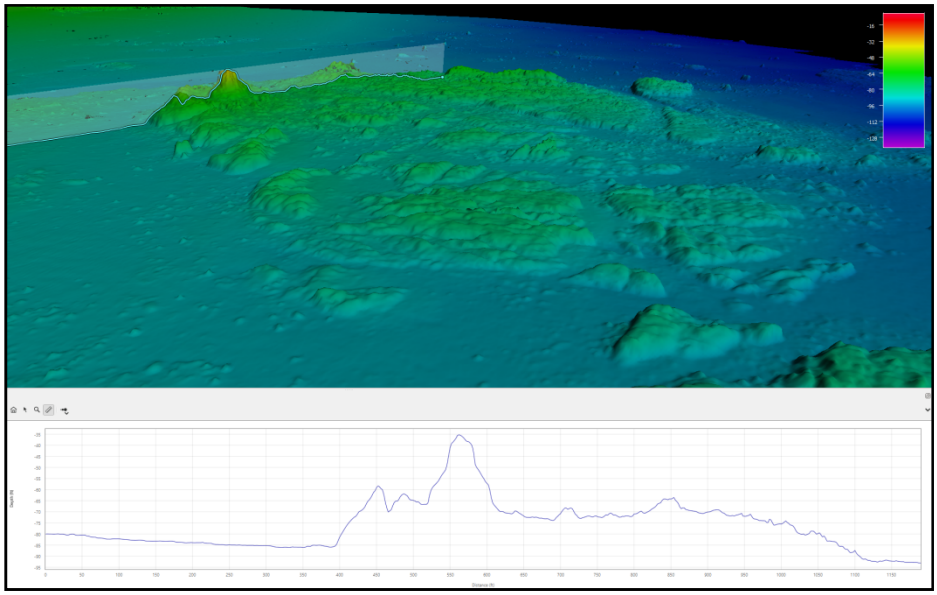

Figure 30 Exposed Bedrock within Rocky Outcropping

Also identified below is a boulder field located near the western limits just south of the rocky outcroppings. This field covers approximately 50 acres and contains over two hundred fifty boulders ranging in 2ft-22ft diameter. One of the larger boulders can be seen in the image below. This boulder has dimensions 22ft x 18ft x 10ft with a shoalest depth of 97.1ft MLLW.

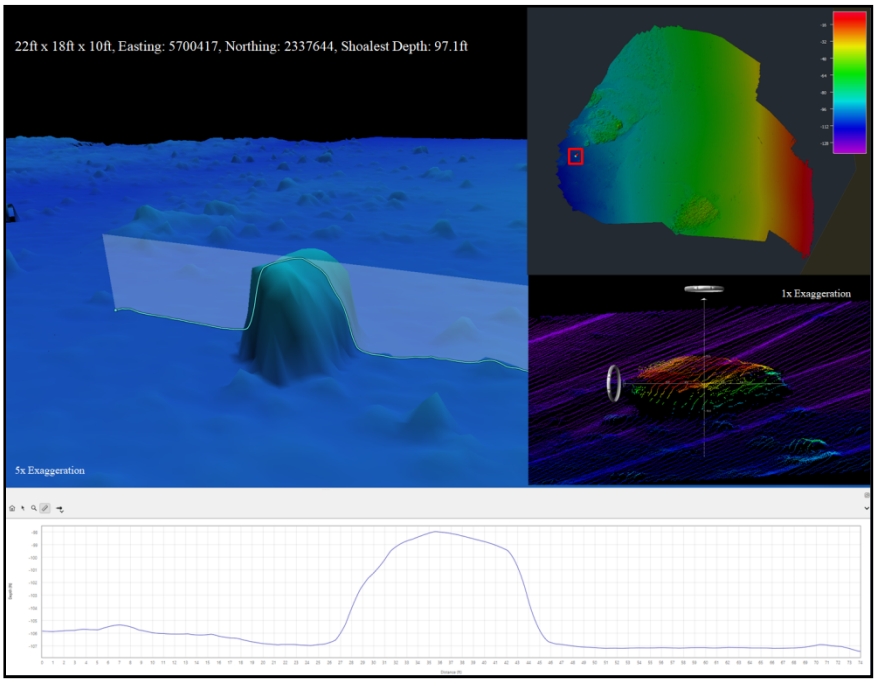

Figure 31 22ft diameter boulder in boulder field

e. *Marine Vegetation*

The area was analyzed in detail for any disturbance that would signify the presence of marine vegetation. Across the area in all the data the isolated rocks and rock outcropping were clearly defined and contrasted with the surrounding seabed of even, homogonous nature. No disturbance was noted outside of the rock outcropping areas or the rocks. An overview of the survey area showing the rock outcroppings as clear against the even surrounding seabed is shown in Figure 32.

