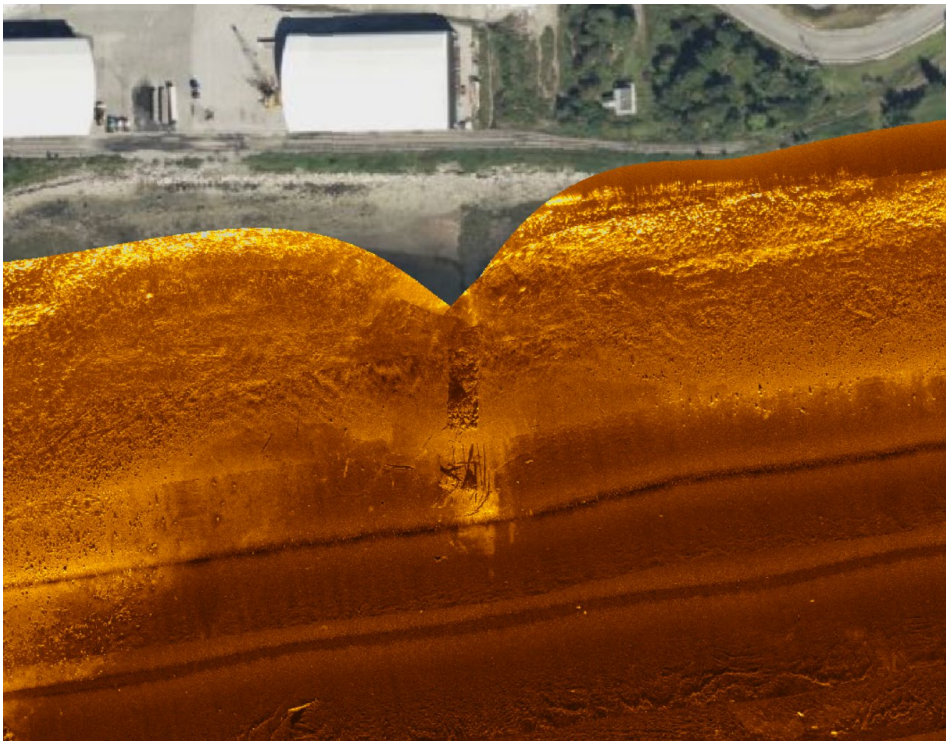
STEELE

Hydrographic and Marine Geophysical Site Characterization Surveys

Mack Point and Sears Island



Searsport, ME

Survey Dates: October 23-26, 2023

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Prepared for:
Stantec

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1. Background

Steele Associates Marine Consultants, LLC (SAMC) was contracted by Stantec to perform multibeam bathymetry, sub-bottom profiling, marine magnetics, and side-scan sonar surveys at Mack Point and Sears Island in Searsport, ME. These surveys were performed under the direction of an NSPS and THSOA Certified Hydrographer. Sub-bottom profile data acquisition and interpretation was performed under the direction of a Senior Marine Geophysicist.

Figure 1. Mack Point and Sears Island Sites

Survey dates: October 23-26, 2023

Survey Personnel:
Kevin Tongue, Project Engineer
Eric Steele, Certified Hydrographer
Douglas Bergersen, PhD, Senior Geophysicist

Survey Grid: NAD83, Maine State Plane, East, Zone ME-1801, US Survey Feet

Vertical Datum: North American Vertical Datum of 1988 (NAVD88). Deliverables have been provided referenced to the Mean Lower Wow Water Datum (MLLW) upon request. MLLW is 5.84-ft below NAVD88.

Survey Vessel: *Marc Robert*, Steele Associates' 29-ft aluminum hull, twin engine vessel

Figure 2. Survey Vessel Marc Robert

Survey Hardware:

Multibeam Bathymetry
Sonar: R2Sonic 2024 multibeam sonar operating at 400-kHz
Inertial Measurement Unit: Applanix POS/MV Wavemaster II
Position and Heading: Applanix POS/MV Wavemaster II Real-time Kinematic GPS utilizing SmartNetNA corrections
Speed of Sound Surface Probe: Valeport MiniSVS
Speed of Sound Profiler: AML Seacast BaseX2
Survey Software: Hypack and Hysweep data acquisition software

Sub-Bottom Profiling
Sub-Bottom Profiler: Innomar Compact parametric sub-bottom profiler operating at 6-kHz and 12-kHz
Position: Applanix POS/MV Wavemaster II Real-time Kinematic GPS utilizing SmartNetNA corrections
Speed of Sound Profiler: AML Seacast BaseX2
Survey Software: Innomar SESWin

Magnetics Survey
Magnetometer: Geometrics G-882 high resolution cesium vapor marine magnetometer
Position: Applanix POS/MV Wavemaster II Real-time Kinematic GPS utilizing SmartNetNA corrections
Software: Hypack and MagEdit

Side-Scan Sonar Survey
Side-scan sonar: Edgetech 4125 600 / 1600-kHz dual frequency sonar
Position: Applanix POS/MV Wavemaster II Real-time Kinematic GPS utilizing SmartNetNA corrections and
Software: Edgetech Discover and Chesapeake SonarWiz

2. Multibeam Bathymetry

Survey dates: October 23-24, 2023

This multibeam bathymetric survey was performed to supplement and expand existing survey coverage of 2022 multibeam surveys performed by others. The survey was performed under the direction of an NSPS / THSOA Certified Hydrographer and in accordance with the U.S. Army Corps of Engineers (USACE) EM Manual 1110-2-1003 for hydrographic surveying.

The multibeam bathymetric survey was performed using an R2Sonic 2024 broadband multibeam bathymetric sonar. Attitude, heading, position, and water level measurements we performed using an Applanix POS MV Wavemaster II inertial measurement unit. Data acquisition and processing were performed using Hypack and Hysweep software.

The survey vessel and equipment have undergone extensive measurements to determine accurate sensor offsets from the vessel's reference frame. Survey calibration includes a bar check, patch test and a comparison to perpendicular transects crosstie data.

This survey was executed to attain 200% bottom coverage of the site. The nearshore portions of these sites contained large boulders field which limited survey coverage. This was particularly problematic in nearshore areas within the Sears Island footprint.

Surveyed depths range from approximately -54-ft to 2-ft NAVD88 across the Mack Point survey area, and approximately -56-ft to 6-ft NAVD88 within the Sears Island block.

Figure 3. Mack Point Bathymetric Color-Filled Contour Map

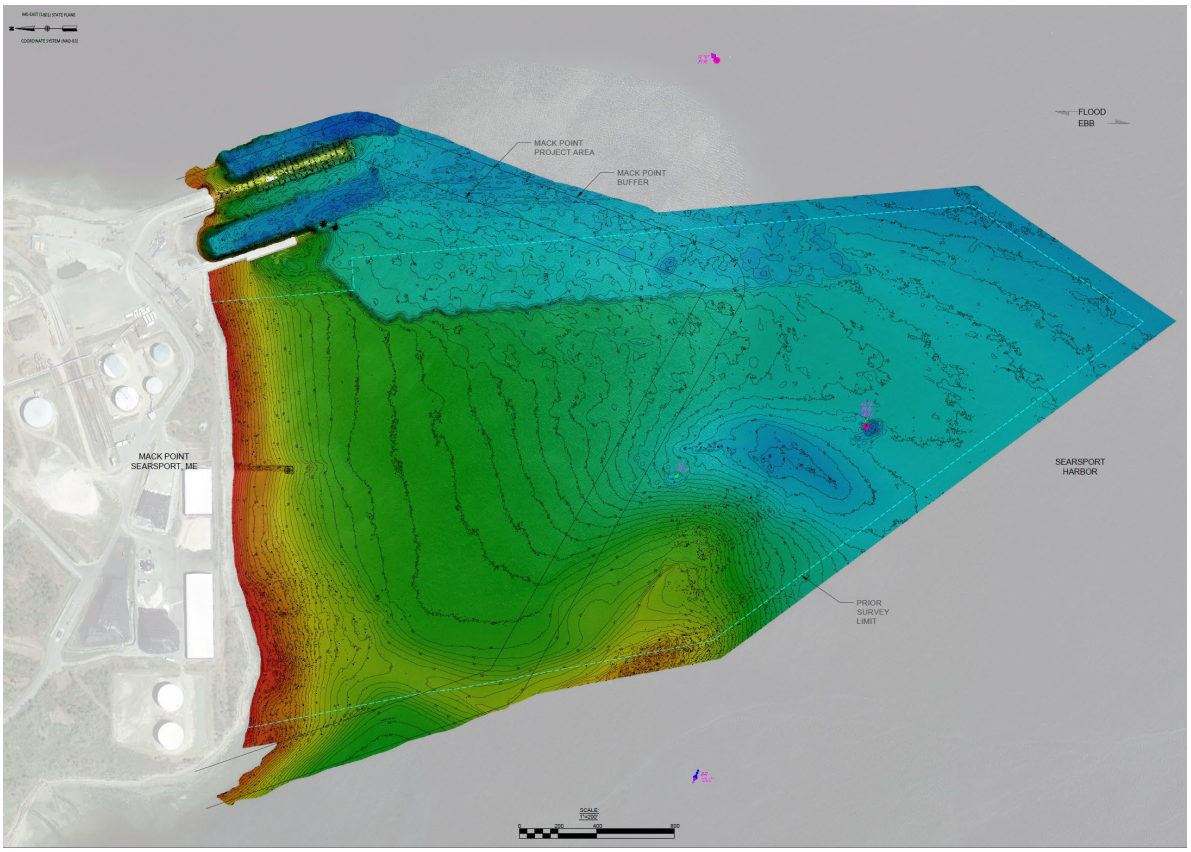
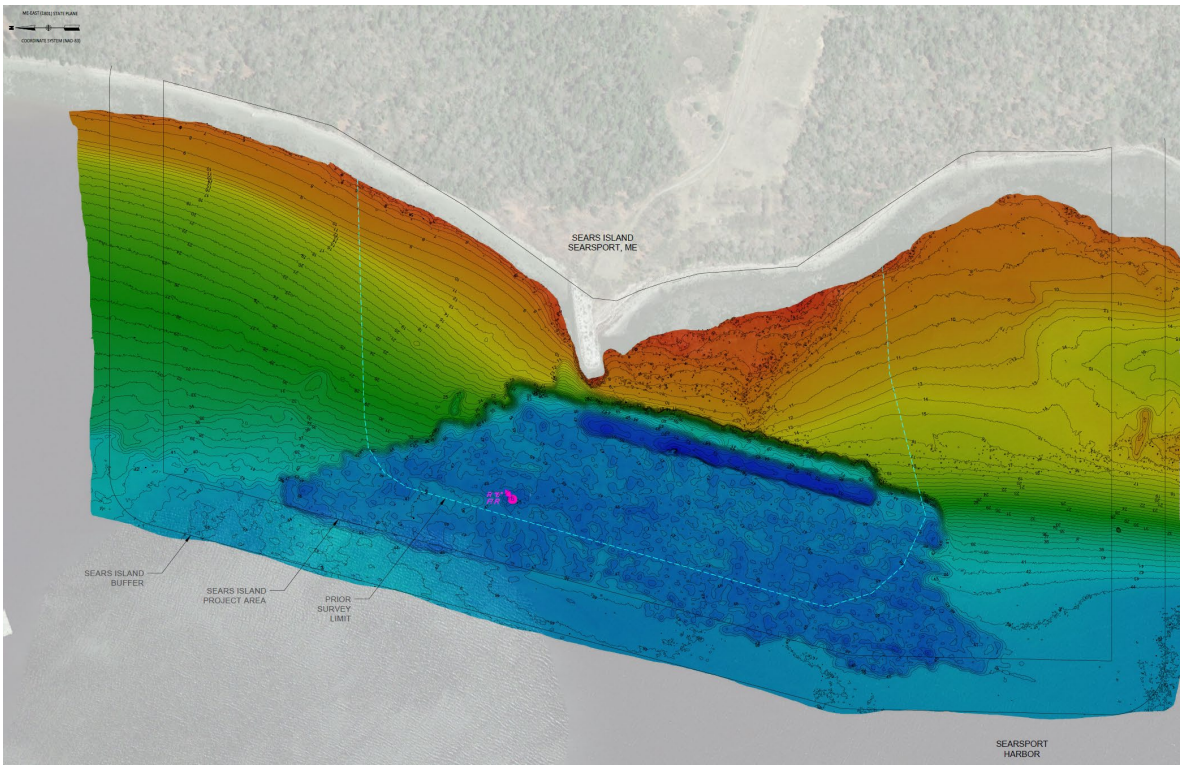


Figure 4. Sears Island Bathymetric Color-Filled Contour Map

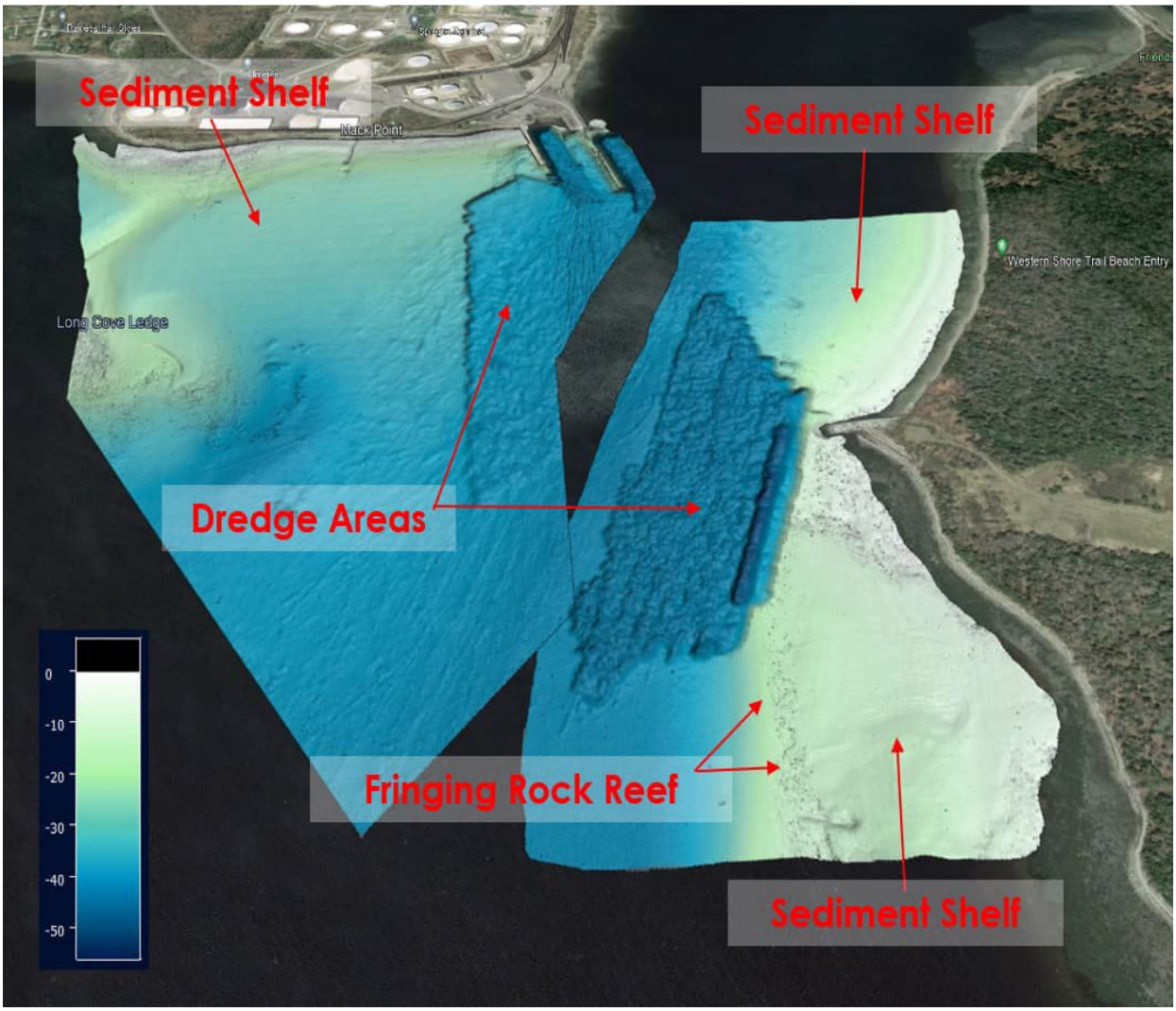


An interpretation of the bathymetric surface from the two survey footprints are shown in Figure 5. Broadly, three physiographic provinces exist across the areas: sediment covered shelves, shelf slopes, and a sediment-filled basin between the two sites.

In the Mack Point area, the southward extending Long Cove Ledge bounds the western edge of the survey block. The bathymetry along the shoreline of Mack Point shows features suggestive of exposed rocks (and hence little sediment accumulation). The shelf narrows to the east across the survey block, with slopes varying between 2°- 4°. A dredge area bounds the eastern edge of the block, and this feeds out into the more regional basin sediments.

Along the western side of Sears Island, the shelf area is broader. The rock jetty at the center of the survey block marks the narrowest portion of the shelf. A linear, fringing rock reef marks the offshore edge of the shelf in the south half of the survey area, and generally suggests thinner sediment coverage across this area. The dredge area lies west of the rock jetty.

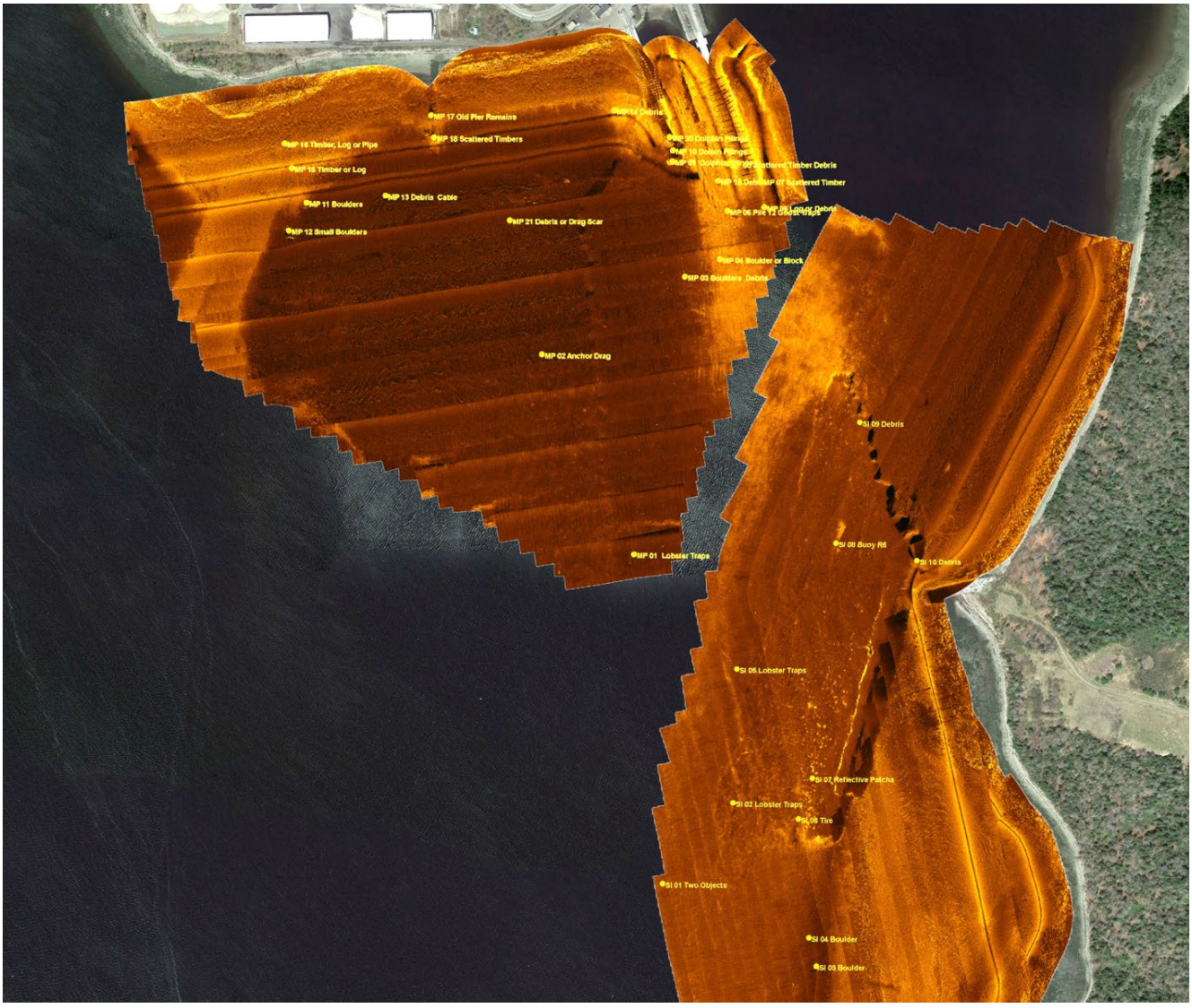
Figure 5. Bathymetric Surface Interpretation Map



3. Side-Scan Sonar

Survey dates: October 25 – 26, 2023

Figure 6. Side-Scan Sonar Mosaic with Target Locations



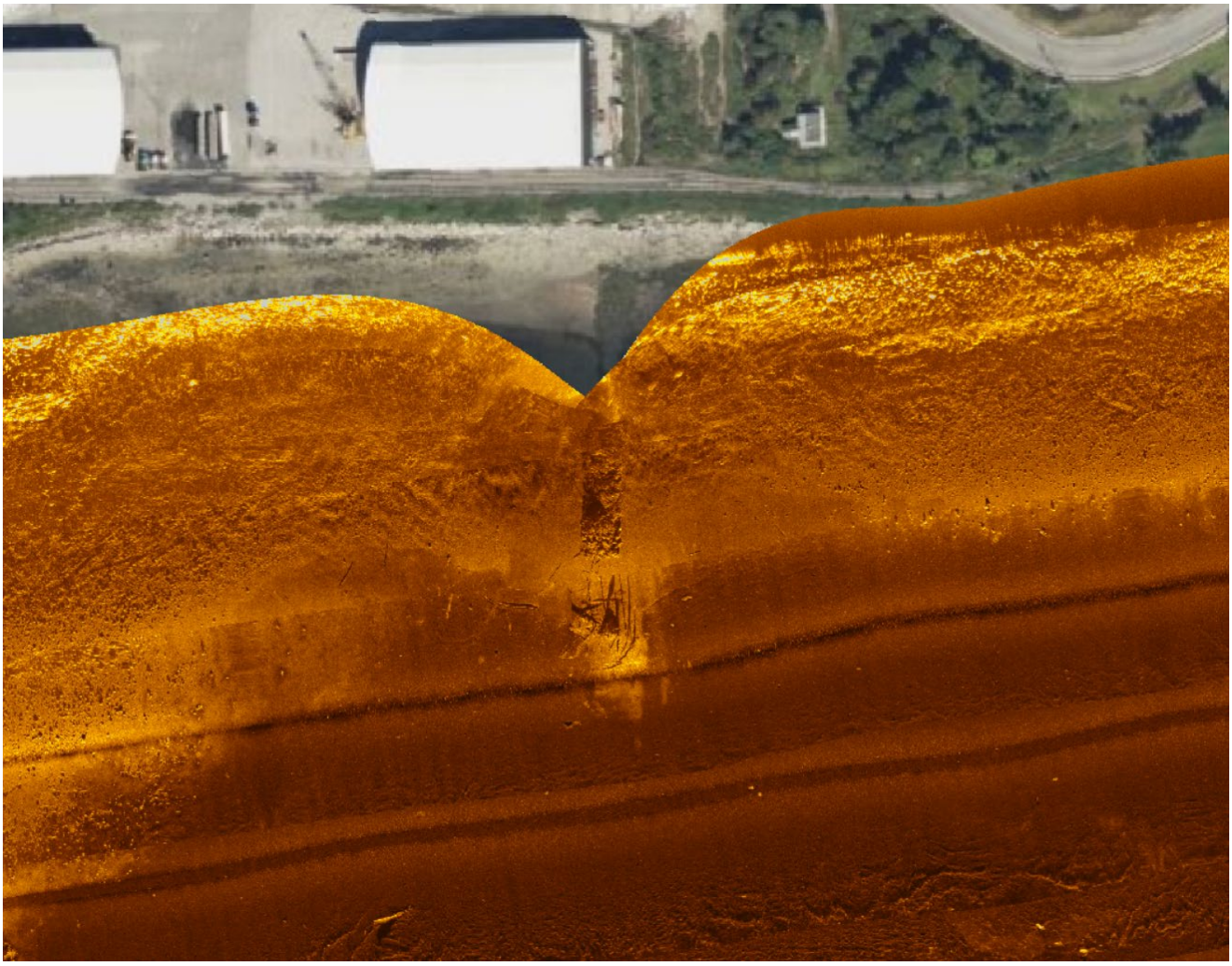
The side-scan sonar survey was conducted at a frequency of 600-kHz. Due to the variable water depth throughout the survey area, the side-scan towfish was secured to the vessel using a shallow-draft tow configuration. This resulted in a fixed cable layback value for side-scan sonar towfish positioning for the entire survey. Side-scan sonar transects were performed at 75-ft intervals oriented parallel to the shoreline. The sonar's range was limited to 50-m to achieve the desired ping rate and maximize across track resolution.

Figure 7. Edgetech 4125 600-kHz / 1600-kHz Side-Scan Sonar

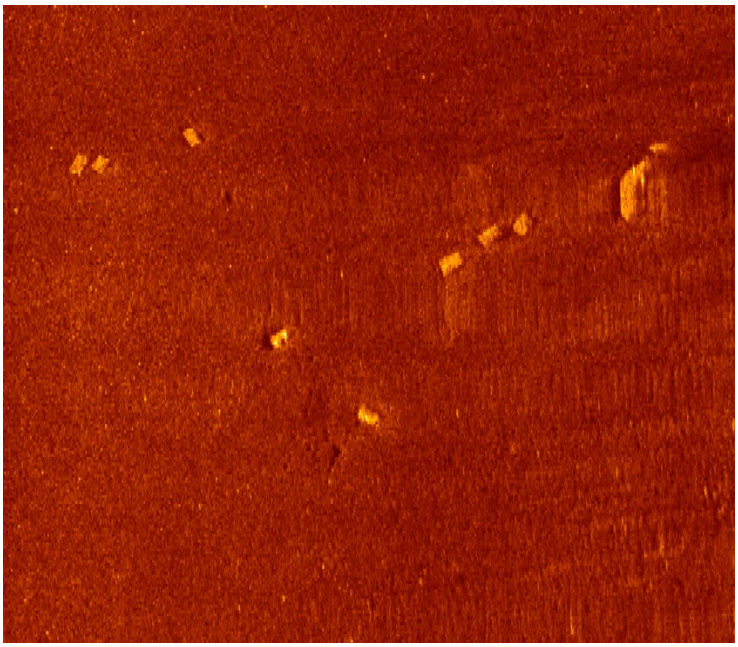
Side-scan sonar data were collected using Edgetech Discover software. Data processing, mosaic generation, and target reporting were performed using Chesapeake SonarWiz software.

While representative lobster traps and boulders are included in the sonar target report, the actual target count is far too great to detail every object identified. Many sonar targets identified in the report consist of miscellaneous debris, ghost lobster traps, and timbers or logs. The remains of the former pier and scattered timbers at Mack Point were clearly visible in in the side-scan data. No obvious objects of archeological or historical significance were detected during the survey.

