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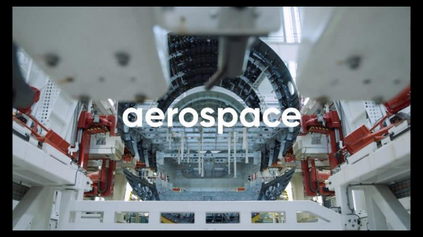

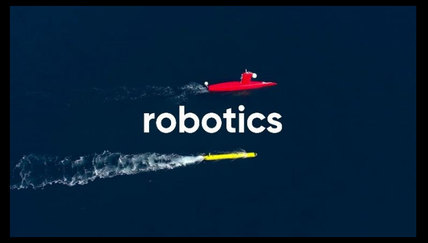

2000+
EMPLOYEES

80
COUNTRIES

320+
MEUROS TURNOVER

20 +
% OF TURNOVER INVESTED IN R&D

24 / 7
TECHNICAL SUPPORT

21
INDUSTRIAL SITES

2000
CUSTOMER BASE

300 +
ACTIVE PATENTS

2023 figures

15 % revenue increase
CAGR 18-22

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A global footprint

24/7 SUPPORT

~ 30 people located ww (6 for America's with USV, INS & LBL specialist)

Training, demo equipment's & webinars upon demand

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Technology provider from components to complex systems

Components

Optic

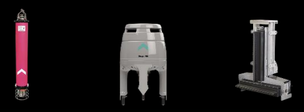




Equipment

Inertial navigation

Sonar & positioning



Quantum instruments

On-board electronic

Simulators

Platforms

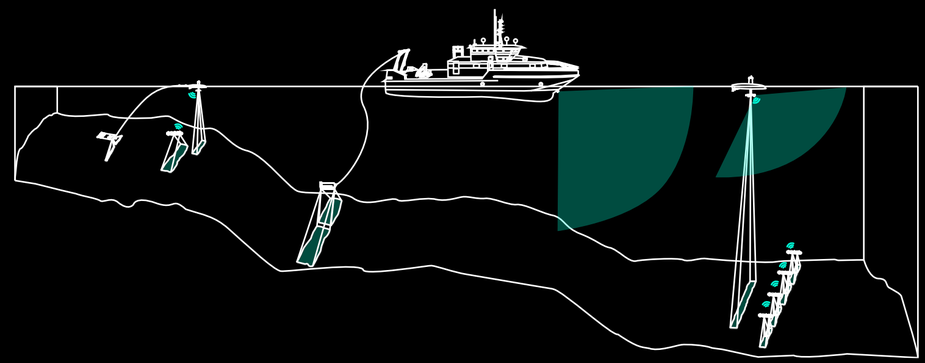
Surface drones

Underwater drones

Unmanned ground & aerial vehicles


Complex systems

AUTONOMOUS DRONES + CONTROL & COMMAND SYSTEM



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EXAIL

EXPANDING REMOTE OPERATION CAPABILITIES

PORTOFOLIO

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Maritime Autonomy Solutions – DriX Family

DriX H-8
Medium range USV

DriX H-9
Long range USV

DriX O-16
Transoceanic range USV

Length	7,71 m	9 m	15,75 m
Displacement	1,6 t	2,1 t	10,5 t
Endurance*	< 10 days	< 20 days	< 30 days
Speed	< 14 kts	< 13 kts	< 16 kts
Fuel capacity	250 L	550 L	2,300 L (dual hybrid propulsion)
Range	1,000 nm	2,000 nm	2,500 nm
Communications	Wifi, 4G, Satellite communication, UHF radio	Wifi, 4G, Satellite communication, UHF radio	Wifi, 4G, Satellite communication, UHF radio
Towing / launch & recovery	ROTVs towing capabilities	ROTVs towing capabilities	ROTVs, Inspection Class ROVs, 1,000 m rated AUVs
Station keeping	Hovering	Hovering	Dynamic Positioning
MBES capacity	3,000 m depth	3,000 m depth	Full ocean depth
Transportation	1x 40' High Cube container	1x 40' High Cube container	2x 40' High Cube container
Other	Launch & Recovery system		Customizable stern section for additional payload integration

* Endurance depends on speed, gondola size, towing capabilities

DRIX H-8

Main Dimensions

Length Overall (LOA)	7,7 m
Beam:	0,82 m
Draft :	2,0 m
Displacement :	1,4 tonnes
Construction materials	
Hull & Deck & superstructure :	Composite materials

DriX H-8

Performance

Maximum Speed :	14 knots
Survey Speed :	8+ knots
Fuel capacity :	250 litres
Fuel Consumption (Survey):	2.5L/h @8 knots
Range :	650 nm @ 8 knots

Machinery

STD propulsion:	1 x 38HP diesel engine
Power Generation:	3 kW

SITUATIONAL AWARENESS : LIDAR, Video Camera, IR camera, AIS

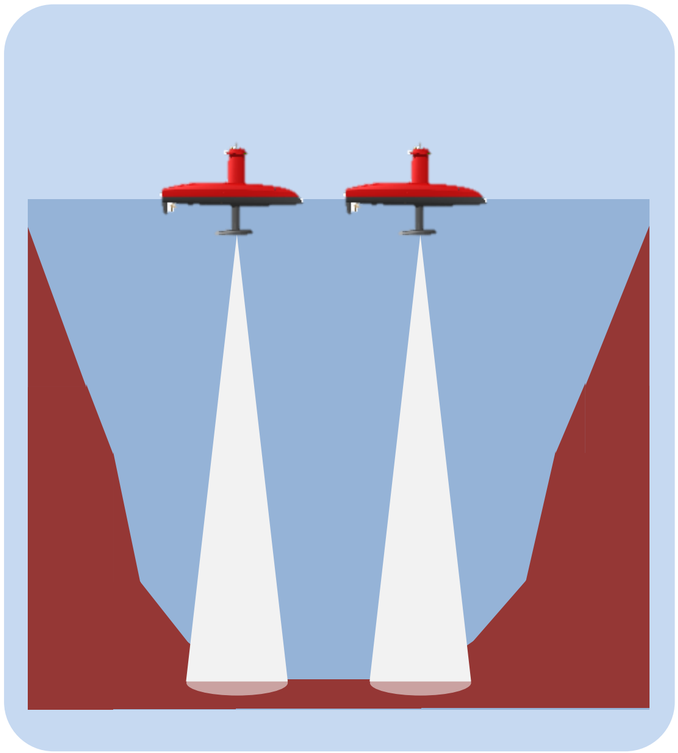
MISSION PAYLOAD: Sensor antennas mounted in gondola (wide range of sensors available. Integration studies for new sensors): MBES, ADCP, SBP, SSS, LBL, USBL etc…

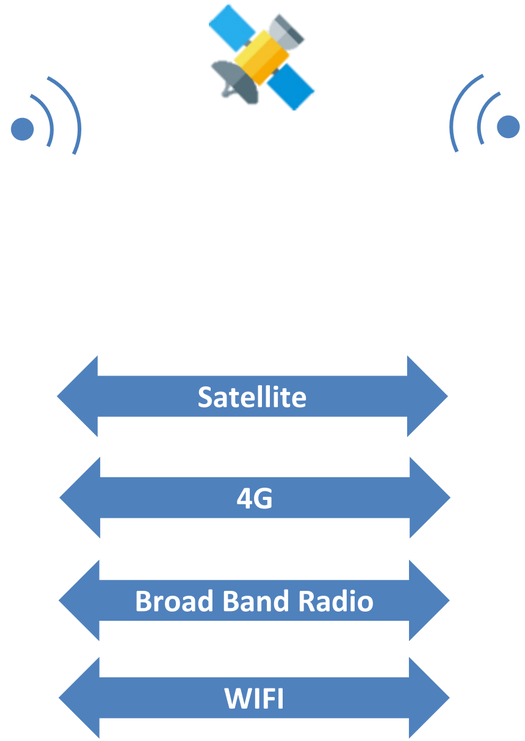
COMMUNICATION: WiFi, Maritime Broadband Radio (MBR) , SATCOM, IRRIDIUM

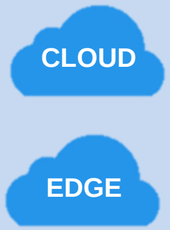
AUTONOMY: 6 – 10 days

iXblue

SUPERVISED AUTONOMY







Multi-Vehicles (Surface, AUV)

Heterogeneous infrastructure

Remote Supervision

Multiple Operational Scenarios

DRIX O-16

A UNIQUE COMBINATION OF SPEED ENDURANCE AND PAYLOAD CAPACIY

DRIX O-16

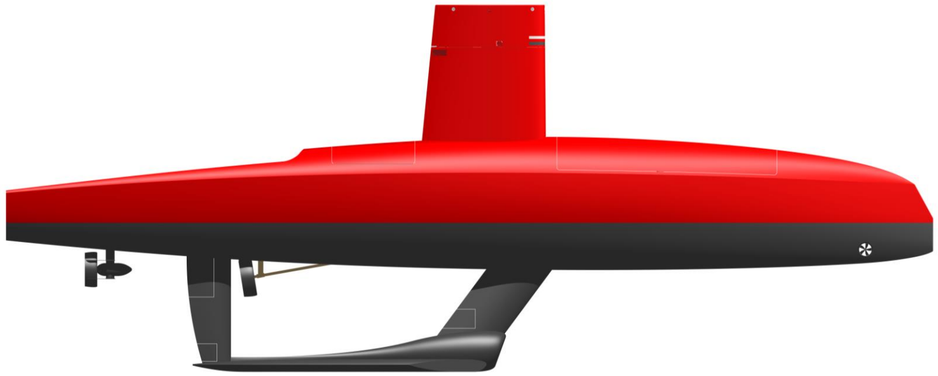
Dimensions	
Length Overall (LOA)	15,57meters
Beam	1.75 meters
Draft	2.5 meters
Light weight	8.5 Tons

Construction Materials	
Hull & Deck & Superstructure	Infusion Epoxy, E-Glass/Carbon/ PVC Core

Performances	
Maximum Speed	12 - 15 knots (Dep. on configurations)
DP capabilities	Yes
Fuel Capacity	2 300 liters
Range	2500 nautic miles @ 8 knots

Machinery	
Dual hybrid propulsion	110 kW FTP Diesel Engine (15 knots max) Azipod 20 kW (electrical) Auxiliary propulsor
Vessel Generators	Auxilary power redundancy up to 20 kW
Air conditioning (IT)	6000 BTU/hour

DriX O-16



System	
CLASS	**Long Range USV**
MISSION EQUIPMENT	Standard hydro-optimized Gondola Customized Gondola option available
MISSION PAYLOAD	Example of iXblue products fitting in Std Gondola: PHINS C7 / Seapix / Echoes 3500 T1 & T3 / GAPS / RAMSES And other third-party sensors.
PAYLOAD CAPACITY	1 x Underwater Gondola (6 m x 2 m) Back-deck : 1 ton capacity AC cooled IT Payload compartment
COMMUNICATION	RADIO SATCOM / IRRIDIUM / MBR
AUTONOMY	30 days at sea
NAVIGATION AREA	Unrestricted (Ice restrictions only)

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DRIX O-16 - OVERVIEW

Dual redundant hybridation:

- Main Engine (110 kW)
- Generator (20 kW)
- Battery pack (20-30 kW.h)
- Azipod (20 kW)

Communication

- RC
- WIFI
- 4G
- Satellite (high bandwidth)
- Radio Broadband

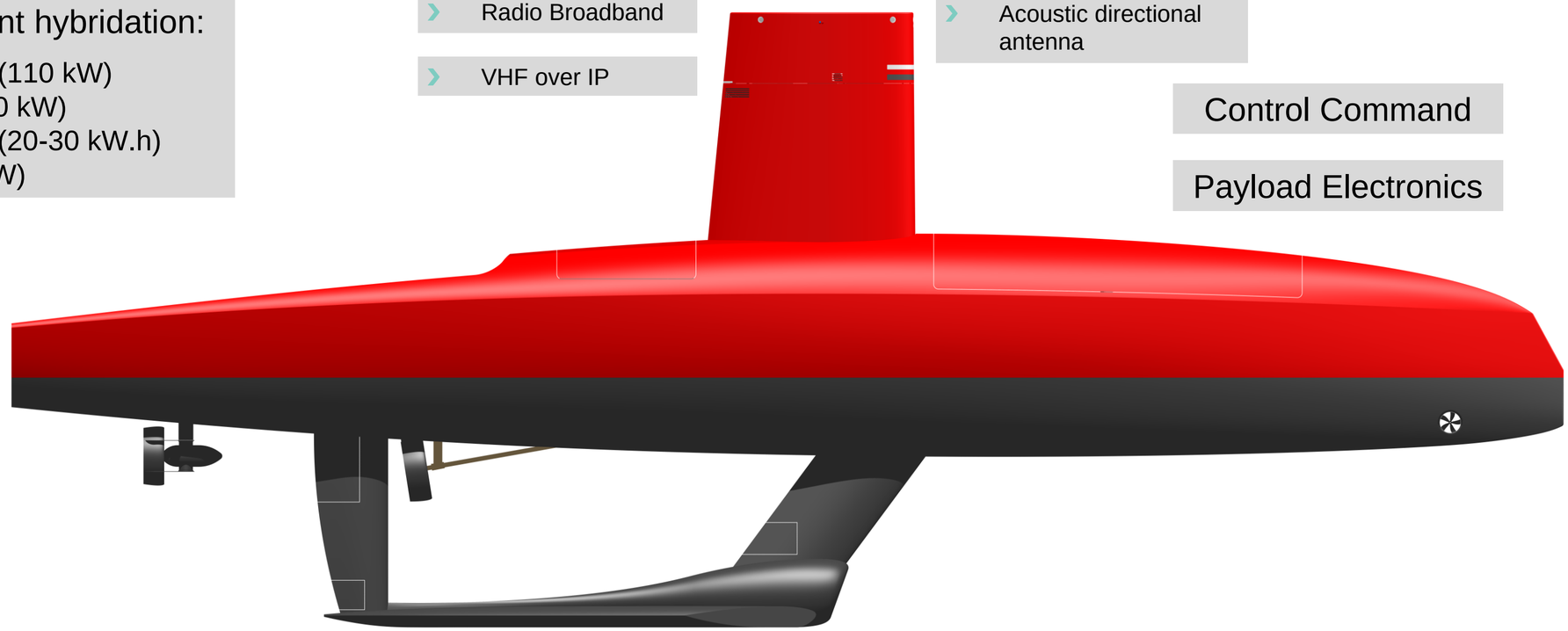
- VHF over IP

Perception

- IR Cameras
- RGB Cameras
- Lidar
- Radar
- AIS (Class A)
- Acoustic directional antenna

