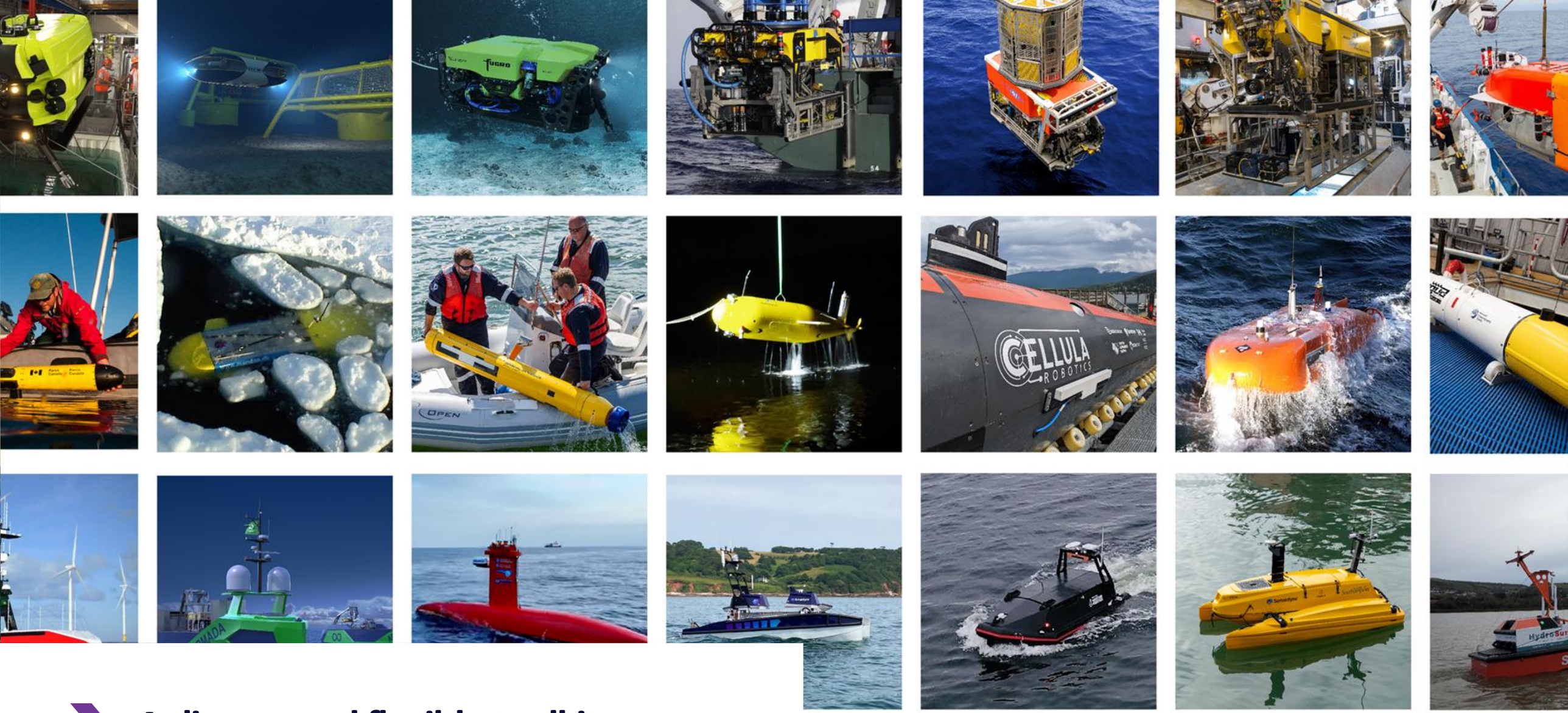
Tracking, Positioning and Comms for subsea vehicles

Aidan Thorn – Business Development Manager, Robotics

The increasing need for CNI protection, and the growing MAS toolkit



A diverse and flexible toolkit:

Requiring accurate tracking, positioning, navigation and comms

A robotics company – without the robots

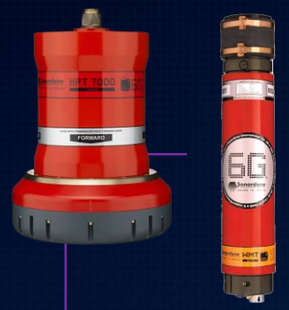
Positioning and Comms

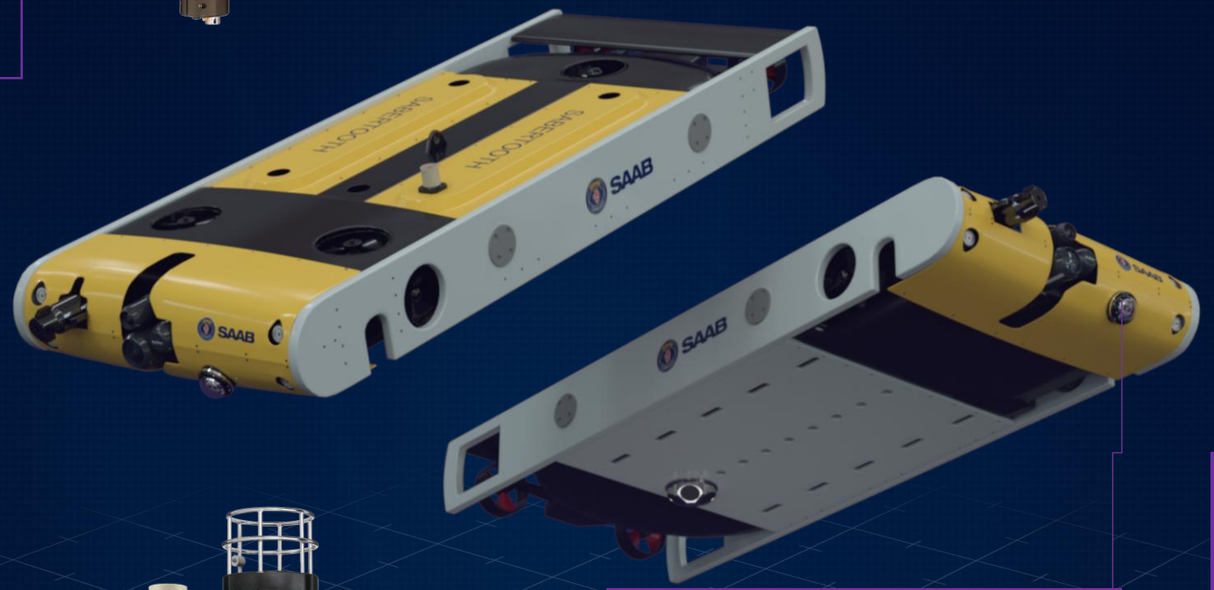
Ranger 2 USBL is a family

Up to 11Km range (LMF)

Track, communicate, position up to 99 targets at one

AUV to AUV comms = swarms





High Accuracy Positioning

Fusion 2 LBL

high accuracy underwater positioning

centimetric precision relative to each other

High speed data offload and remote control

Optical modem for command and control during vehicle docking operations, and high-speed harvest of data from sensors deployed on the seabed or on structures, cables, and moorings.

Navigating

SPRINT-Nav is a family of all-in-one INS and DVL hybrid acoustic-inertial navigation instruments that enables subsea vehicles to navigate themselves in the subsea domain, and provides precision improvements to USBL positioning solutions, and reduces the operation cost of LBL positioning solutions.

AUV and ROV Operations

When subsea we can help you position and navigate your AUV or ROV. Our solutions come with a number of C-SWaP options suitable for a large range of subsea vehicles.

Positioning, Tracking, and Communications

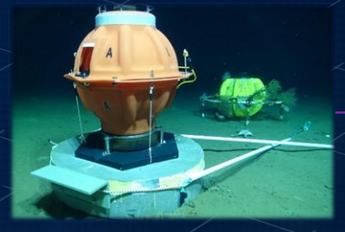
You can position, track, and communicate with your assets reliably in any water depth. Your USV will be able to position itself accurately relative to a seabed transponder, even in a GNSS denied environment, and track deployed underwater vehicles,

Precise Navigation

SPRINT-Nav is a family of all-in-one INS and DVL hybrid acoustic-inertial navigation instruments that provide fast, precise and robust navigation, guidance and control information.

Data Harvesting

Deliver your ocean data when you want it to where you want it - a safe, clean and low-cost alternative to using personnel and vessels. Using any of the Ranger 2 family of USBL on your USV, connect to Sonardyne's wide range of instruments, dataloggers, and modems to recover your data through secure wireless acoustic communications.



USV Operations

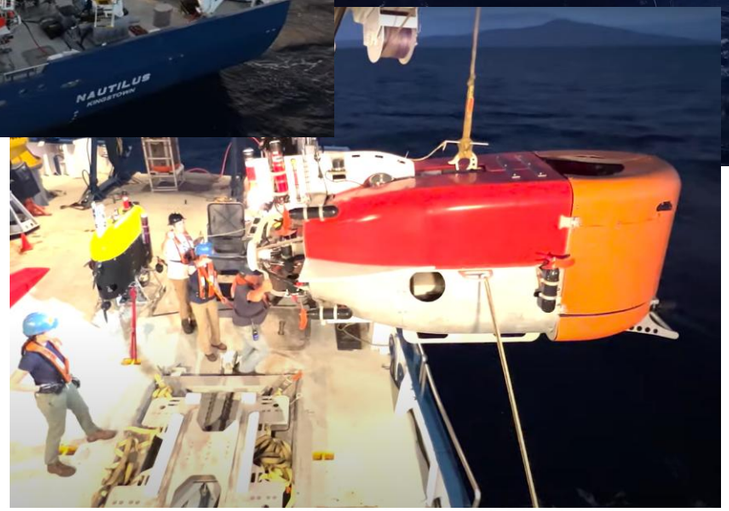
Direct your USV throughout its entire mission using Sonardyne's high performance navigation, tracking, and communication systems. Determine position accurately relative to seabed transponders or by precise inertial navigation systems, track deployed AUV's and ROV's, locate and recover data from monitoring instruments on the seabed, cables, moorings, and other assets.