Figure 8. Targets MP 07 & MP 08, Former Pier and Scattered Timbers, Mack Point



Figures 9 & 10. Targets SI 05 & MP 01, Typical Lobster Traps



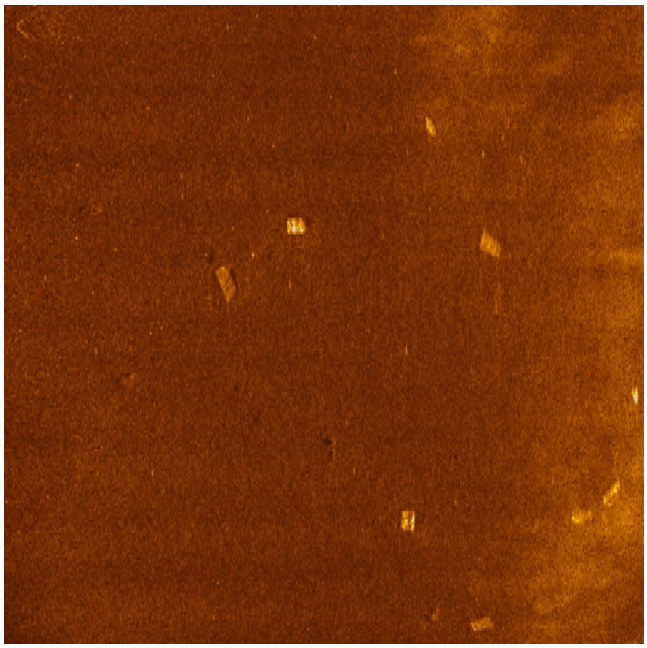


Figure 11. Target MP 19, Debris at Mack Point Near Sprague Terminal

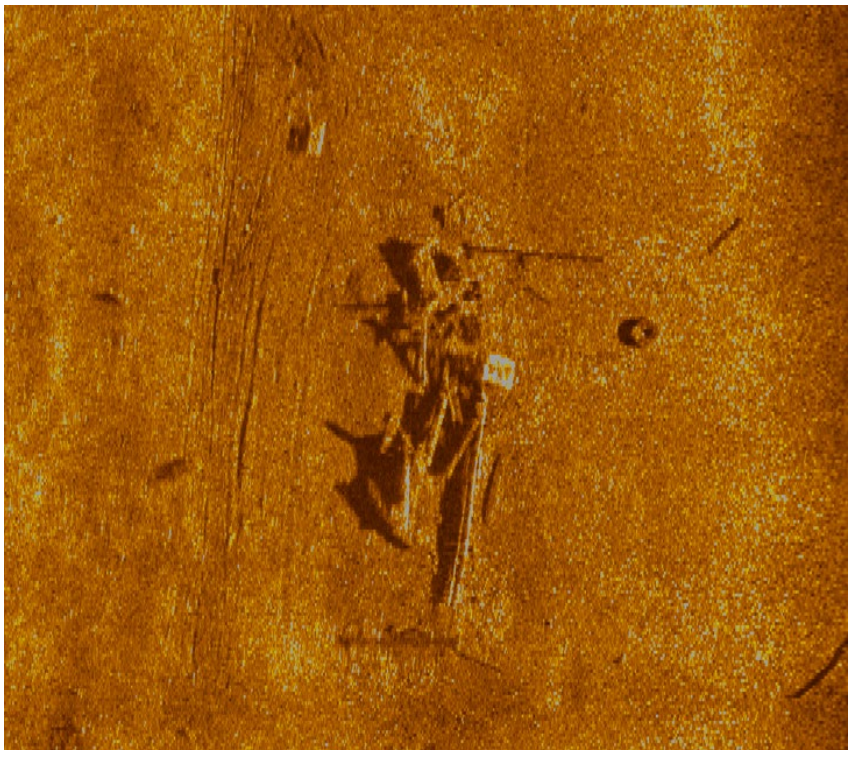


Figure 12. Target SI 10, Debris near Sears Island

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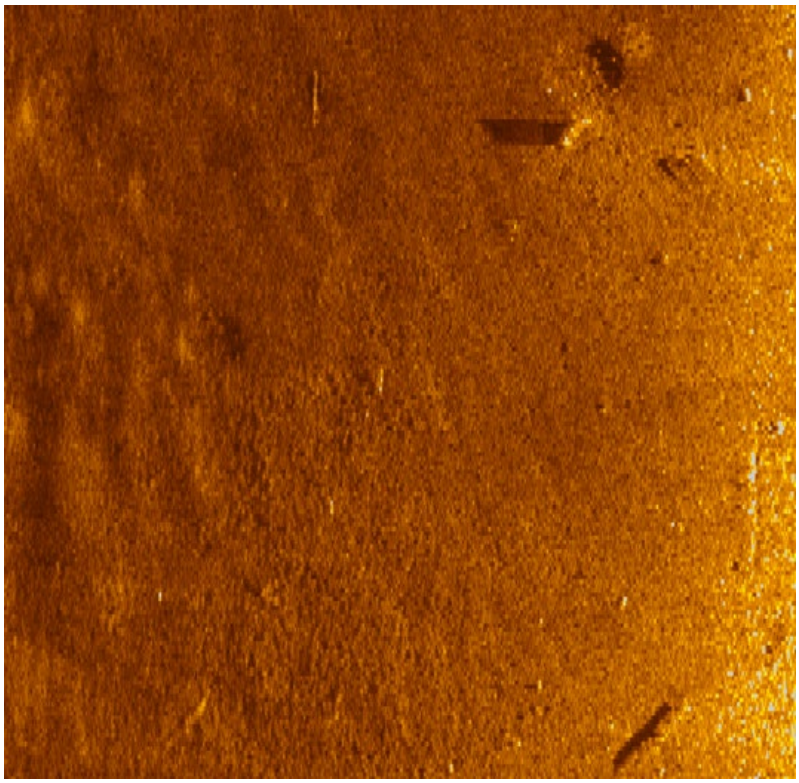


Figure 13. Target SI 07, Reflective Patches of Bottom Adjacent to Sears Island

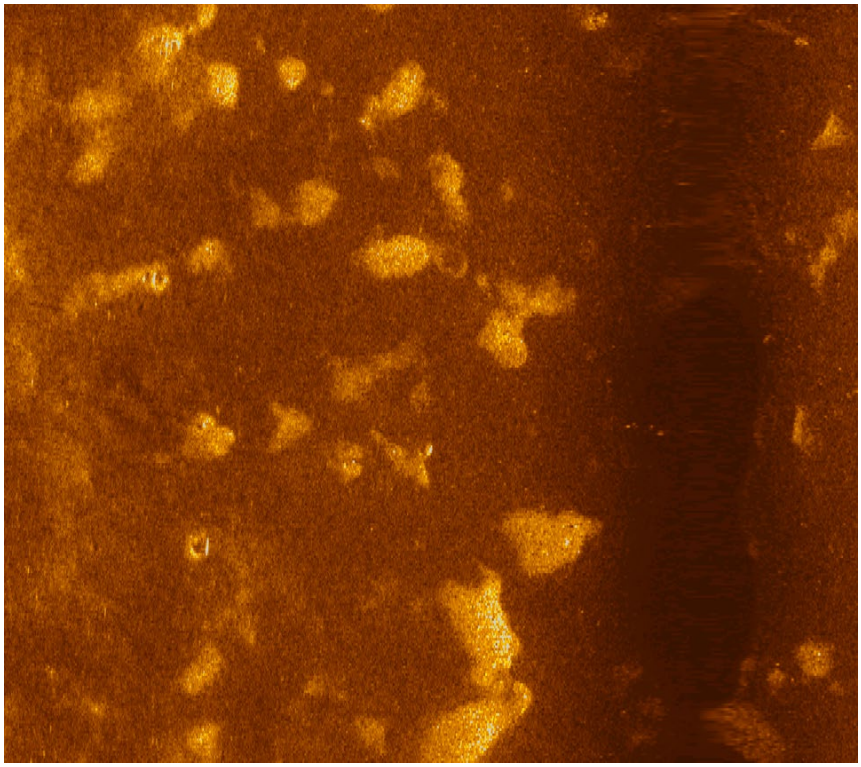
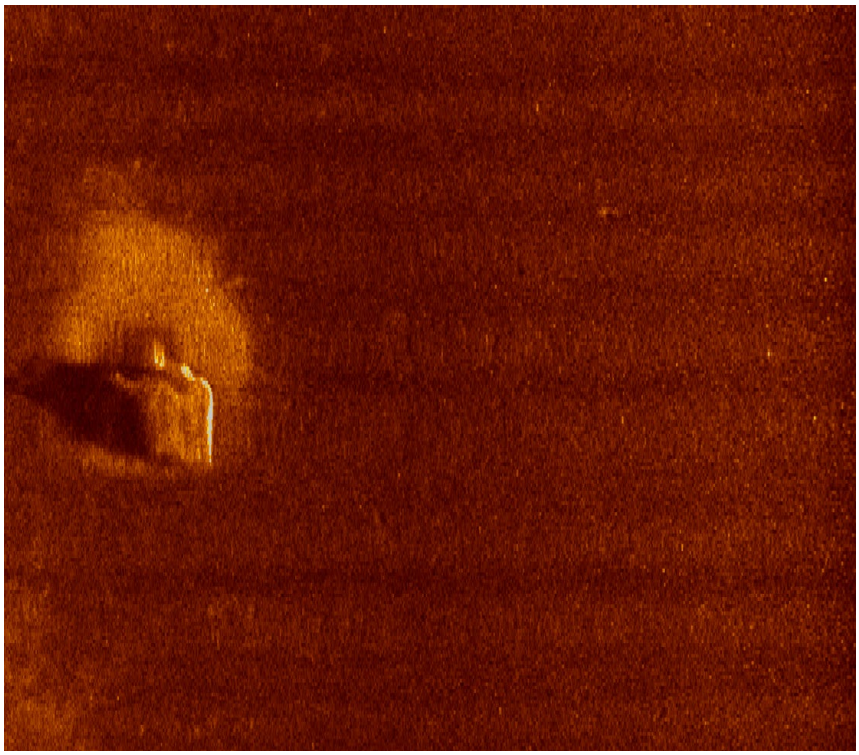


Figure 14. Target SI 03, Nearshore Boulder, Sears Island



Post-processed side-scan sonar acoustic signals were used to generate a backscatter mosaic. Backscatter is determined by the intensity and characteristics of an acoustic return reflected from the seafloor. Different bottom types, material composition, and textures reflect acoustics differently. These differences provide information about the nature of the seafloor and can aid in bottom classification. In the figure below the harder bottom types appear lighter in color with greater reflection intensity, and the less intense return of softer bottom types appear darker as more acoustic energy is absorbed by the bottom.

Figure 15. Side-Scan Backscatter Mosaic and Bottom Types

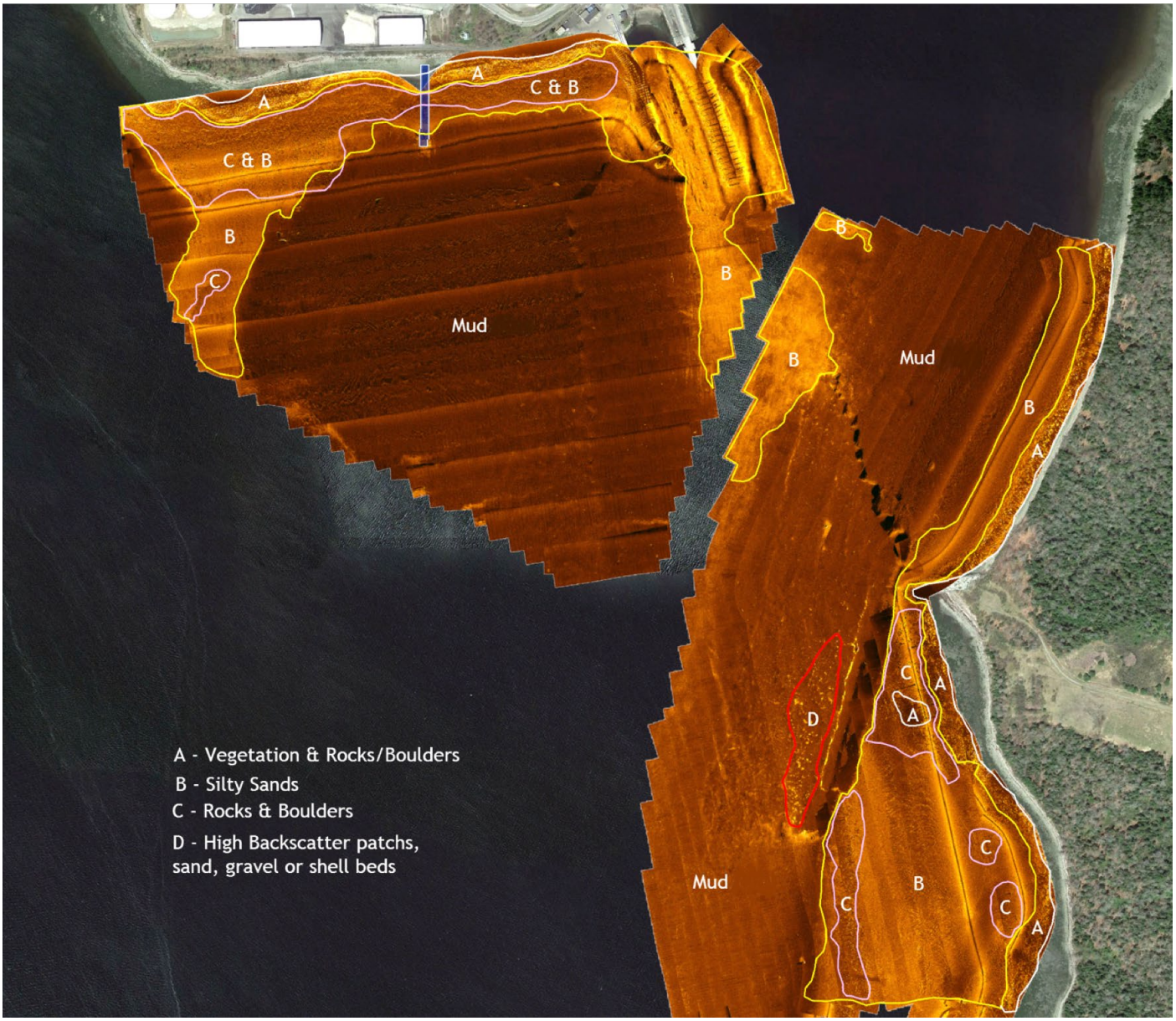


Table 1. Side-Scan Sonar Target Locations

ID	Description	Easting	Northing
MP 01	Lobster Traps	880094	283953
MP 02	Anchor Drag	879616	285002
MP 03	Boulders, Debris	880368	285405
MP 04	Boulder or Block	880553	285496
MP 05	Log or Debris	880788	285767
MP 06	Ghost Traps	880595	285748
MP 07	Scattered Timbers	880770	285905
MP 08	Scattered Timber, Debris	880596	285997
MP 09	Dolphin Pilings	880307	286010
MP 10	Dolphin Pilings	880311	286067
MP 11	Boulders	878384	285802
MP 12	Small Boulders	878289	285658
MP 13	Debris, Cable	878798	285837
MP 14	Debris	880002	286277
MP 15	Timber, Log	878306	285984
MP 16	Timber Log, Pipe	878270	286115
MP 17	Old Pier Remains	879038	286257
MP 18	Scattered Timbers	879054	286142
MP 19	Debris	880545	285907
MP 20	Dolphin Pilings	880292	286137
MP 21	Debris, Drag Scar	879449	285706
SI 01	Two Objects	880236	282228
SI 02	Lobster Traps	880608	282649
SI 03	Boulder	881042	281790
SI 04	Boulder	881004	281940
SI 05	Lobster Traps	880632	283350
SI 06	Tire	880951	282552
SI 07	Reflective Patches	881025	282776
SI 08	Navigational Aid Buoy R6	881155	284006
SI 09	Debris	881284	284638
SI 10	Debris	881581	283912

4. Marine Magnetics

Marine magnetics data was collected using a Geometrics G-882 total field cesium vapor magnetometer to detect and locate magnetic anomalies. The survey consisted of transects spaced at 75-ft intervals and oriented parallel to the shoreline.

Figure 16. Geometrics G-882 Cesium Vapor Marine Magnetometer

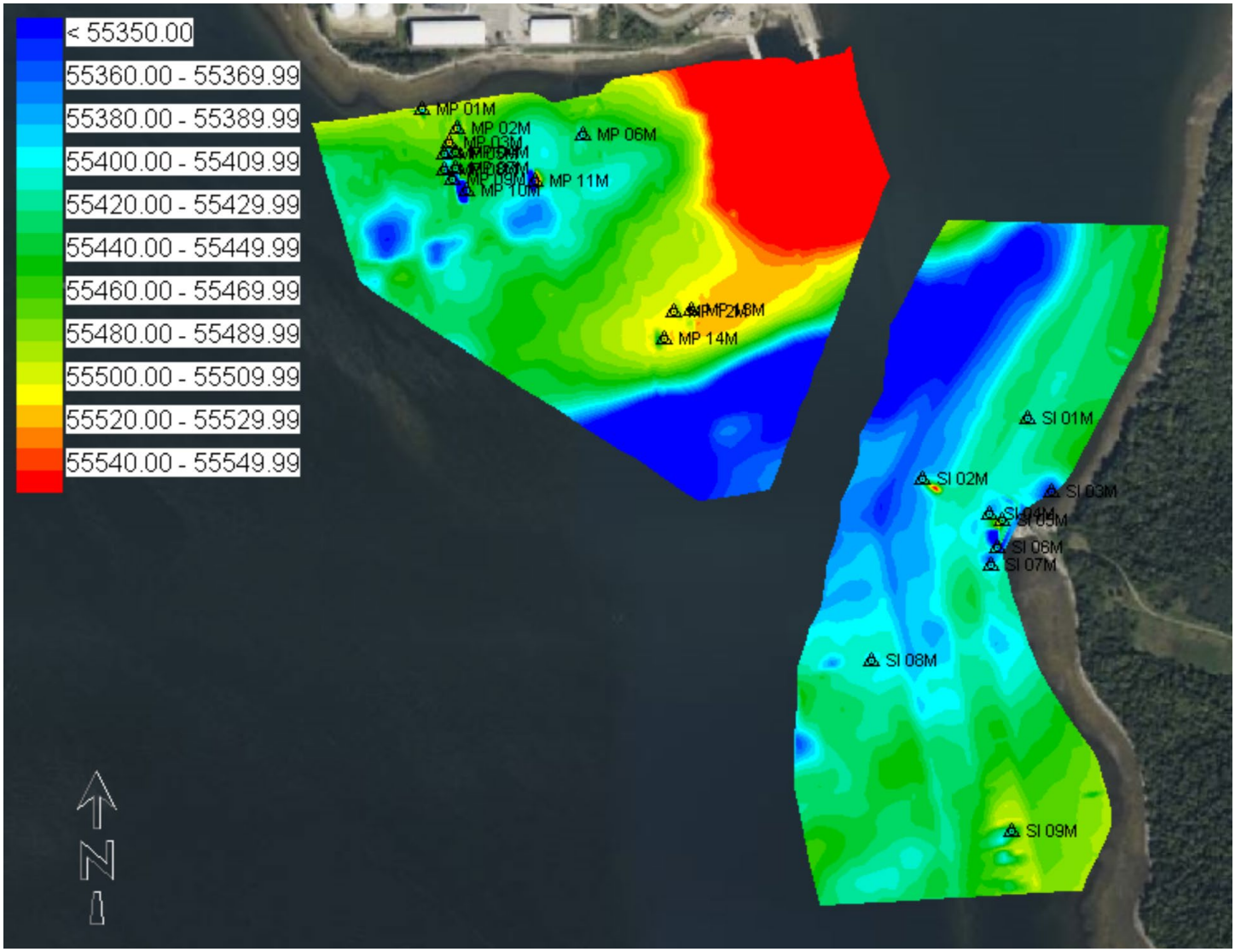
The Geometrics G-882 was selected for its ability to detect relatively small targets at great distances. For reference, this sensor can detect one ton of iron or steel at 100-ft or more, 250-lbs at 50-ft, and 30-lbs at 25-ft. The magnetometer continually measures the intensity of earth's magnetic field and detects variations and anomalies caused by materials containing iron such as local geology and man-made ferrous objects including small artifacts, ships, navigational aids, or pipelines. Contouring of total magnetic field data displays the distortions present within the site and anomalies where the sensor detected a ferrous object presenting dipole structure with a magnetic high and low. While contours may point to the general vicinity of a magnetic distortion, a dipole typically indicates close proximity to the object's location.

Due to the shallow water depth and encountered, the magnetometer towfish was suspended from a towed float at a depth of approximately 4-ft. Towfish position was determined using Hypack's Towfish driver using a fixed layback of 100-ft. The towfish position accuracy was verified by performing reciprocal passes adjacent to a known magnetic target.

Excessive noise was encountered in the vicinity of the Sprague Terminal and area adjacent to the piers. As a result, any potential magnetic targets located in this area are undetectable. The boulders present limited nearshore survey coverage.

Data processing was performed using Hypack's Magnetometer Editor software. International Geomagnetic Reference Field (IGRF) and shore-based corrections from the International Association of Geomagnetism and Aeronomy (IAGA) corrections were applied to the raw readings to remove background gamma. An azimuth-based gamma adjustment was also applied to correct for gamma changes resulting from reciprocal azimuths.

Figure 17. Total Magnetic Field Color Contours with Target Overlay



Several dozen smaller magnetic anomalies were detected which seem to be attributed to the large number of ghost lobster traps present at these sites. This report focuses on the larger magnetic anomalies detected. It is important to note that the location of detected anomalies may not coincide with actual target locations. This is simply the location along the survey transect where the greatest anomaly was detected. Several magnetic hits coincide with locations identified as side-scan sonar targets. These correlate with features identified as debris, boulders, possible pipe, apparent cable, navigational aid buoy, and scattered timber debris. These targets and features are identified below.

Figure 18. Side-Scan Sonar Target MP 02 / Magnetometer Target MP 12M: Possible anchor drag scar or debris

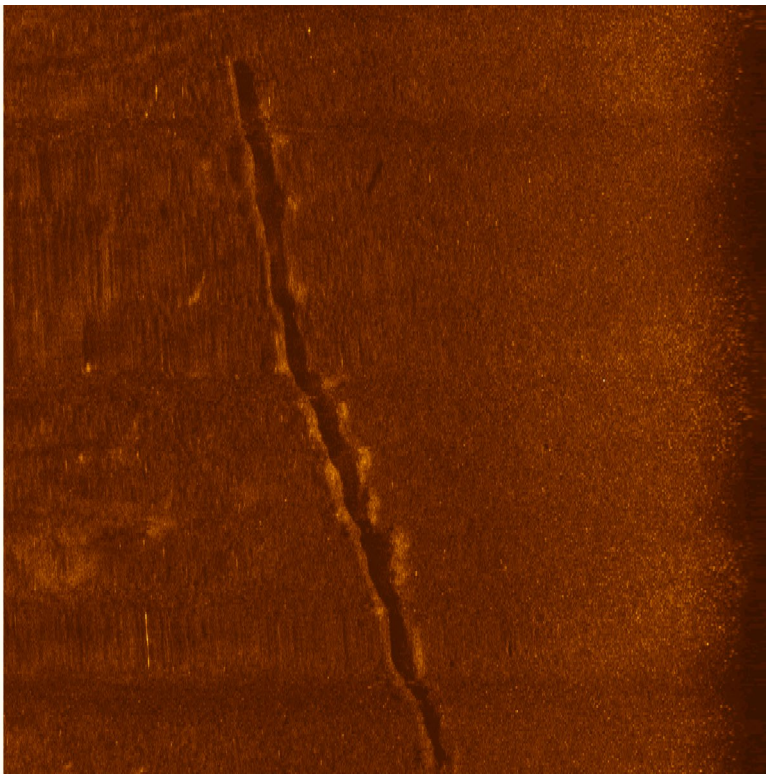


Figure 19. Side-Scan Sonar Target MP 13 / Magnetometer Target MP 11M: Debris and cable

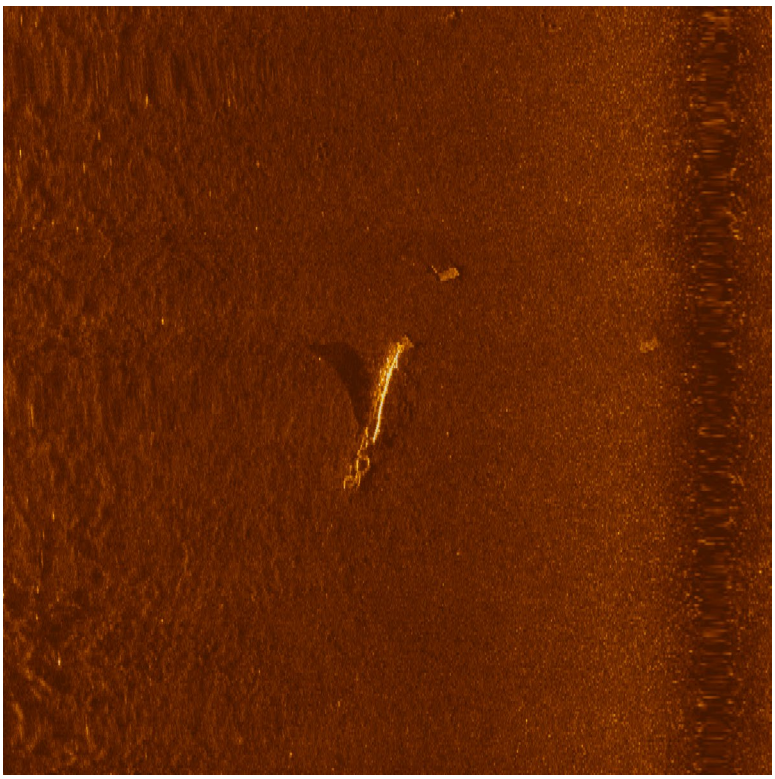


Figure 20. Side-Scan Sonar Target MP 11 / Magnetometer Target MP 10M: Apparent boulders

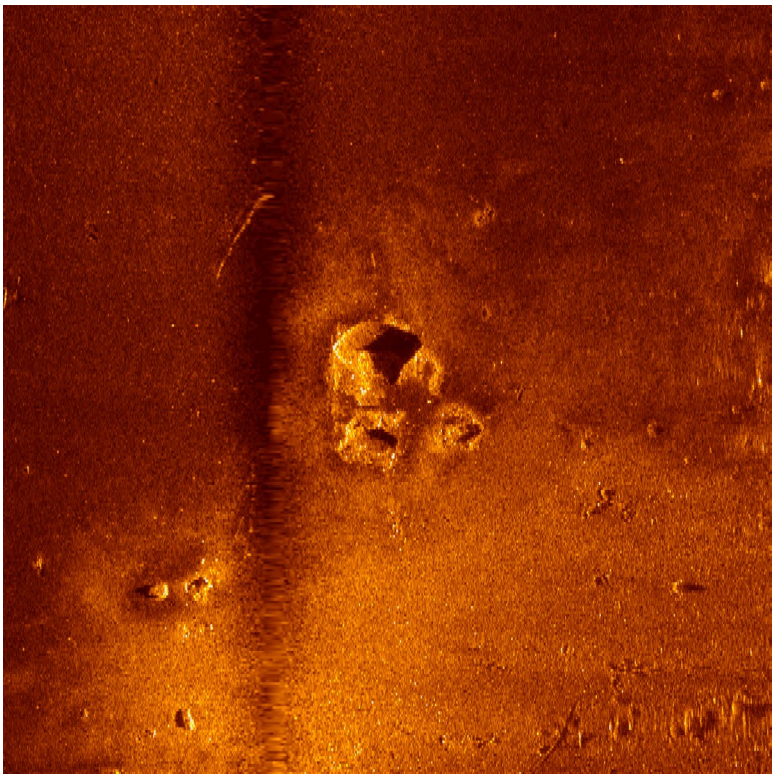


Figure 21. Side-Scan Sonar Target MP 15 / Magnetometer Target MP 05M: Apparent timber, log or pipe

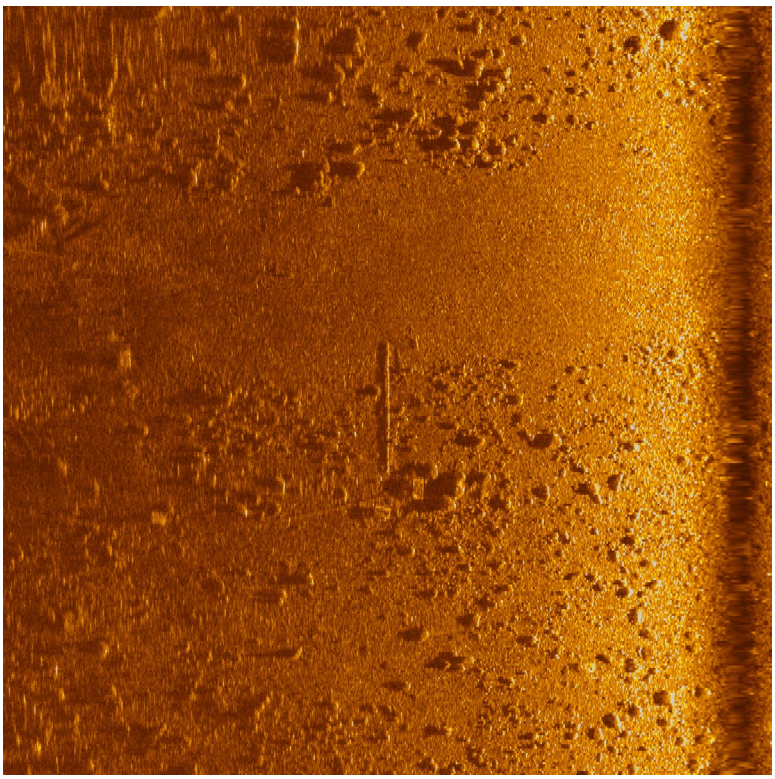


Figure 22. Side-Scan Sonar Target MP 16 / Magnetometer Target MP 02M & 03M: Apparent pipe

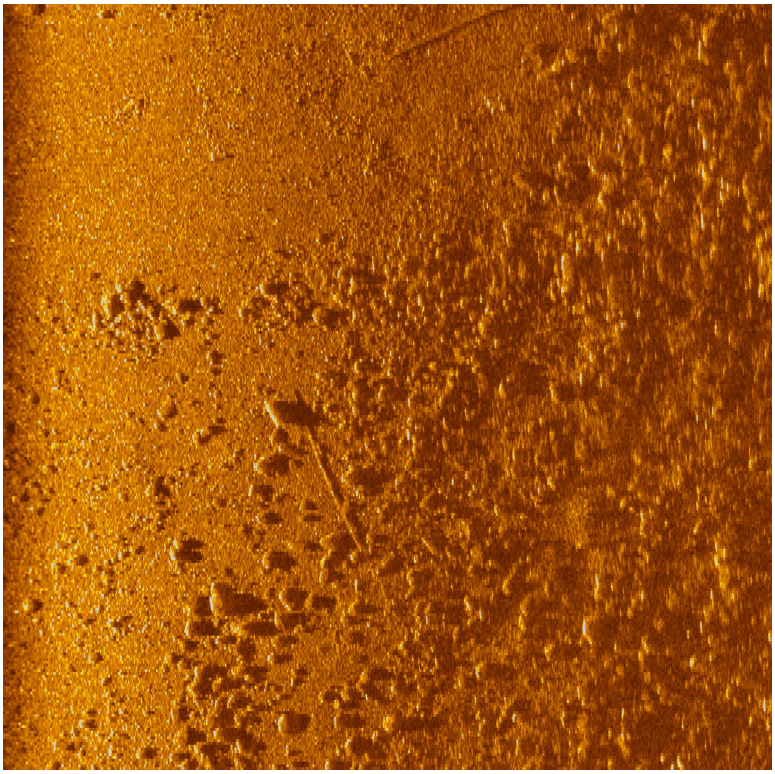


Figure 23. Side-Scan Sonar Target MP 18 / Magnetometer Target MP 06M: Scattered timbers

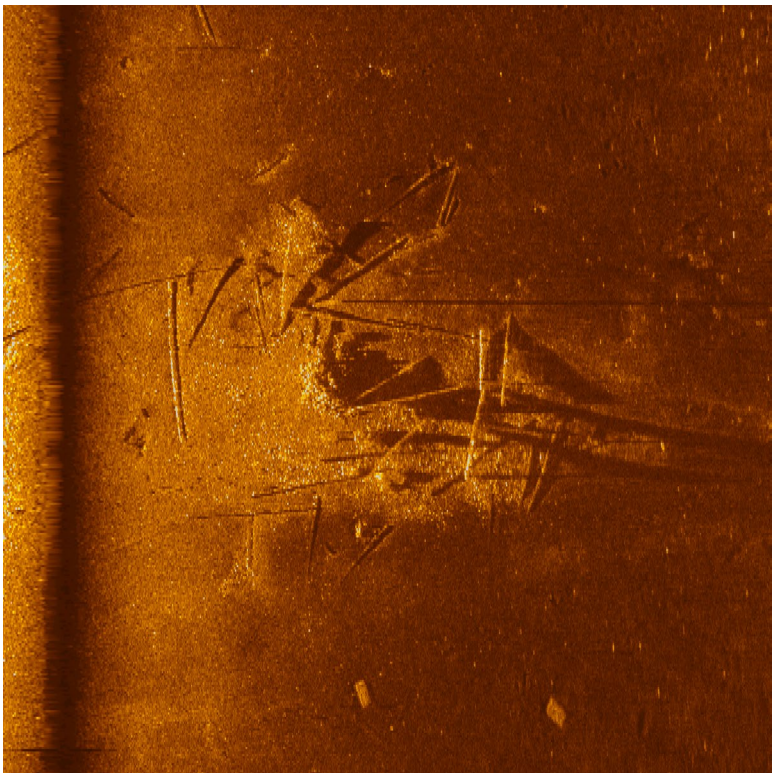


Figure 24. Side-Scan Sonar Target SI 08 / Magnetometer Target SI 02M: Navigational Aid Buoy R6 anchor and chain

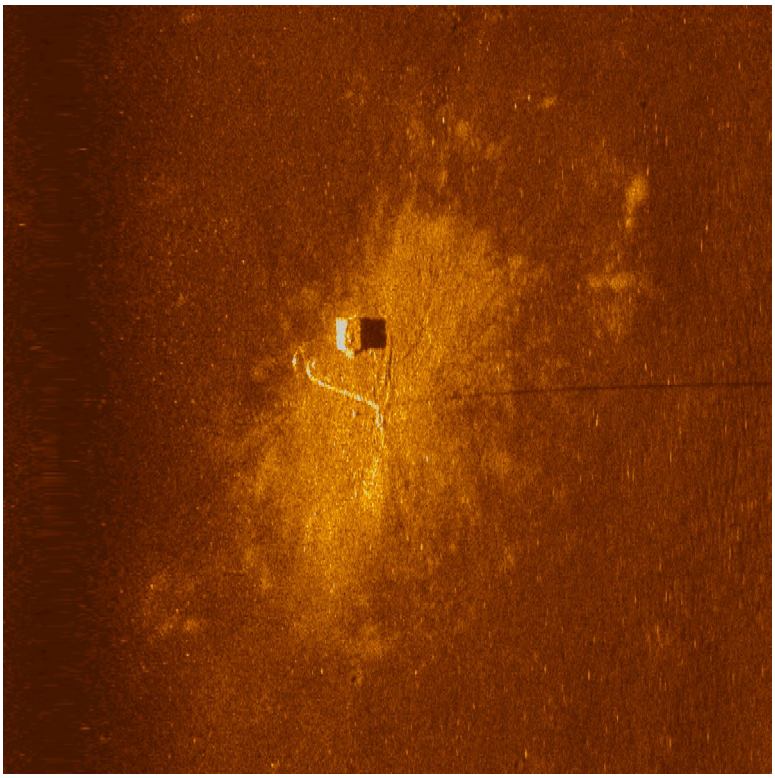


Figure 25. Side-Scan Sonar Target SI 10 / Magnetometer Target SI 04M: Debris

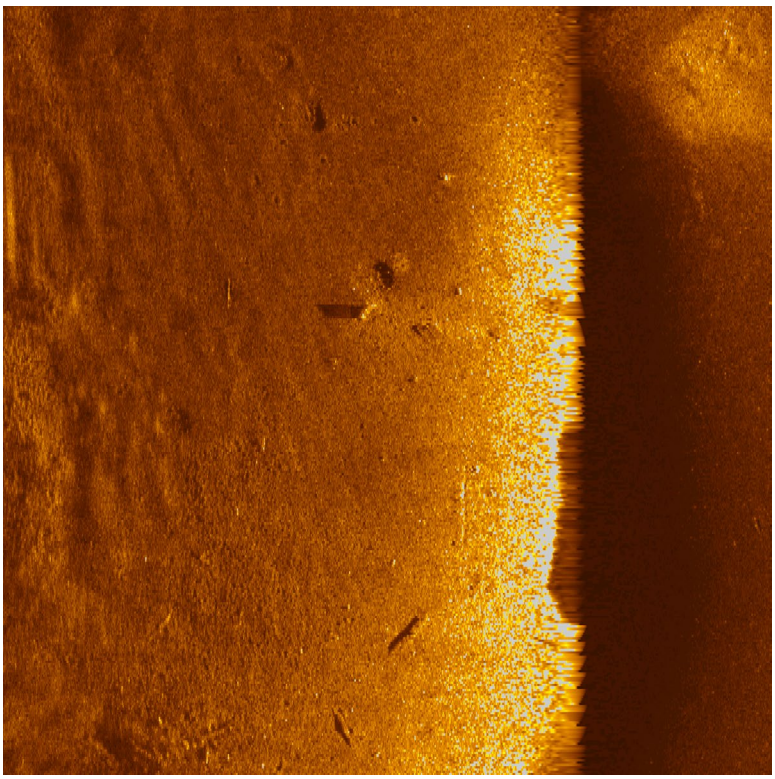


Table 2. Marine Magnetics Approximate Anomaly Locations

ID	Easting	Northing
MP 01M	878137	286259
MP 02M	878344	286147
MP 03M	878300	286060
MP 04M	878330	286005
MP 05M	878264	285993
MP 06M	879095	286108
MP 07M	878332	285915
MP 08M	878266	285906
MP 09M	878314	285841
MP 10M	878404	285778
MP 11M	878804	285839
MP 12M	879629	285055
MP 13M	879735	285073
MP 14M	879576	284896
SI 01M	881728	284422
SI 02M	881109	284065
SI 03M	881868	283988
SI 04M	881503	283856
SI 05M	881580	283818
SI 06M	881547	283660
SI 07M	881514	283554
SI 08M	880806	282986
SI 09M	881632	281975

5. Sub-Bottom Profiling

The SBP data were acquired with an Innomar *compact* parametric sub-bottom profiler system mounted on an over-the-side pole aboard the survey vessel.