Control Command

Payload Electronics



Versatile Payload interface

Perception

- Forward Looking sonar

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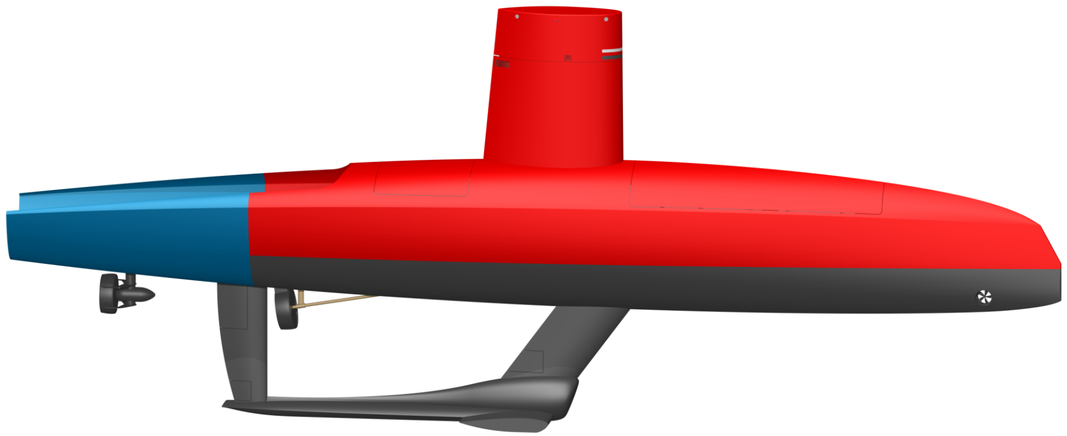
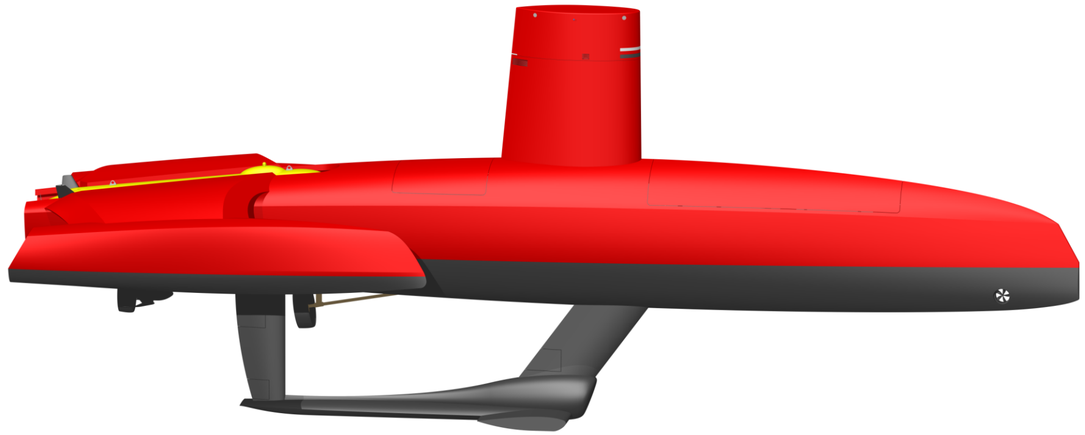
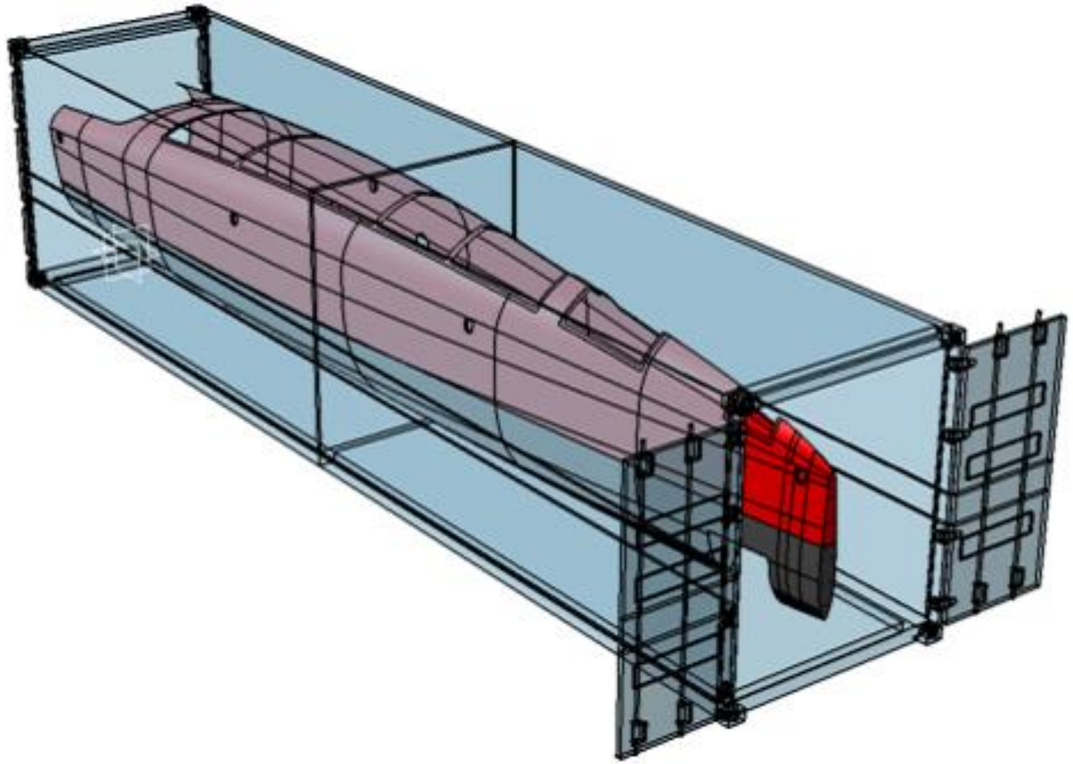
DRIX O-16 – PAYLOAD INTEGRATION

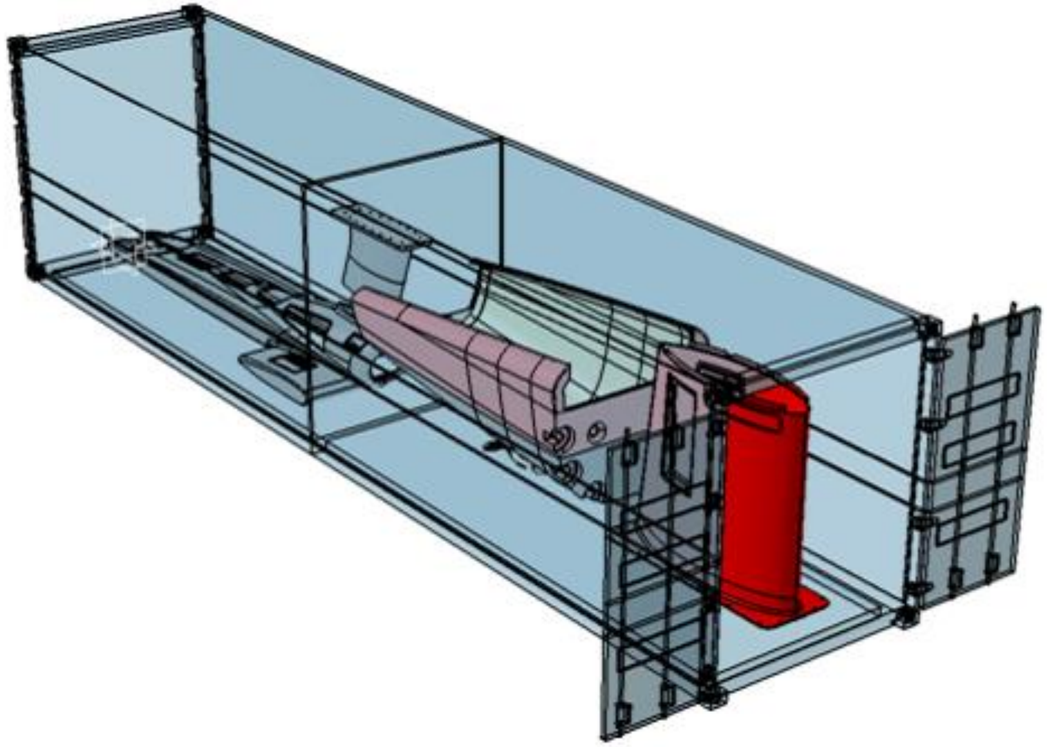
Configurable Aft Extension





DRIX O-16 – CONTAINER TRANSPORTATION





PERFORMANCES ADAPTED TO HYDROGRAPHIC DATA COLLECTION AND BEYOND

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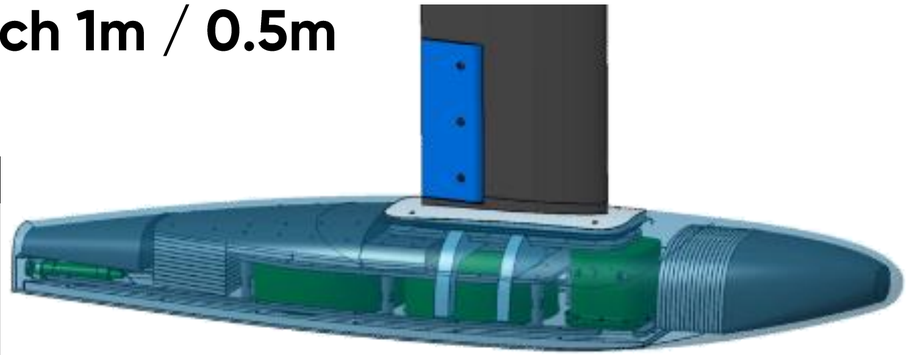
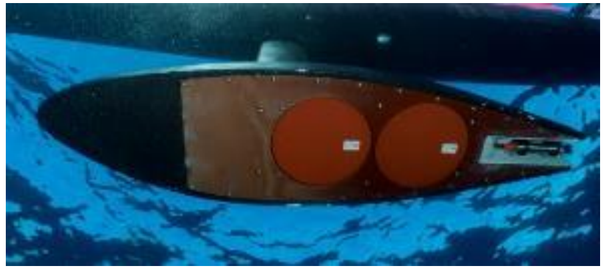
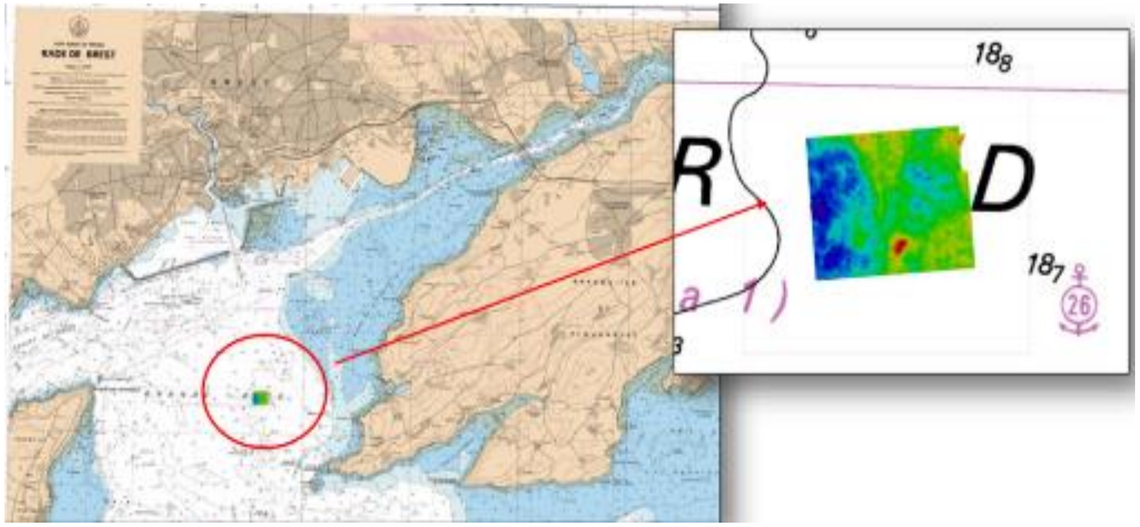
IHO Grade survey operation: Special / Exclusive Order