Autonmous Survey Systems

USVs / AUVs / ROVs / ROTVs
and combining them all

Extending the Boundaries of Remote & Autonomous Ops

Sonardyne



"We are more than exceeding our goals of communication and collaboration with tracking and two-way communication among all three vehicles and the ship - using the USV to follow the vehicles and as a relay when the vehicles get out of ship's range. All done with the Sonardyne systems"

Prof Larry Mayer, University of New Hampshire

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https://www.youtube.com/watch?v=S9N6JcMYhpY
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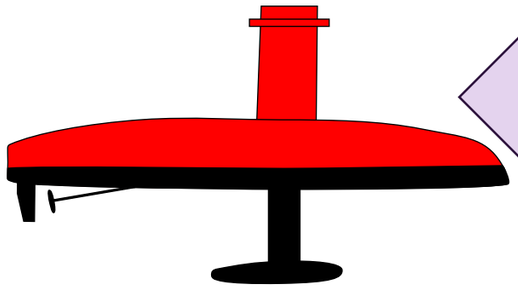
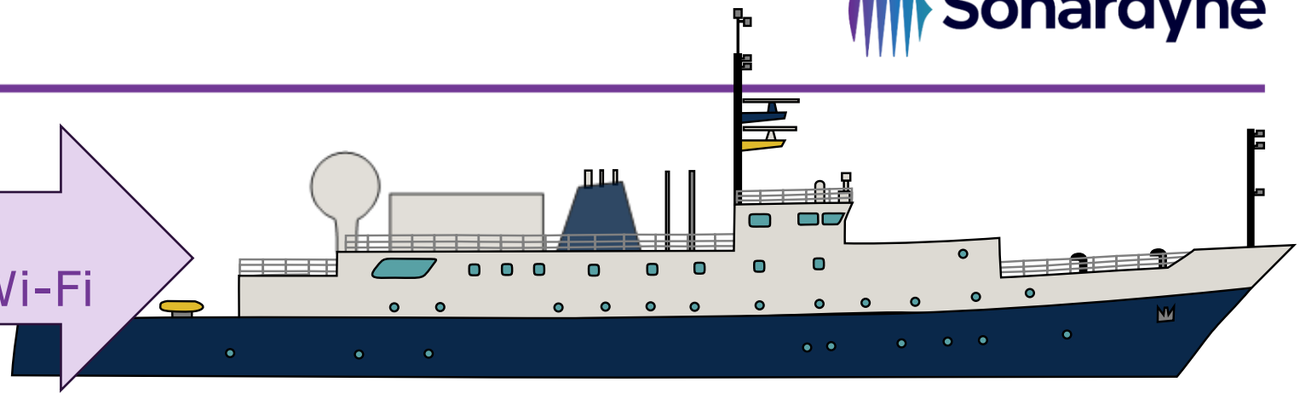
THE UNIVERSITY OF SOUTHERN MISSISSIPPI

THE UNIVERSITY OF RHODE ISLAND

NOAA OCEAN EXPLORATION
20 YEARS • 2001-2021

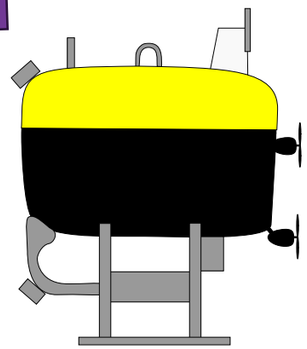


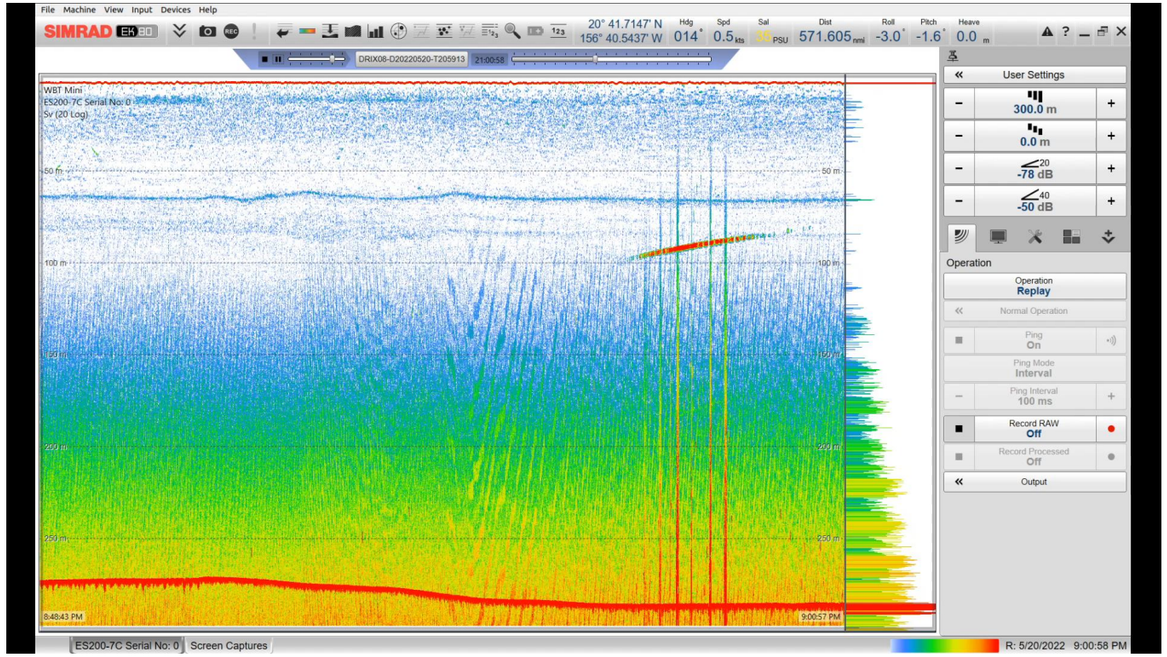
Starlink, Marine Broadband Radio or Wi-Fi