The Mack Point survey consisted of 23 transects oriented perpendicular to the shoreline in a N-S direction and 4 transects oriented parallel to shoreline (in a roughly E-W direction). Line spacing for the primary lines was approximately 150-ft and 300-ft for the cross lines (Figure 26). Transect length varied across the survey block.

The Sears Island survey consisted of 36 transects oriented perpendicular to the shoreline in a radiating fashion, changing from NW-SE in the north and WSW-ENE in the south (Figure 26). Cross tie information was provided by 5 transects oriented parallel to shoreline (bending from NE in the north to SE in the south). Line spacing for the primary lines was approximately 150-ft, although this narrowed around the rock jetty extending from the western shore of the island. The cross line spacing was approximately 200-ft. Transect length varied across the survey block.

Figure 26. Sub-Bottom Profile Survey Transects

Parametric sonars take advantage of the non-linear properties of water to create low frequency signals from the high-pressure transmission of two primary higher frequencies. For the Innomar systems the high frequency signals are centered around 100-kHz, with low frequency signals that can be adjusted between 4-kHz to 15-kHz (depending on penetration and resolution requirements). Advantages of parametric systems in comparison to other subbottom profilers include smaller beam footprints, short transmit pulses, constant directivity for different frequencies, no ringing or side lobes to received signal, and high ping rates. All of the above result in the highest possible horizontal and vertical resolution.

The low frequency channel was of primary interest for this survey because the principal objective was mapping the sediment thickness overlying a cemented carbonate platform. The low frequency settings used for this survey was 8kHz with a pulse length of 258 µsec (~15 inches).

Interpretation techniques included automated picking of the seabed reflector from the high frequency (HF) / 100-kHz channel followed by manual adjustment to correct mistakes made by the automated algorithms. This seabed reflector was then applied to the low frequency (LF) / data. The SBP seabed reflector was then aligned with the multibeam bathymetry surface to reduce all data to NAVD88 datum.

Two reflectors were identified and interpreted across the survey area. The first reflector marks the base of an uppermost sediment unit presumed to be largely unconsolidated. The second reflector was deeper and more inconsistent. It marks the top of either a more consolidated unit or the bedrock horizon.

A differencing algorithm was applied between the seabed reflector and the primary subsurface reflector to derive sediment unit thickness using an assumed average velocity of 4800 ft/sec (conversion of the two-way time associated with the SBP trace data to a metric measurement). The same sediment velocity was used to derive reflector depths.

The two reflectors were identified and digitized across both the Mack Point and Sears Island survey blocks. The uppermost reflector marks the base of an interpreted unconsolidated sediment unit that appears to be the focus of dredging efforts. The second reflector is generally deeper and marks either a more consolidated underlying sediment unit or a rock “basement” unit. The upper reflector truncates against the basement reflector across both areas.

Figures 27 through 30 below show the reflector patterns and sediment units in four transects across the Mack Point survey area (from west to east). The uppermost sediment unit is thin in the west, more prominent across the center of the block, and then diminishes again in the east where dredging has occurred.

Horizontal scale lines at 20-ft intervals; vertical lines at 50-ft intervals.

Figure 27. Figure 3: Reflectors showing the base of the unconsolidated sediment unit (blue arrows) and “basement” reflector (green arrows) observed across the Mack Point survey area.

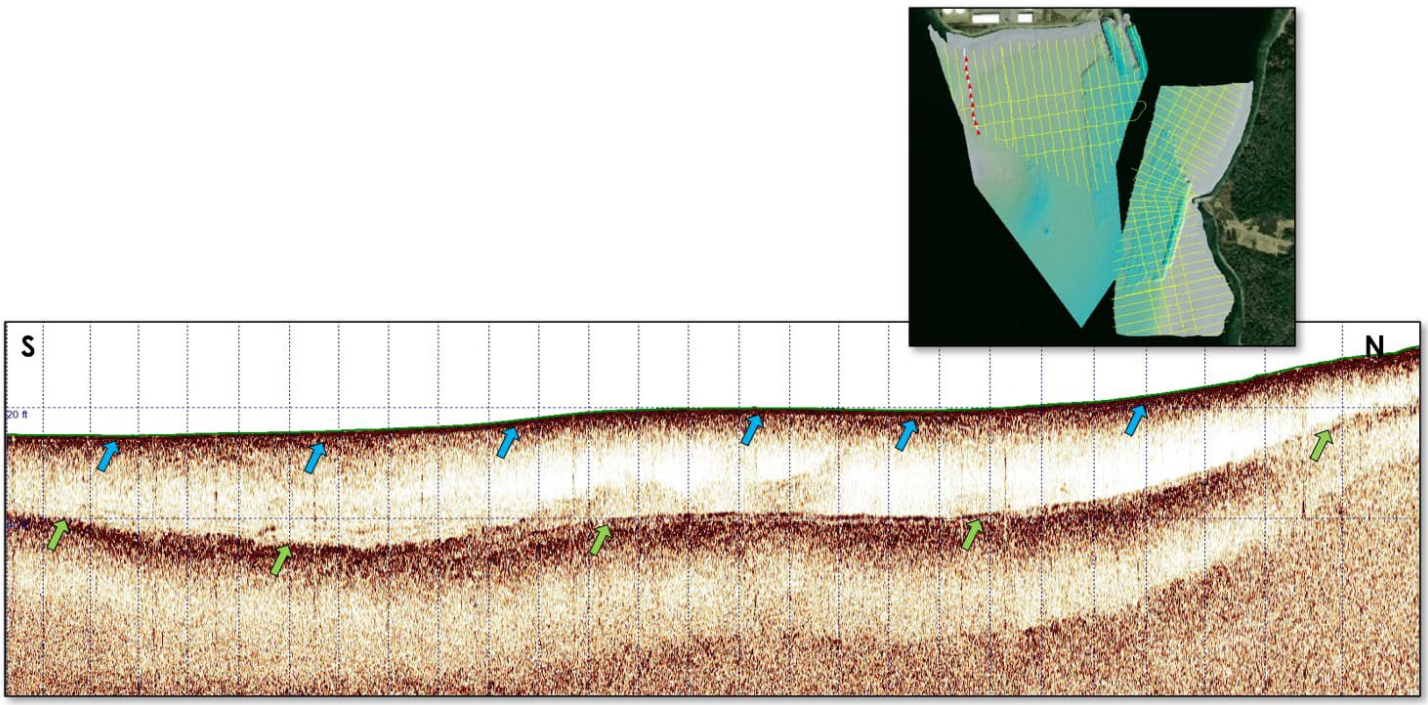


Figure 28. Reflectors showing the base of the unconsolidated sediment unit (blue arrows) and "basement" reflector (green arrows) observed across the Mack Point survey area. Seabed multiple shown by red line.

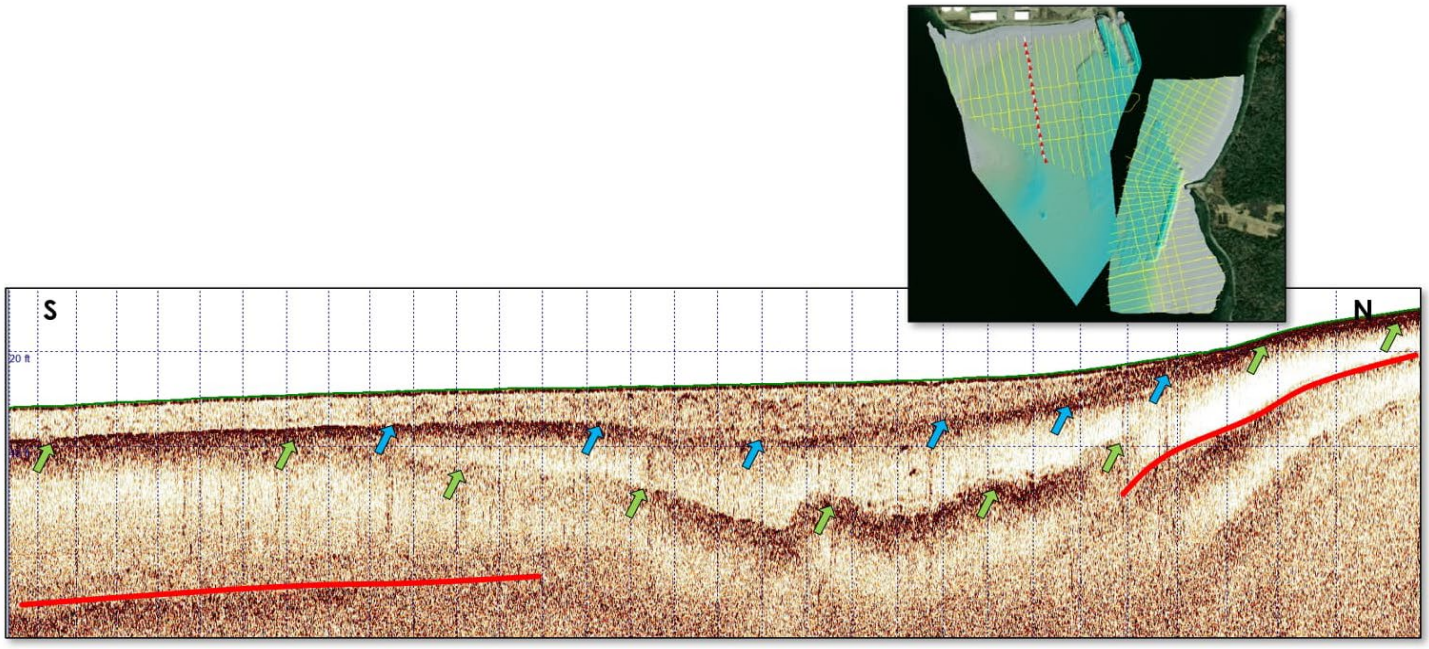


Figure 29. Reflectors showing the base of the unconsolidated sediment unit (blue arrows) and "basement" reflector (green arrows) observed across the Mack Point survey area. Seabed multiple shown by red line.

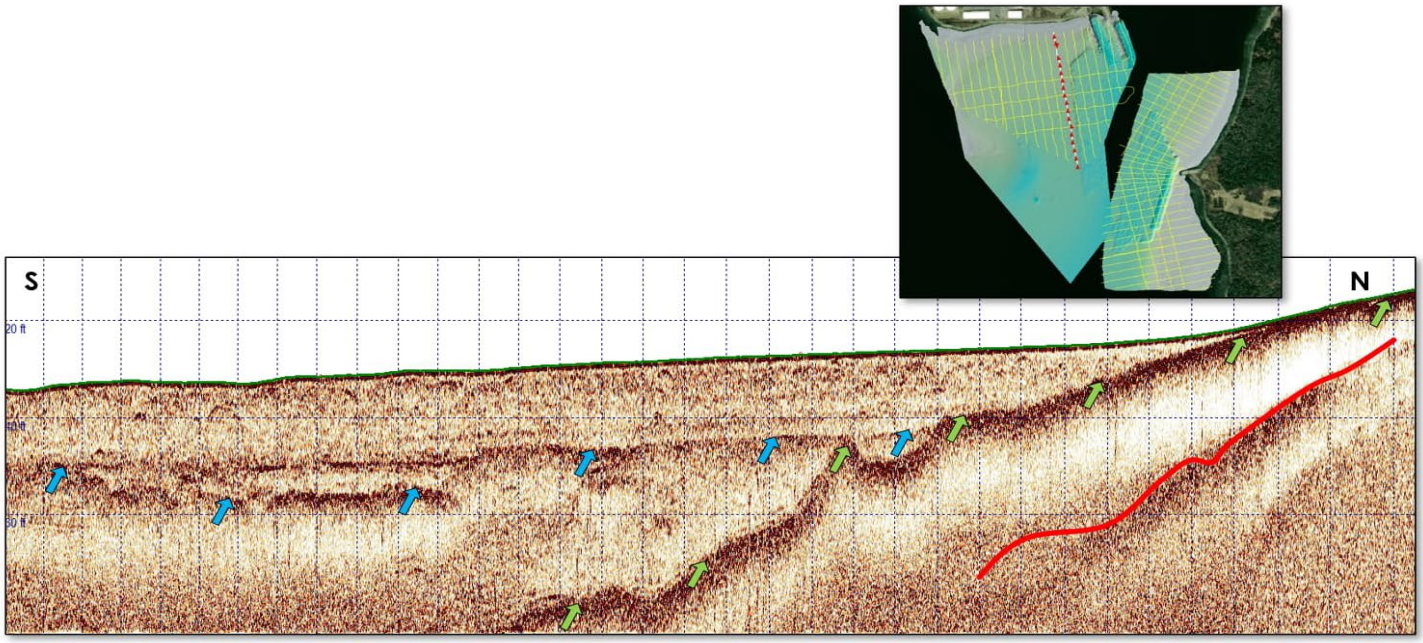


Figure 30. Reflectors showing the base of the unconsolidated sediment unit (blue arrows) and "basement" reflector (green arrows) observed across the Mack Point survey area.

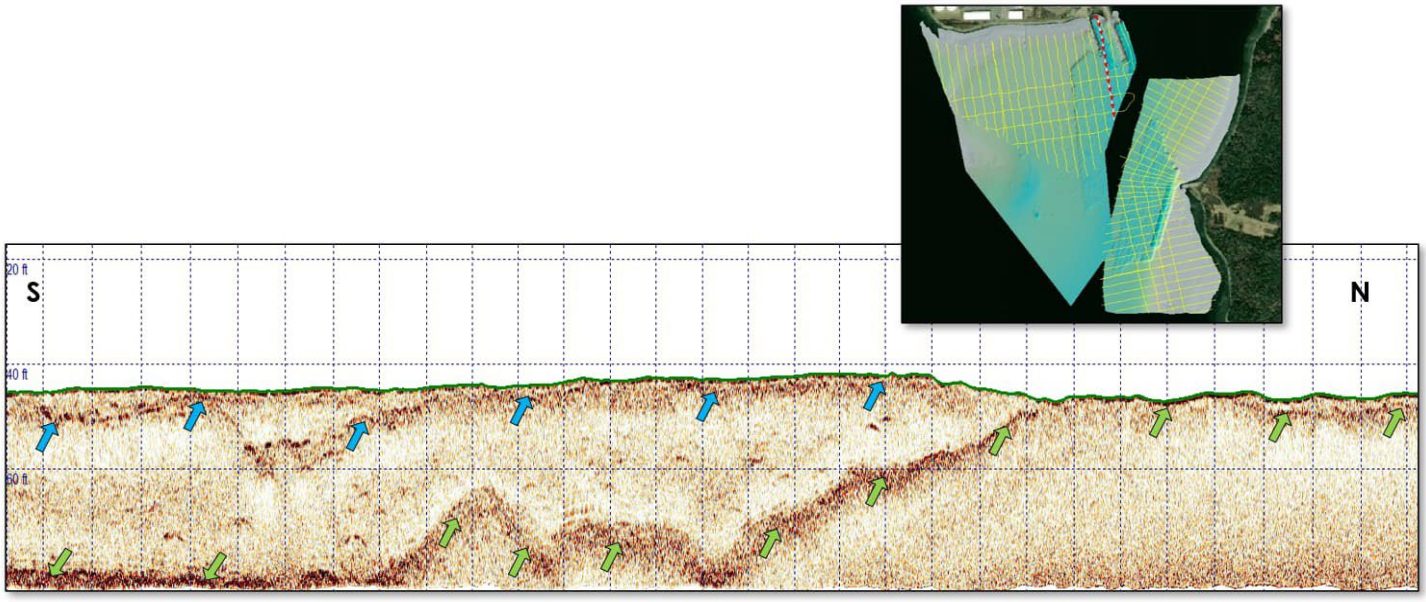
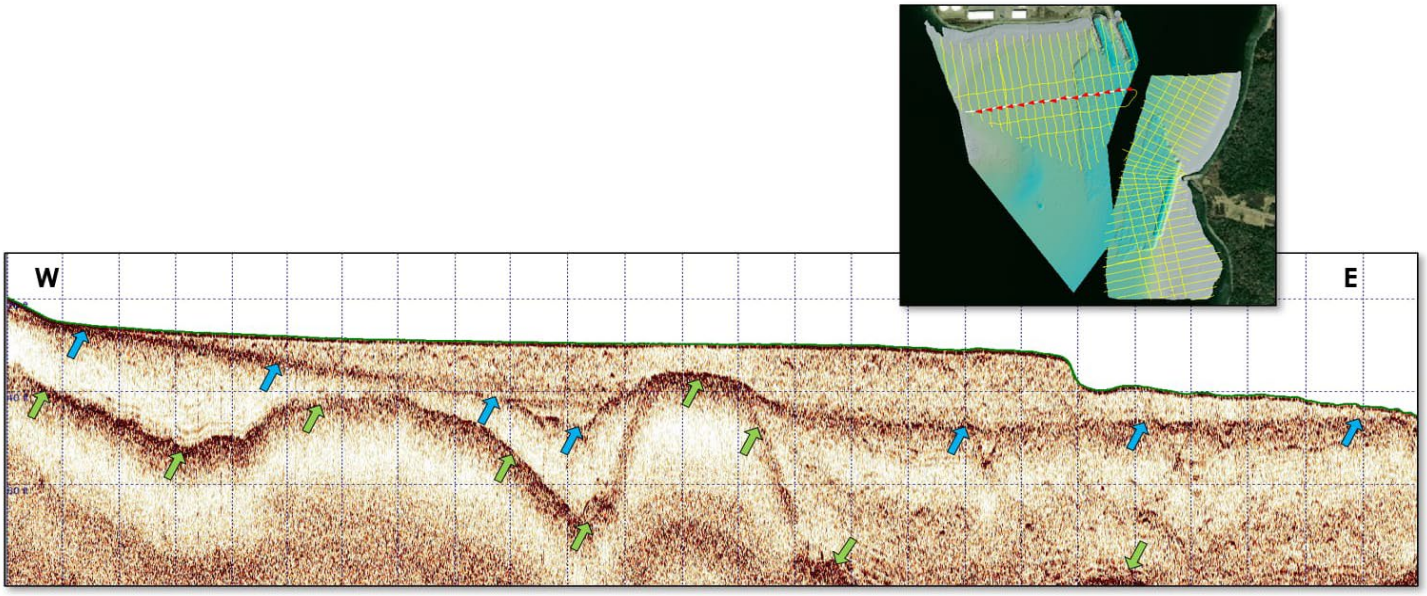


Figure 31 shows a transect oriented parallel to the shoreline across the Mack Point survey block. This helps illustrate the sediment thickness patterns discussed in the paragraphs below.



The pair of isopach maps in Figures 32 and 33 show the sediment thickness above the interpreted unconsolidated unit reflector and the “basement” reflector, respectively. The unconsolidated unit thickness diminishes on the east and west sides of the survey block, and adjacent to the Mack Point shoreline in the north. A thick sequence of sediment fills a trough across the middle of the survey area which is disrupted by a N-S orientated ridge-like feature that’s also apparent in the basement unit thickness isopach map. This feature lies west of the current dredge area in Mack Point.

The basement isopach map isn’t as extensive as the unconsolidated sediment unit isopach simply because the basement reflector could not be tracked across the entire survey block. Sediment thickness diminishes towards the Long Cove Ledge bathymetric feature and as noted above across the N-S ridge located at the center of the block.

Figure 32. Unconsolidated sediment unit thickness for Mack Point

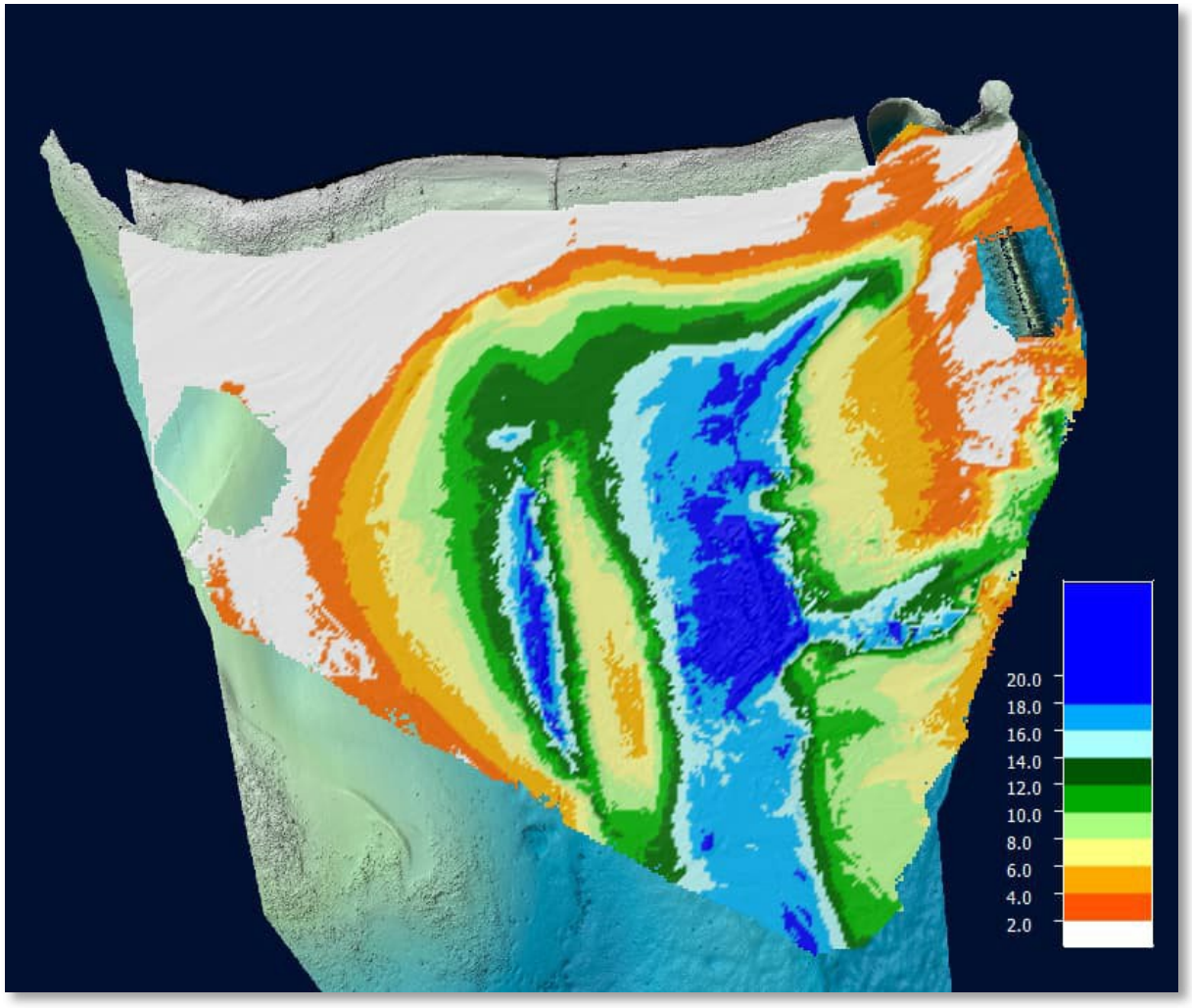
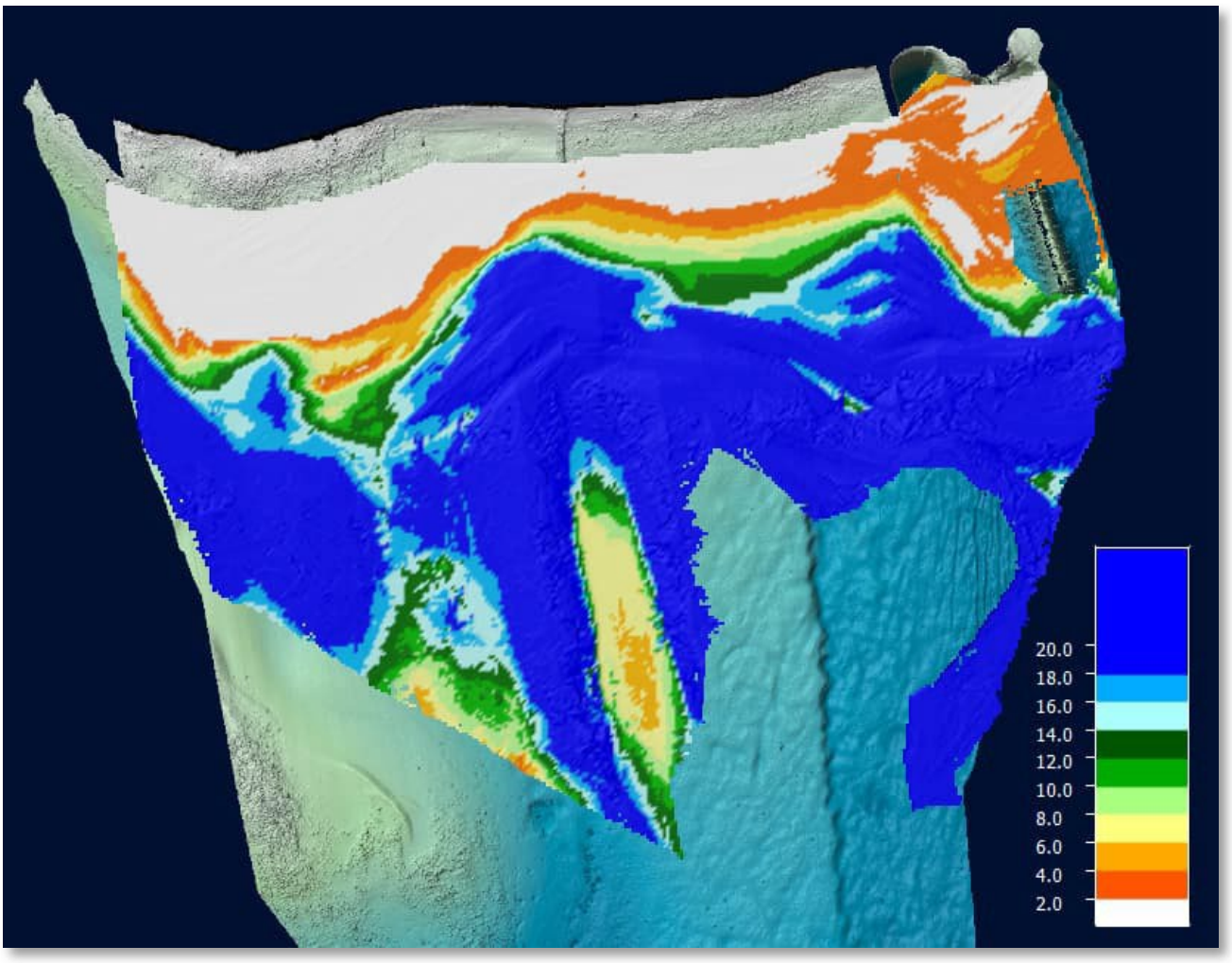


Figure 33: Sediment unit thickness above the interpreted basement reflector for Mack Point.



As noted previously, the same two reflectors were digitized across the Sears Island survey block.

Figures 34 through 37 show the reflector patterns and sediment units for four transects oriented perpendicular to the Sears Island shoreline (from south to north), and Figures 38 and 39 show the isopach maps for the unconsolidated unit and the entire sediment unit above the basement reflector.