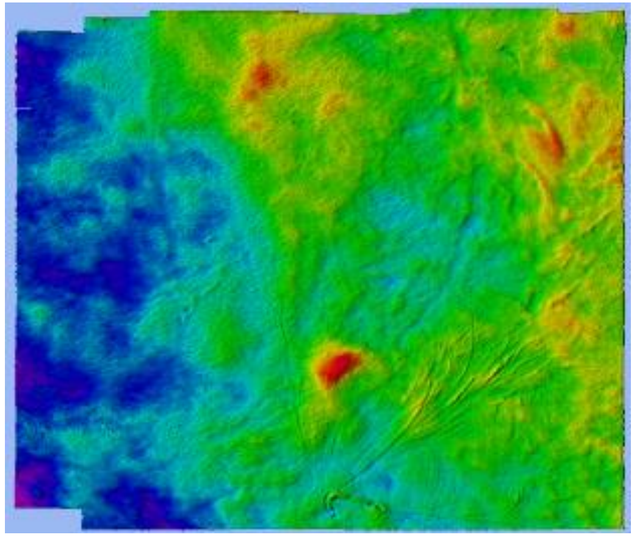
Full seafloor bathymetric coverage and Cubic feature search 1m / 0.5m

Système	DriX H8	DriX H9	DriX O16
Payload	EM 2042 or equivalent + SBP – Echoes + ADCP – 500kHz + SVP/CTD winch 500m	EM 2042 or equivalent + SBP – Echoes ar + ADCP – 500kHz + SVP/CTD winch 500m	EM 2042 or equivalent + SBP – Echoes + ADCP – 500kHz + **MVP winch 500m**
Draft Water depth applicable	2m 4 to 40m	2m 4 to 40m	2.5m 5 to 40m
Survey speed / Max Speed	8kts / 13kts	8kts / 13kts	8kts / 13kts
Endurance @survey speed	**3 days – 500Nm**	**7 days – 1000Nm expected**	**3500Nm**
Operations	Port to Port Force Multiplier with DDS	Mainly Port to Port option DDS	Port to Port







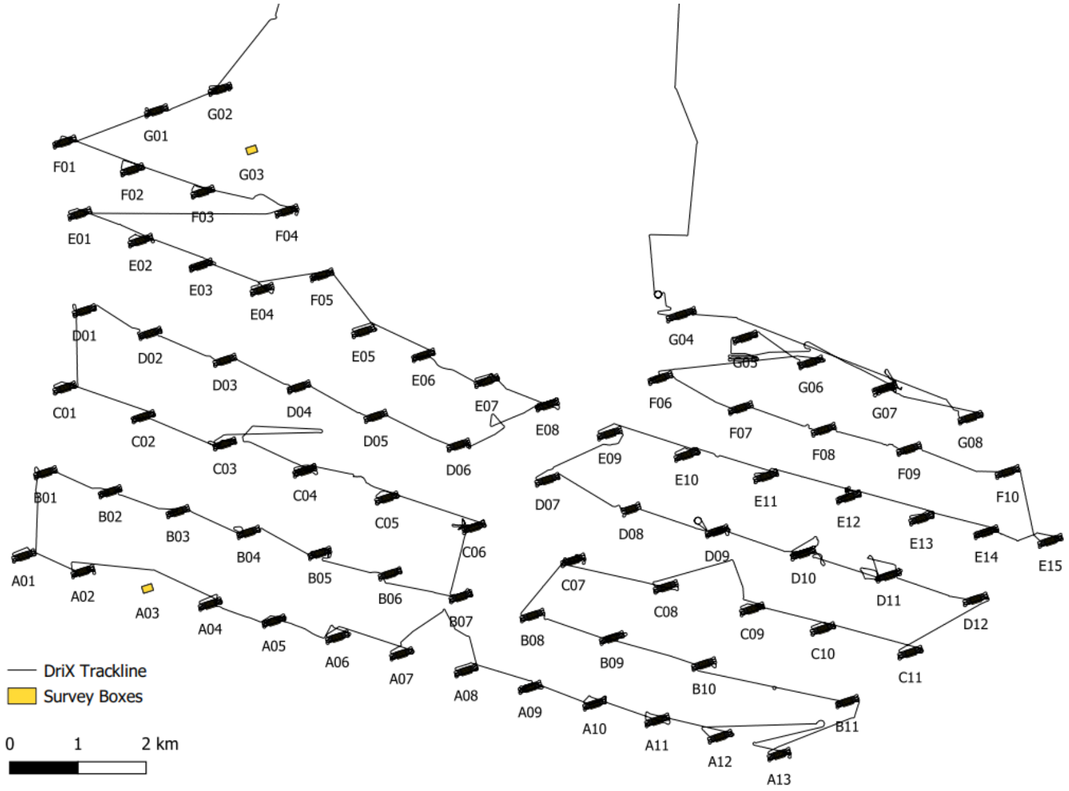


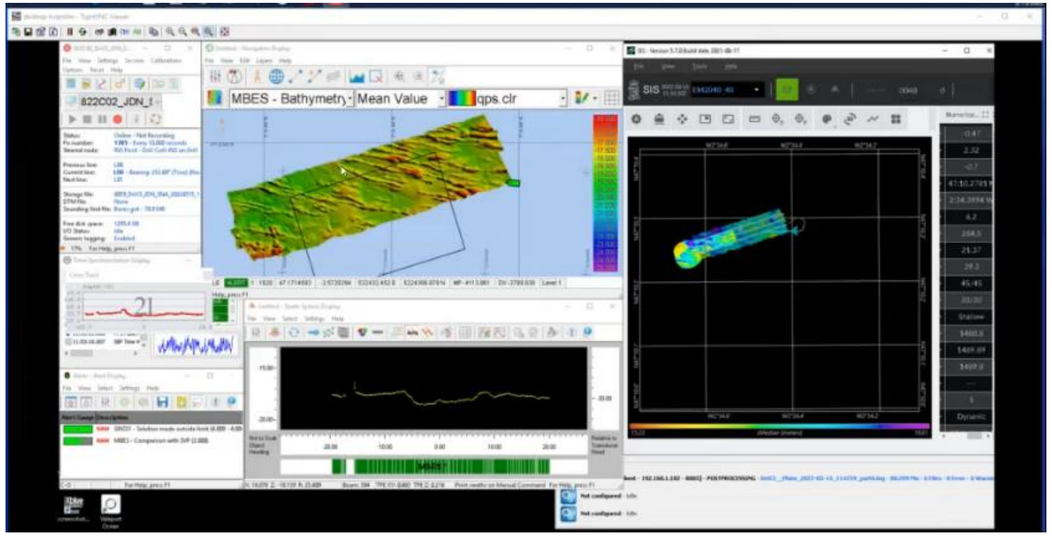
Marine Civil Engineering (MCE) / offshore windfarm development

Offshore wind turbine

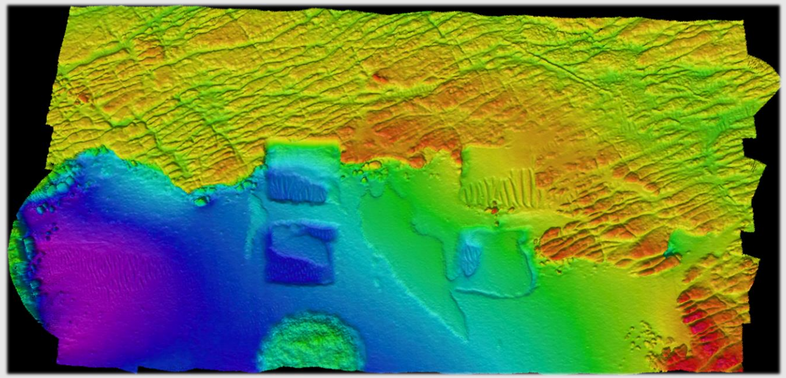
Objectives

- 80 WTG - 200mx100m boxes to survey with MBES only
- Scouring and seabed inspection survey around wind turbine foundations.
- Over the horizon operation supervised from 800km away.





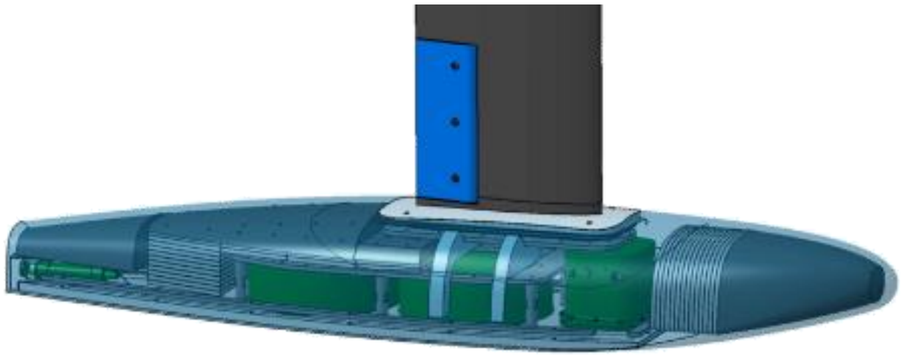
Marine Civil Engineering (MCE) / offshore windfarm development

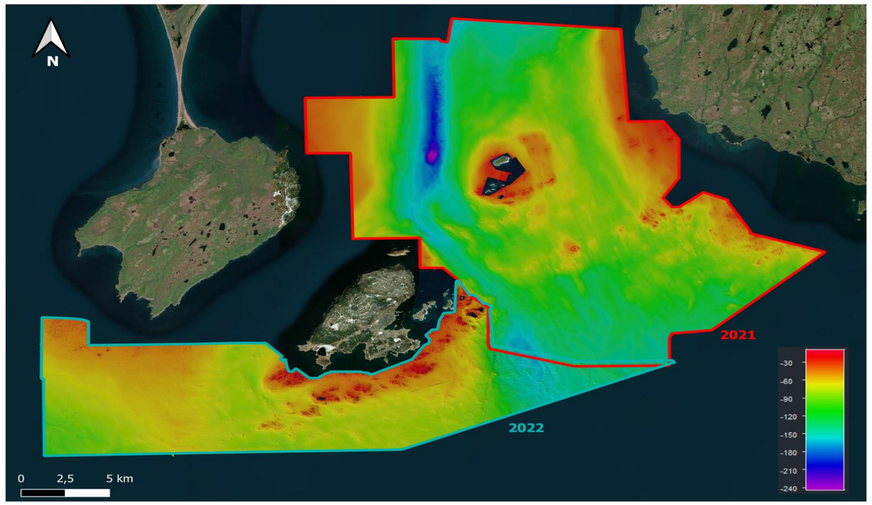
Benefits of DriX USV vs Vessels	DRIX (OTH Ops)	Opportunity Vessel
	80 Wind Turbines Foundation survey	
Survey Platform 		
Duration of Operation	**35 hours** No Weather downtime	**6 Days** 30% Weather Downtime
CO^2 Equ **1l = 2.6kg equ CO_2**	**0.2 t CO_2** 99% savings	**23.4 t CO_2**
Man-hours Risk Exposure	**8h** 99% Savings	**1050 h**

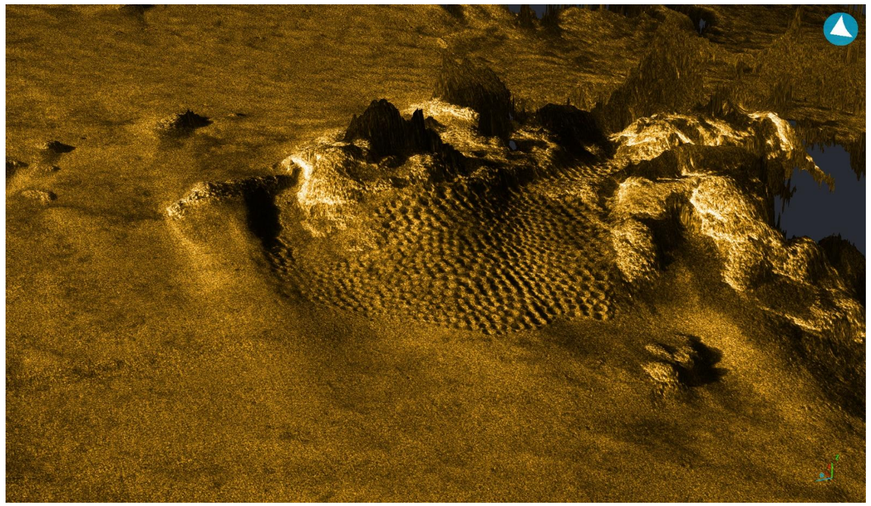
IHO Grade survey operation: IHO Order 1 A

