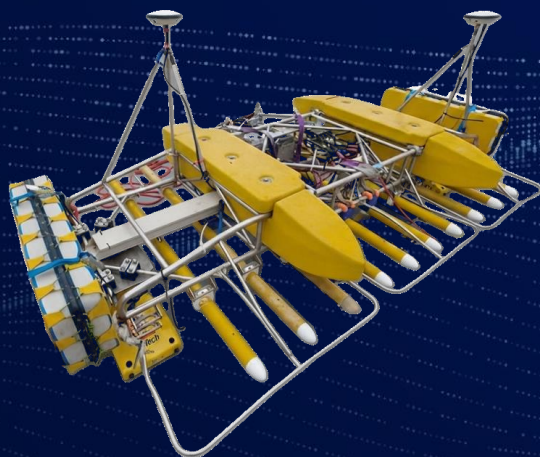


SUB-BOTTOM IMAGING

3D Chirp

True 3D imaging of the **shallow subsurface**: buried objects, cables and geology in one volume.



The 3D Chirp is a surface-towed seismic imaging system that acquires high-resolution, three-dimensional datasets of the shallow subsurface. It produces true 3D seismic volumes of the upper tens of metres of sediment, imaging buried objects, cables and geological structure with decimetre-scale horizontal and centimetre-scale vertical resolution.

Two EdgeTech 3400-OTS Light chirp sources, a 60-channel hydrophone array and a Seapath 380 inertially aided GNSS system with RTK corrections are mounted on a rigid frame, maintaining precise source–receiver geometry and repeatable acquisition throughout the survey.

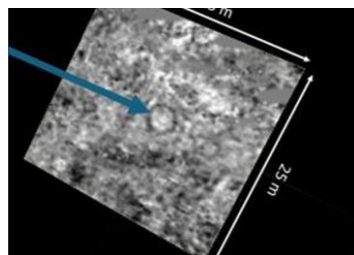
Data are processed on source–receiver mid-points using a 3D seismic workflow. The resulting volumes can be sliced in any direction, supporting buried-object assessment, cable depth-of-burial measurement, geohazard assessment and detailed ground modelling.

APPLICATIONS

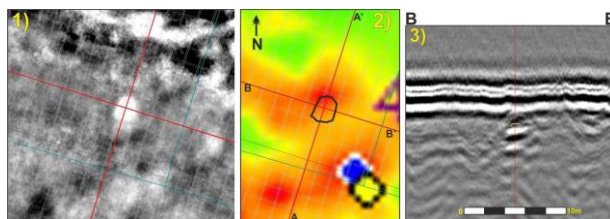
- Pre-construction hazard avoidance
- Pipeline and cable route assessment
- Post-construction cable depth of burial
- UXO detection and analysis
- Marine archaeology
- High-resolution stratigraphy
- Offshore engineering and infrastructure surveys

FEATURES & BENEFITS

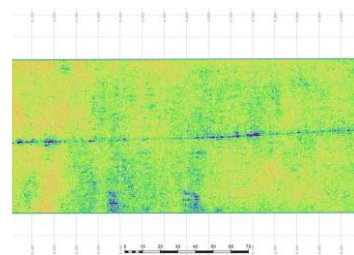
- Wide-bandwidth dual chirp sources, 2–16 kHz
- 60-channel areal hydrophone array for high fold and improved signal-to-noise
- True 3D, geometrically corrected imaging: NMO-stacked and pre-stack migrated volumes
- 2.5 m swath per pass with trace spacing under 0.1 m
- Industry-standard 3D SEG-Y output for interpretation in common software
- Seismic inversion for geotechnical properties, such as relative density and undrained shear strength, where calibration data are available



Stage 1: 3D diffraction ring from a buried object in a time slice (25 m × 25 m).



Stage 2: migrated target analysis, object c. 0.6 m below seabed. 1) Time slice 2) Magnetic data 3) Profile.