The unconsolidated sediment unit extends across the Sears Island shelf across the northern half of the survey area but appears to pinch out on the basement reflector across the southern half. A thicker accumulation (up to 20-ft) resides in a depression to the north of the current dredge activity location. Thickness of unconsolidated sediments across the Sears Island dredge area range from ~6-ft to <0.5-ft.

The basement isopach map (Figure 39) shows a shelf depression south of the Sears Island rock jetty and behind the fringing rock reef marking the edge of the shelf. This depression is illustrated in the SBP transect shown in Figure 41. Sediment thickness within this depression exceeds 25-ft. A smaller sediment accumulation lies west of the shelf depression, at the southern extent of the current dredge area. This might be related to redistributed dredge sediments. Sediment thickness across the shelf is generally less than 2-ft.

Horizontal scale lines at 20-ft intervals; vertical lines at 50-ft intervals.

Figure 34. Reflectors showing the base of the unconsolidated sediment unit (blue arrows) and "basement" reflector (green arrows) observed across the Mack Point survey area. Seabed multiple shown by red line.

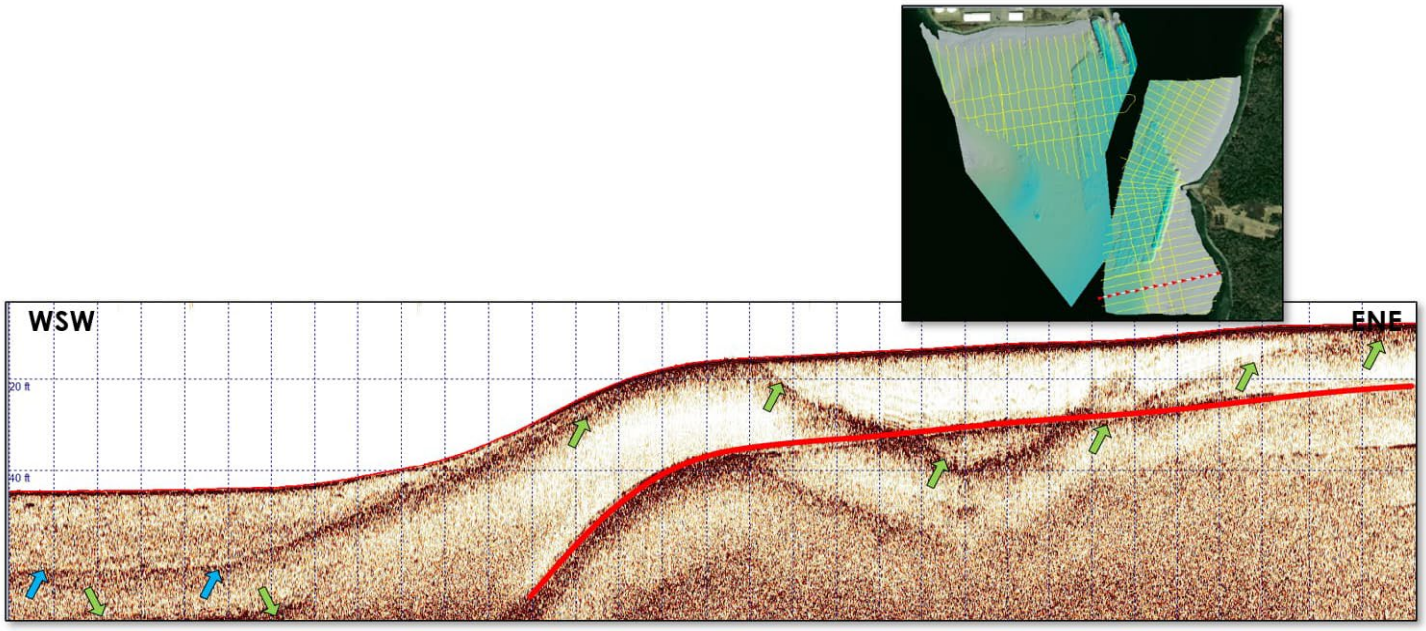


Figure 35. Reflectors showing the base of the unconsolidated sediment unit (blue arrows) and "basement" reflector (green arrows) observed across the Mack Point survey area. Seabed multiple shown by red line.

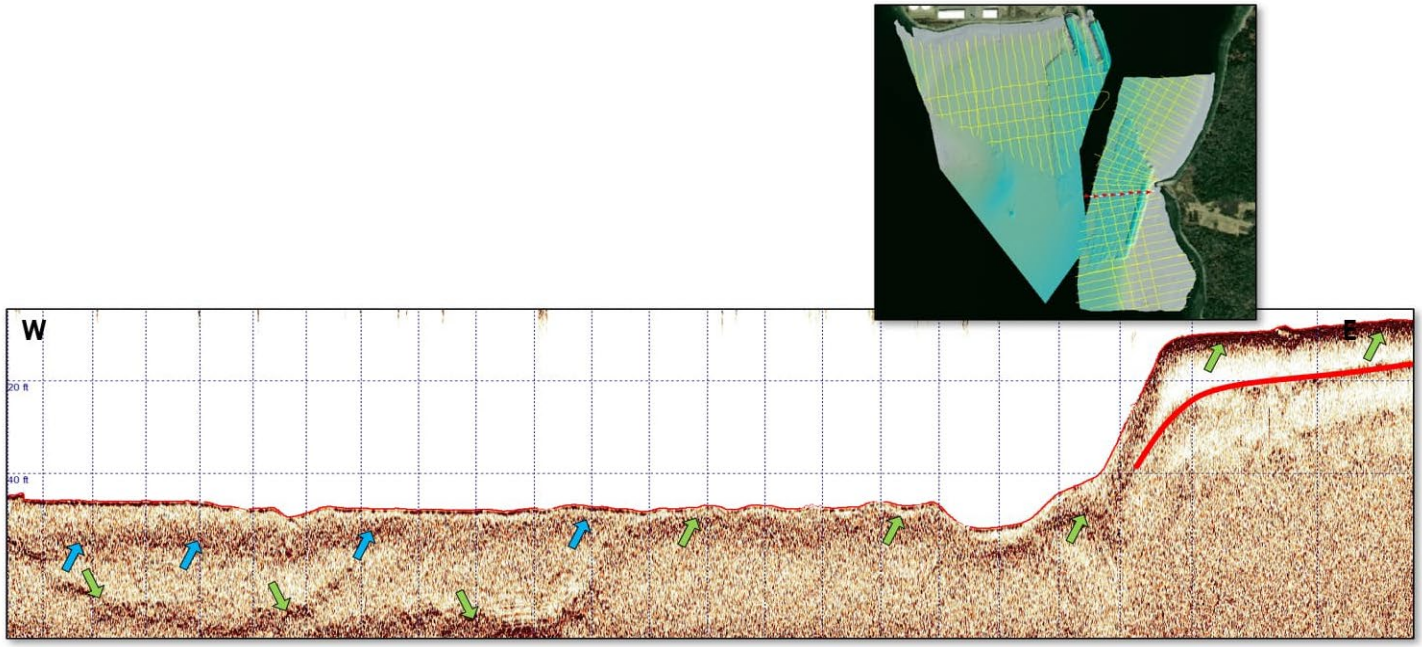


Figure 36. Reflectors showing the base of the unconsolidated sediment unit (blue arrows) and "basement" reflector (green arrows) observed across the Mack Point survey area. Seabed multiple shown by red line.

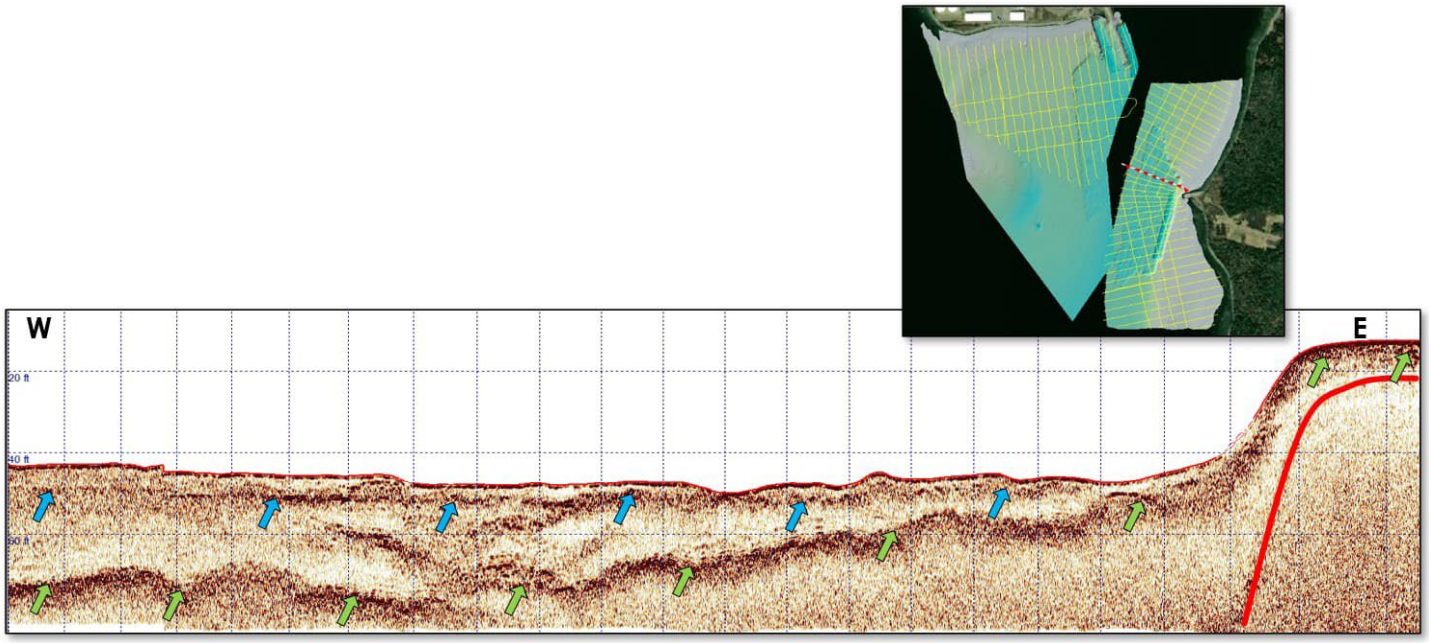


Figure 37. Reflectors showing the base of the unconsolidated sediment unit (blue arrows) and "basement" reflector (green arrows) observed across the Mack Point survey area. Seabed multiple shown by red line.

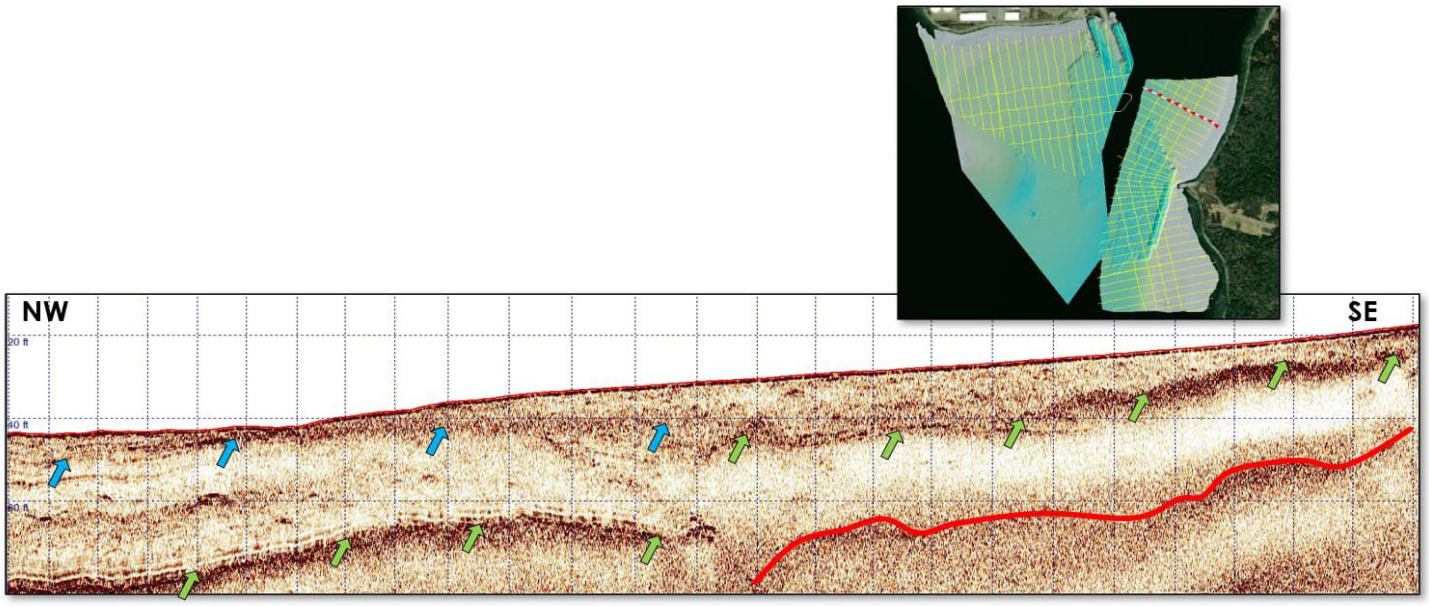


Figure 38. Unconsolidated sediment unit thickness for Sears Island

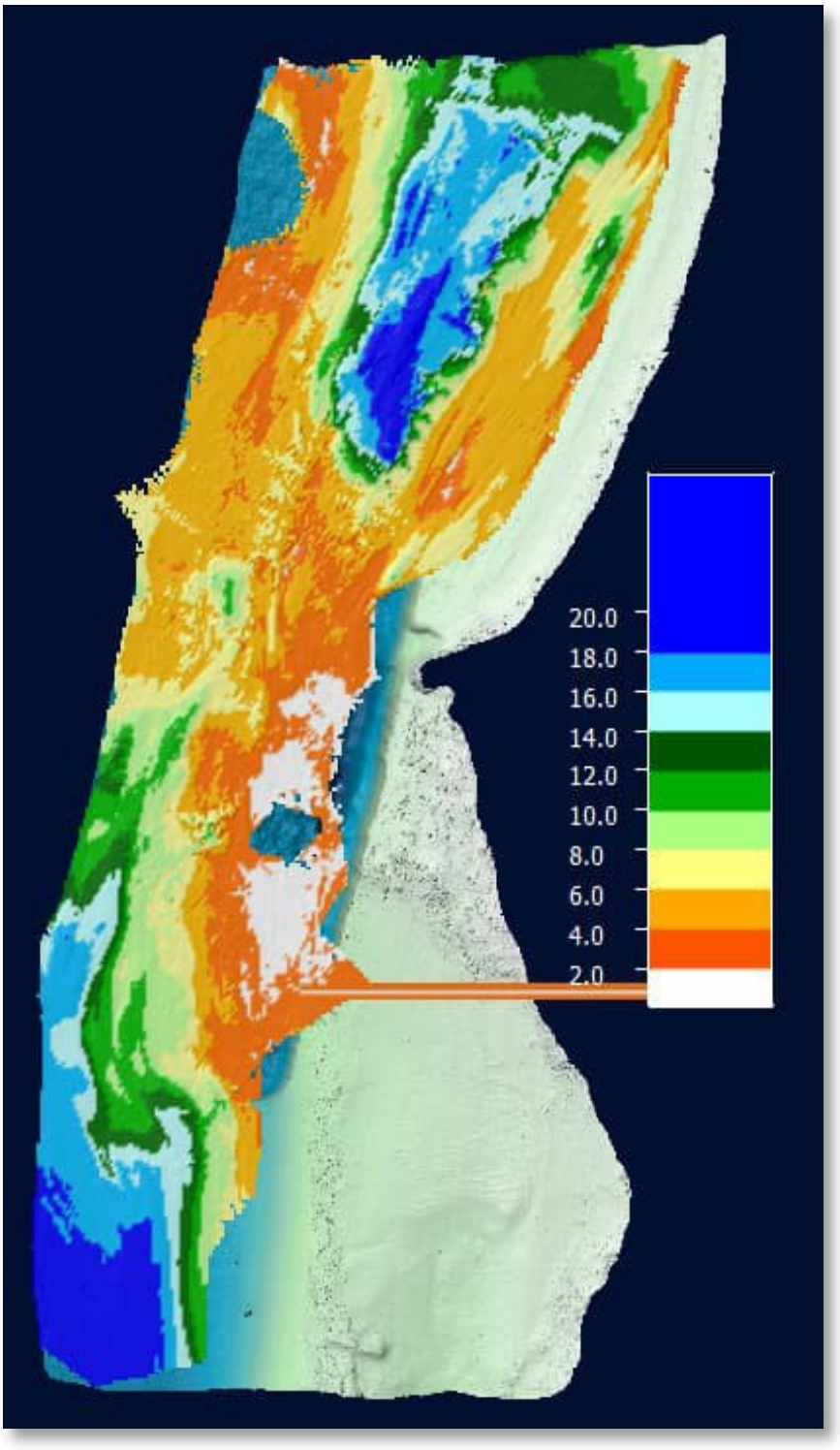
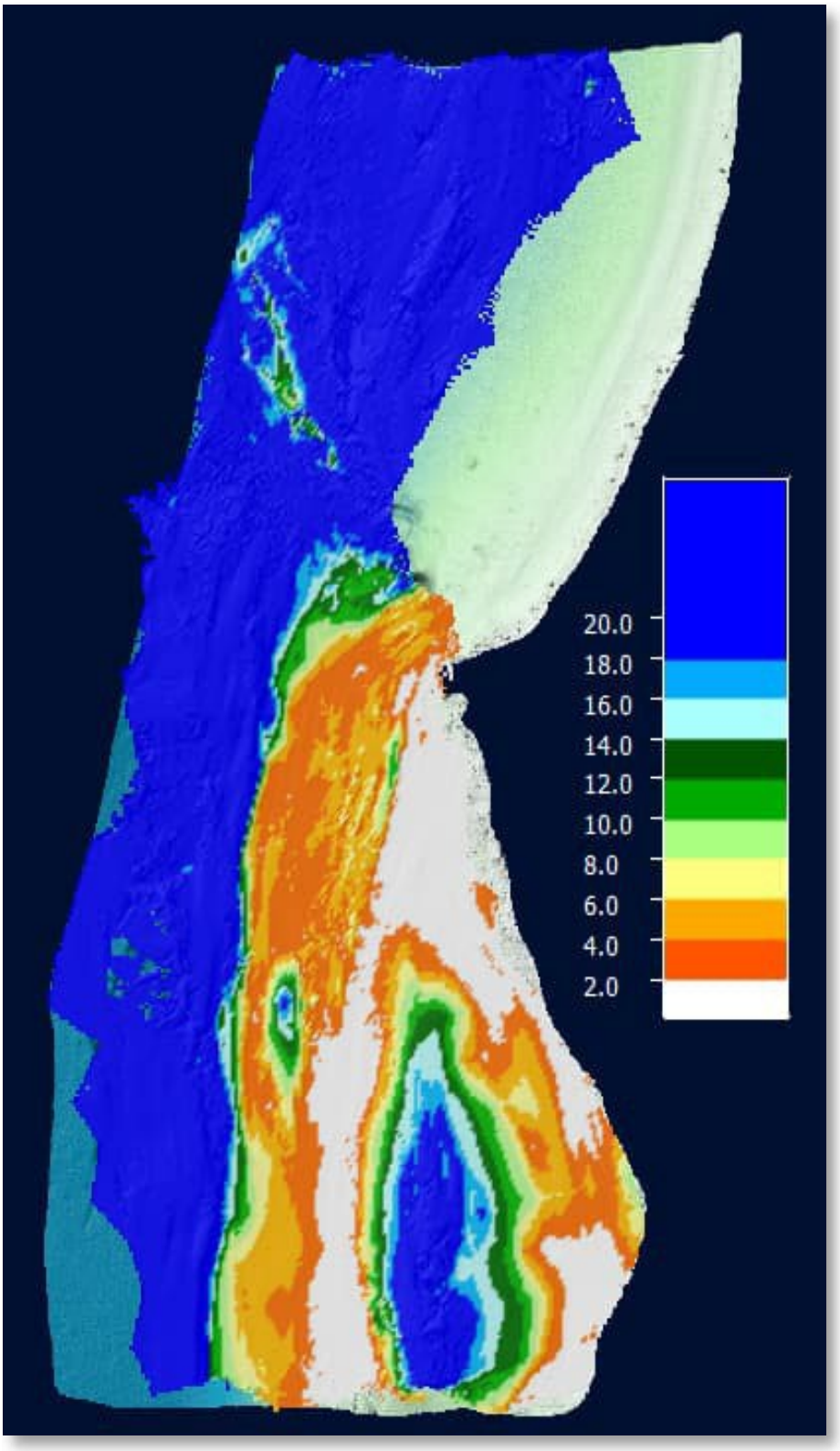


Figure 39. Sediment unit thickness above the interpreted basement reflector for Sears Island.



6. Summary

The multibeam bathymetric data reveals three physiographic provinces exist across the survey areas: sediment covered shelves, shelf slopes, and a sediment-filled basin between the two sites.

The Mack Point shoreline shows features suggestive of exposed rocks and little sediment accumulation. The shelf narrows to the east and slopes to a dredged area.

The western side of Sears Island contains a broader shelf area with a rock jetty at the center marking the narrowest portion of the shelf. A fringing rock reef marks the offshore edge of the shelf in the south half of the survey area, and generally suggests thinner sediment coverage across this area. A dredged area lies west of the rock jetty.

Side-scan sonar backscatter data supports this assessment. High backscatter intensity areas along both the Mack Point and Sears Island shorelines suggests rocky hard bottom which transitions to silty sands with boulders, and finally a silty bottom with boulders present.

Sub-bottom profile reflector patterns across both sites suggest two primary sediment units exist across the area. The uppermost reflector marks the base of an interpreted unconsolidated sediment unit which appears to be the focus of current dredge operations. The lower reflector marks the top of either a consolidated sediment unit or rock basement. The depth of this reflector could have implications for dredging operations.

For the Mack Point survey area, the unconsolidated sediment unit thickness diminishes on the east and west sides of the survey block, and adjacent to the Mack Point shoreline in the north. A thick sequence of sediment fills a trough across the middle of the survey area.

A N-S orientated ridge-like feature results in thinning of the unconsolidated unit west of the current dredge area. This feature relates to the basement reflector. Sediments also thin across and adjacent to the Long Cove Ledge.

For the Sears Island survey area, the unconsolidated sediment unit extends across the northern half of the Sears Island shelf but appears to pinch out on the basement reflector across the southern half. A thicker accumulation (up to 20-ft) resides in a depression to the north of the current dredge activity location. Thickness of unconsolidated sediments across the Sears Island dredge area ranges from ~6-ft to less than 0.5-ft.

The basement isopach map for Sears Island shows a shelf depression filled with sediment south of the Sears Island rock jetty and behind the fringing rock reef marking the edge of the shelf. Sediment thickness within this depression exceeds 25-ft. A smaller sediment accumulation lies west of the shelf depression at the southern extent of the current dredge area. This might be related to redistributed dredge sediments. Sediment thickness across the Sears Island shelf is generally less than 2-ft.

7. Survey Disclaimer

These hydrographic and geophysical surveys were conducted for informational purposes only. The results and interpretations provided are subject to limitations and uncertainties inherent in the hydrographic and geophysical survey process. The accuracy of the survey data is influenced by numerous factors, including equipment limitations, environmental and site conditions, and the nature of the survey. The data must be interpreted with caution, and professional judgement is required for accurate understanding and application. Use of this data acknowledges that factors outside of the surveyor's control may affect the data, and that Steele Associates Marine Consultants, LLC and its agents are not liable for errors, omissions, or inaccuracies in the survey data or data products. The user accepts full responsibility for any decisions made based on the survey results and agrees that Steele Associates Marine Consultants, LLC and its agents are not responsible for any loss, damage, or injury arising from the use of this survey data. The user agrees to indemnify and Steele Associates Marine Consultants, LLC, and its agents harmless from any claims or liabilities arising from use of this survey data. Steele Associates Marine Consultants, LLC reserves the right to modify or update this disclaimer as necessary.

8. Deliverables

Multibeam bathymetric survey deliverables include the following:

- Combined bathymetric data with previous surveys performed by others
- PDF color contour plots
- XYZ point files as 3-ft by 3-ft average and minimum depth per cell
- CAD DXF files containing 1-ft contours and spot soundings

Side-Scan Sonar survey deliverables include the following:

- PDF Mosaic plots with target locations, backscatter bottom classification
- Mosaic GeoTiffs
- Side-Scan Sonar Target Report and Location Table

Marine Magnetics survey deliverables include the following:

- PDF Total field contour plots with target locations
- Total magnetic field contours as DXF
- Marine magnetics target location table

Sub-Bottom Profile survey deliverables include the following:

- PDF isopach color contour plots
- XYZ point files for sediment unit thickness
- CAD DXF files containing isopach contours

STEELE

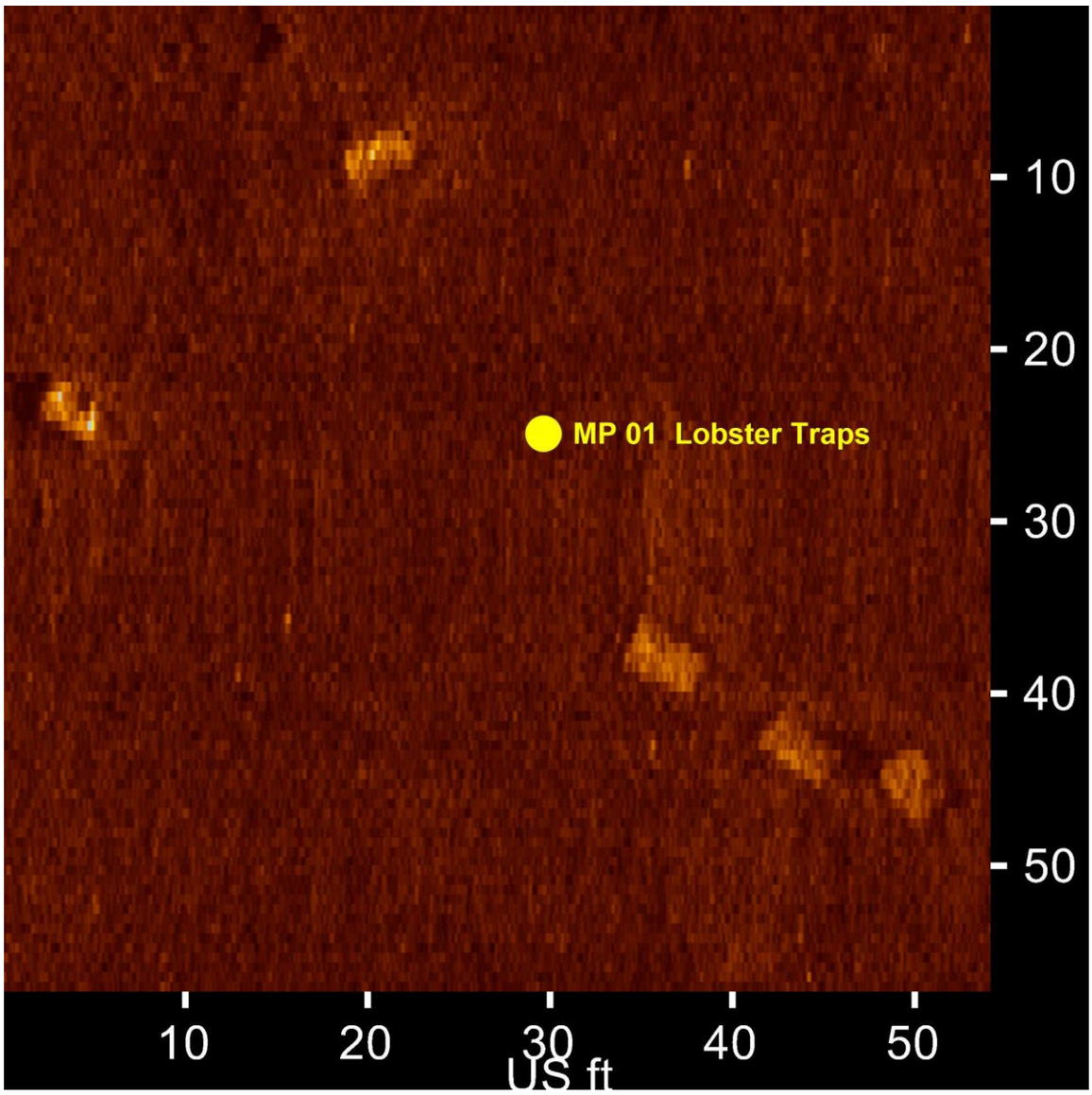
Side-Scan Sonar
Target Report

Mack Point and Sears Island
Searsport, ME

Survey Dates: October 25-26, 2023

Edgetech 4125 600-kHz / 1600-kHz
Edgetech Discover
Chesapeake SonarWiz

Steele Associates Marine Consultants, LLC
94 Gifford Street
Falmouth, MA 02540
508.540.0001

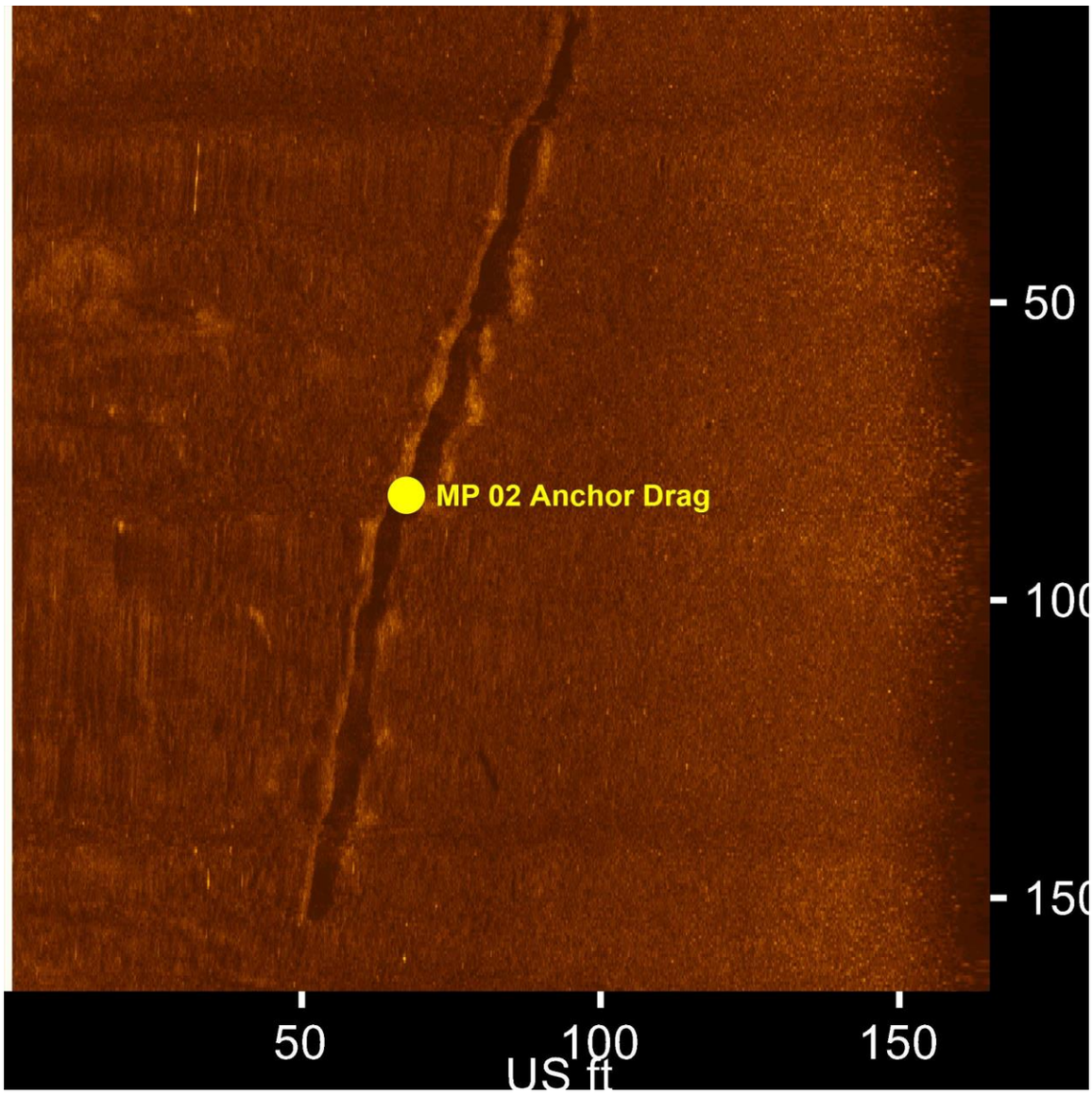


MP 01 Lobster Traps

- Sonar Time at Target: 10/25/2023 5:25:54 PM
- Click Position
  (X) 508048.93 (Y) 4921302.14 (Projected)
  44° 26.69440' N 068° 53.96065' W (NAD27LL)
  44° 26.69850' N 068° 53.93087' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025172504.jsf
- Course Made Good: 83.750 Degrees