Partial bathymetric coverage and Cubic feature search 2m or 10% of depth (>40m)

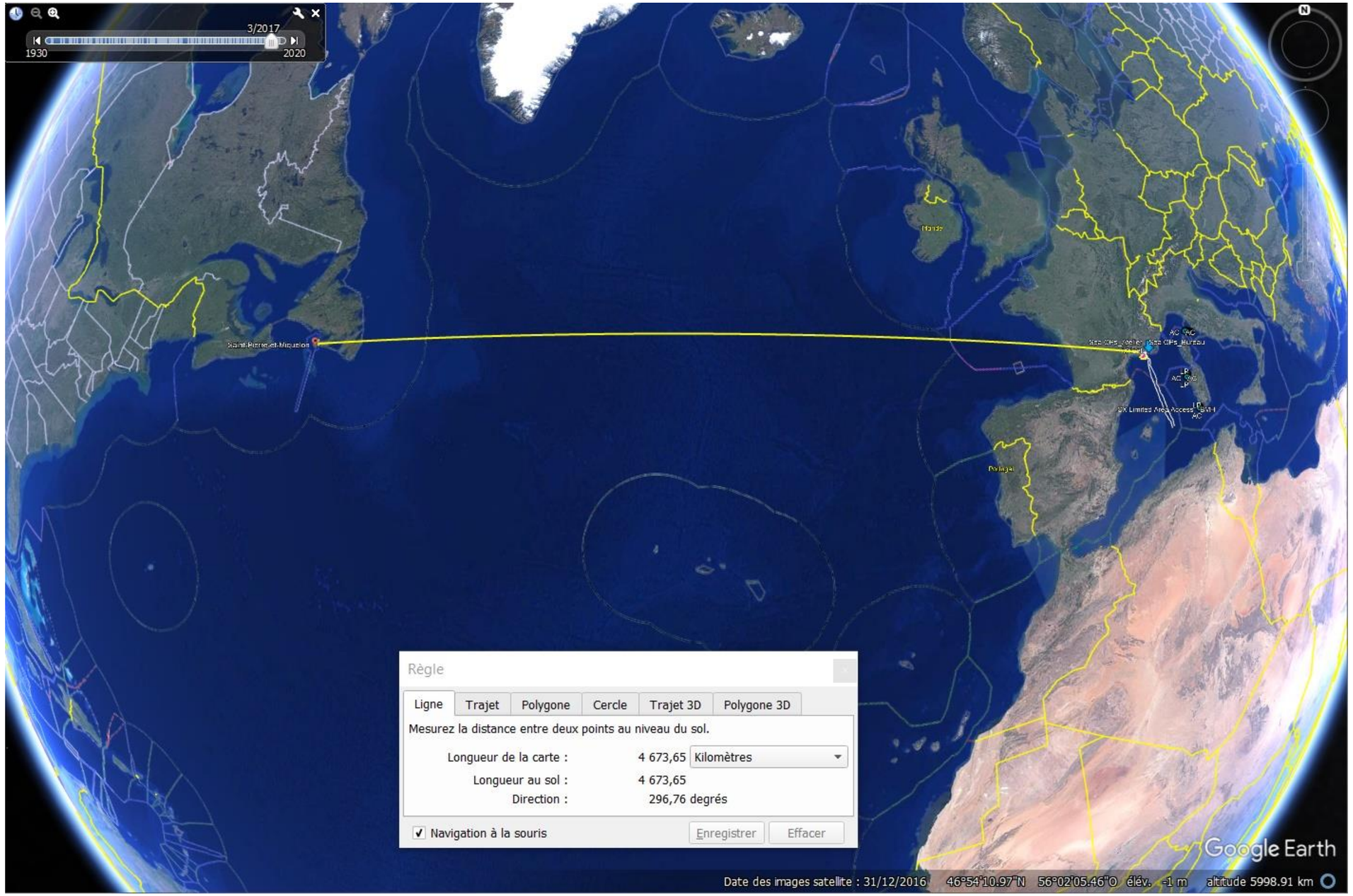
Système	DriX H8	DriX H9	DriX O16
Payload	EM 2042 or equivalent + SBP – Echoes Or **EM2042 + SAMS 150** SVP/CTD winch 500m	EM 2042 or equivalent + SBP – Echoes Or **EM2042 + SAMS 150** SVP/CTD winch	EM 2042 or equivalent + SBP – Echoes USBL - GAPS **Towing sidescan sonar or SAMS150** **MVP winch**
Draft Water depth applicable	2m 4 to 300m	2m 4 to 300m	2.5m 5 to 300m
Survey speed / Max Speed	7 to 10kts / 13kts	7 to 10kts / 13kts	7 to 10kts / 13kts
Endurance @survey speed	**2 to 3 days – 500Nm**	**5 to 7 days – 800 to 1000Nm**	**2000 to 3500Nm**
Operations	Port to Port Force Multiplier with DDS	Mainly Port to Port option DDS	Port to Port







Autonomous remote – EEZ and Archeological survey Canada/France



Autonomous remote – EEZ and Archeological survey Canada/France

North Atlantic – 650km² survey

- **Archaeological survey**
- **EEZ bathymetric survey**
- **Sedimentologic model**

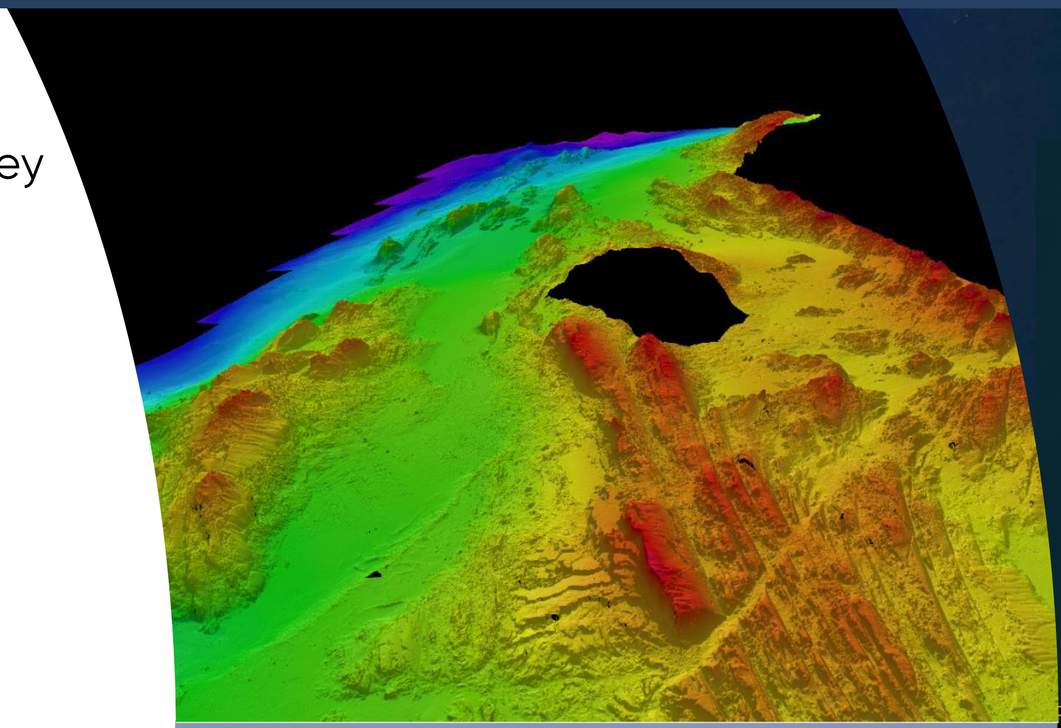
Harsh Weather :

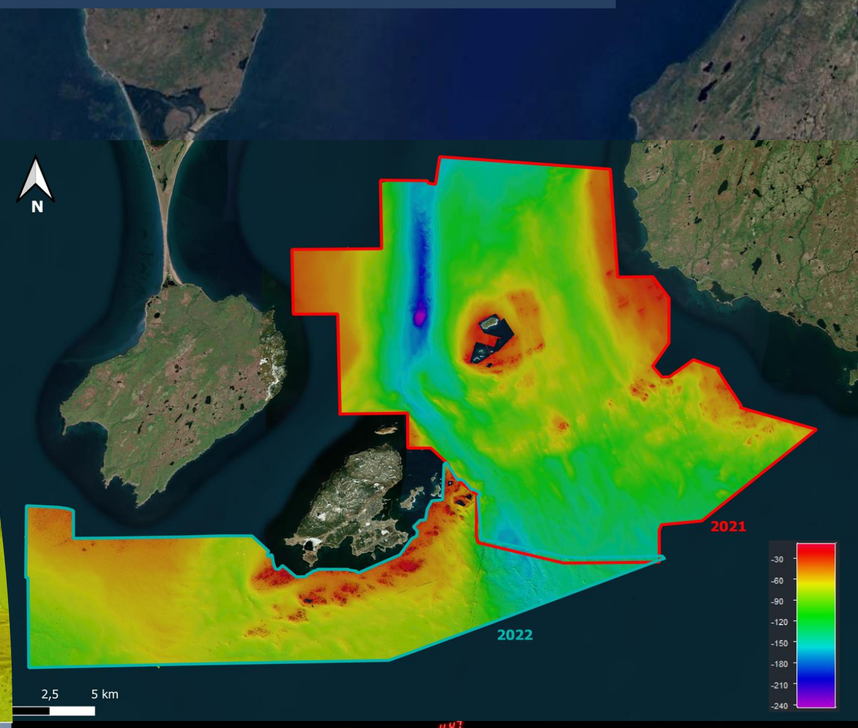
- Av. SeaState 4
- Wind up to 45kts
- Tidal current up to 2.5 kts
- Extremely Bad visibility

Supervised Over THE HORIZON

- GPRS network
- Satellite communication solution

Data: > **6.0 Terabit**





Autonomous remote – EEZ and Archeological survey Canada/France

Benefits of DriX USV vs Vessels	DRIX (OTH Ops)	Opportunity Vessel
Archaeological search	**9000 line km – 650km²** **Water depth 5 to 270m**	
Survey Platform		
Duration of Operation	**60 Days** 10% Weather downtime	**80 Days** 30% Weather Downtime
CO^2 Equ **1l = 2.6kg equ CO_2**	**6.5 t CO_2** **98% savings**	**338 t CO_2**
Man-hours Risk Exposure	**180h** 99% Savings	**15500 h**

SAMS PERFORMANCES

SAMS – Multiple Sidescan Sonar imaging modes

- **Multiple Imaging Modes → Multiple Applications**
- **Multiple Imaging Modes → To adapt to environmental constraints**

SAMS/interfero
Real-aperture single beam

+

SAMS/interfero
Real-aperture multibeam

+

SAMS/interfero
Incoherent multi-Aperture

+

SAMS/interfero
SAS processing at fixed gain

+

SAMS/interfero
SAS processing at constant resolution

	Sams-150	**Sams-50**
Central frequency	150 kHz	55 kHz
Frequency bandwidth	30 kHz	15 kHz
Swath	500 m	1,600 m
Along-track/ Across-track resolution	6 cm x 2.5 cm	50 cm x 5 cm
Coverage rate	Up to 5 km²/h	Up to 6 km²/h
Interferometry capabilty	Built-in	Optional