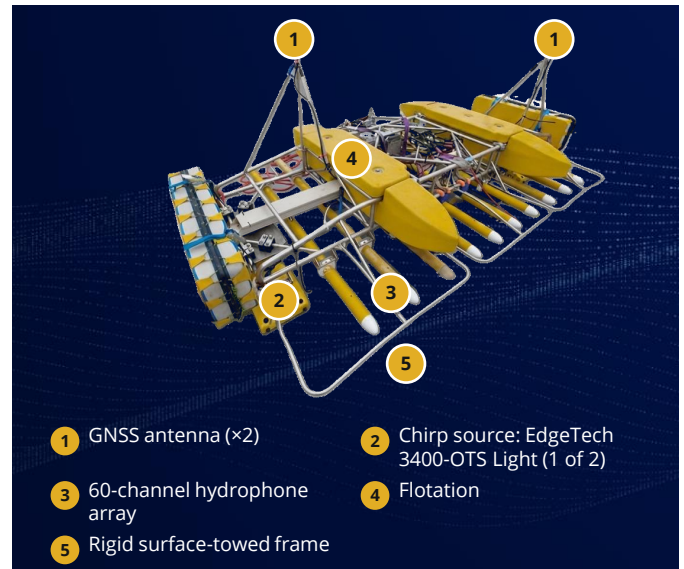


Amplitude attribute tracing a buried cable along the survey corridor.

3D Chirp Specifications

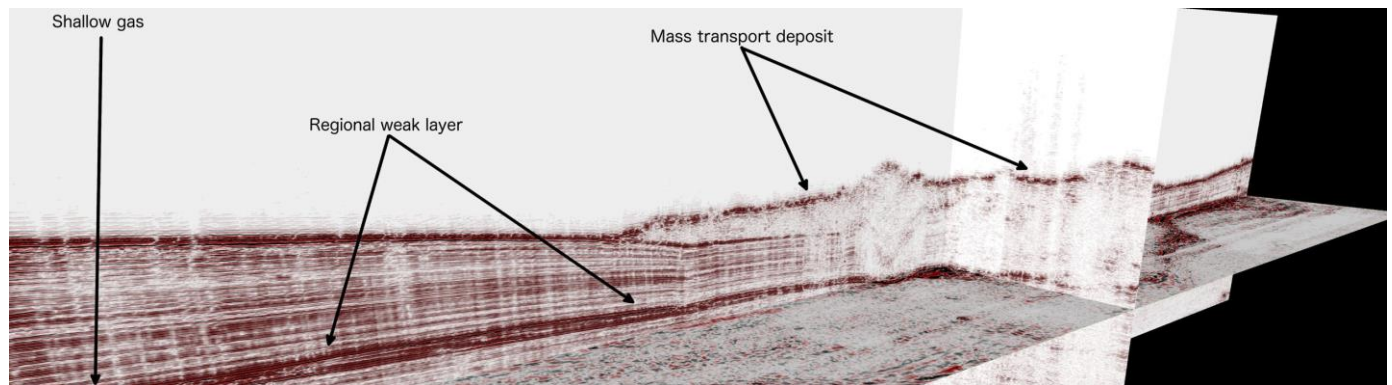
Parameter	Specification
Acoustic sources	2 × EdgeTech 3400-OTS Light chirp
Source bandwidth	2–16 kHz
Receiver array	60 hydrophone channels (10 across-track × 6 along-track)
Positioning	Seapath 380 inertially aided GNSS with MRU 5+ and RTK corrections
Mounting	Rigid surface-towed frame
Frame dimensions	2.9 × 1.8 m
Weight	240 kg
Swath	2.5 m per pass
Trace spacing	< 0.1 m
Horizontal resolution	Decimetre-scale
Vertical resolution	c. 5 cm demonstrated in finer-grained soils
Penetration	Upper tens of metres (sediment dependent)
Processing outputs	NMO-stacked and pre-stack migrated 3D volumes; seismic inversion (optional)
Data output	3D SEG-Y
Sound Pressure Level	203 dB re 1 µPa @ 1 m (RMS) 210 dB re 1 µPa @ 1 m (peak)

Performance depends on site conditions, including sediment type, target size, contrast, orientation and burial depth, noise, positioning and survey geometry. Resolution values describe imaging capability and are not detection guarantees.



ADVANCED 3D PROCESSING

Combining data from multiple sources, receivers and survey passes improves signal-to-noise. Deghosting, demultiple and designature processing suppress coherent noise, and the full waveform is preserved for quantitative inversion.



Interpreted 3D Chirp volume showing shallow gas, a regional weak layer and a mass transport deposit.

1 Detect

NMO-stacked volumes show buried objects as 3D diffractions, logged with X, Y and Z.

2 Characterise

Pre-stack migration focuses targets to estimate position, shape, dimensions and burial depth.

3 Interpret

Geology, cables and targets are mapped in plan and section at any orientation.