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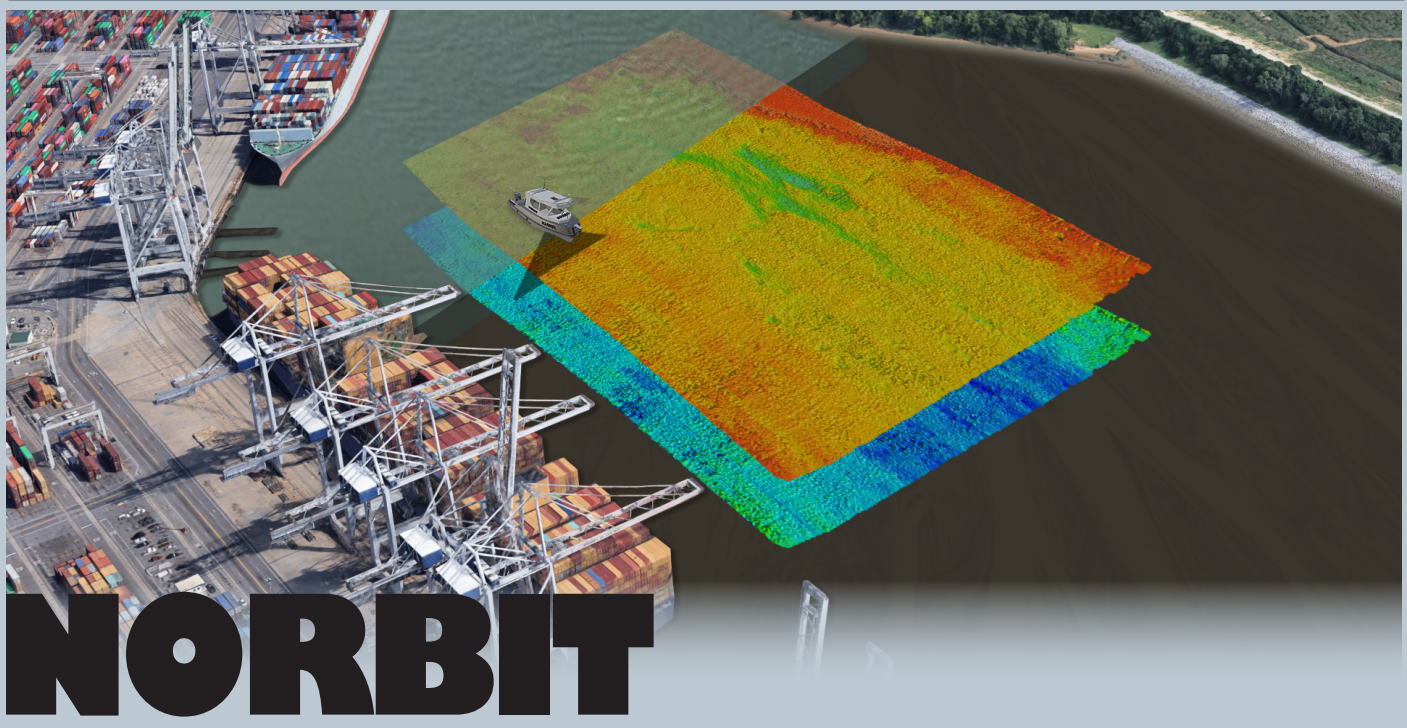
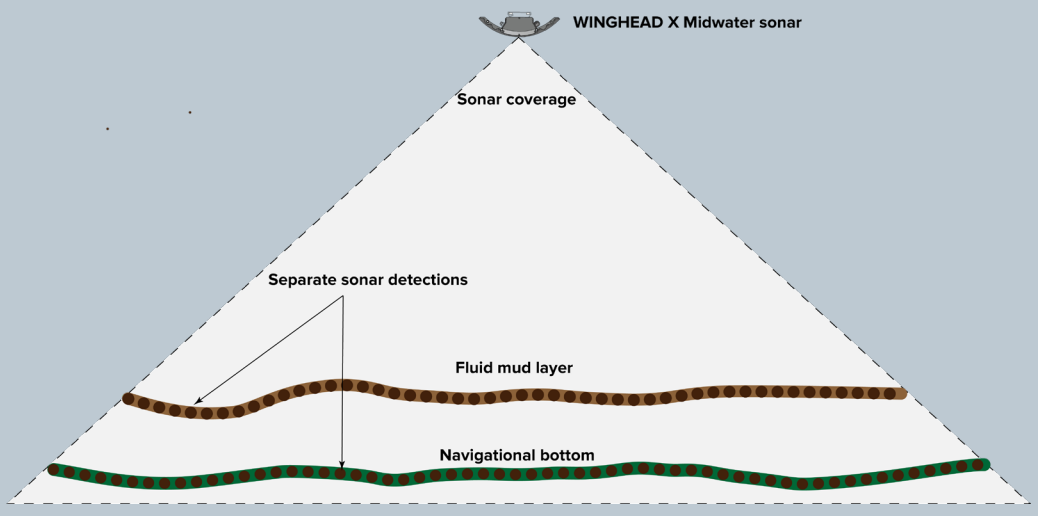