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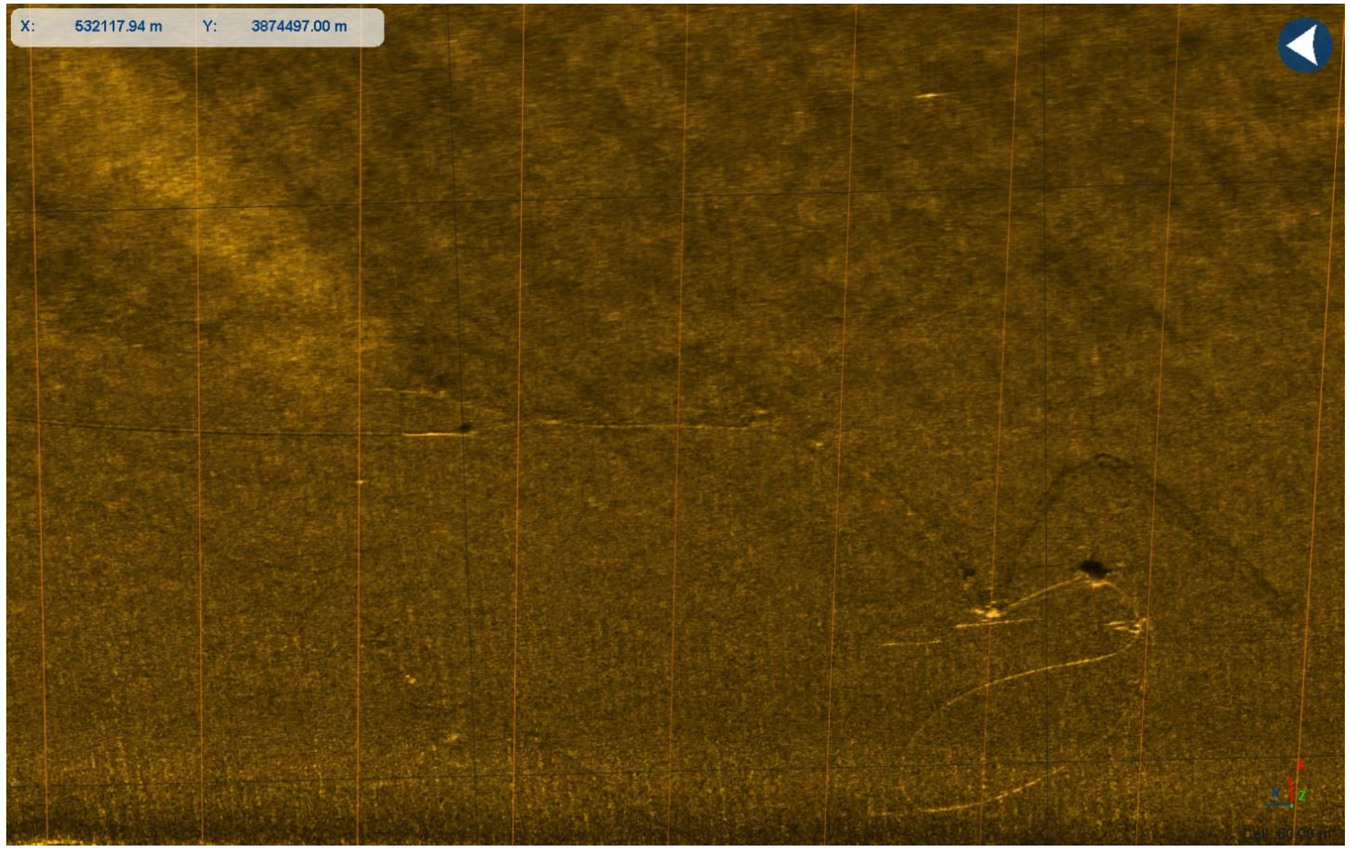
Multi-Aperture sidescan sonar incoherent integration

- Image quality and detection improvement
- From Real-Aperture Single Beam mode (eq. SSS) to SAMS Multiple Aperture Incoherent Mode



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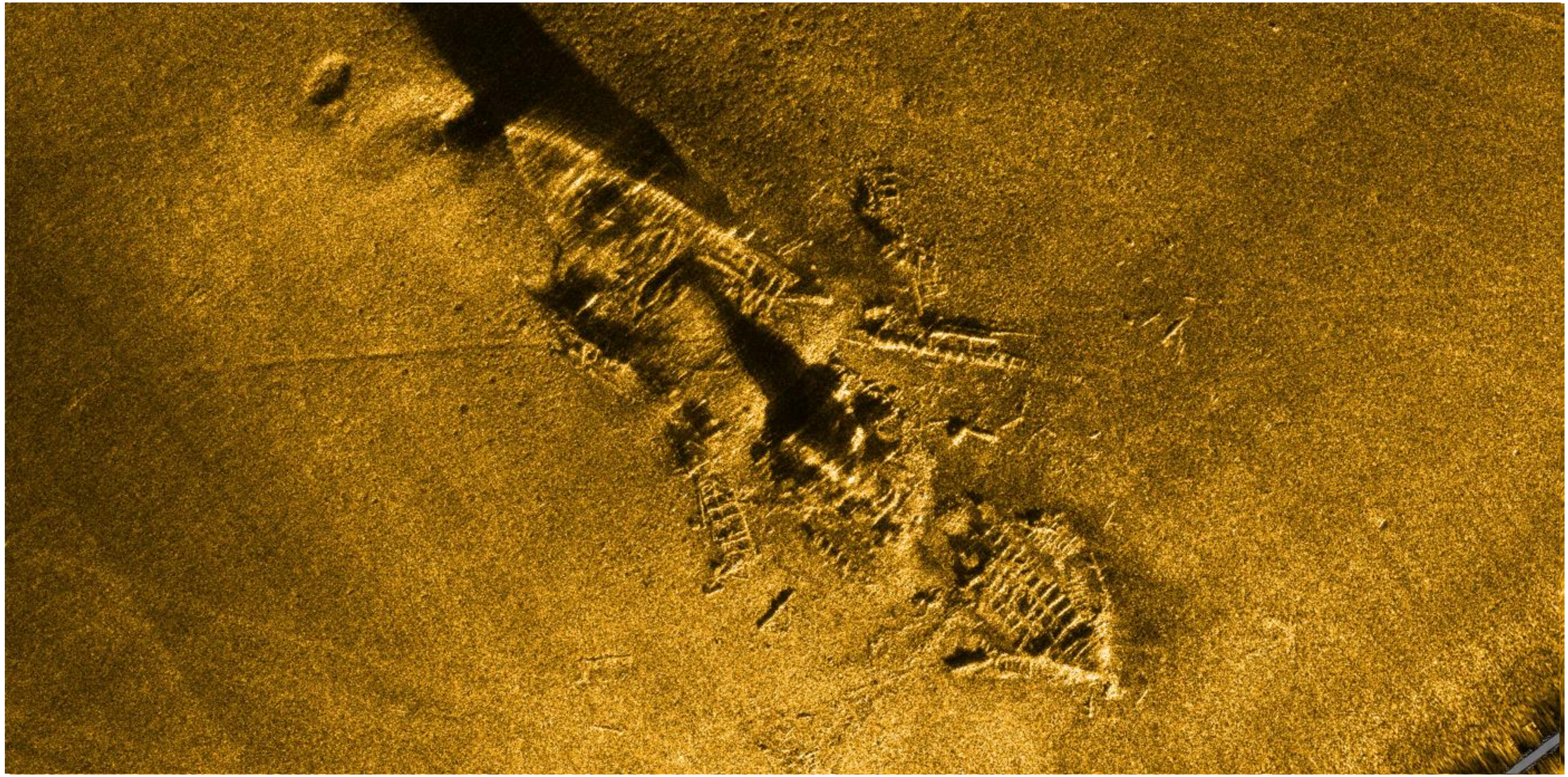
Sidescan -> SAMS Incoherent processing -> SAMS Coherent processing



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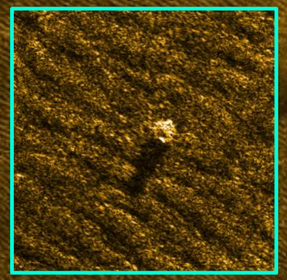
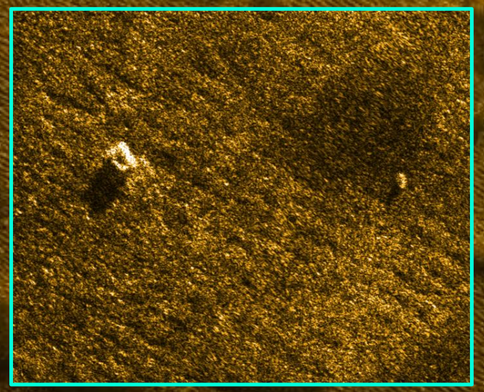
Monitoring and detection of underwater structures

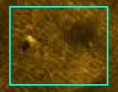
- 300 m swath – 30 m depth
- Sea state 2/3