Sonardyne Mini Ranger 2 telemetry and communication

Watercolumn Sonar



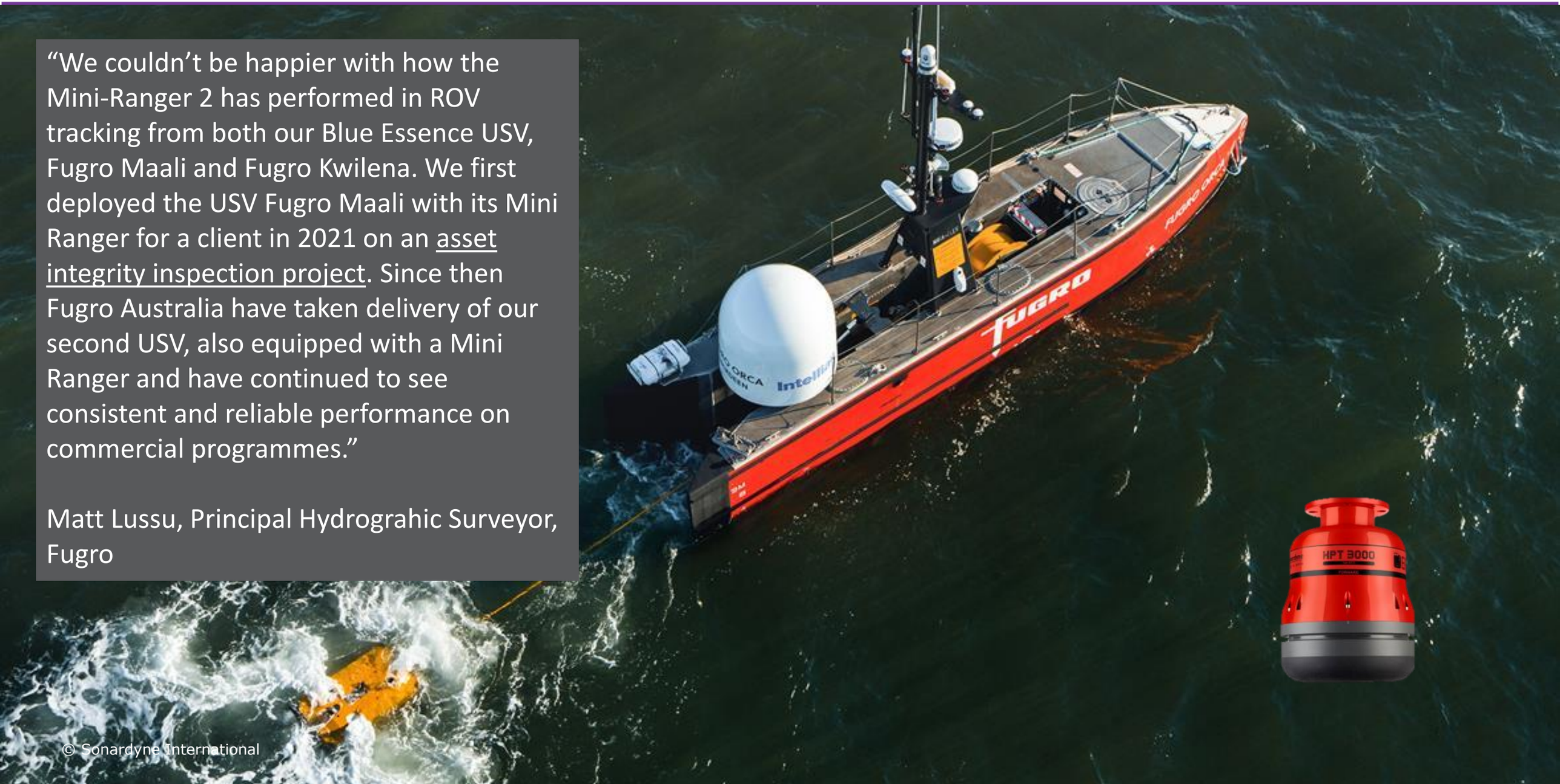


Layer confirmed using EK80, command sent to Mesobot to change depth, once confirmed that Mesobot was in the layer, command to sample for eDNA was sent:
“VERIFIED - DIRECTED SAMPLING”