Acoustic Sensors for Layered Media Detection (LMD)

The NORBIT LMD is a unique NORBIT approach to ZOC category A1 hydrographic survey over the areas with suspended muds using portable multibeam echo sounders. It provides a clear identification of both fluid mud layer and navigable bottom layer. It provides a clear identification of both fluid mud layer and navigable bottom layer in one single surveying operation with reduced need to run single beam echo sounder or density profiling. This ground-breaking solution uses NORBIT WINGHEAD X Midwater, operating with an ultra-wide frequency range of 50-440 kHz. It operates by using two concurrent detection processes within the same broadband signal, each at different frequency bands, to identify separate layers.

Different frequency bands exploit the frequency-dependent propagation characteristics of acoustic waves in stratified seabed environments. Higher acoustic frequencies are used to detect the surface of fluid mud layers, while lower frequencies penetrate deeper to detect the harder underlying seabed. By combining information from multiple frequency bands, the sonar system can distinguish between sediment layers and identify the navigational bottom separately from the overlying fluid mud.



Layered media detection (LMD) method showing two separately detected layers.

WINGHEAD®

Acoustic Sensors for Layered Media Detection (LMD)

NORBIT WINGHEAD X Midwater

Ultra High-Resolution, integrated, 3D Long Range, Motion Stabilised Bathymetric System for LMD

The Long Range WINGHEAD X Midwater is a versatile, dual-use sonar system designed for ultra-high-resolution underwater imaging, featuring a curved-array broadband multibeam echo sounder. Engineered to perform reliably in the most demanding and harsh environments, the WINGHEAD X Midwater combines cutting-edge technology with a compact form factor, making it ideal for deployments where space is limited.

The system supports LMD operations, enhancing its ability to conduct accurate underwater measurements. Additionally, its integrated GNSS/INS navigation system makes the WINGHEAD X Midwater an all-in-one solution, particularly suited for challenging survey environments with suspended sediments or reduced visibility.

Features:
- Curved Rx Array
- Agile Penetrator 50-440kHz FM
- 256-2048 Expandable Beamformer
- 2°x2°@ 100kHz, 1°x1°@ 200kHz, 0.5°x0.5°@ 400kHz
- Multi-Detect
- Compact Size

Effective sub-lutocline detections requires:
- Low frequency band (to penetrate)
- High frequency band (to detect lutocline)
- FM signals with high bandwidth (for resolution)
- Long pulse lengths (for improved SN)

Practicalities:
- Portability easily handled,
- Small boat installations
- Ease of use
- Objective penetrating detections
- Employed as a conventional sonar

Entire sonar system is delivered in one Pelican Case



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