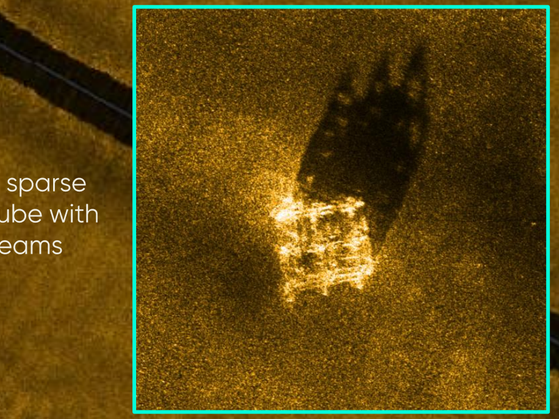
40 cm diameter
cylindrical object



40 cm x 50 cm object



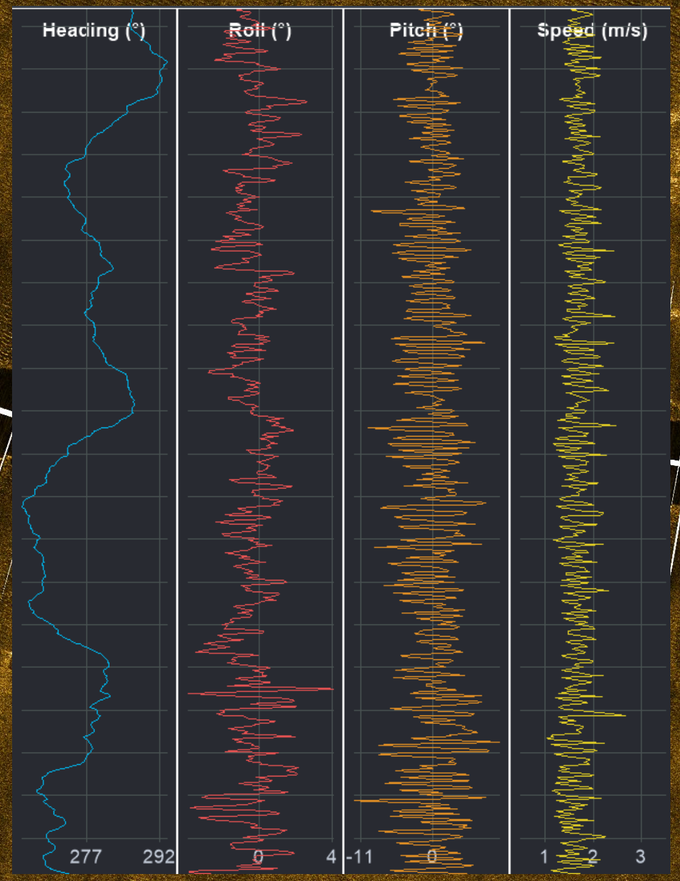


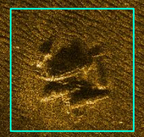


6 x 6 x 6 m sparse
metalical cube with
20 cm beams

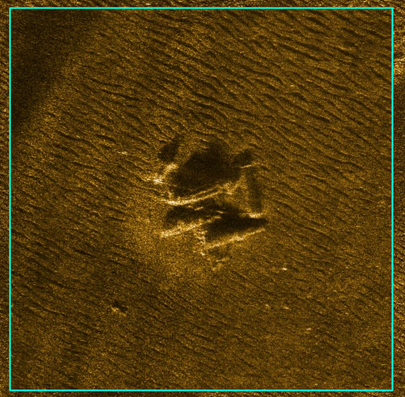
Robustness to platform motion

- 300 m swath – 30 m depth
- Sea state 4



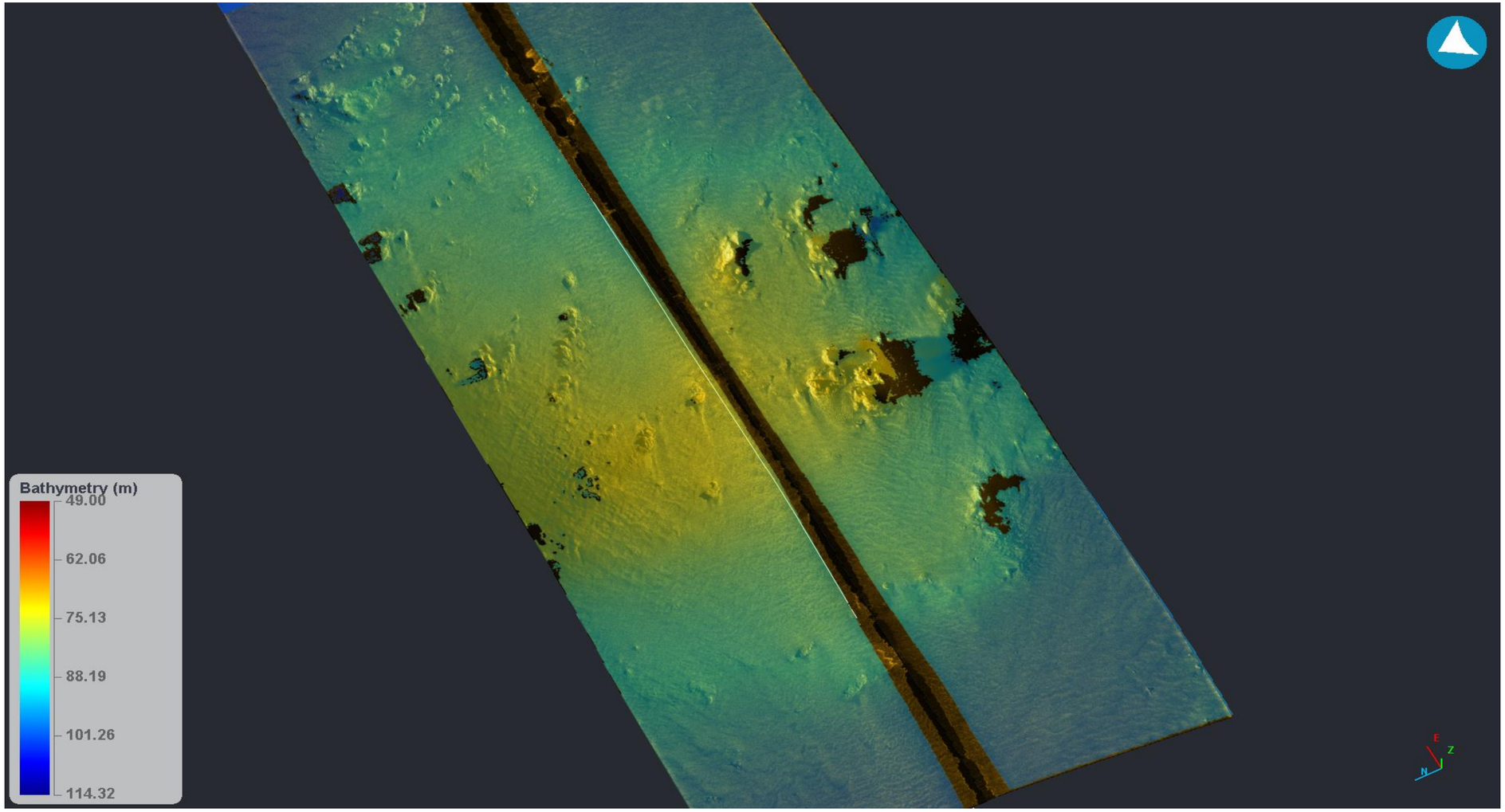


Airplane wreck
9 m long

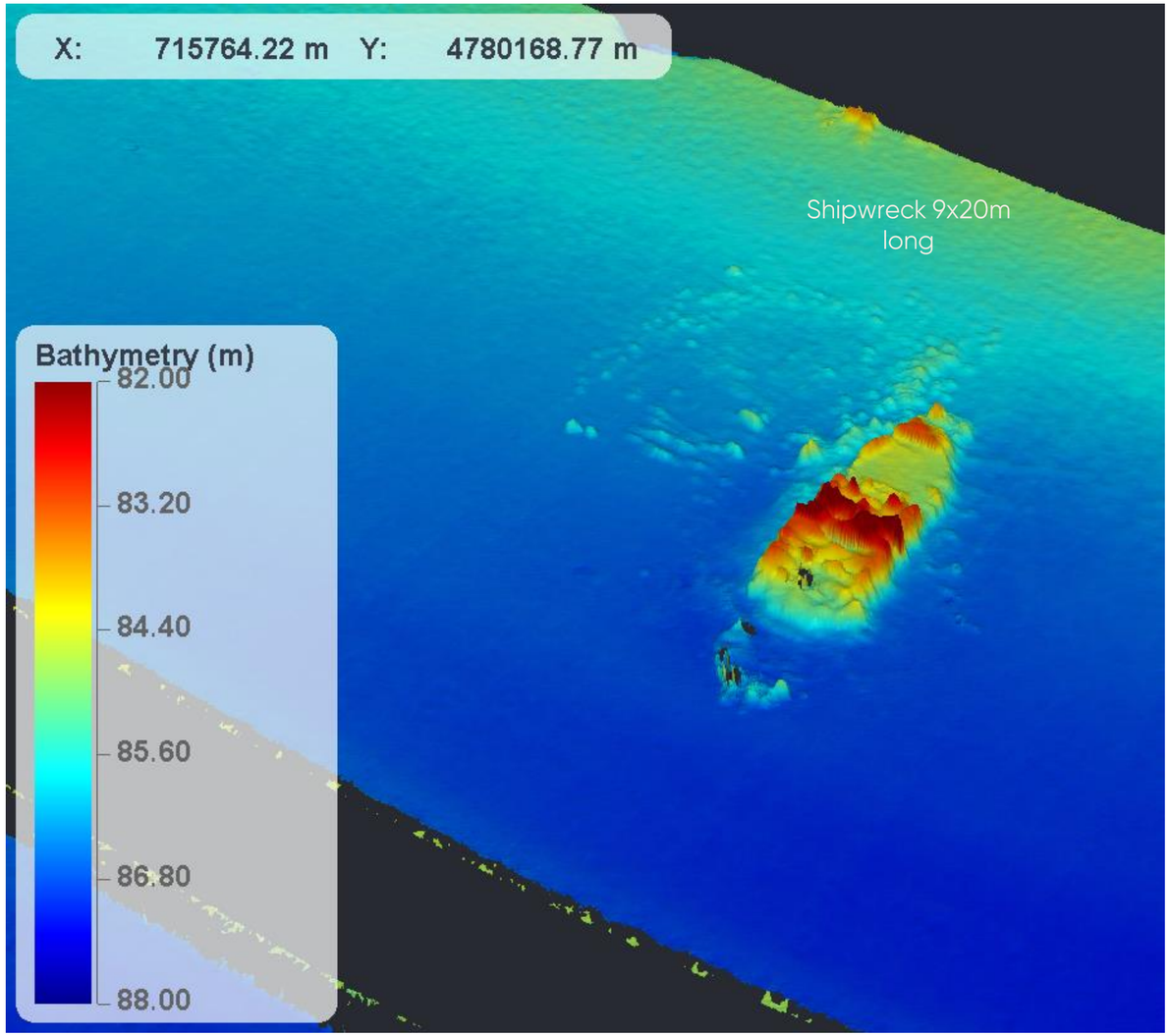


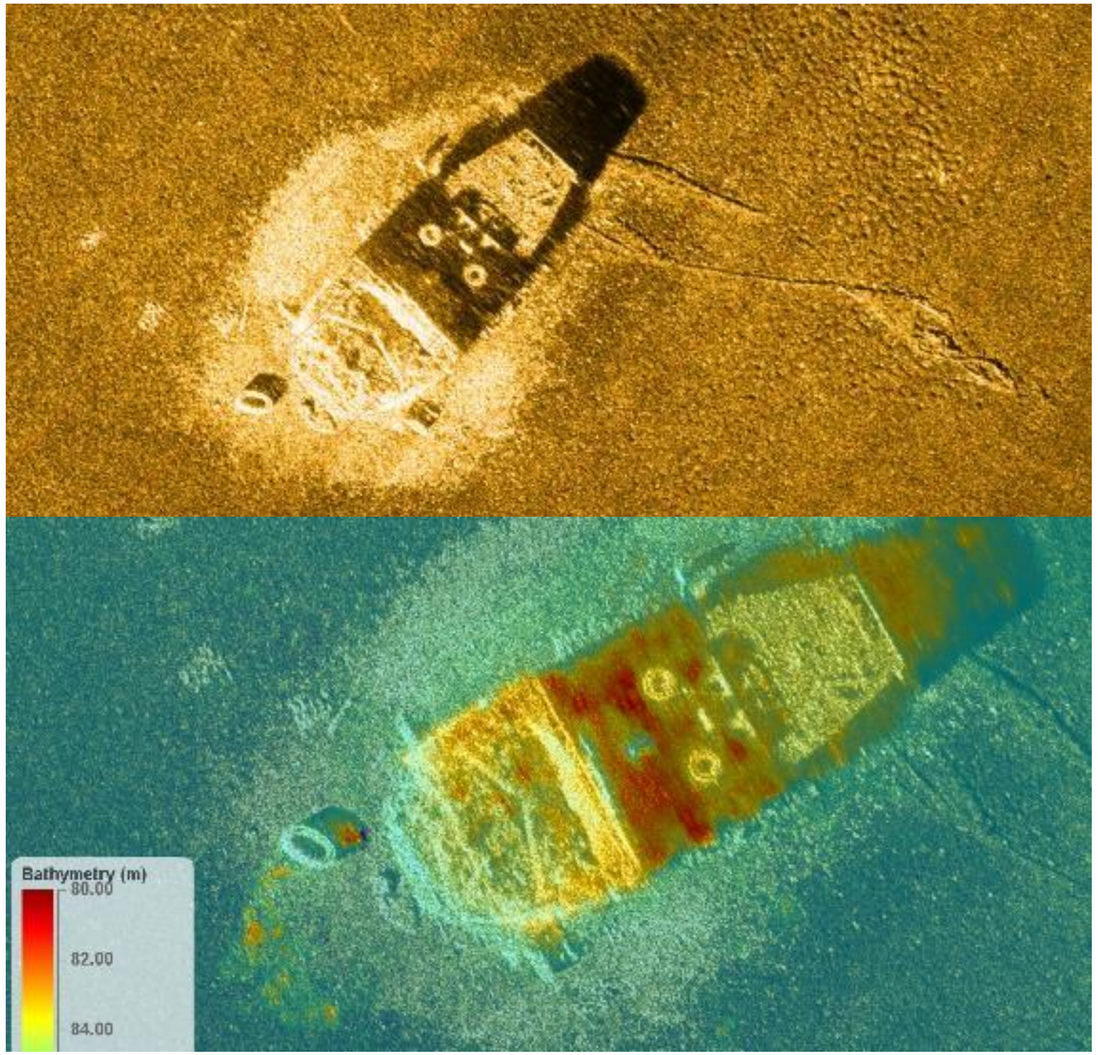
Built-in interferometric capability – To Be Qualified

- 400 m full swath



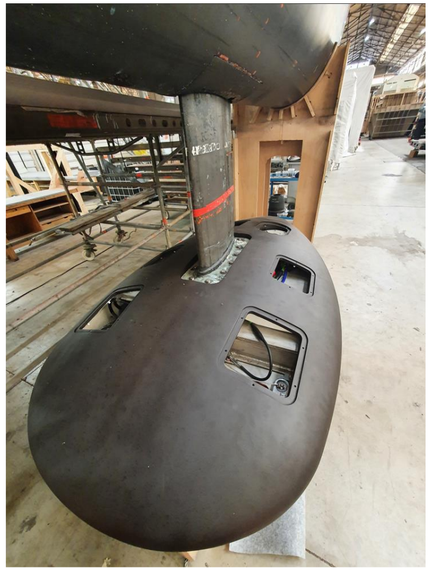
Built-in interferometric capability – To Be Qualified

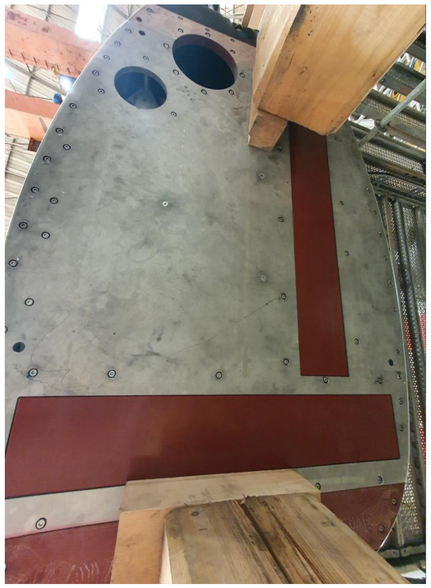




IHO Grade survey operation
IHO Order 1 - Extended water depth

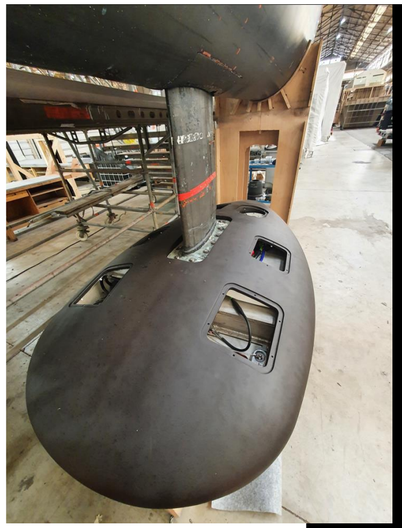
Système	DriX H8	DriX H9	DriX O16
Payload	EM 712 SBP – Echoes or Innomar SVP/CTD winch 500m	EM 712 SBP – Echoes or Innomar SVP/CTD winch 500m	EM 712 Or EM304MK2 – TBD EM124 or equivalent SBP – Echoes or Innomar ADCP – 50kHZ MVP winch 500m
Draft Water depth applicable	2m 10 to 3000m	2m 10 to 3000m	2.5m 10 to 10000m
Survey speed / Max Speed	6 to 7kts / 10kts	6 to 7kts / 10kts	TBC / 13kts
Endurance @survey speed	2 to 3 days – 400Nm	5 to 7 days – 1000Nm	3500Nm
Operations	Port to Port Force Multiplier with DDS	Mainly Port to Port option DDS	Port to Port