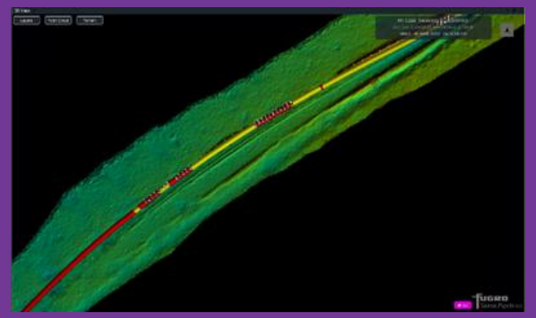
Remote navigation and tracking

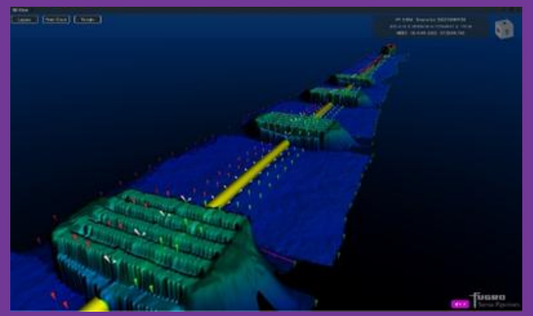
"We couldn't be happier with how the Mini-Ranger 2 has performed in ROV tracking from both our Blue Essence USV, Fugro Maali and Fugro Kwilena. We first deployed the USV Fugro Maali with its Mini Ranger for a client in 2021 on an asset integrity inspection project. Since then Fugro Australia have taken delivery of our second USV, also equipped with a Mini Ranger and have continued to see consistent and reliable performance on commercial programmes."