Dimensions and attributes

- Target Width: 0.72 US ft
- Target Height: 0.00 US ft
- Target Length: 1.21 US ft
- Target Shadow: 0.00 US ft

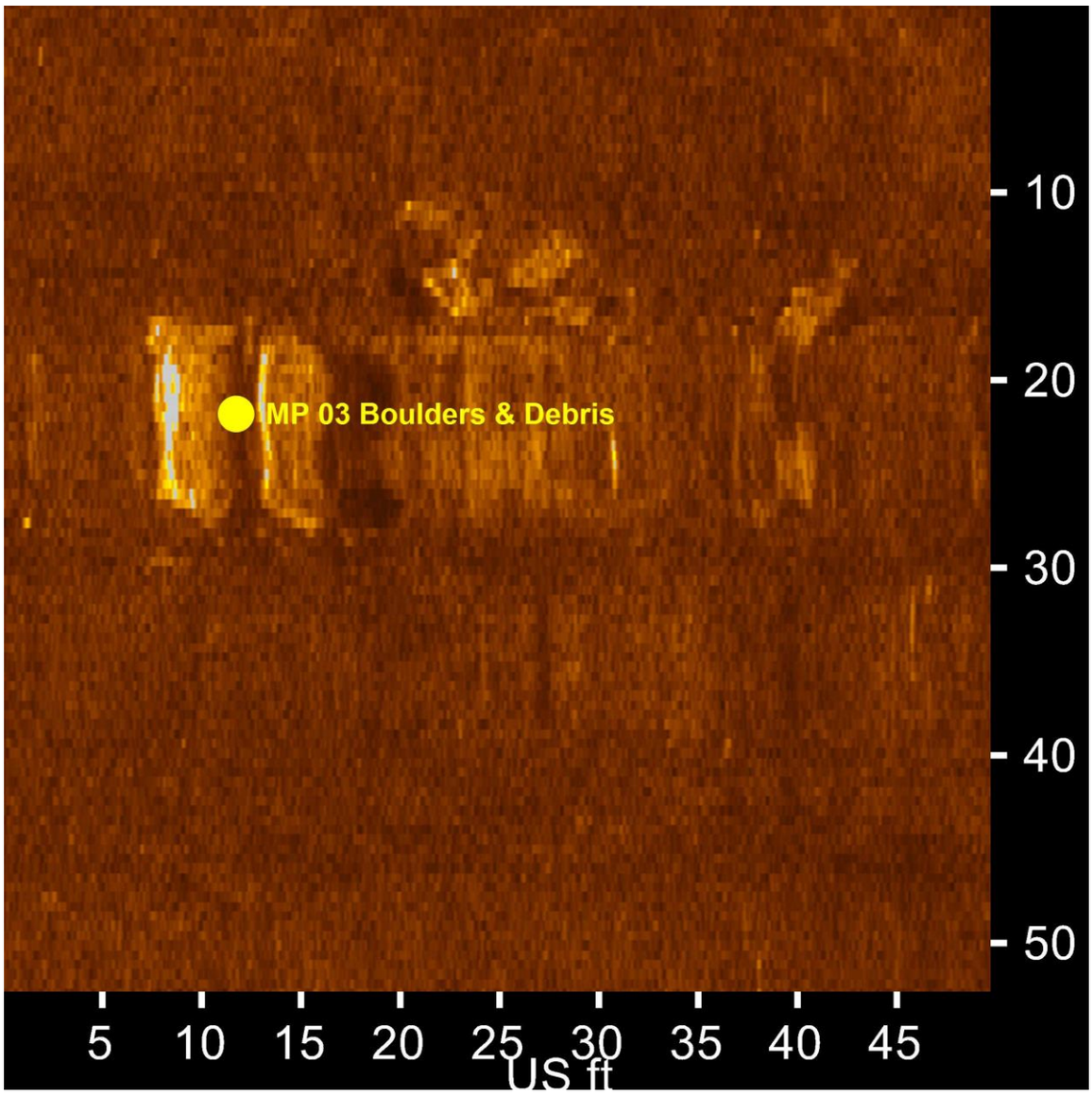


MP 02 Anchor Drag

- Sonar Time at Target: 10/25/2023 6:13:38 PM
- Click Position
  (X) 507901.44 (Y) 4921620.78 (Projected)
  44° 26.86662' N 068° 54.07158' W (NAD27LL)
  44° 26.87071' N 068° 54.04179' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025181051.jsf
- Course Made Good: 81.424 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

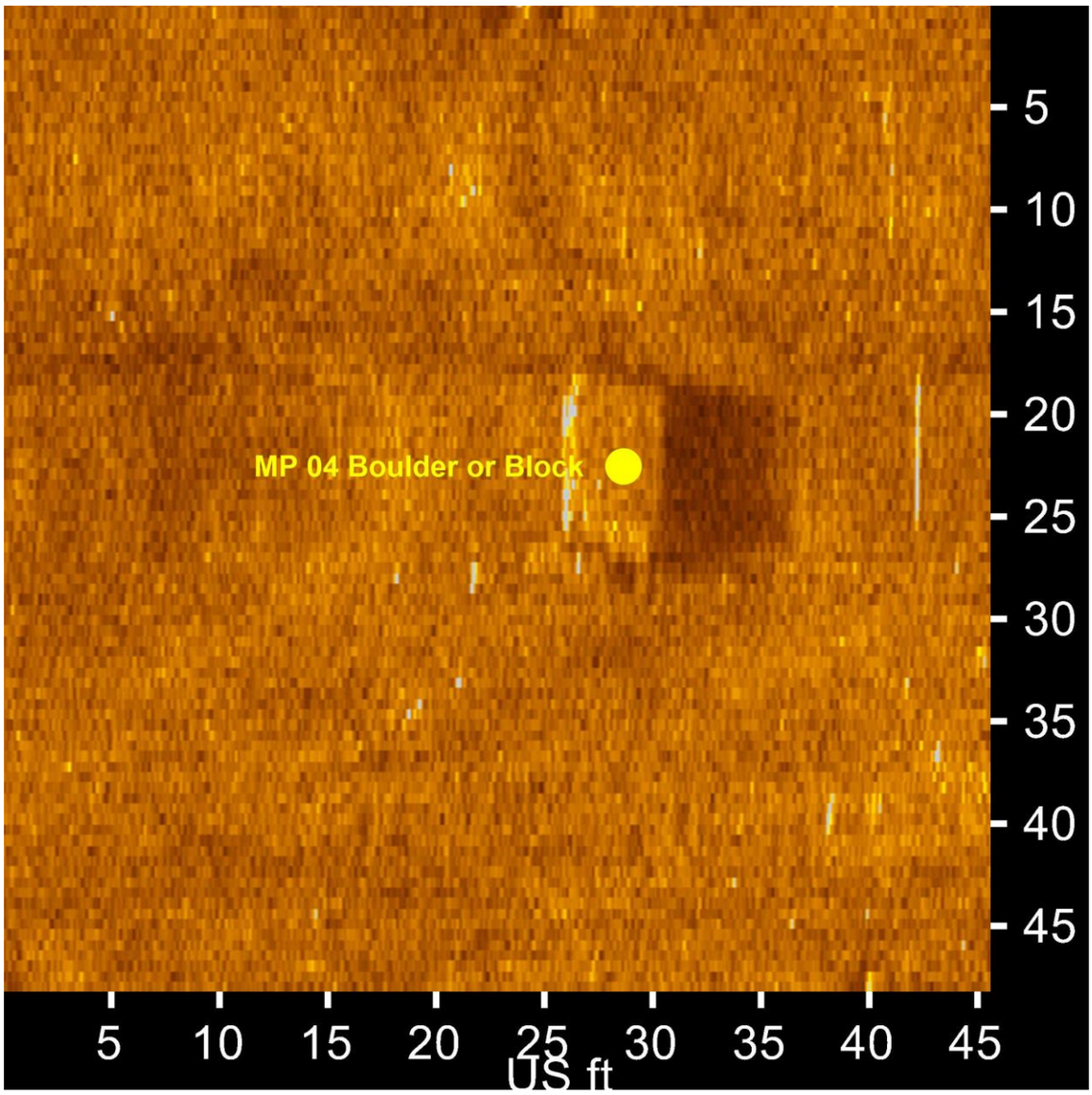


MP 03 Boulders & Debris

- Sonar Time at Target: 10/25/2023 6:46:21 PM
- Click Position
  (X) 508129.69 (Y) 4921745.06 (Projected)
  44° 26.93360' N 068° 53.89934' W (NAD27LL)
  44° 26.93769' N 068° 53.86955' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025184534.jsf
- Course Made Good: 259.529 Degrees

Dimensions and attributes

- Target Width: 0.94 US ft
- Target Height: 0.97 US ft
- Target Length: 2.63 US ft
- Target Shadow: 2.77 US ft

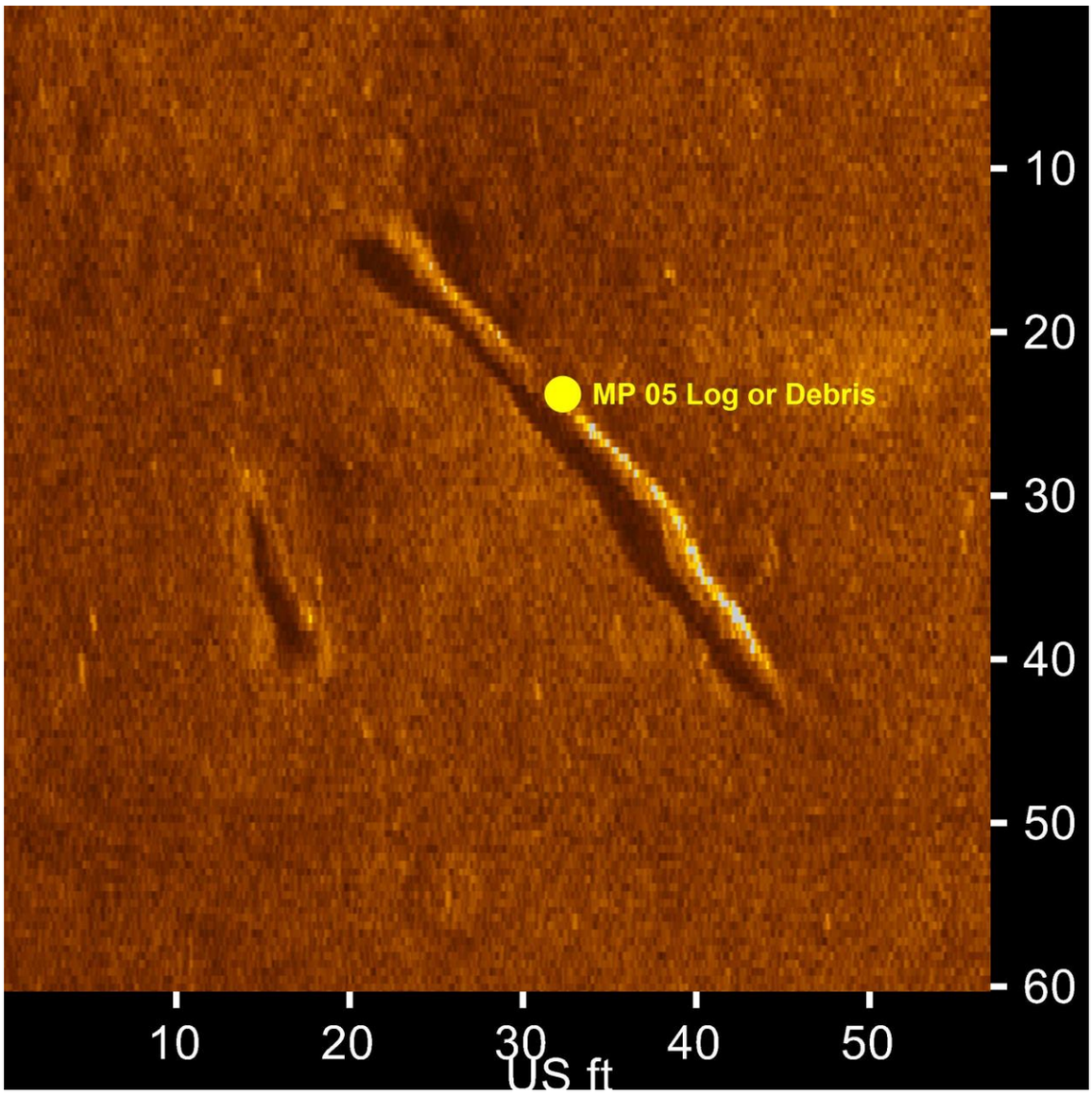


MP 04 Boulder or Block

- Sonar Time at Target: 10/25/2023 6:45:55 PM
- Click Position
  (X) 508185.90 (Y) 4921773.11 (Projected)
  44° 26.94872' N 068° 53.85693' W (NAD27LL)
  44° 26.95281' N 068° 53.82714' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025184534.jsf
- Course Made Good: 259.762 Degrees

Dimensions and attributes

- Target Width: 1.64 US ft
- Target Height: 0.00 US ft
- Target Length: 2.37 US ft
- Target Shadow: 0.00 US ft

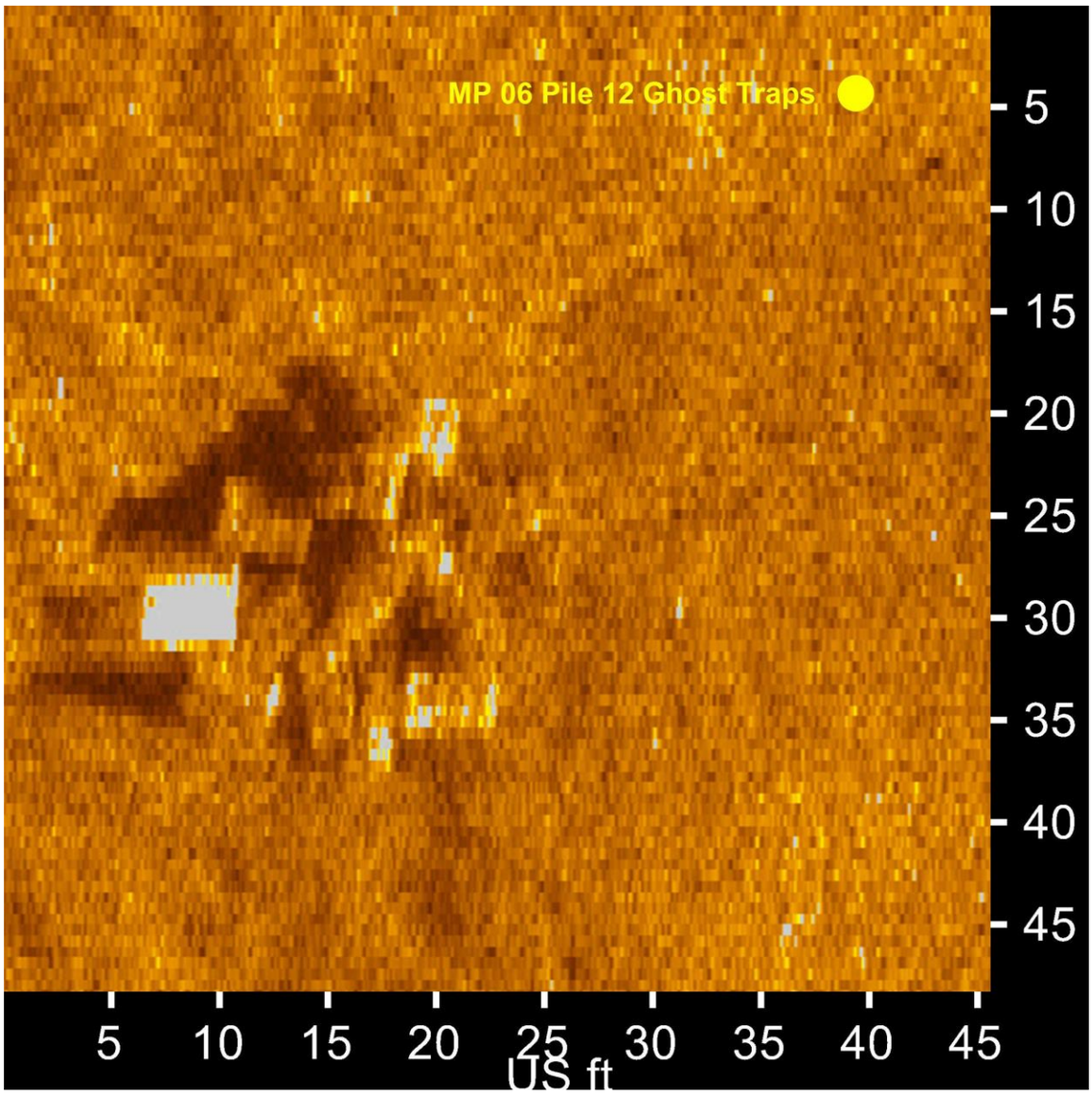


MP 05 Log or Debris

- Sonar Time at Target: 10/25/2023 7:32:21 PM
- Click Position
  (X) 508257.03 (Y) 4921855.99 (Projected)
  44° 26.99343' N 068° 53.80321' W (NAD27LL)
  44° 26.99752' N 068° 53.77342' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025193201.jsf
- Course Made Good: 262.491 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.42 US ft
- Target Length: 12.13 US ft
- Target Shadow: 0.89 US ft

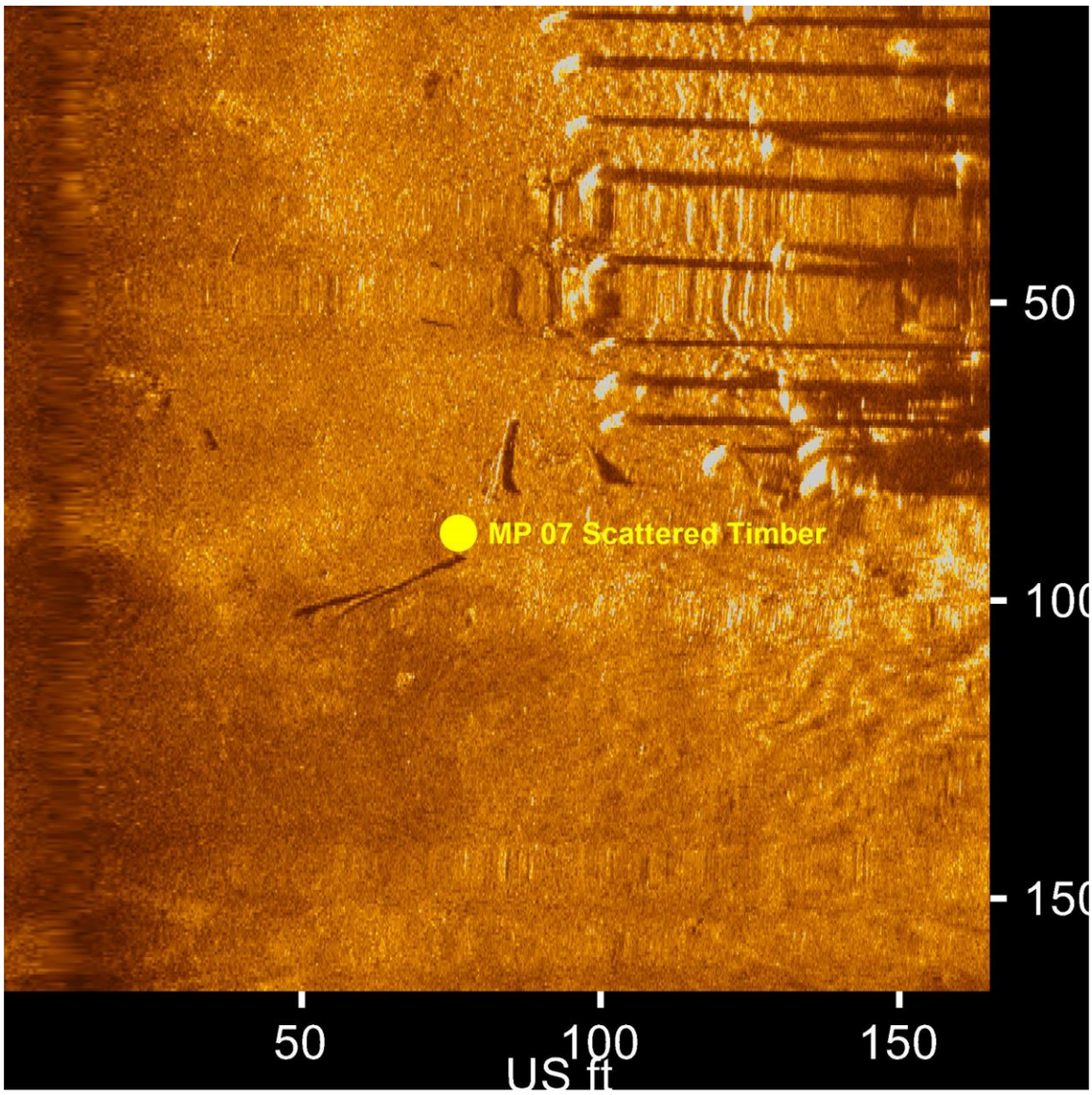


MP 06 Pile 12 Ghost Traps

- Sonar Time at Target: 10/25/2023 7:32:44 PM
- Click Position
  (X) 508198.39 (Y) 4921850.09 (Projected)
  44° 26.99029' N 068° 53.84744' W (NAD27LL)
  44° 26.99438' N 068° 53.81765' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025193201.jsf
- Course Made Good: 261.982 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

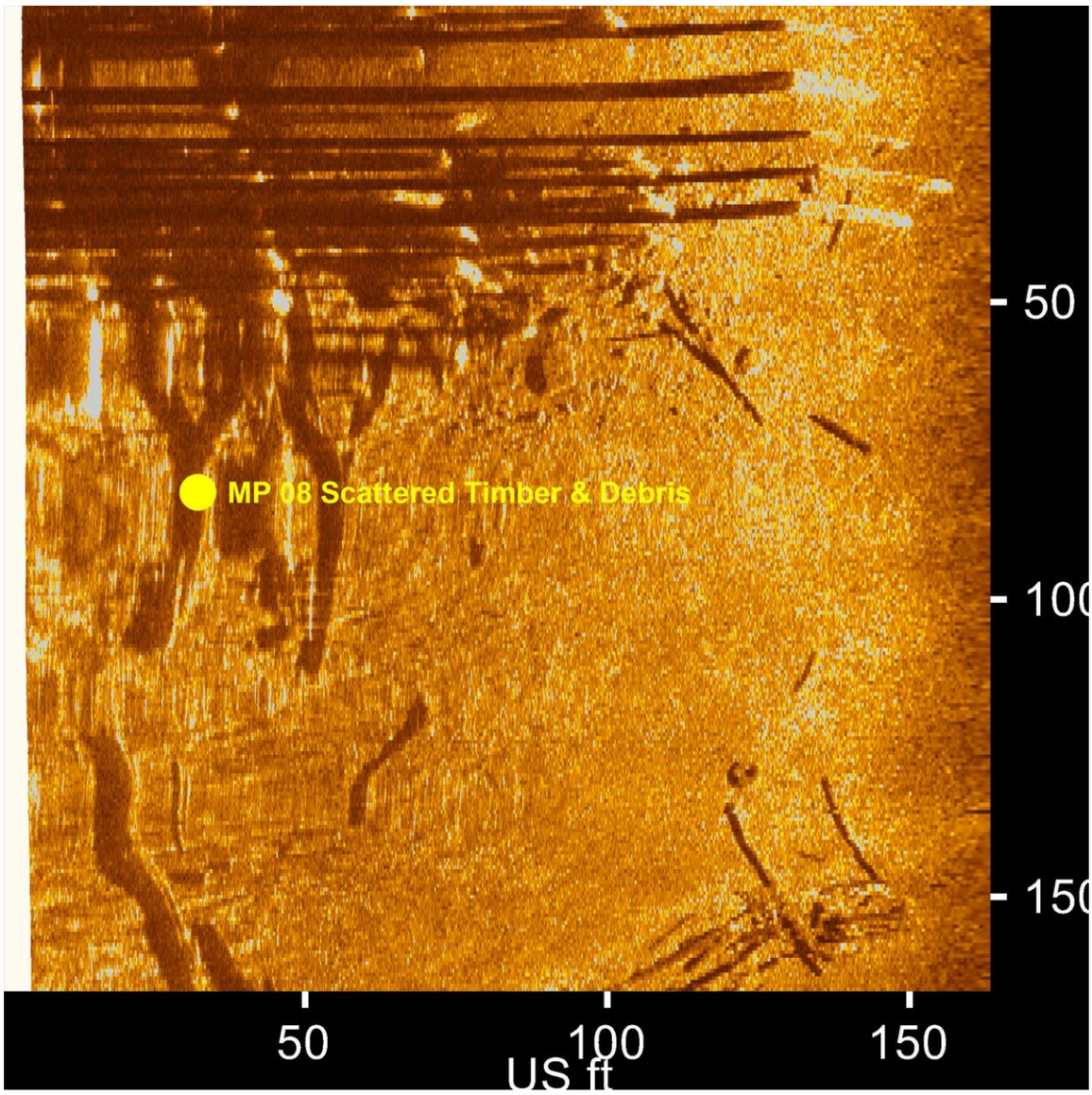


MP 07 Scattered Timber

- Sonar Time at Target: 10/25/2023 7:32:23 PM
- Click Position
  (X) 508251.27 (Y) 4921898.17 (Projected)
  44° 27.01622' N 068° 53.80751' W (NAD27LL)
  44° 27.02031' N 068° 53.77772' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025193201.jsf
- Course Made Good: 262.496 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

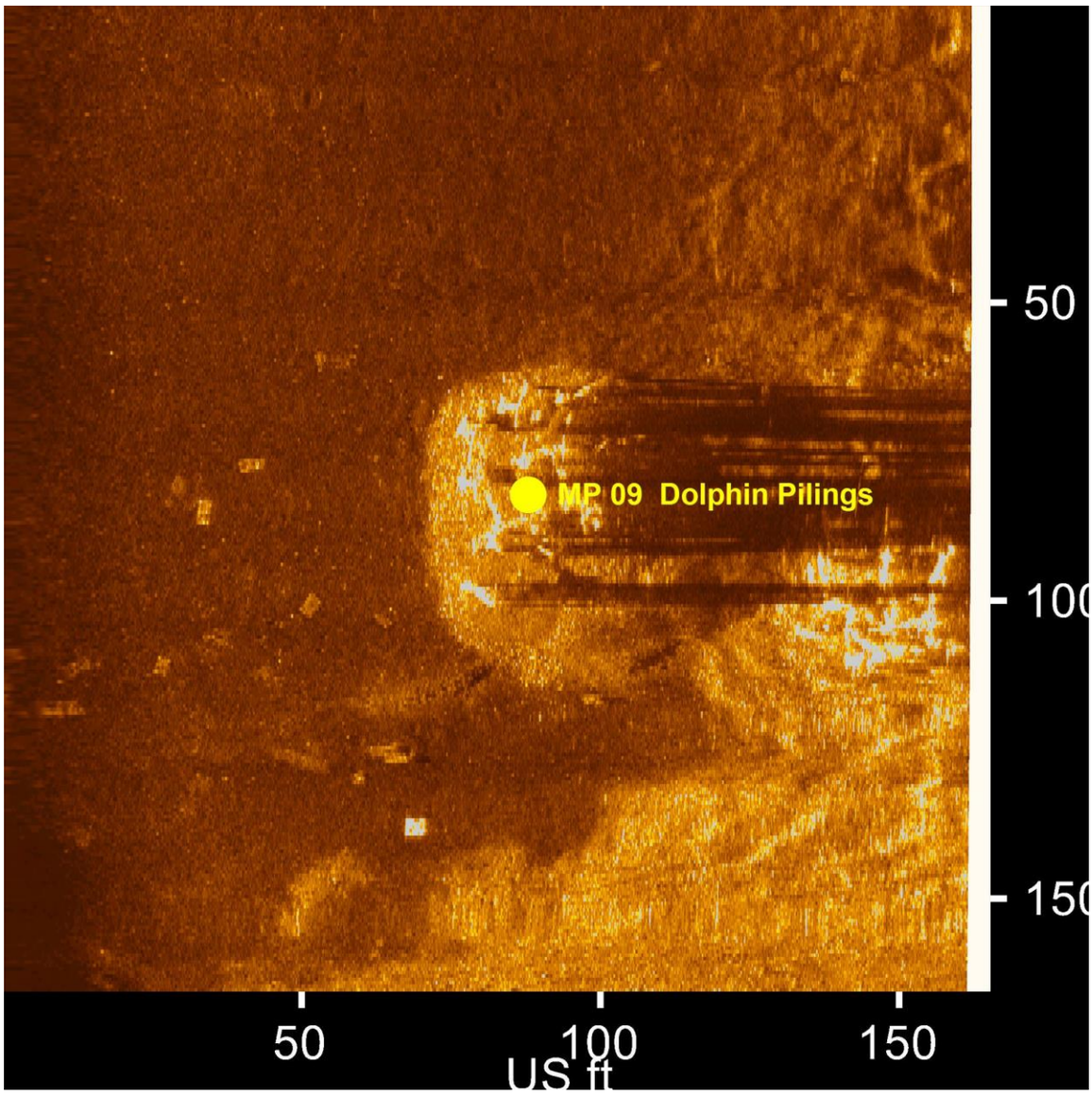


MP 08 Scattered Timber & Debris

- Sonar Time at Target: 10/25/2023 7:45:50 PM
- Click Position
  (X) 508198.09 (Y) 4921925.76 (Projected)
  44° 27.03116' N 068° 53.84759' W (NAD27LL)
  44° 27.03525' N 068° 53.81780' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025194010.jsf
- Course Made Good: 79.393 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