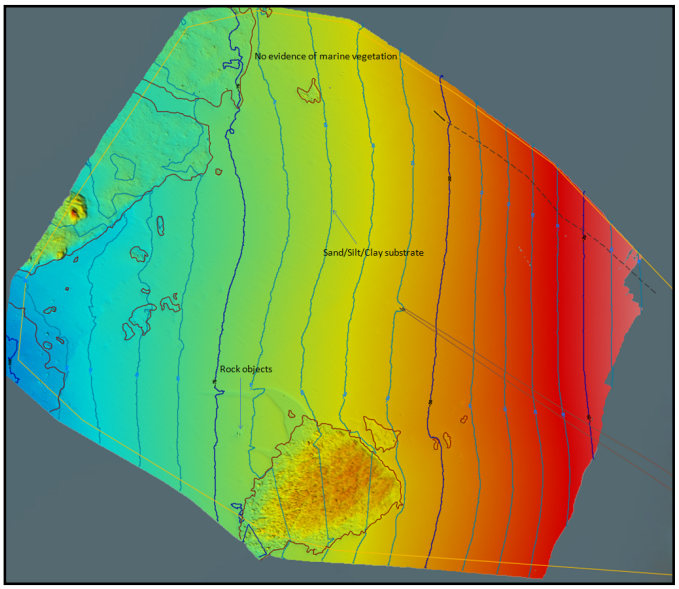

Figure 32 Image showing rock objects are evident but there is no evidence of marine vegetation

Additional analysis was completed around all the rock outcropping areas. The rocks and rock outcroppings are distinct in comparison with the flat surrounding seabed. One such analysis area is shown in Figure 33.

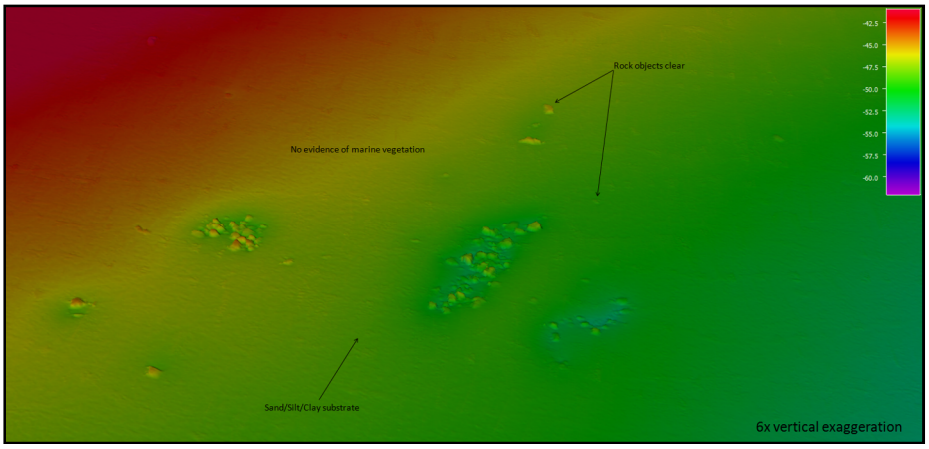

Figure 33 Around rock outcroppings the sediment is even and homogenous

Moreover, gridding techniques were adopted to confirm that there was no disturbance that would signify the presence of marine vegetation. An overview of the data colored by 95% confidence level standard deviation is shown below in Figure 34. The rock outcroppings and isolated rocks are clear but there is no evidence of disturbance due to marine vegetation.