Matt Lussu, Principal Hydrograhic Surveyor, Fugro



Remote navigation and tracking

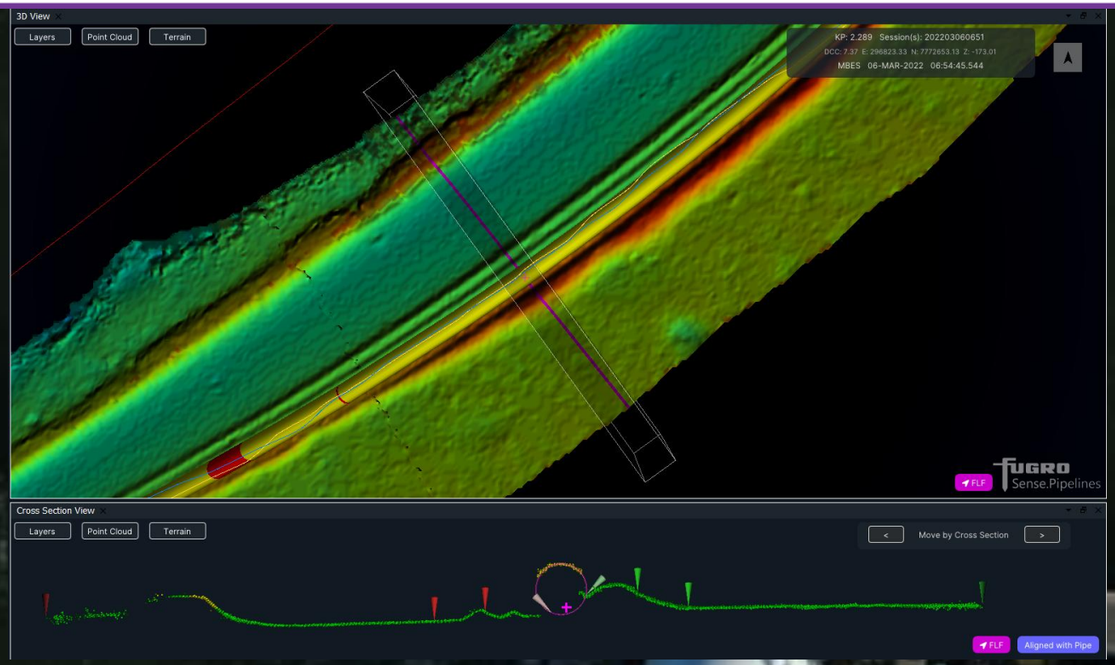


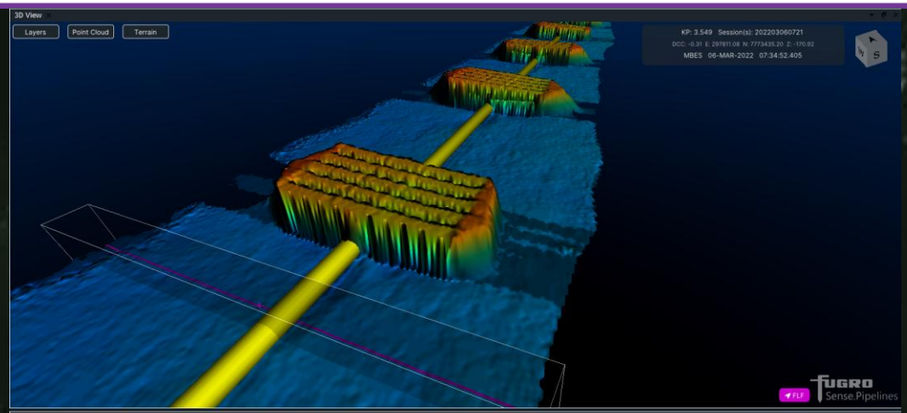


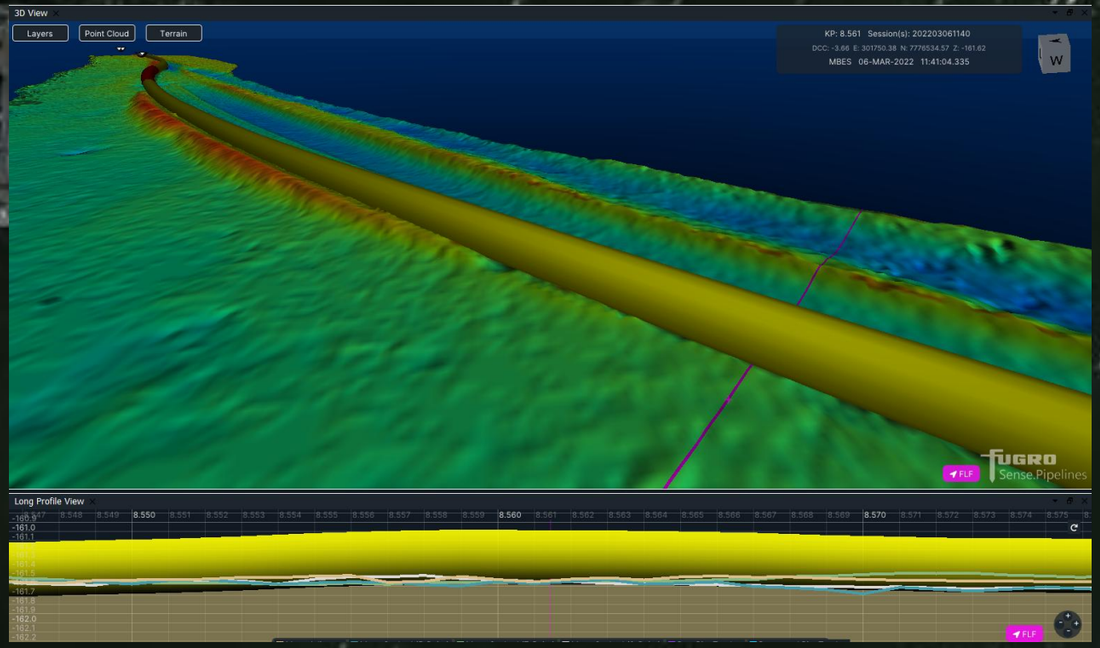
We were attracted to the SPRINT Nav Mini form factor and integrated DVL. The ability of the DVL to achieve bottom track from the surface for most of our deployments in water depths less than 200 metres also brings efficiencies to our operations. The performance we've seen from SPRINT Nav Mini after Janus processing for MBES surveys is on a par with larger work class ROV deployed systems Fugro uses.