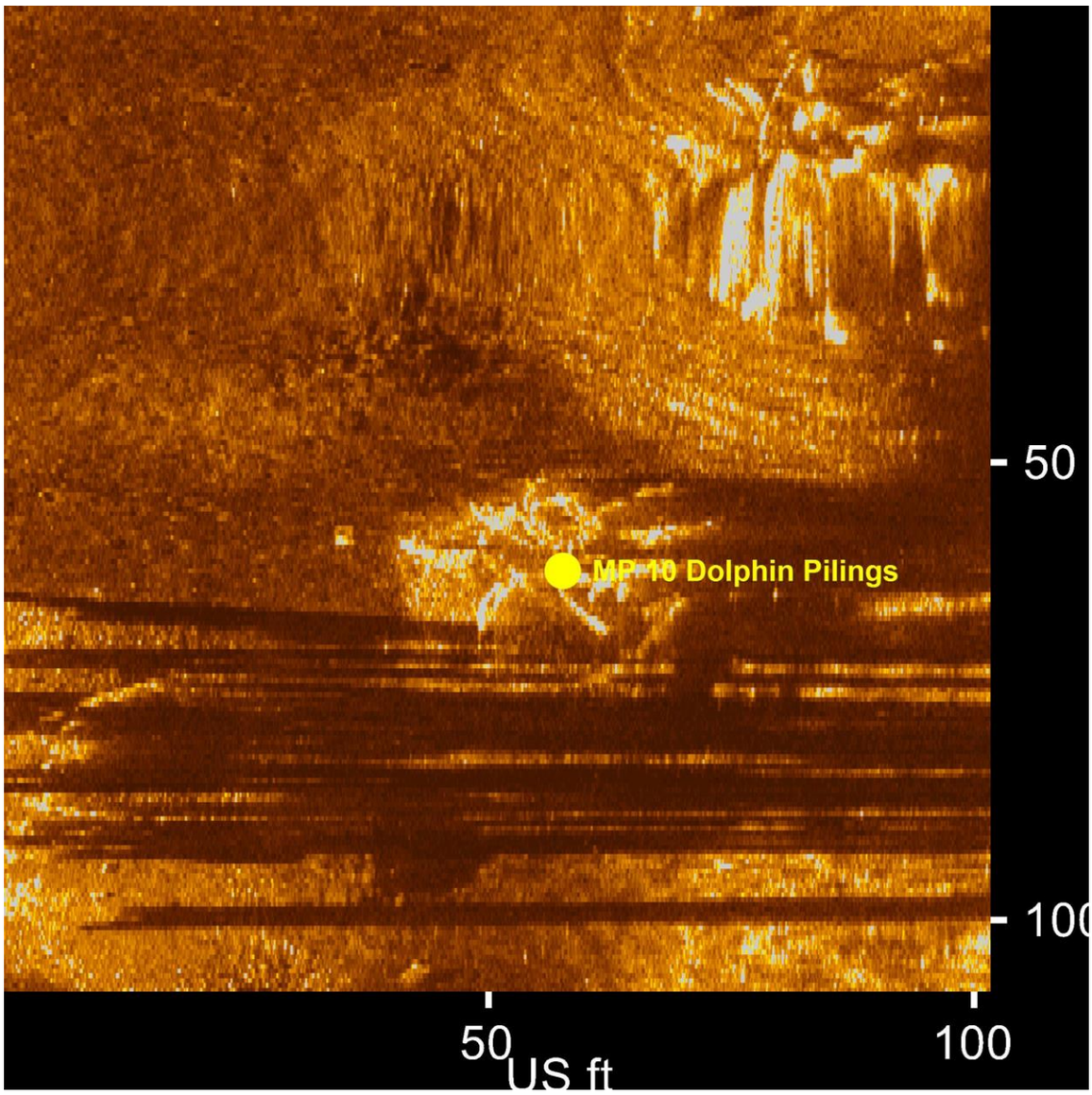


MP 09 Dolphin Pilings

- Sonar Time at Target: 10/25/2023 7:49:36 PM
- Click Position
  (X) 508109.87 (Y) 4921929.11 (Projected)
  44° 27.03303' N 068° 53.91412' W (NAD27LL)
  44° 27.03712' N 068° 53.88433' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025194845.jsf
- Course Made Good: 261.549 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

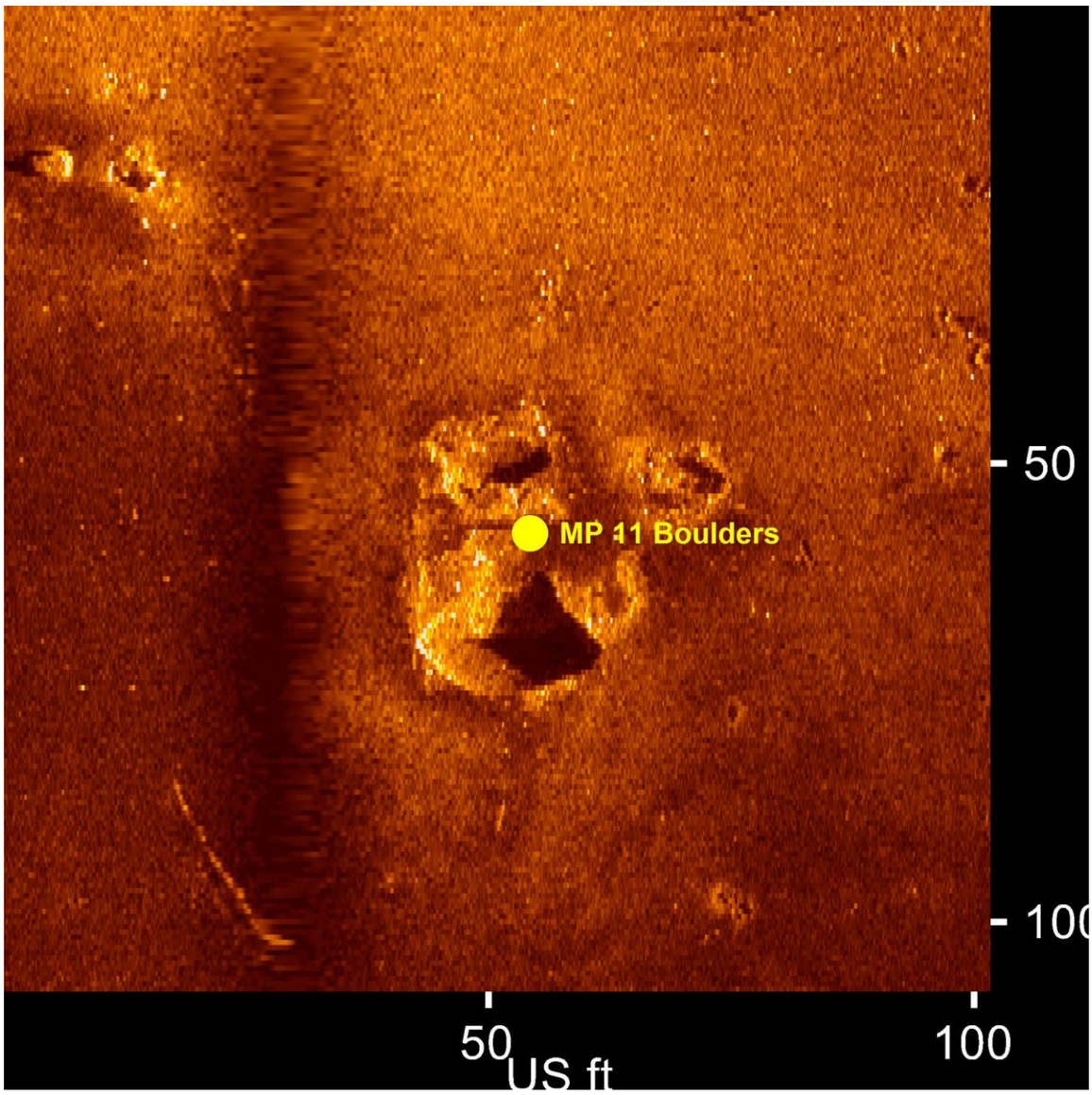


MP 10 Dolphin Pilings

- Sonar Time at Target: 10/25/2023 8:04:04 PM
- Click Position
  (X) 508111.19 (Y) 4921946.72 (Projected)
  44° 27.04255' N 068° 53.91310' W (NAD27LL)
  44° 27.04664' N 068° 53.88331' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025200357.jsf
- Course Made Good: 303.236 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

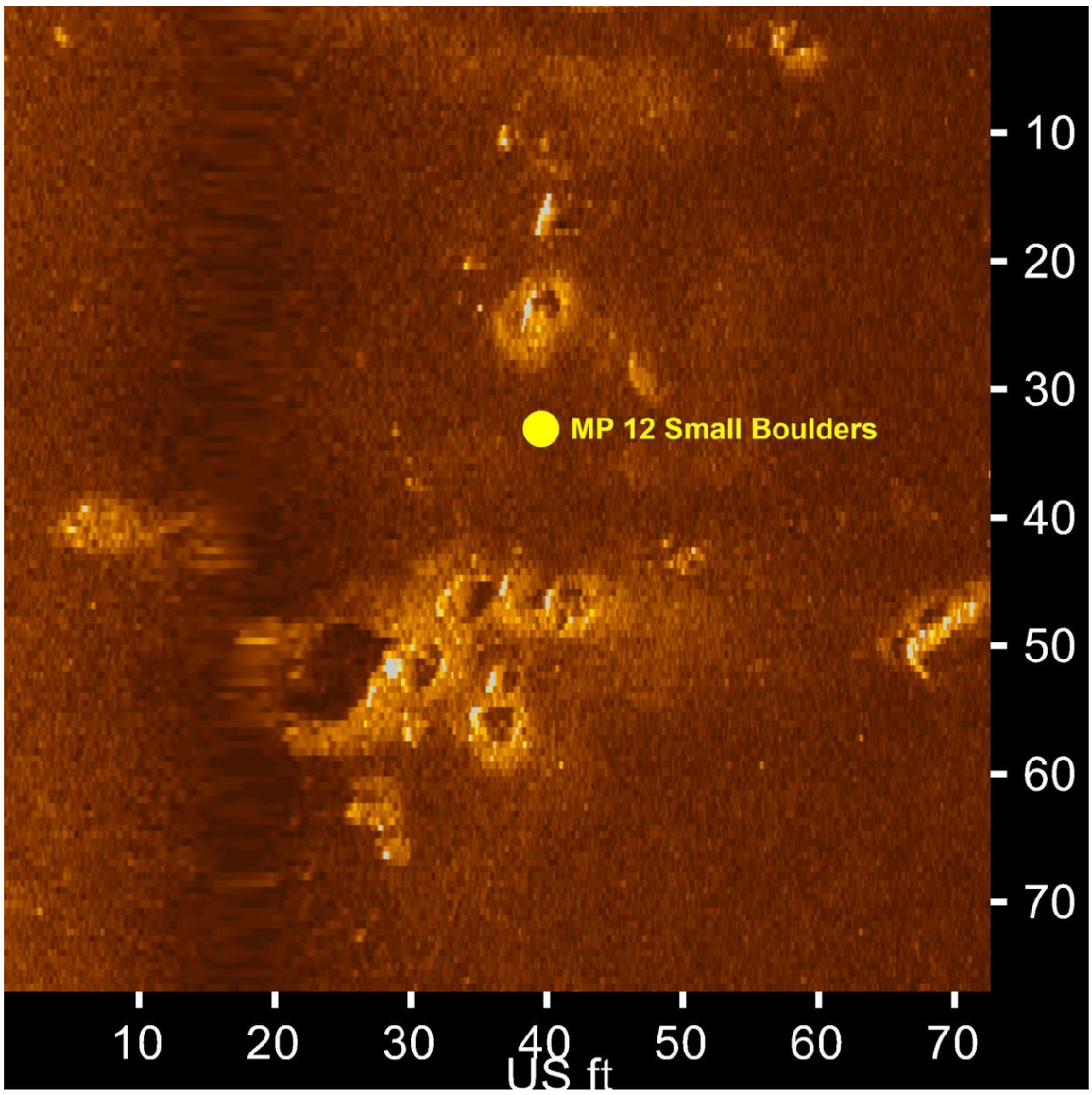


MP 11 Boulders

- Sonar Time at Target: 10/25/2023 8:08:05 PM
- Click Position
  (X) 507524.35 (Y) 4921862.25 (Projected)
  44° 26.99731' N 068° 54.35573' W (NAD27LL)
  44° 27.00139' N 068° 54.32593' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025200357.jsf
- Course Made Good: 259.421 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

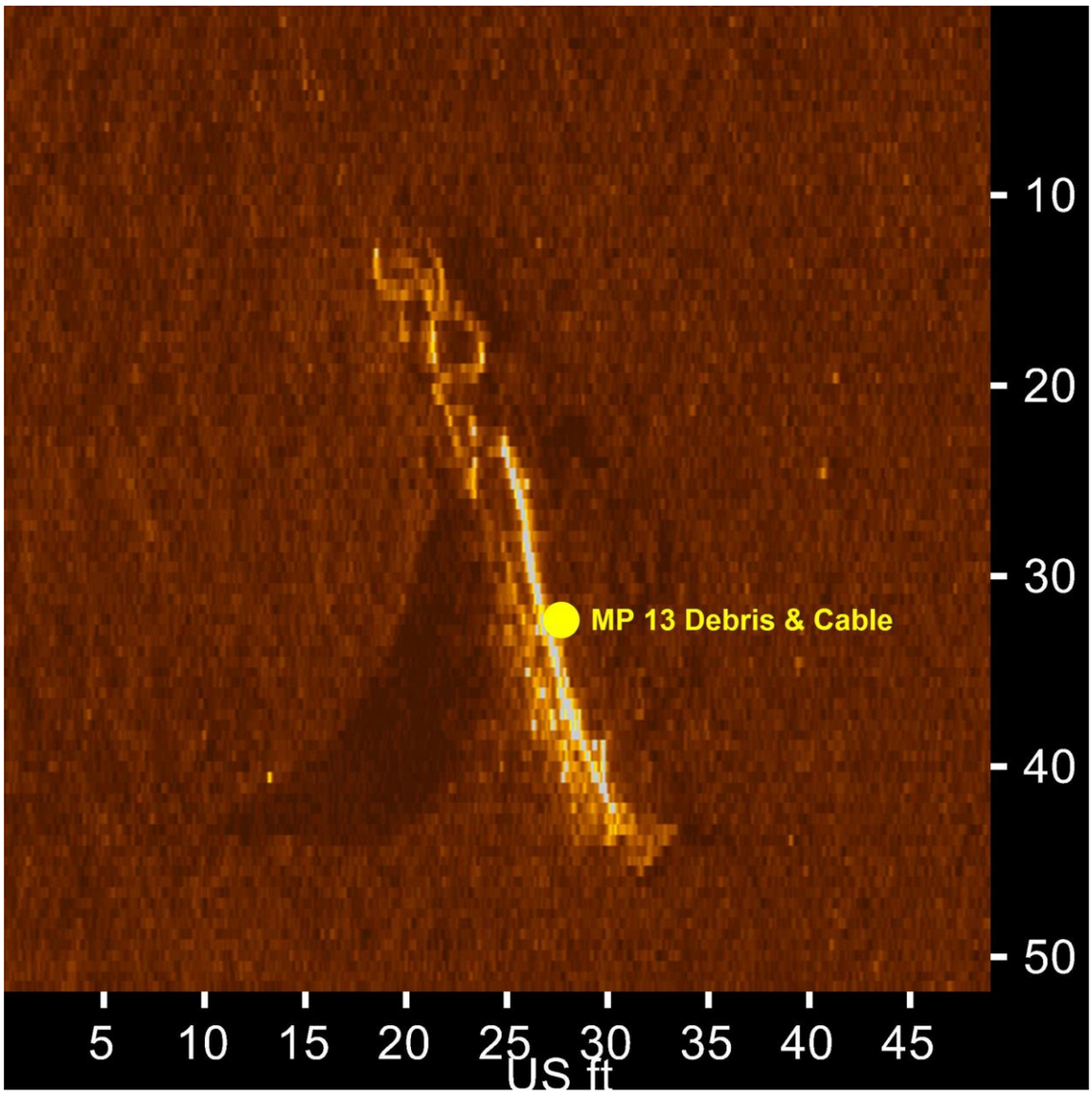


MP 12 Small Boulders

- Sonar Time at Target: 10/25/2023 7:57:43 PM
- Click Position
  (X) 507495.71 (Y) 4921818.18 (Projected)
  44° 26.97352' N 068° 54.37736' W (NAD27LL)
  44° 26.97760' N 068° 54.34756' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025195624.jsf
- Course Made Good: 73.582 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

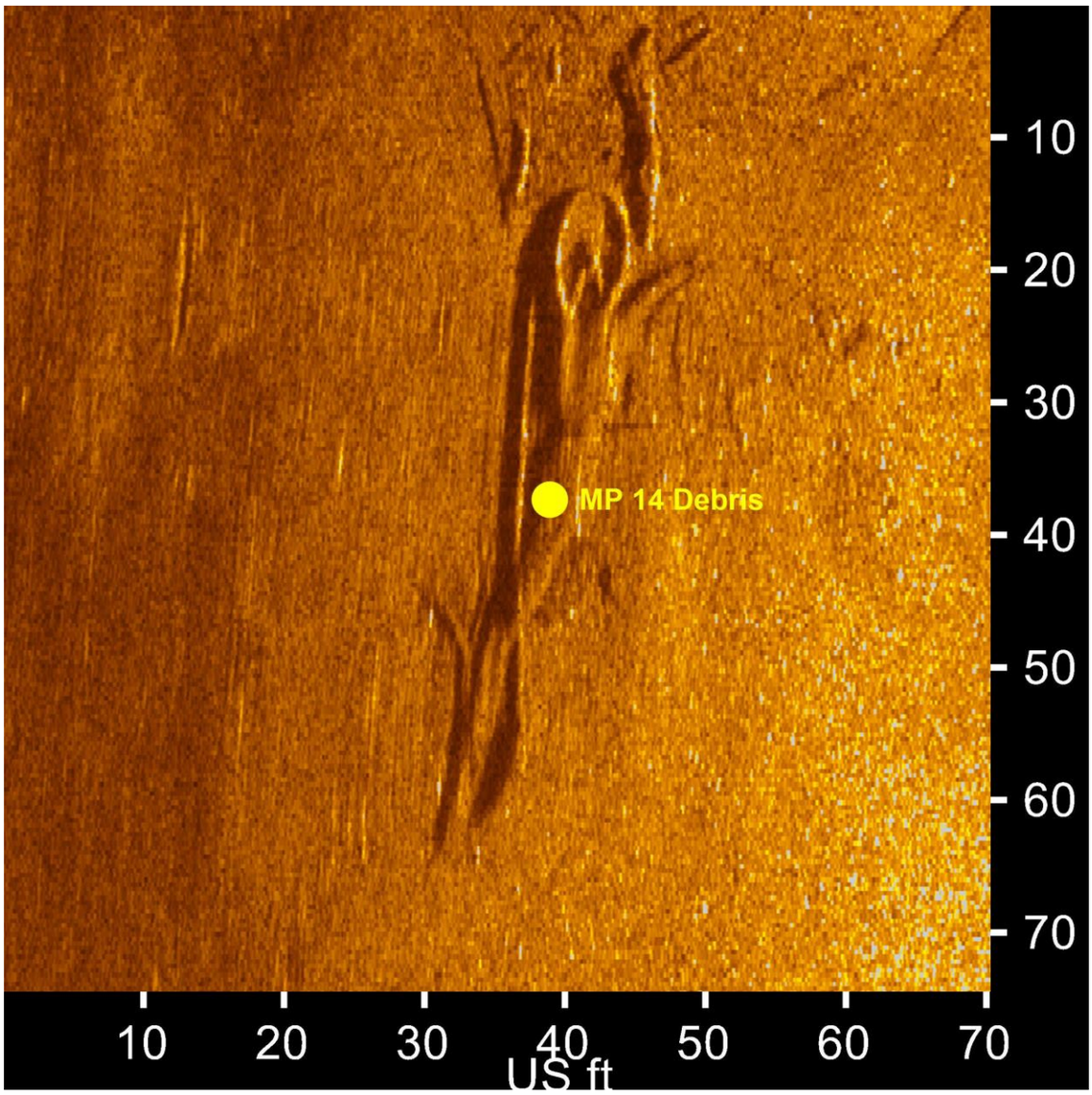


MP 13 Debris & Cable

- Sonar Time at Target: 10/25/2023 7:58:52 PM
- Click Position
  (X) 507650.50 (Y) 4921873.62 (Projected)
  44° 27.00337' N 068° 54.26058' W (NAD27LL)
  44° 27.00745' N 068° 54.23078' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025195624.jsf
- Course Made Good: 81.801 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

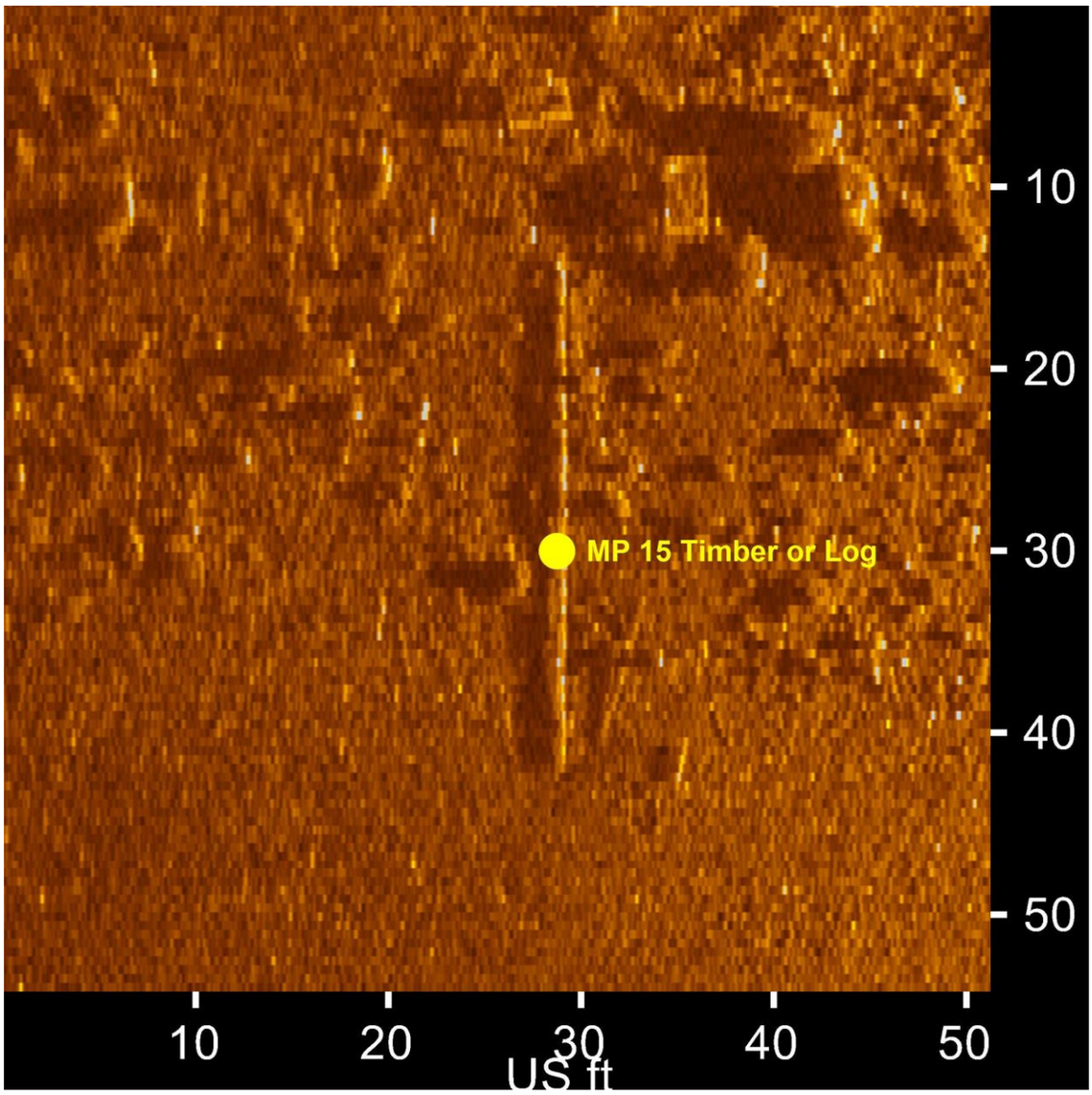


MP 14 Debris

- Sonar Time at Target: 10/26/2023 1:38:03 PM
- Click Position
  (X) 508016.53 (Y) 4922010.00 (Projected)
  44° 27.07679' N 068° 53.98443' W (NAD27LL)
  44° 27.08088' N 068° 53.95464' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026133736.jsf
- Course Made Good: 272.764 Degrees

Dimensions and attributes

- Target Width: 1.60 US ft
- Target Height: 0.00 US ft
- Target Length: 6.04 US ft
- Target Shadow: 0.00 US ft

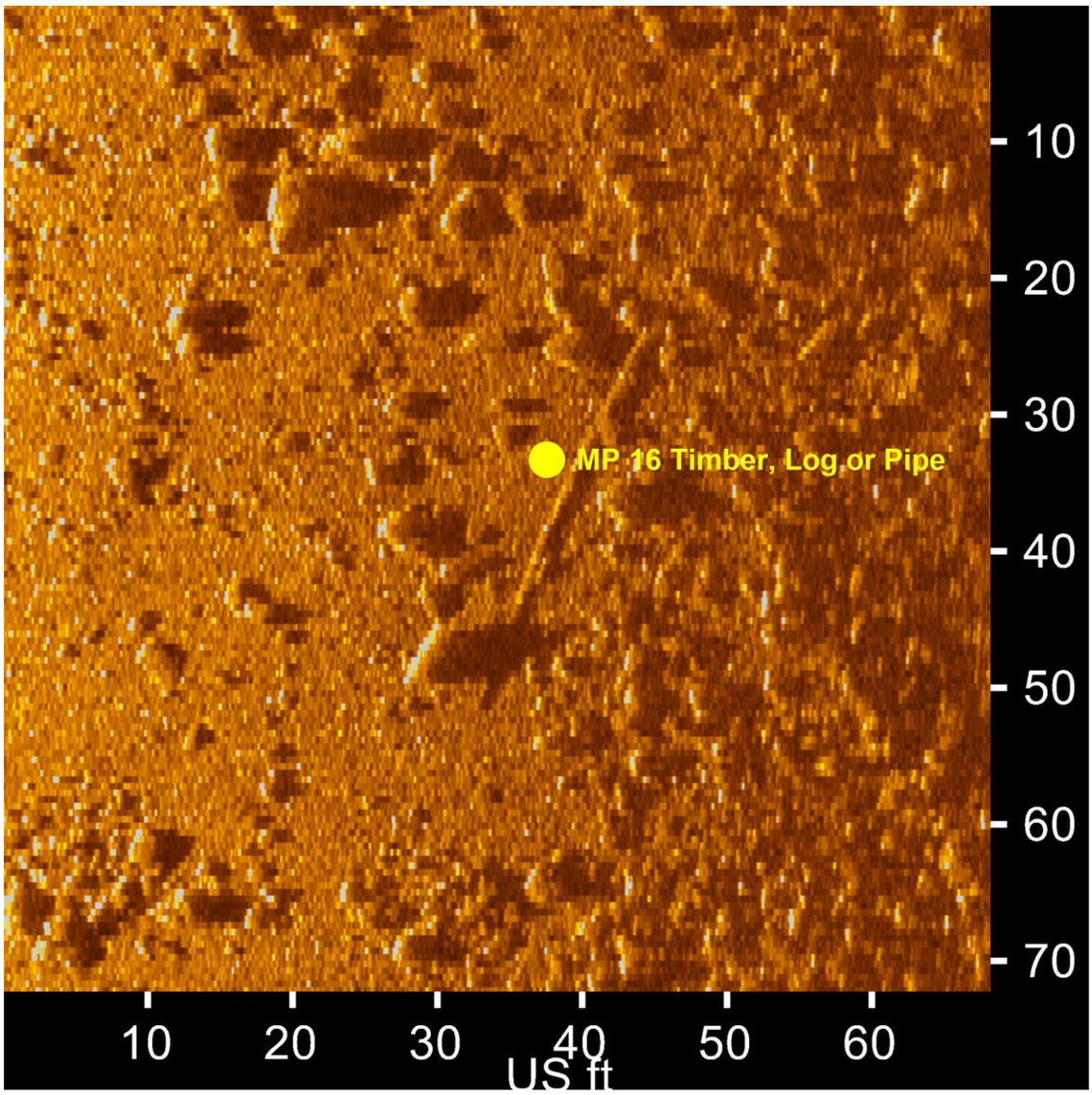


MP 15 Timber or Log

- Sonar Time at Target: 10/26/2023 1:42:08 PM
- Click Position
  (X) 507500.44 (Y) 4921917.51 (Projected)
  44° 27.02717' N 068° 54.37371' W (NAD27LL)
  44° 27.03125' N 068° 54.34391' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026133736.jsf
- Course Made Good: 261.170 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 8.87 US ft
- Target Shadow: 0.00 US ft