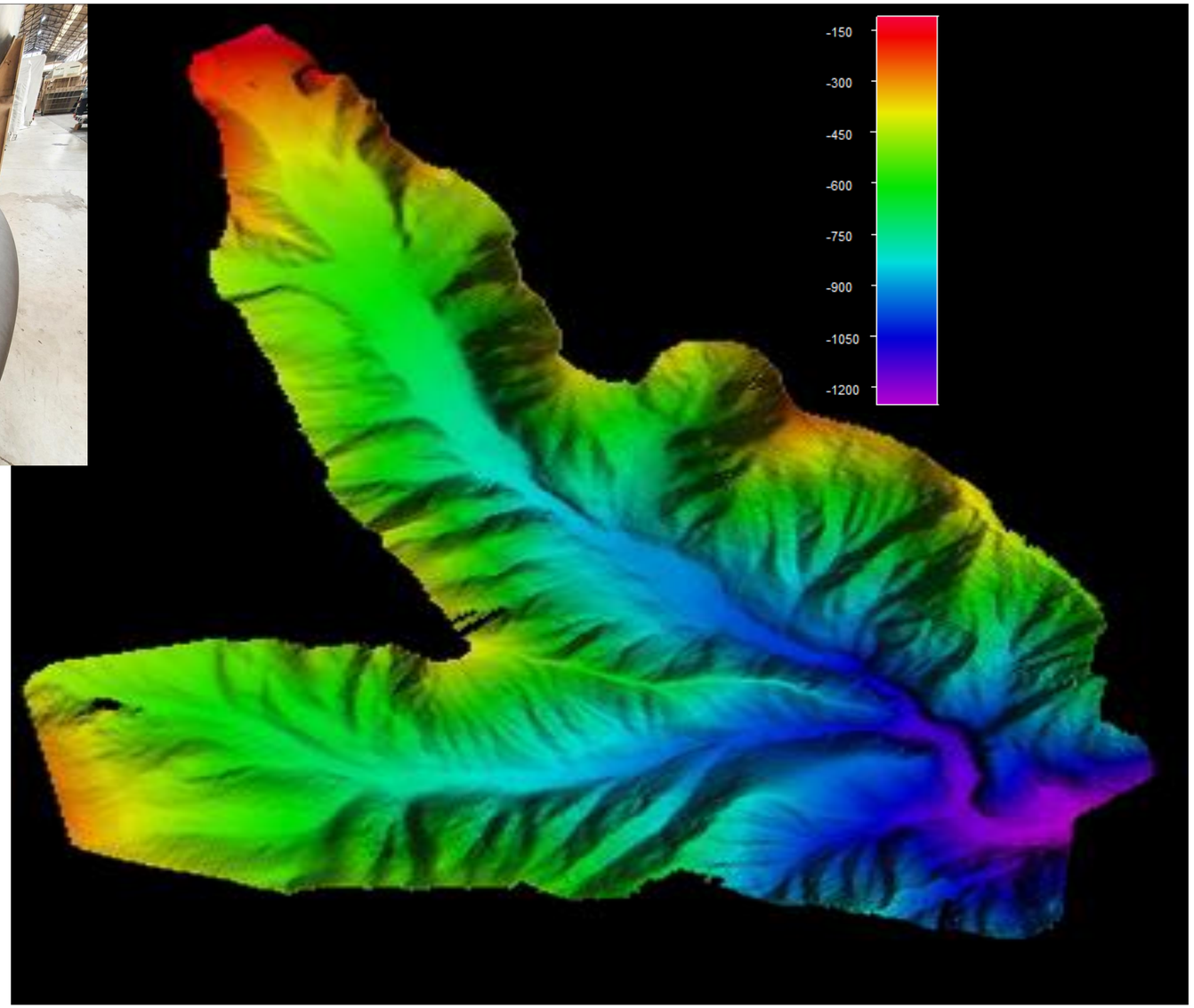


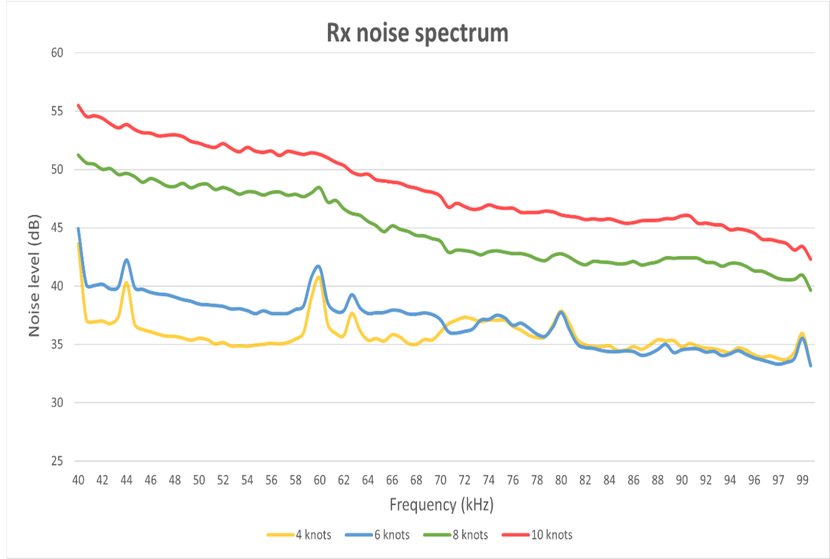


Charting canyons down to 3000m

EM712 on DriX H8

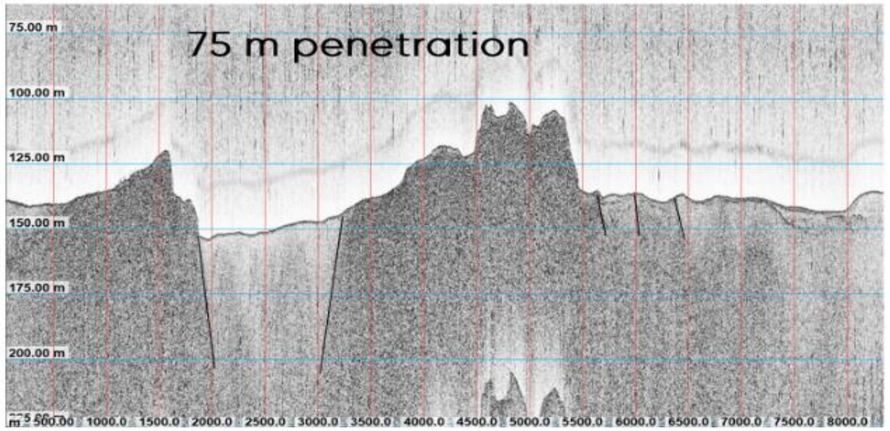


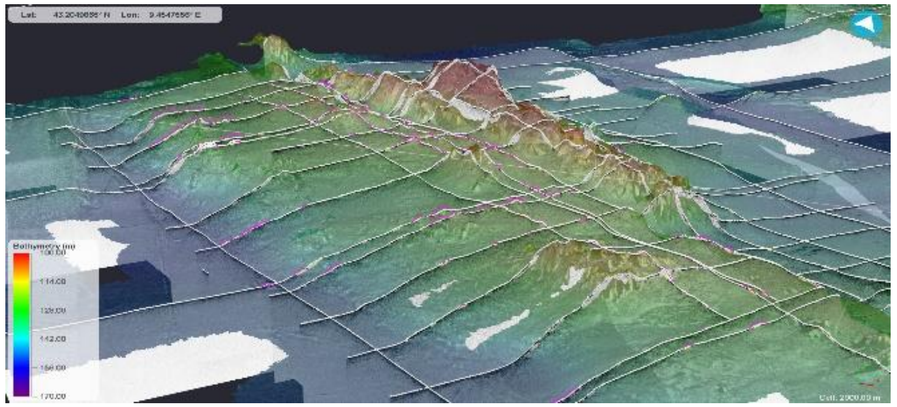


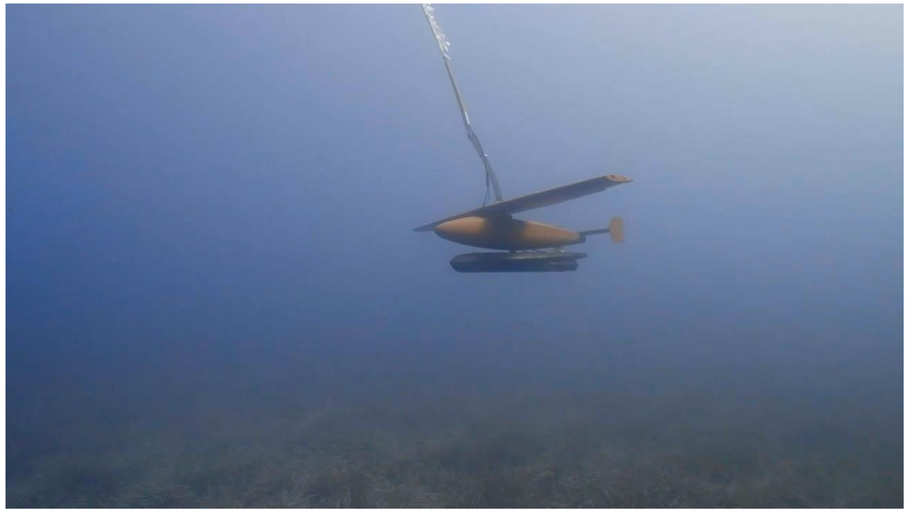


Multiple Hydrospatial Observations use

Système	DriX H8	DriX H9	DriX O16
Payload	Up to 3 systems - Shallow Water MBES - SBP – Echoes or Innomar - ADCP – 500kHz - Hydrophones - Fish Stock monitoring sonar - USBL	Up to 3 systems - Shallow Water MBES - SBP – Echoes or Innomar - ADCP – 500kHz - Hydrophones - Fish Stock monitoring sonar - USBL	To be confirmed - Shallow Water MBES - Full ocean depth MBES - Forward looking sonar - ADCP 50kHz – 100kHz - ….
Towing capacity	FlipiX fixed length cable 100m max immersion - Sidescan sonar - Magnetometer - **Streamer passive acoustic**	FlipiX fixed length cable 100m max immersion - Sidescan sonar - Magnetometer - **Streamer passive acoustic**	Winch cable max immersion to be confirmed - Sidescan sonar - Magnetometer - **Streamer passive acoustic** - **Oceanographic winch** **Range to be confirmed**
Deployment capacity	None	None	**ROV small inspection** **AUV small 300m max depth**
Draft	2m	2m	2.5m
Survey speed / Max Speed	8kts / 13kts	8kts / 13kts	8kts / 13kts
Endurance @survey speed	3 days – 500Nm 1 to 2 days with FlipiX	7 days - 1000Nm expected 3 days with FlipiX	3500Nm to be confirmed
Operations	Port to Port Force Multiplier with LARS **Overing mode**	Mainly Port to Port Possible LARS **Overing mode**	Port to Port **Static Positioning**