Matt Lussu. Principal Hydrographic Surveyor. Fugro

Remote navigation and tracking



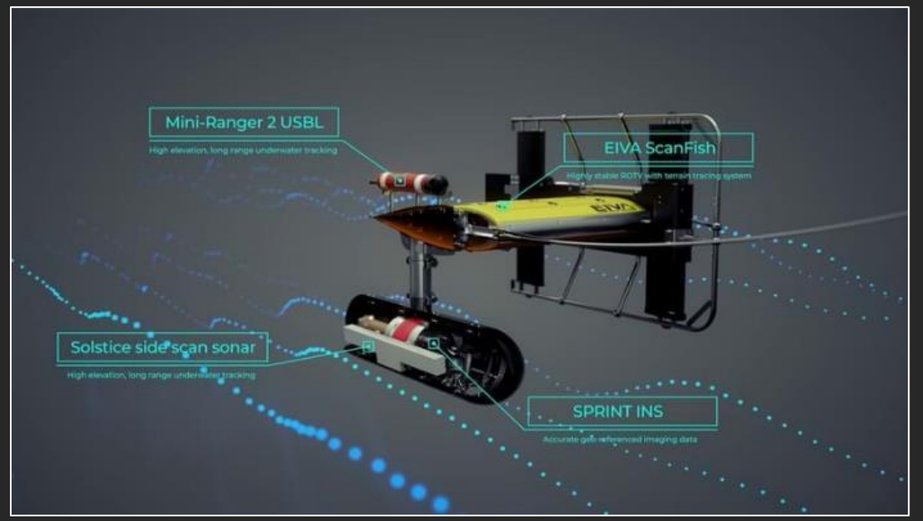


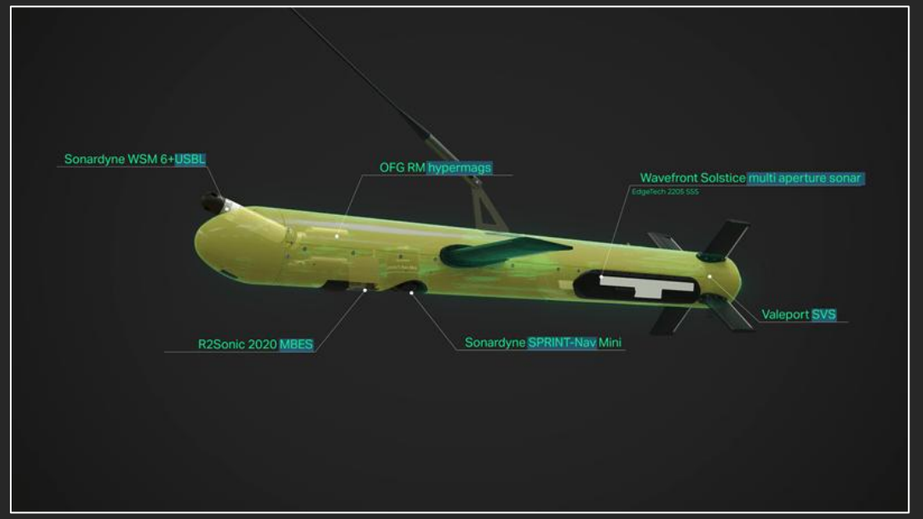


Introduction to ROTV Technology

Key components of an ROTV?

- Frame and towing system
- Sensors: magnetometers, sidescan sonar, sub bottom profilers, navigation systems
- Positioning, tracking, navigation and comms