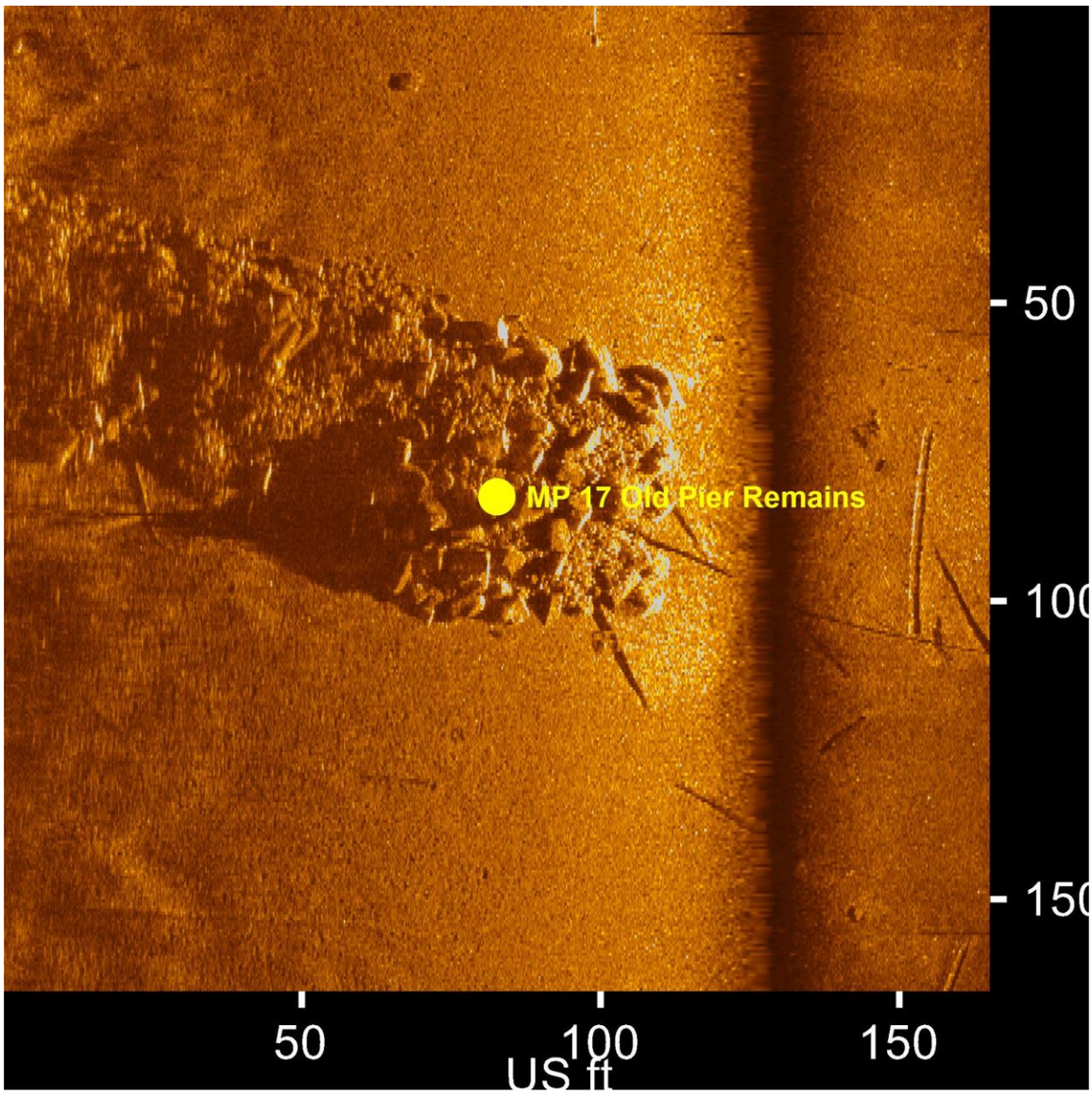


MP 16 Timber, Log or Pipe

- Sonar Time at Target: 10/26/2023 1:42:10 PM
- Click Position
  (X) 507489.05 (Y) 4921957.27 (Projected)
  44° 27.04866' N 068° 54.38226' W (NAD27LL)
  44° 27.05274' N 068° 54.35246' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026133736.jsf
- Course Made Good: 261.400 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 9.11 US ft
- Target Shadow: 0.00 US ft

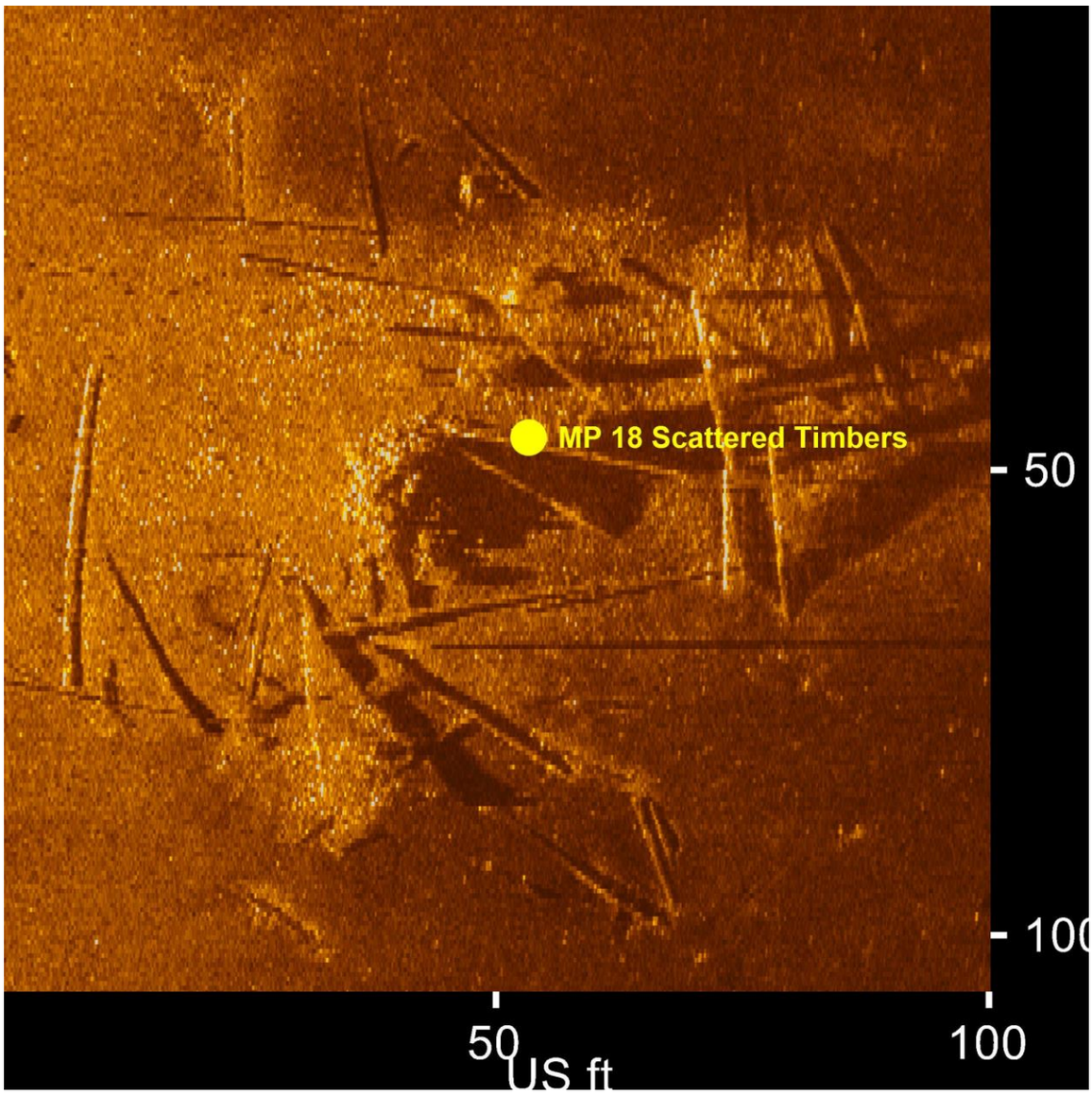


MP 17 Old Pier Remains

- Sonar Time at Target: 10/26/2023 1:49:28 PM
- Click Position
  (X) 507723.04 (Y) 4922002.04 (Projected)
  44° 27.07269' N 068° 54.20577' W (NAD27LL)
  44° 27.07677' N 068° 54.17597' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026134547.jsf
- Course Made Good: 82.168 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

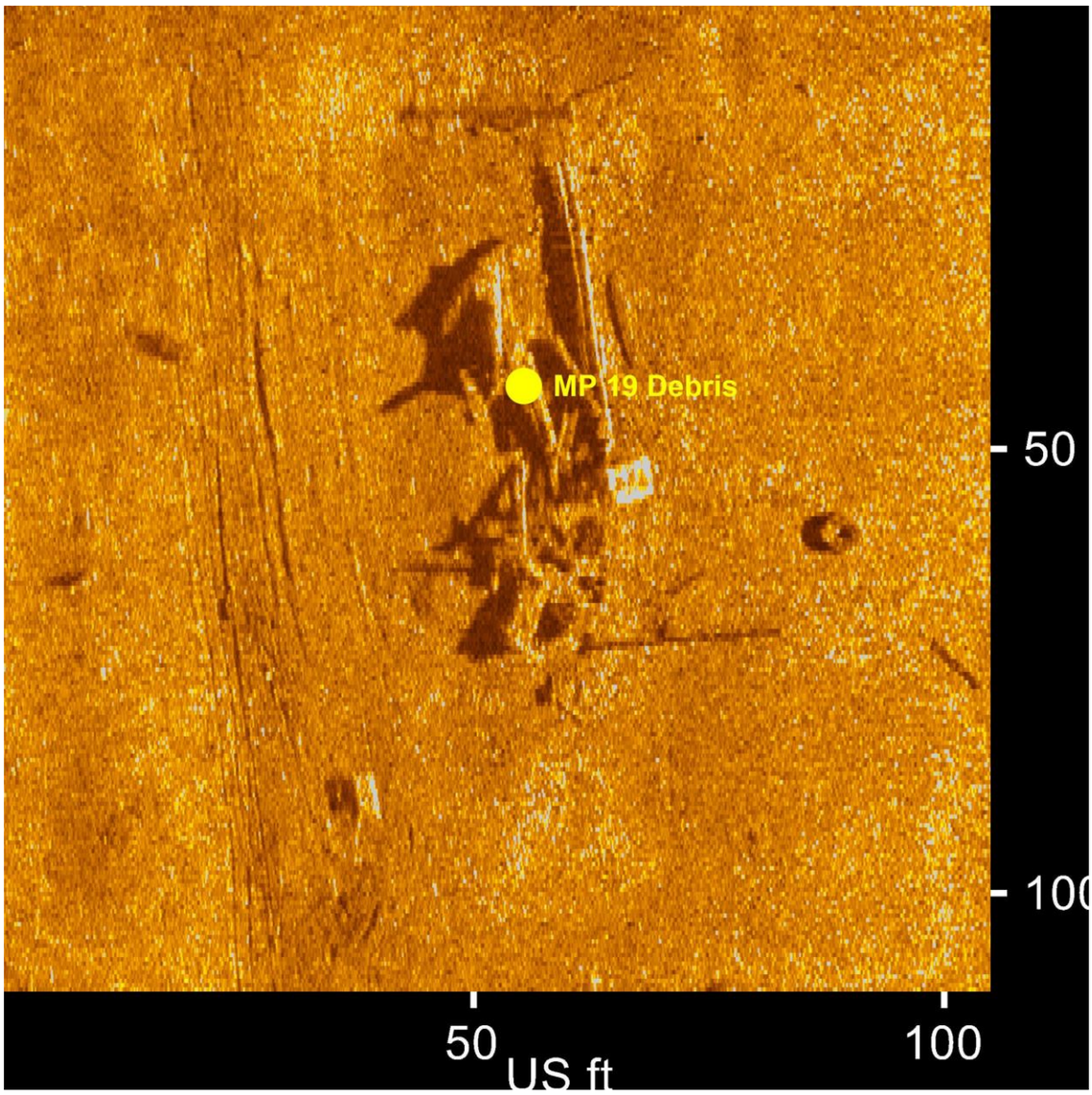


MP 18 Scattered Timbers

- Sonar Time at Target: 10/26/2023 1:49:28 PM
- Click Position
  (X) 507728.07 (Y) 4921967.00 (Projected)
  44° 27.05376' N 068° 54.20201' W (NAD27LL)
  44° 27.05784' N 068° 54.17221' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026134547.jsf
- Course Made Good: 82.121 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

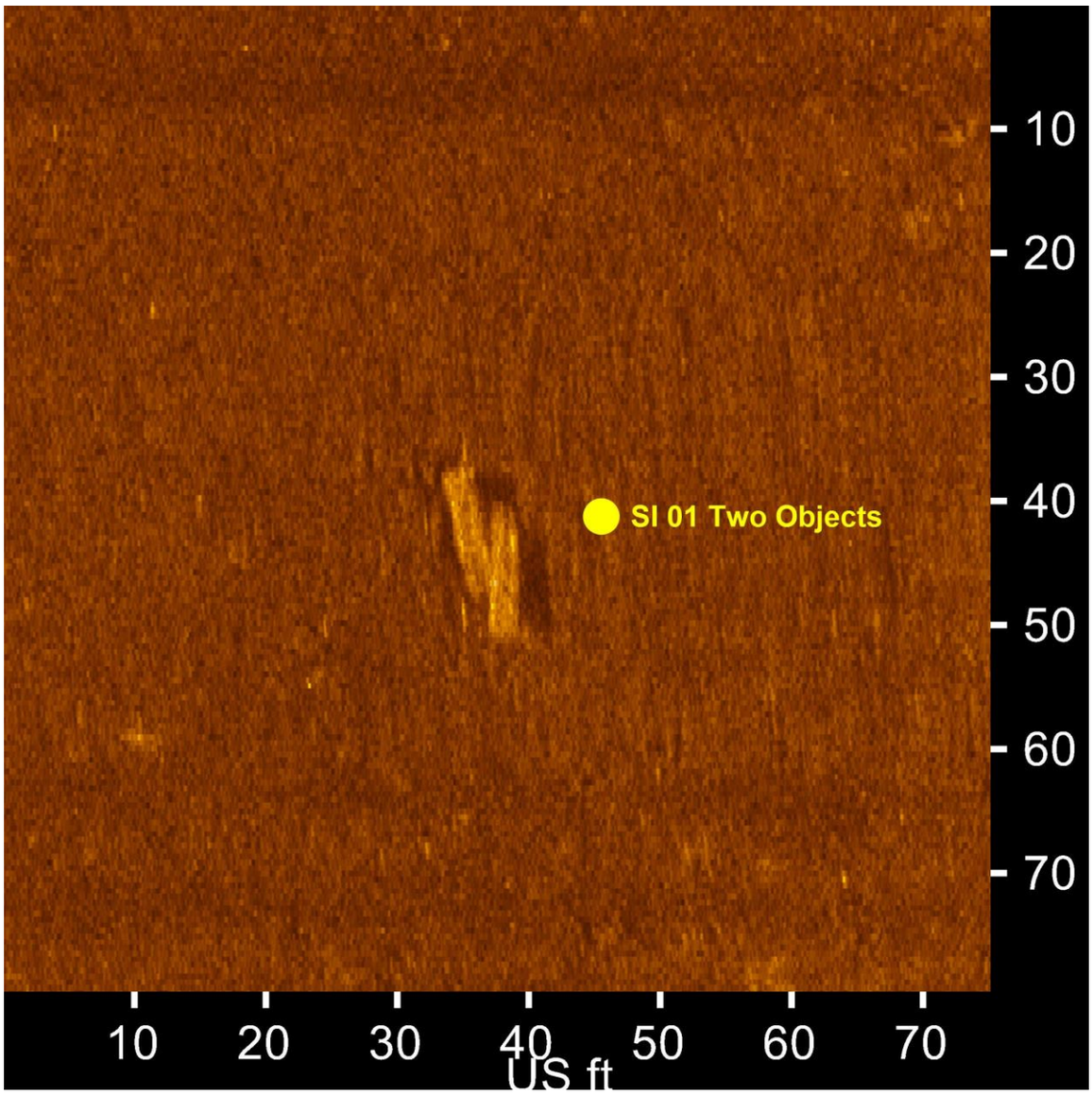


MP 19 Debris

- Sonar Time at Target: 10/25/2023 8:34:24 PM
- Click Position
  (X) 508182.81 (Y) 4921898.39 (Projected)
  44° 27.01639' N 068° 53.85914' W (NAD27LL)
  44° 27.02048' N 068° 53.82935' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025203402.jsf
- Course Made Good: 342.215 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

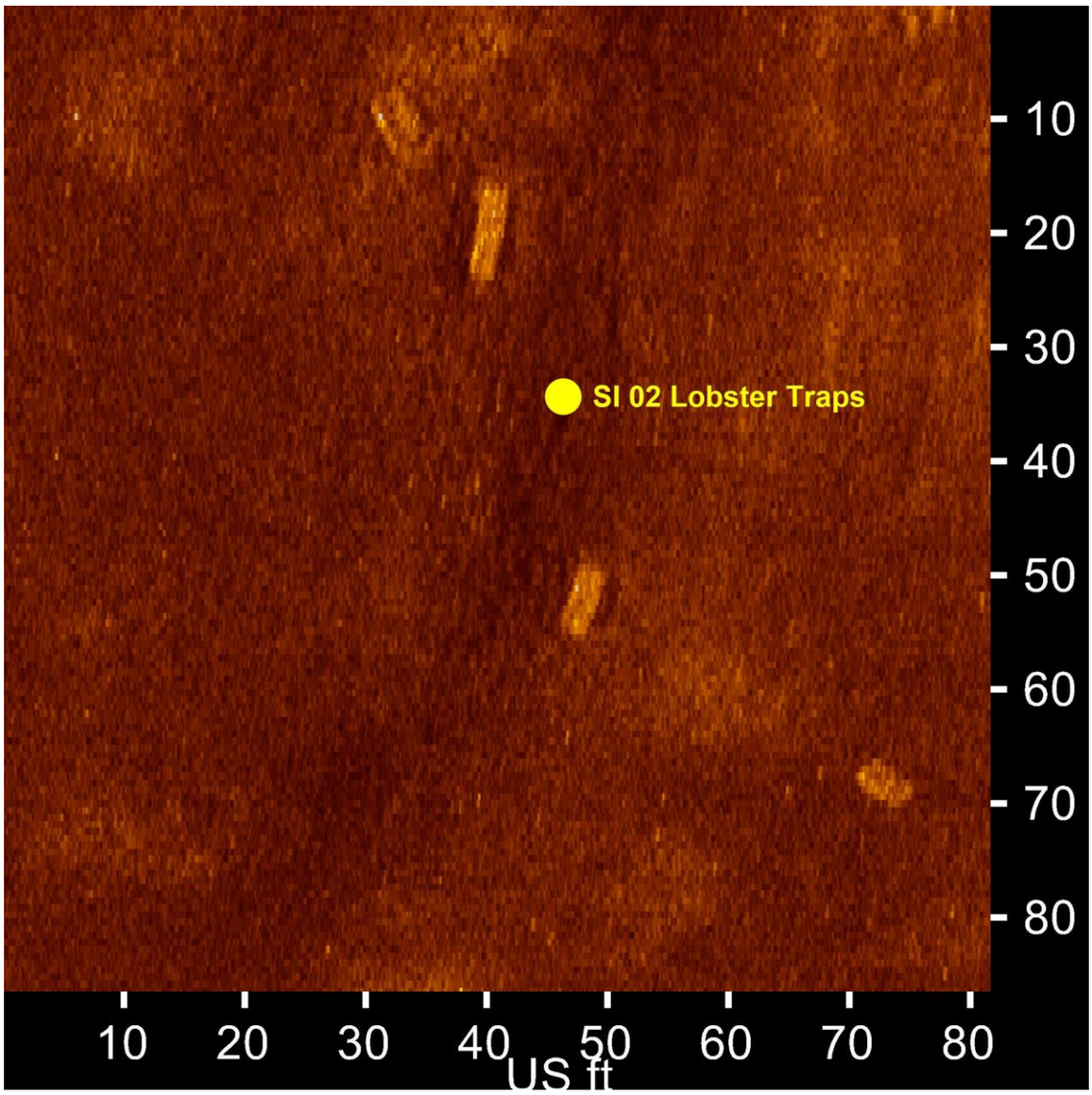


SI 01 Two Objects

- Sonar Time at Target: 10/25/2023 3:30:13 PM
- Click Position
  (X) 508095.33 (Y) 4920776.56 (Projected)
  44° 26.41047' N 068° 53.92615' W (NAD27LL)
  44° 26.41456' N 068° 53.89637' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025153005.jsf
- Course Made Good: 169.159 Degrees

Dimensions and attributes

- Target Width: 0.49 US ft
- Target Height: 0.39 US ft
- Target Length: 2.95 US ft
- Target Shadow: 1.28 US ft

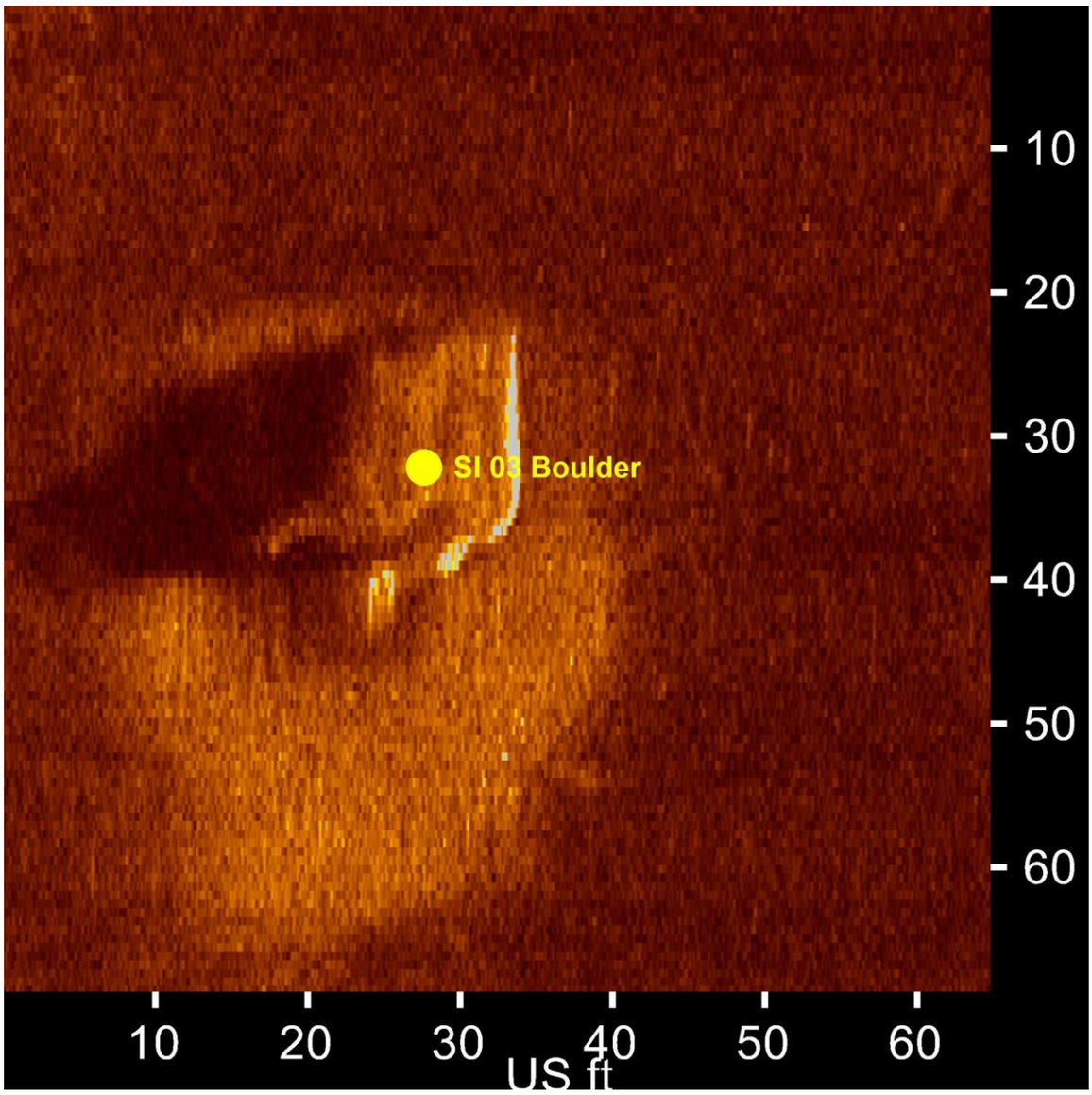


SI 02 Lobster Traps

- Sonar Time at Target: 10/25/2023 3:44:35 PM
- Click Position
  (X) 508208.04 (Y) 4920905.59 (Projected)
  44° 26.48008' N 068° 53.84105' W (NAD27LL)
  44° 26.48418' N 068° 53.81127' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025154233.jsf
- Course Made Good: 346.272 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

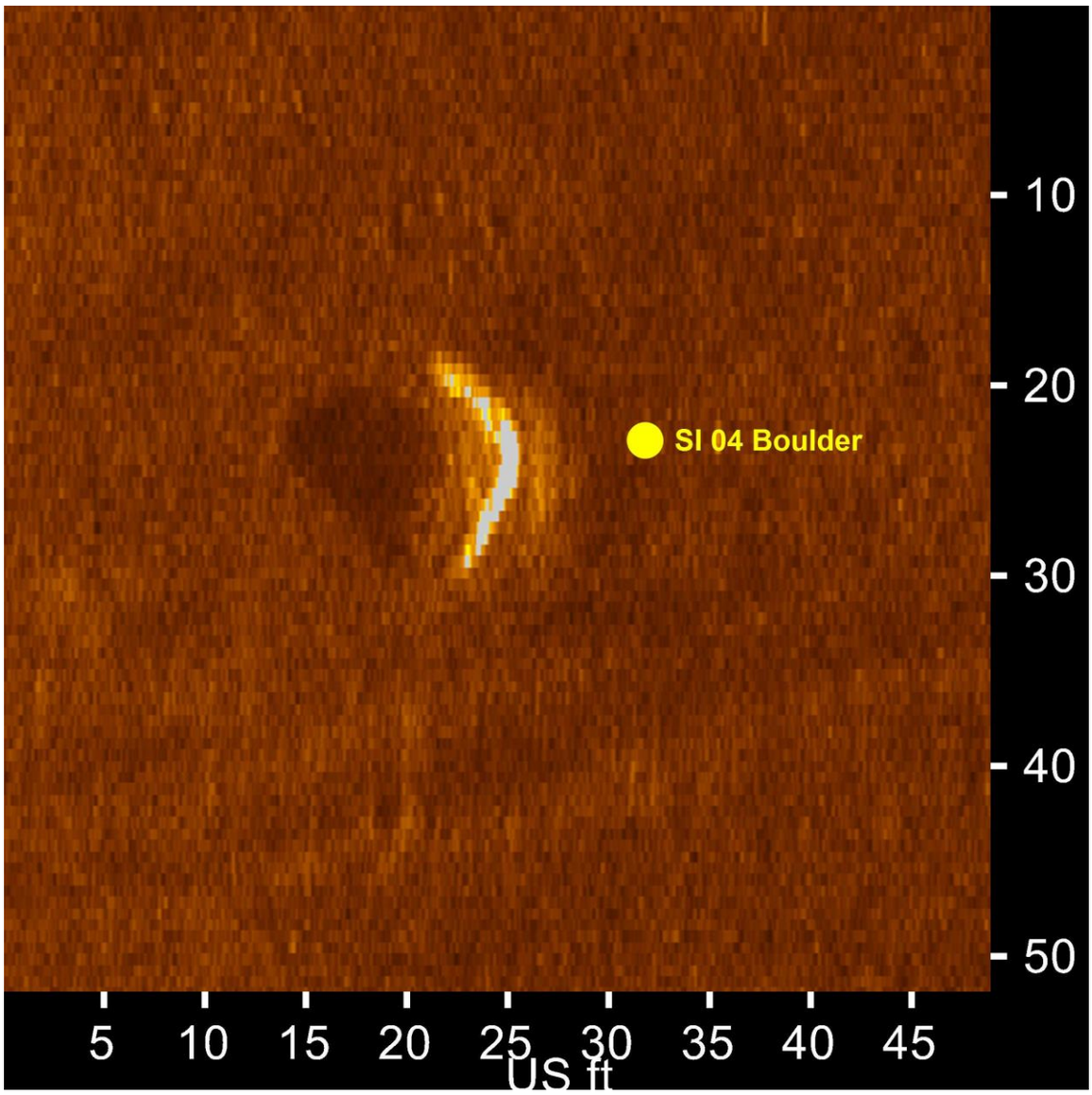


SI 03 Boulder

- Sonar Time at Target: 10/25/2023 4:00:35 PM
- Click Position
  (X) 508341.73 (Y) 4920644.75 (Projected)
  44° 26.33909' N 068° 53.74050' W (NAD27LL)
  44° 26.34319' N 068° 53.71072' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025155711.jsf
- Course Made Good: 167.271 Degrees

Dimensions and attributes

- Target Width: 3.63 US ft
- Target Height: 1.72 US ft
- Target Length: 4.94 US ft
- Target Shadow: 8.10 US ft

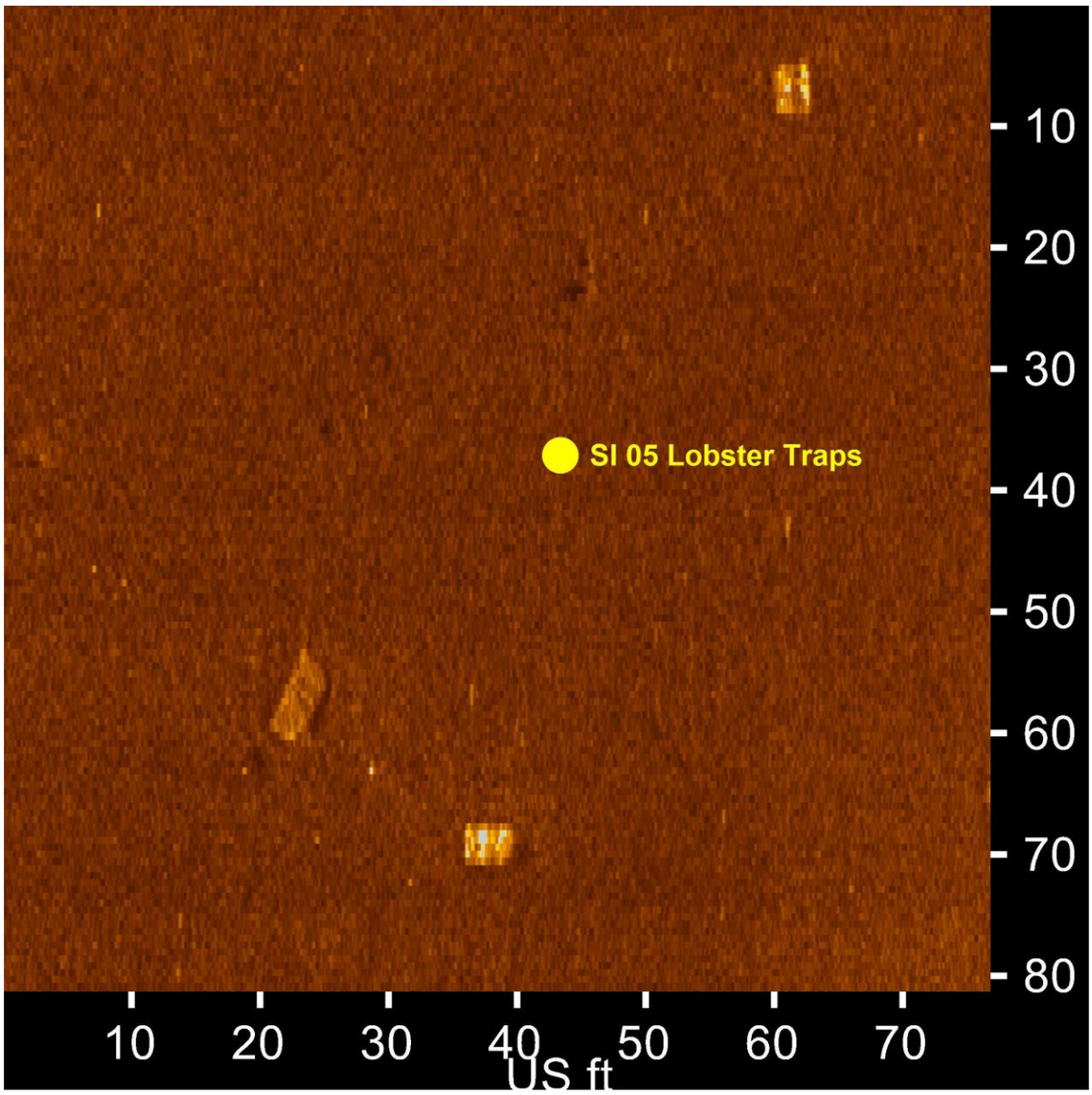


SI 04 Boulder

- Sonar Time at Target: 10/25/2023 4:00:17 PM
- Click Position
  (X) 508329.93 (Y) 4920690.33 (Projected)
  44° 26.36373' N 068° 53.74935' W (NAD27LL)
  44° 26.36783' N 068° 53.71958' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025155711.jsf
- Course Made Good: 167.119 Degrees