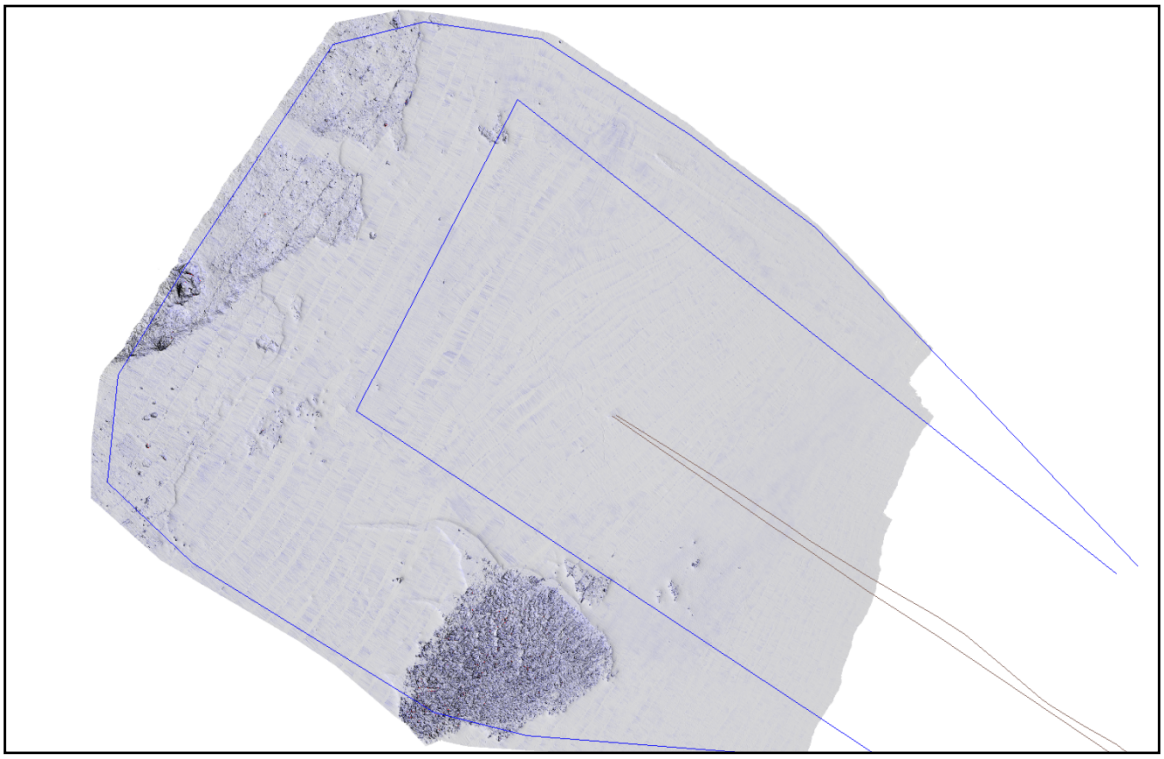

Figure 34 Data colored by standard deviation 95% confidence level.

The data shows that the isolated rocks are clear with these gridding techniques, but no marine vegetation is present.

6. CONCLUSIONS

The conclusions for the pre-decommissioning survey are as follows

- All data was acquired in a safe manner with no incidents
- Multibeam coverage was achieved across the entire survey area up to a safe point given the weather conditions (5ft below MLLW)
- Data acquired achieved all the objectives required.
  - Creating accurate and detailed bathymetry
  - Indentifying rock outcrops
  - Locating the pipeline
  - Locating debris object
- The pipeline was exposed for approximately 29ft
- One (1) Debris objects was noted
- One hundred seventeen (117) Rock objects were noted
- Large rock outcropping areas of up to 40 acres were identified
- The rock outcropping areas were offshore on the edge of the survey area as well as south of the pipeline at the southern central edge of the survey area
- A large boulder field covering 50 acres containing in excess of two hundred fifty (250) boulders was identified
- No marine vegetation was identified in the entire survey area

7. DELIVERABLES

The following data will be delivered along with this report:

- A PDF plot of the survey area with bathymetry and features
- ESRI Arc GIS Shapefiles of the following;
  - Extents of rock outcroppings
  - Pipeline alignments
  - Surface debris objects
  - Rock/Boulders
  - 5ft contours
- Excel geodatabase of debris objects and rocks
- Gridded bathymetry data as 1x1ft XYZ (ASCII text file .xyz)

Disclaimer

All data analysis, interpretations, conclusions, and recommendations in this document are based upon sound scientific principles, using appropriate technology, and have been completed by qualified and experienced hydrographers and marine scientists. It does not constitute a warranty or guarantee, expressed or implied, nor does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations, or ordinances. eTrac inc. cannot be held liable or responsible for onsequences arising from the use of the information presented in this report. All bathymetry data is valid for the time in which the survey was conducted.