EIVA

Enabling future operations

Nested robotics

Underpinned by acoustics

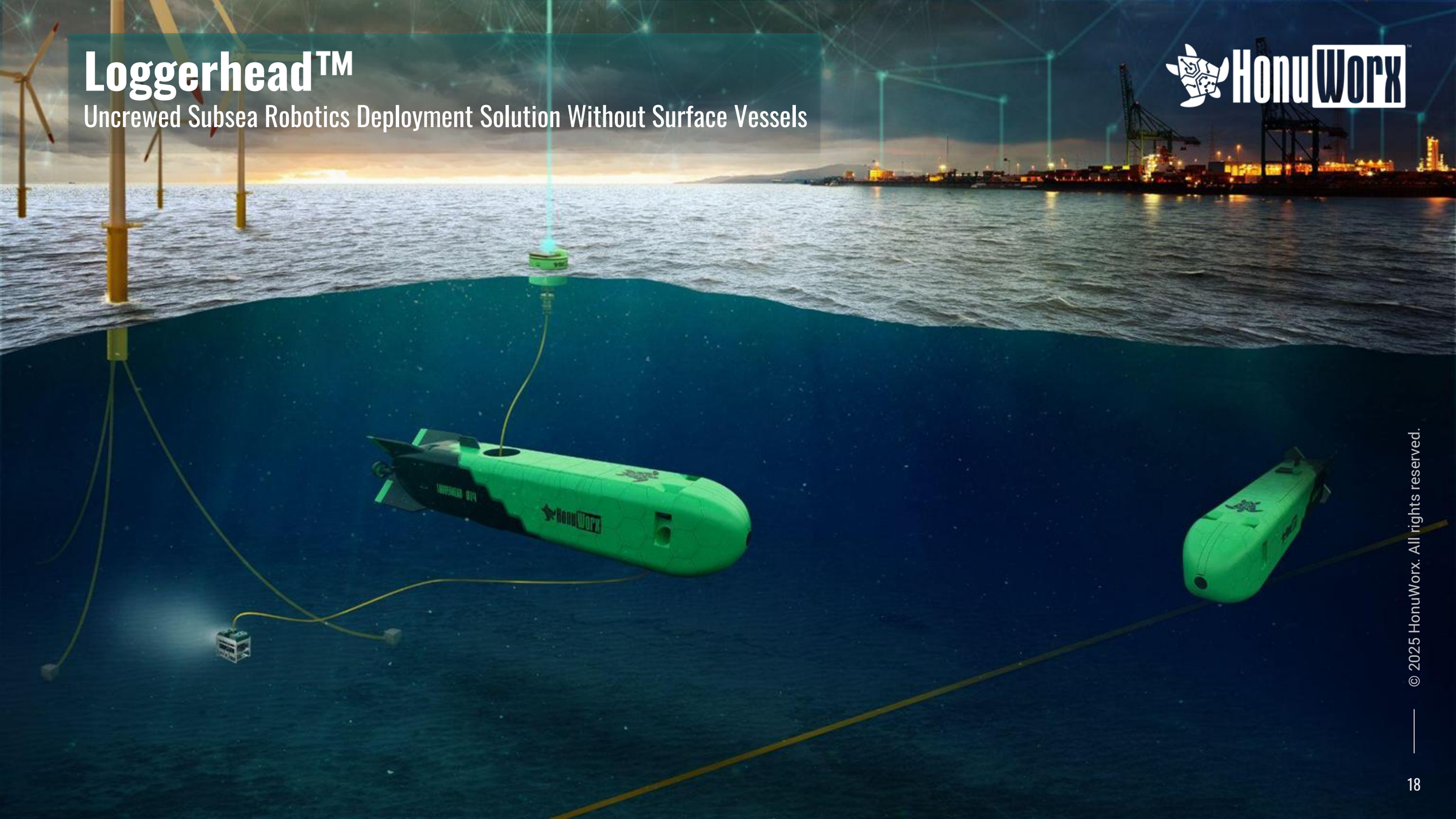
equinor

Long Endurance AUVs

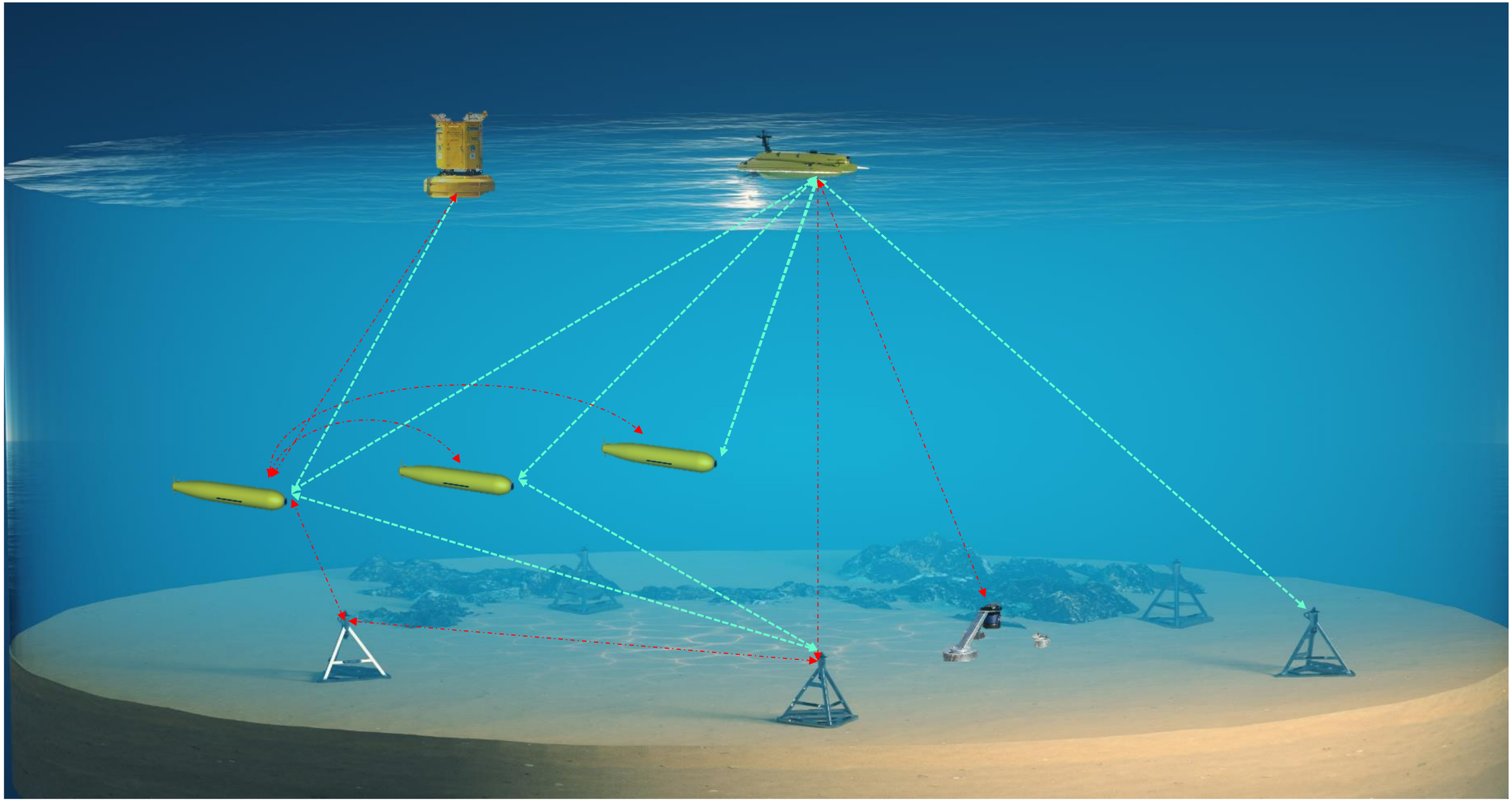
Navigation is key

Loggerhead™

Uncrewed Subsea Robotics Deployment Solution Without Surface Vessels



Seabed positioning



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Read more in the next issue of Ocean Robotics Planet Magazine

Thank you


WINDCAT 101
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