Dimensions and attributes

- Target Width: 1.41 US ft
- Target Height: 1.31 US ft
- Target Length: 3.44 US ft
- Target Shadow: 5.50 US ft

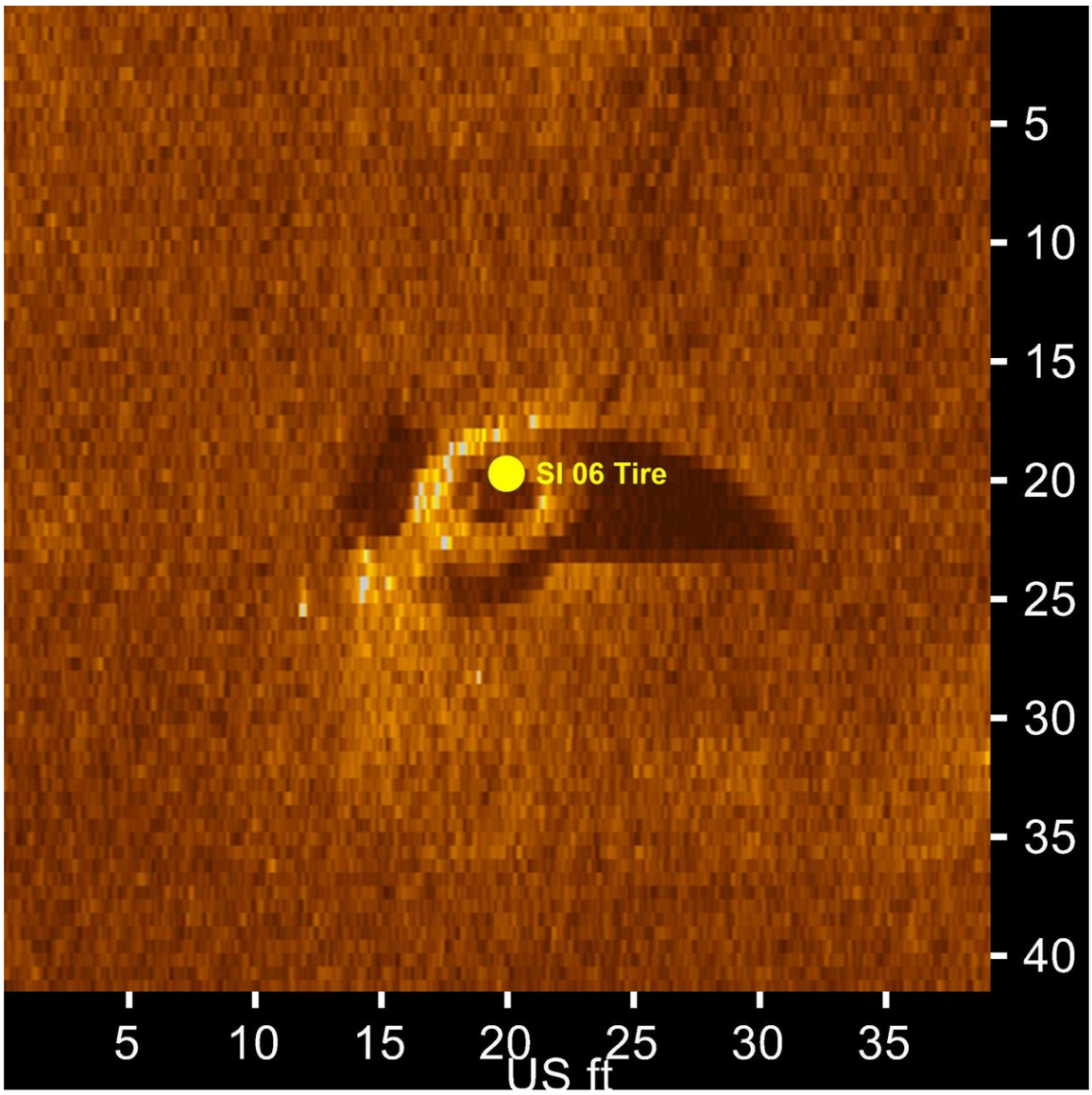


SI 05 Lobster Traps

- Sonar Time at Target: 10/25/2023 4:09:28 PM
- Click Position
  (X) 508213.90 (Y) 4921119.27 (Projected)
  44° 26.59551' N 068° 53.83643' W (NAD27LL)
  44° 26.59960' N 068° 53.80665' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025160826.jsf
- Course Made Good: 166.684 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

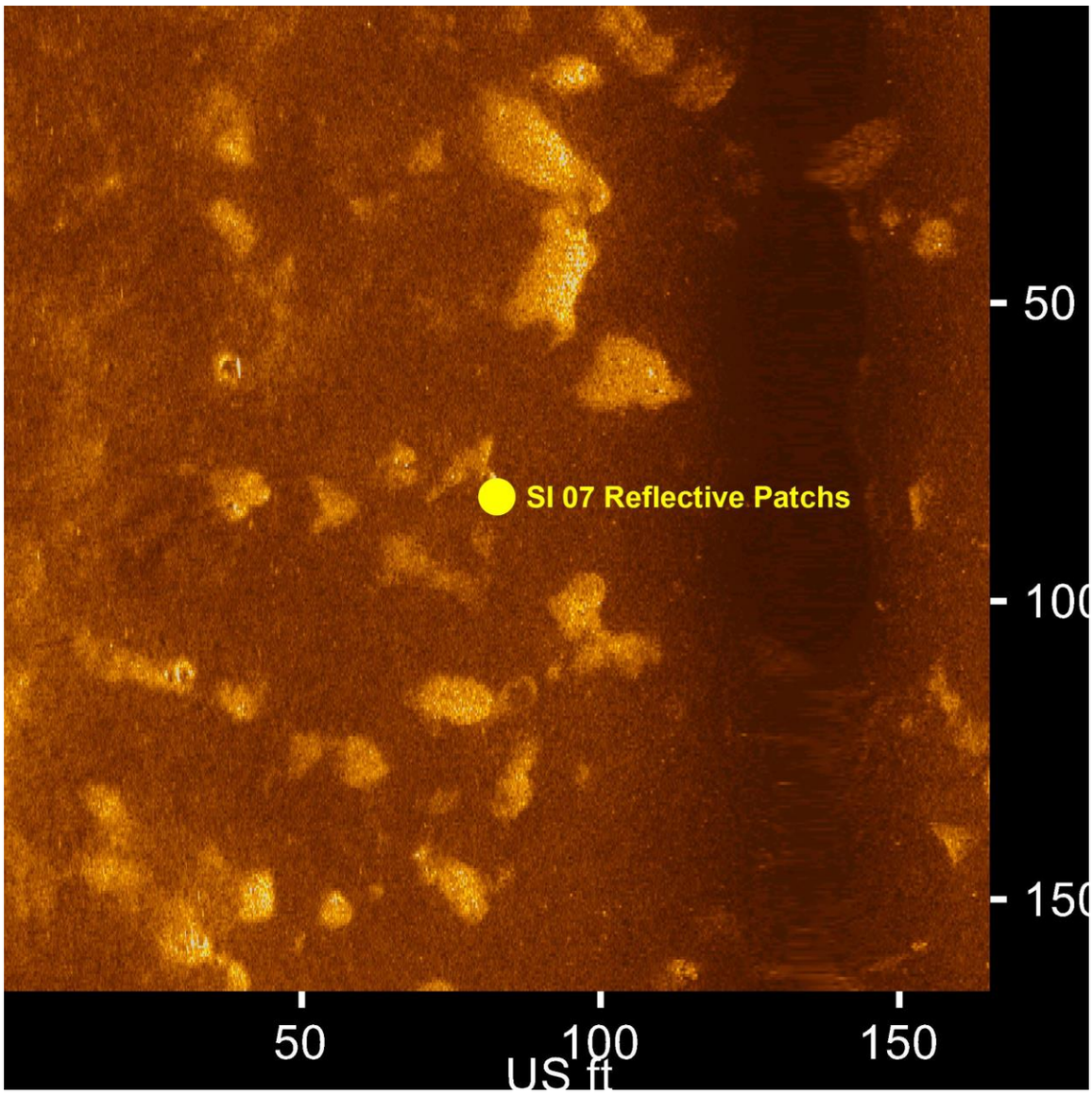


SI 06 Tire

- Sonar Time at Target: 10/25/2023 4:46:49 PM
- Click Position
  (X) 880950.75 (Y) 282552.42 (Projected)
  44° 26.46450' N 068° 53.76222' W (NAD27LL)
  44° 26.46860' N 068° 53.73244' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025164015.jsf
- Course Made Good: 166.760 Degrees

Dimensions and attributes

- Target Width: 1.83 US ft
- Target Height: 1.19 US ft
- Target Length: 1.78 US ft
- Target Shadow: 2.85 US ft

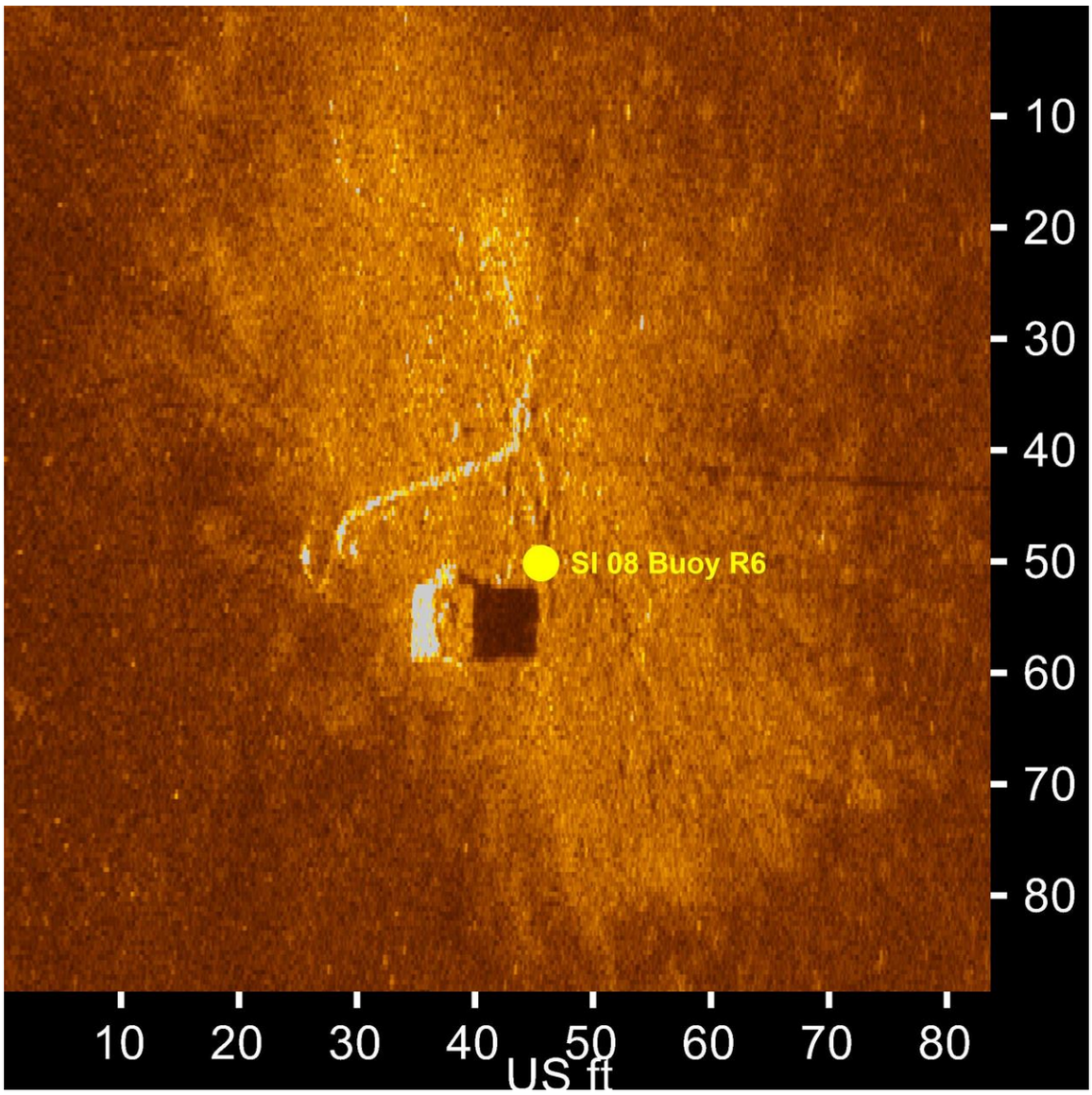


SI 07 Reflective Patchs

- Sonar Time at Target: 10/26/2023 11:19:28 AM
- Click Position
  (X) 508334.89 (Y) 4920945.02 (Projected)
  44° 26.50130' N 068° 53.74536' W (NAD27LL)
  44° 26.50539' N 068° 53.71559' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026111619.jsf
- Course Made Good: 347.223 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

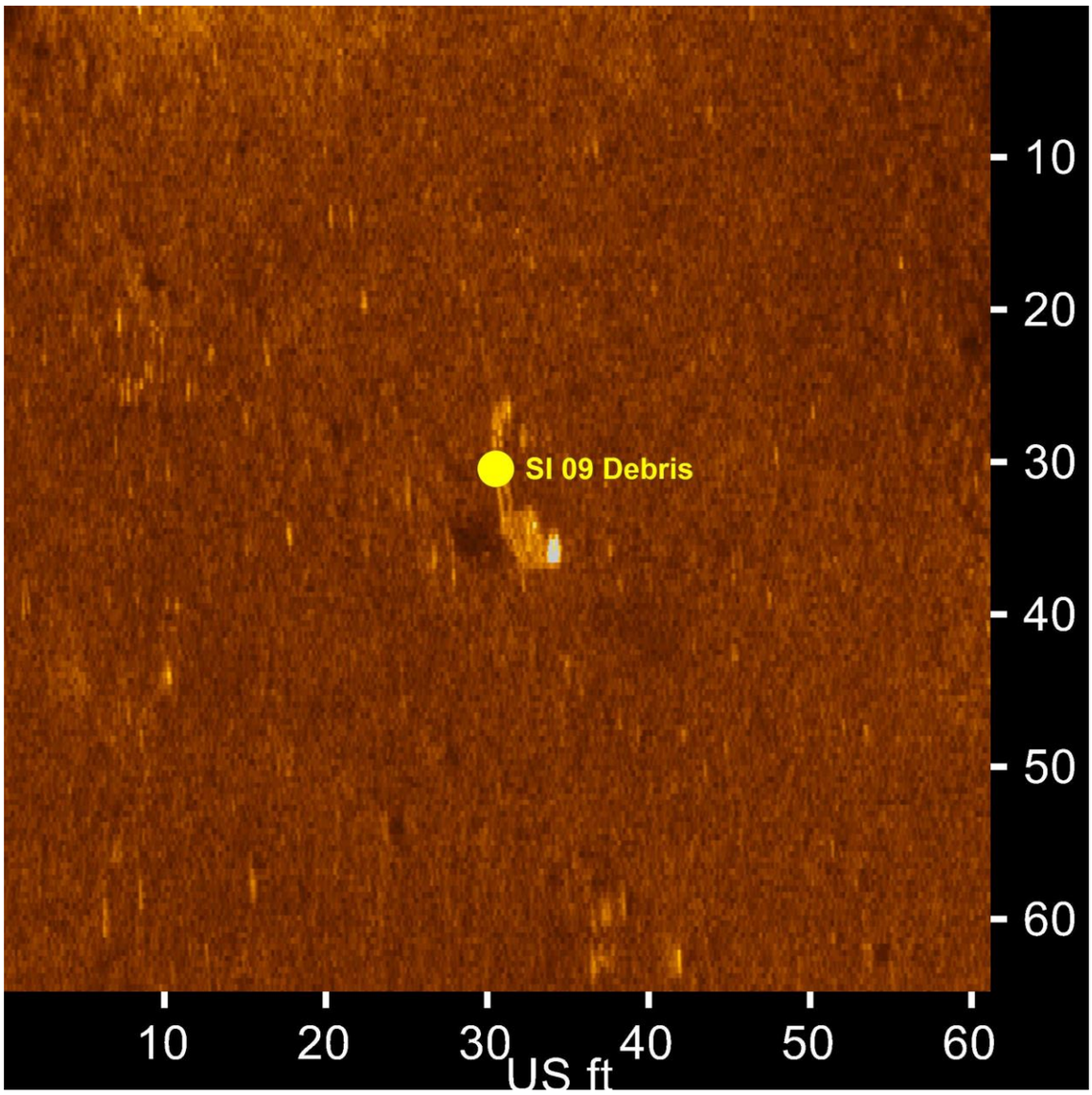


SI 08 Buoy R6

- Sonar Time at Target: 10/26/2023 11:51:17 AM
- Click Position
  (X) 508372.05 (Y) 4921320.19 (Projected)
  44° 26.70393' N 068° 53.71698' W (NAD27LL)
  44° 26.70803' N 068° 53.68720' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026114330.jsf
- Course Made Good: 28.613 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft

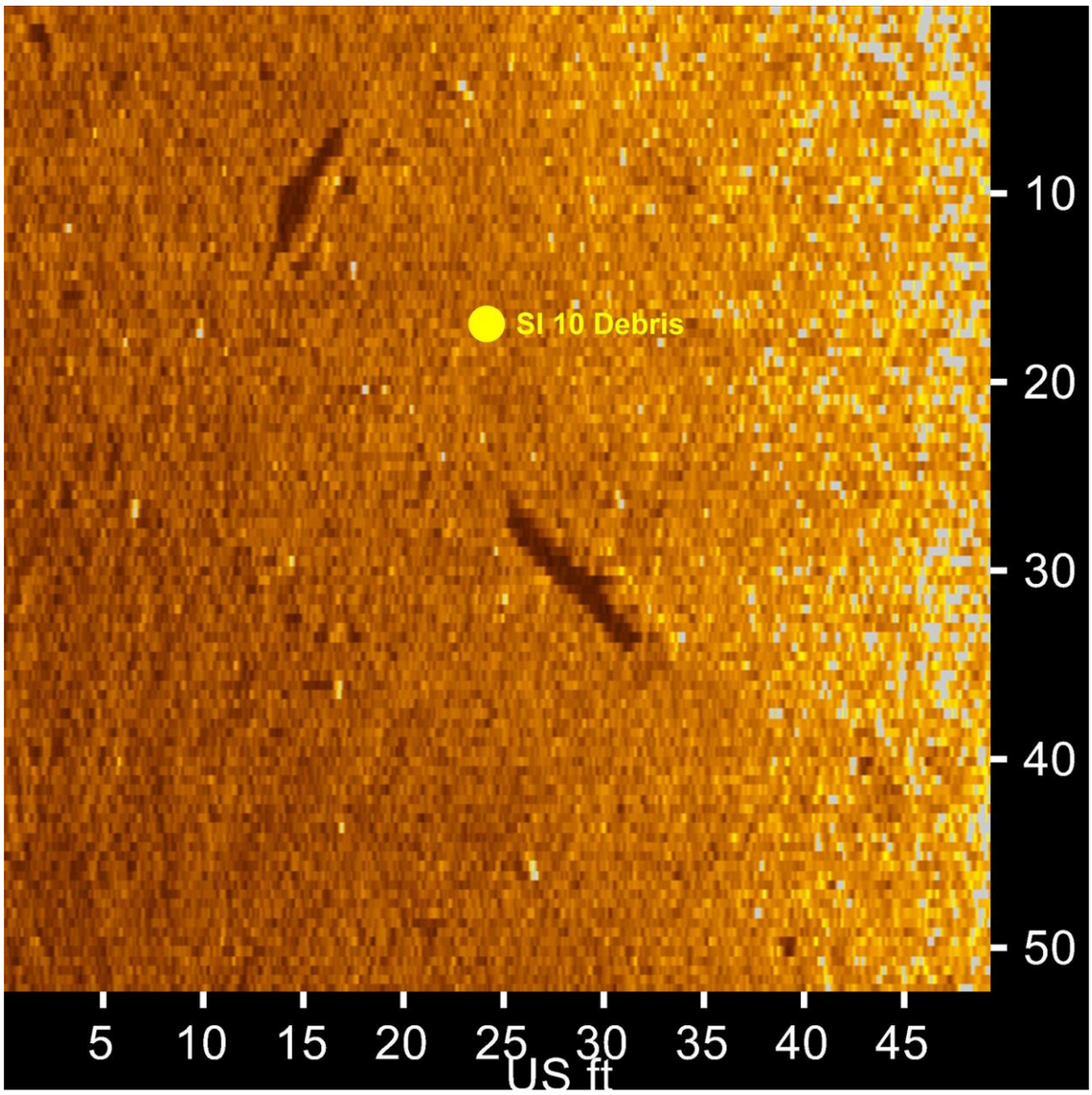


SI 09 Debris

- Sonar Time at Target: 10/26/2023 11:53:11 AM
- Click Position
  (X) 508410.23 (Y) 4921512.82 (Projected)
  44° 26.80795' N 068° 53.68801' W (NAD27LL)
  44° 26.81205' N 068° 53.65823' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026114330.jsf
- Course Made Good: 27.848 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.18 US ft
- Target Length: 3.21 US ft
- Target Shadow: 0.73 US ft

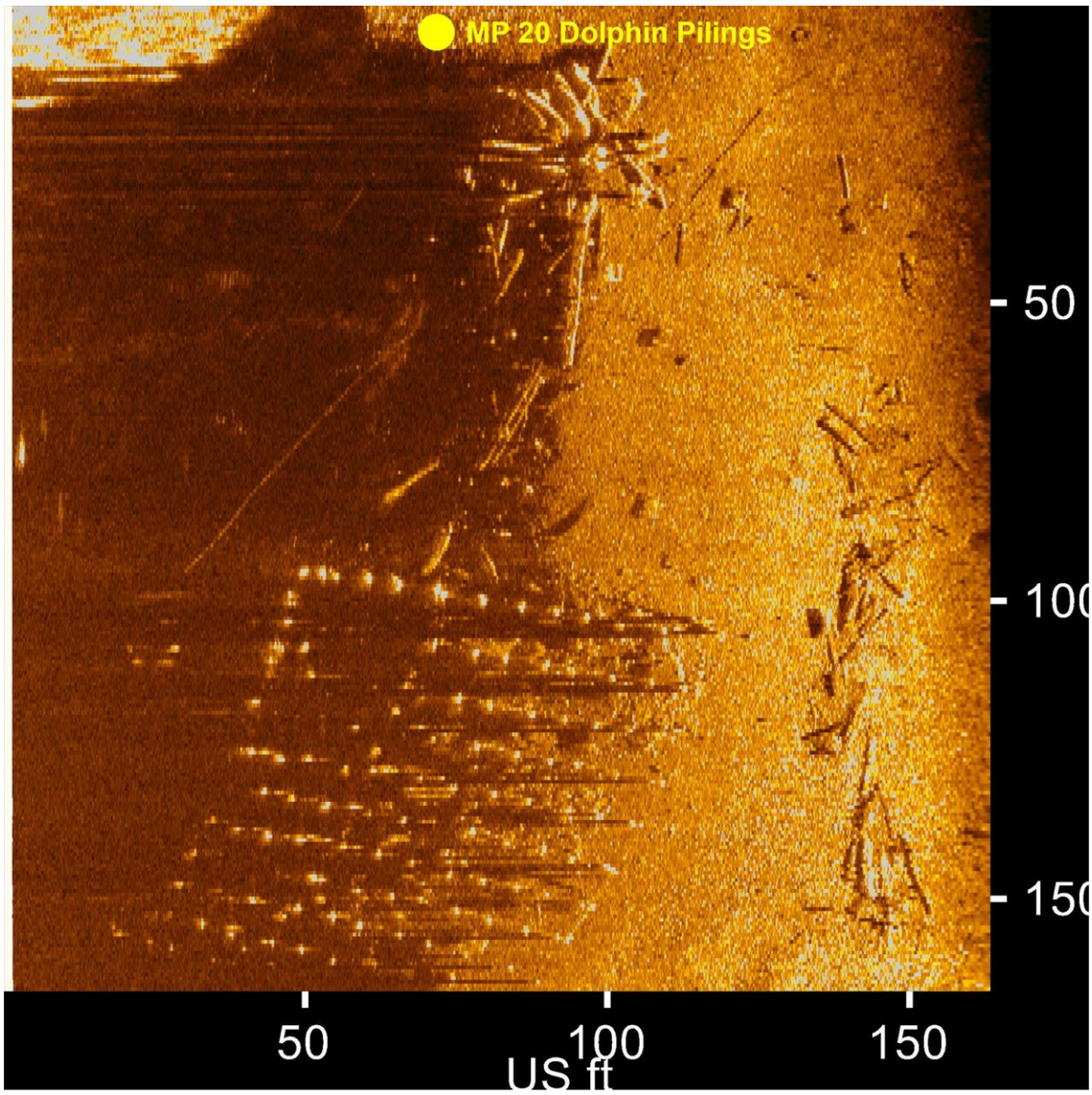


SI 10 Debris

- Sonar Time at Target: 10/26/2023 12:31:12 PM
- Click Position
  (X) 508502.21 (Y) 4921292.41 (Projected)
  44° 26.68883' N 068° 53.61887' W (NAD27LL)
  44° 26.69293' N 068° 53.58909' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231026122652.jsf
- Course Made Good: 206.130 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 3.14 US ft
- Target Shadow: 0.00 US ft

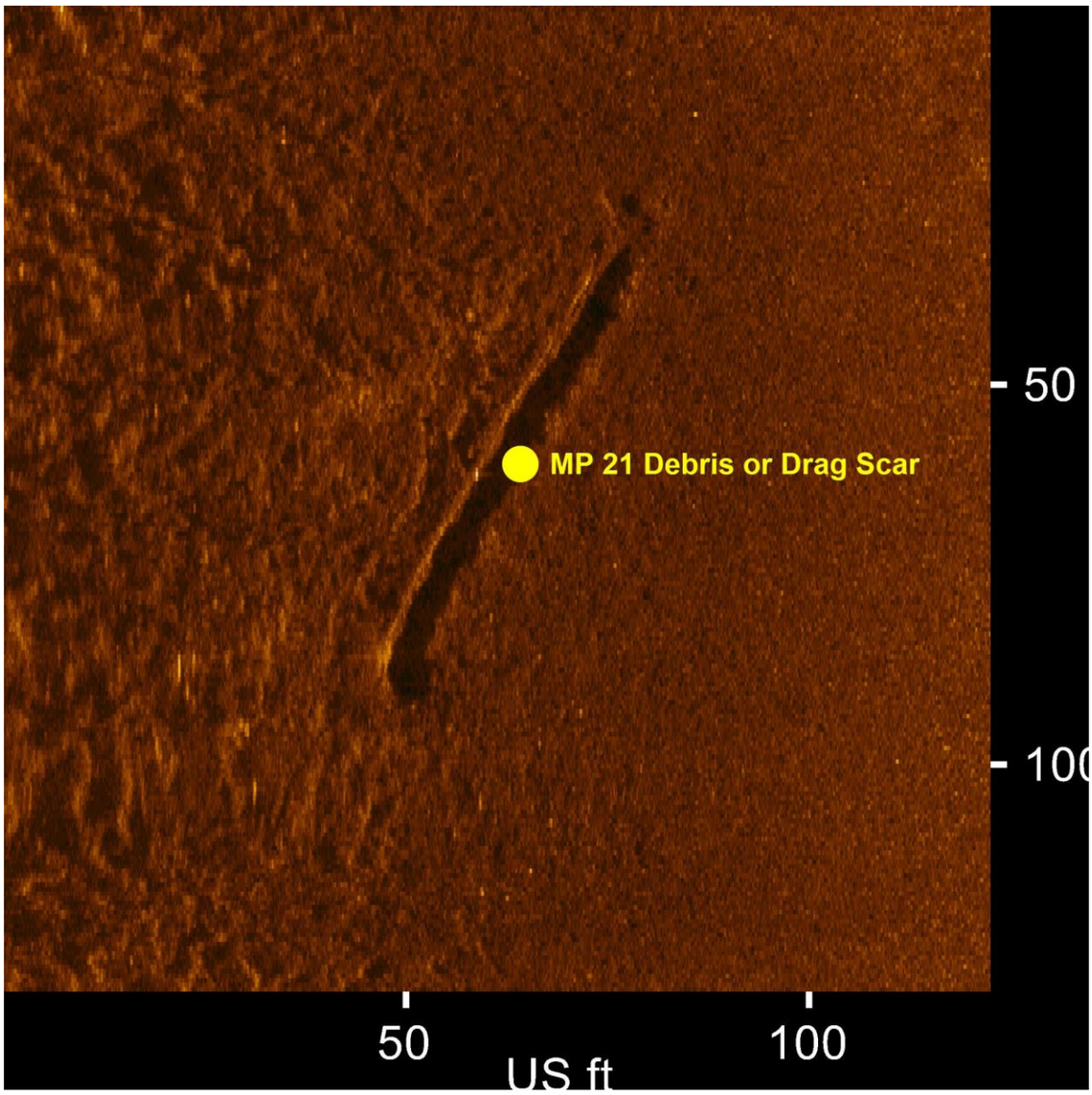


MP 20 Dolphin Pilings

- Sonar Time at Target: 10/25/2023 8:32:05 PM
- Click Position
  (X) 508105.15 (Y) 4921967.92 (Projected)
  44° 27.05400' N 068° 53.91764' W (NAD27LL)
  44° 27.05809' N 068° 53.88784' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025202645.jsf
- Course Made Good: 151.149 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft



MP 21 Debris or Drag Scar

- Sonar Time at Target: 10/25/2023 7:51:22 PM
- Click Position
  (X) 507849.21 (Y) 4921834.98 (Projected)
  44° 26.98236' N 068° 54.11077' W (NAD27LL)
  44° 26.98645' N 068° 54.08097' W (LocalLL)
- Map Projection: EPSG:32619
- Acoustic Source File: 20231025194845.jsf
- Course Made Good: 263.284 Degrees

Dimensions and attributes

- Target Width: 0.00 US ft
- Target Height: 0.00 US ft
- Target Length: 0.00 US ft
- Target Shadow: 0.00 US ft