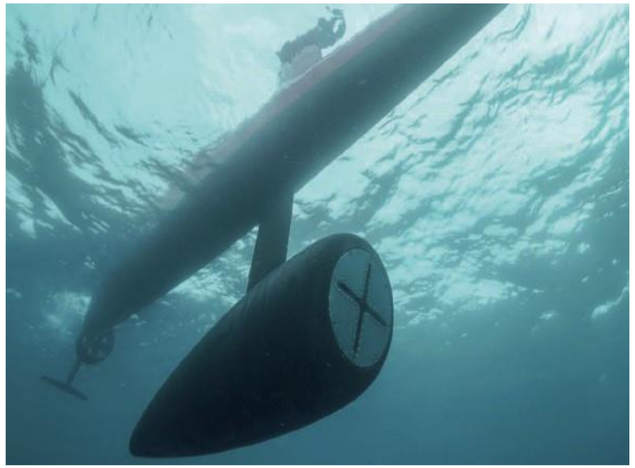


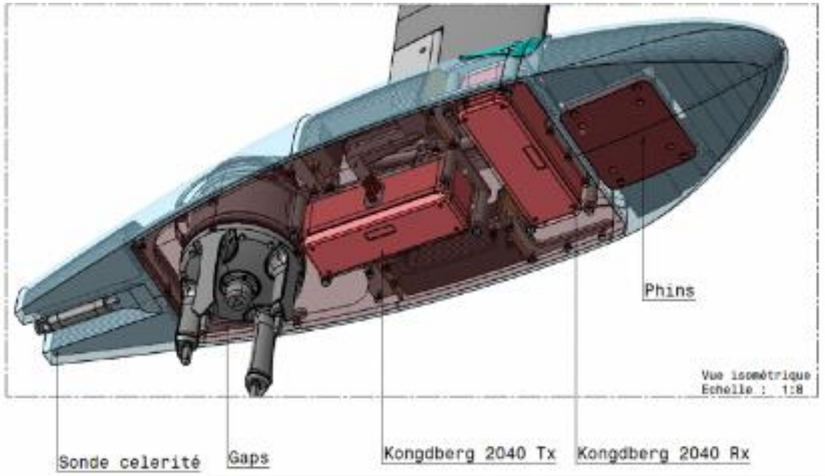


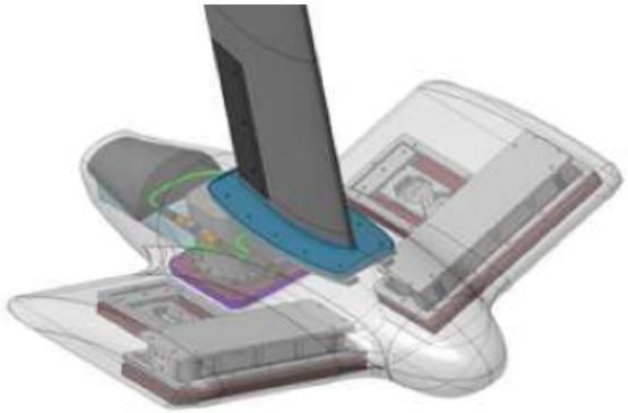


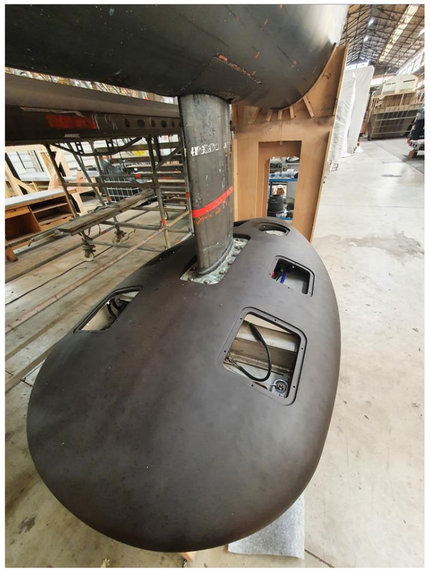
A universal platform

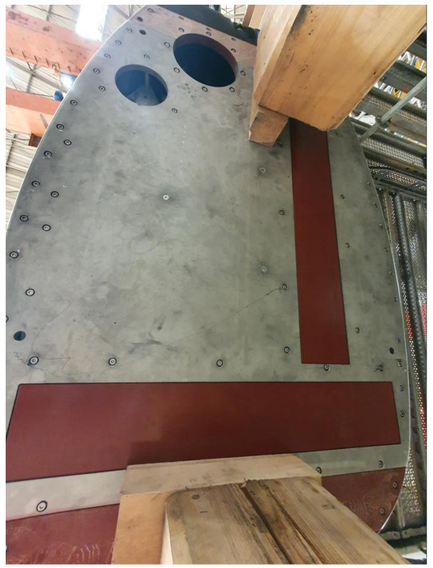
A gondola to house any type of relevant sensor – « Underwater awareness »

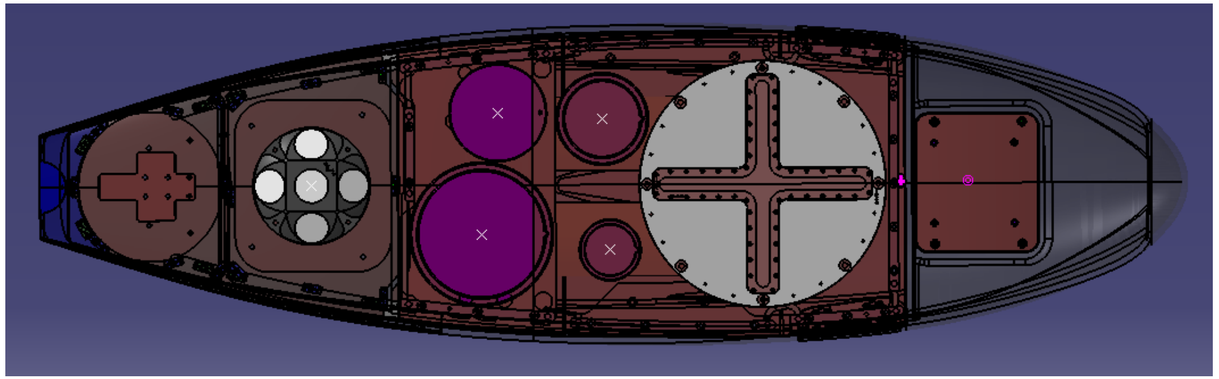












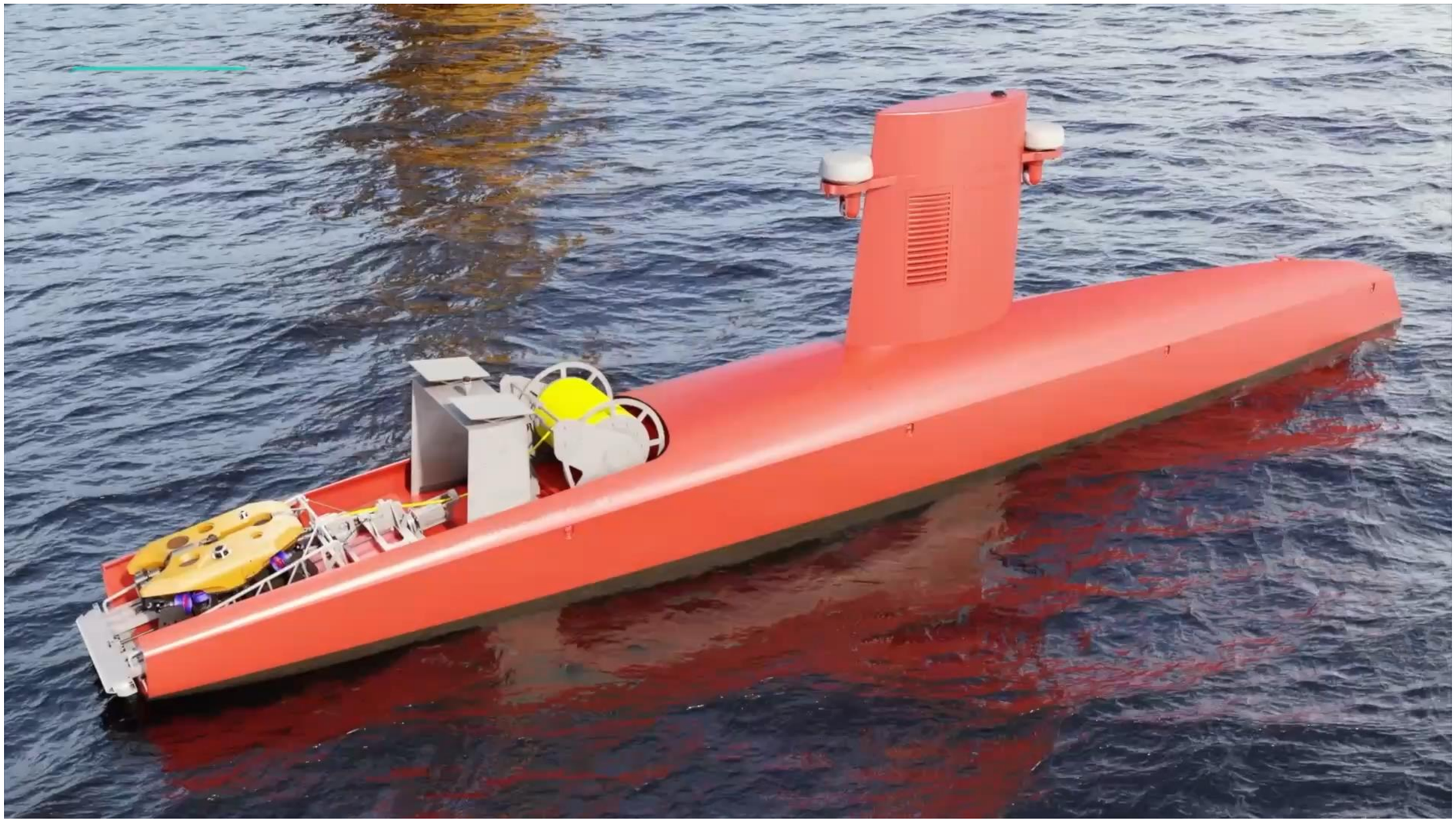
- Multiple brands of SBES / MBES
- Side Scan Sonar
- Sub bottom profiler
- USBL

- Acoustic modem
- Hydrophone
- ADCP
- CTD, SVS,

Multiple Hydrospatial Observations use

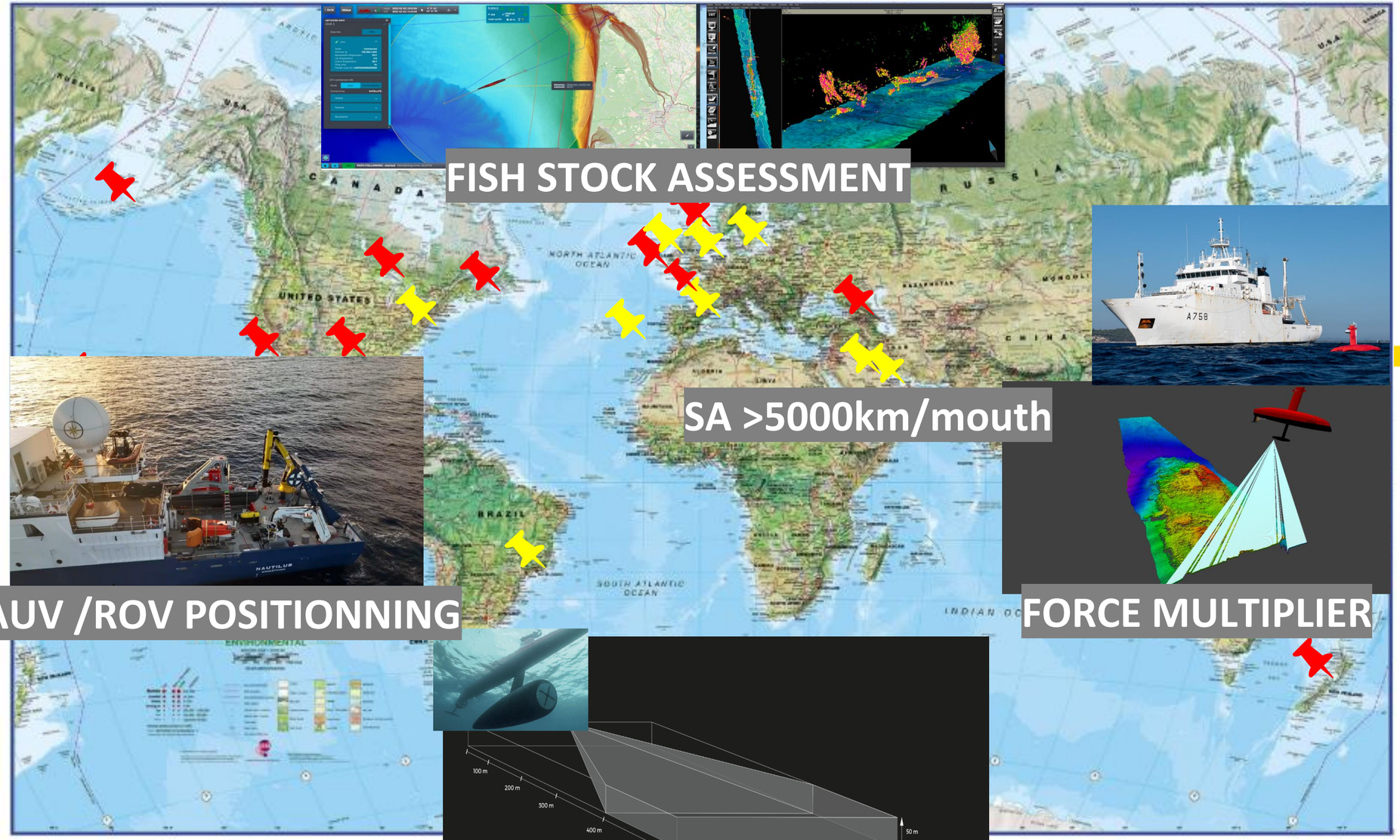
- Numerous Serendipity Observations

DRIX O-16 BACK DECK LAUNCH & RECOVERY RAMP



Main references – Multipurpse applications

Previous operation
Present positions of DriXs



SHOM

British Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

OCEAN INFINITY

Unique Group
Strength in Depth

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

TotalEnergies

Jan De Nul GROUP

Boskalis

DREBBEL DE MÉXICO

WAM

Schlumberger

sulmara SUBSEA

MARYNARKA WOJENNA · BIURO HYDROGRAFICZNE

Ifremer

University of New Hampshire

GUARDIAN GEOMATICS

OCEANEERING

OCEANTECH

Unmmaned Surface Vehicles (USV)

DriX, an efficient survey machine

Greener, Safer, Faster and Better

In a few figures	
Greener - Fuel consumption	**Only 2 L/h at survey speed (around 8 knots)**
Safer - Reduced crew exposure	**2 or 3 operators for 2 DriX**
Faster - Total Survey execution	**up to 10 time faster (complete cycle from planning to data delivery)**
Reduced weather dependency	**Operation in SS5 with measurement quality 3-4 times better than IHO exclusive order**
Reduced post processing	**Statistics other a reference area shows 100% of beams within specifications**
Collaborative autonomy	**Multiple Drix as a force multipliers**
Remote supervision	**Over the Horizon operation when the vessel cannot sustain the sea state**

Key take away

- **DRIX becomes DriX Series to push further the limit of applications**
- **A unique track record**
- **Constant improvment**

- **A versatile and open architecture offering (multiple payload, coms, ROS)**
- **A wide range of services: Training, offshore support, ROC support, Maintenance, spares**
- **A wide choice of possible Business model**
  - You can purchase DriX
  - GOCO
  - COCO