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iXblue develops advanced technologies to match Customers' challenges in tough environments

iXblue
PHOTONIC SOLUTIONS

Specialty Fibers
& Photonic
Components

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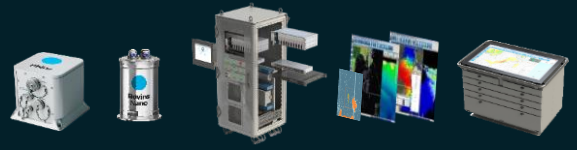
NAVIGATION SYSTEMS



Inertial Systems
& Navigation Solutions

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ACOUSTICS SYSTEMS

Acoustic Positioning
& Sonar / Sounder solutions

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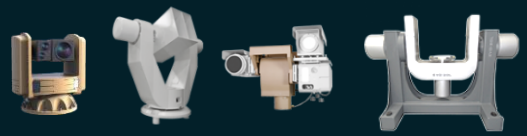
MOTION SYSTEMS



Multi-axis Tables, Simulators,
Pan & Tilt & Positioners

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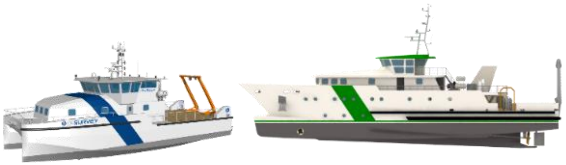
DIVISION H2X



Composite
Specialized ships

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SEA OPERATION

A Survey
Company

Improving Hydrographic survey with USV platform - DRIX

21st MBSHC – Regional IHO commission

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TABLE OF CONTENT

1. What is the USV DriX
2. Large scale deployment
3. Raising hydrographic awareness

WHAT IS THE USV DriX ?

What do we expect from unmanned Surface Vessel

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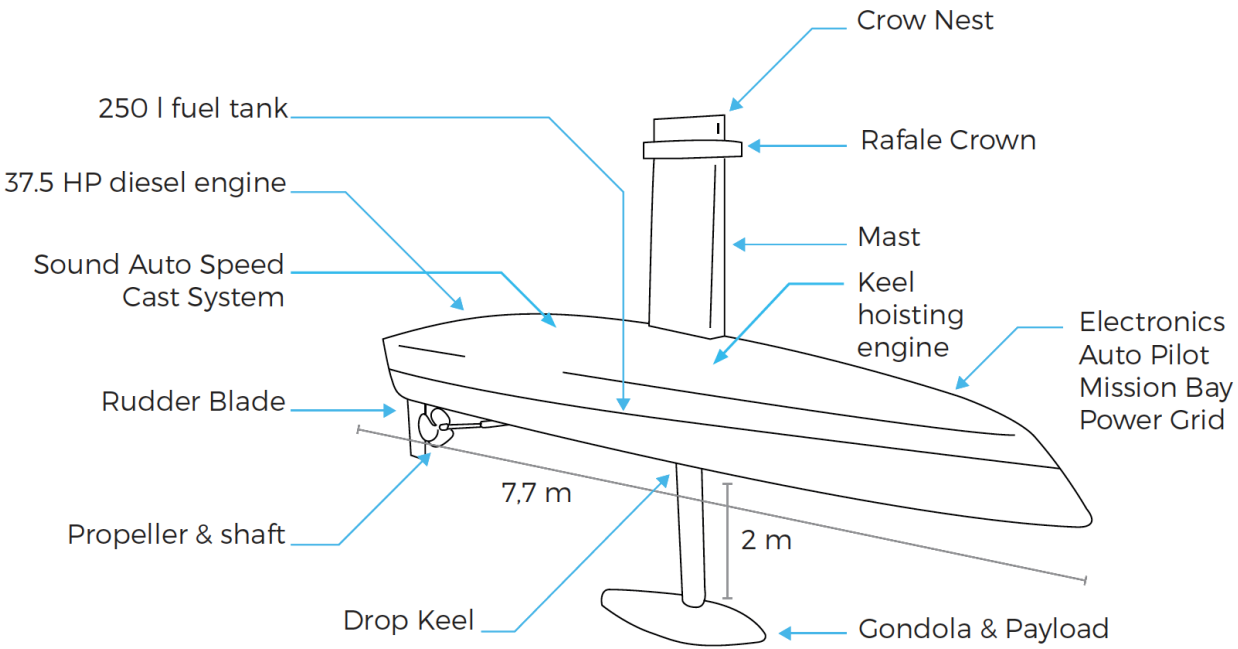
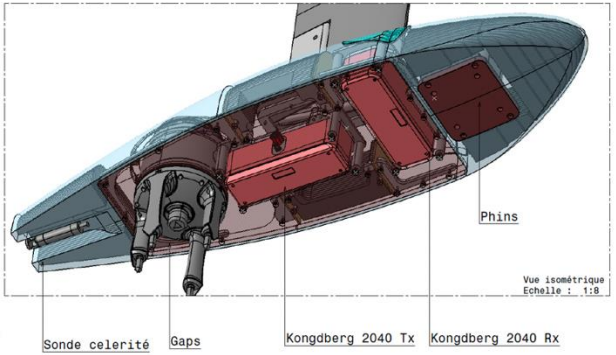
An hydrodynamic serving data gathering and endurance





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DriX : AN UTMOST STABILITY FOR THE SENSORS

Video of DriX in strong winds (40kts)

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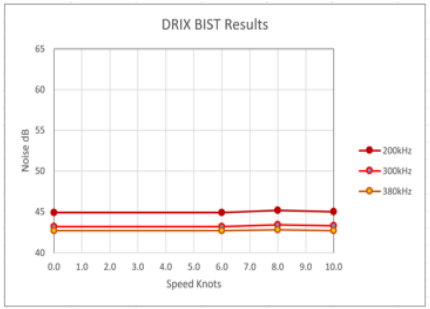
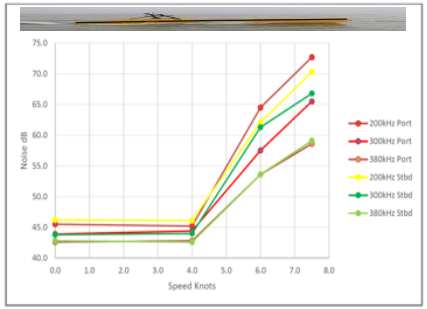
A silent environment

BIST TEST : Results of the observed noise level using a EM2040C MBES transducer

DriX
(Gondola in France)

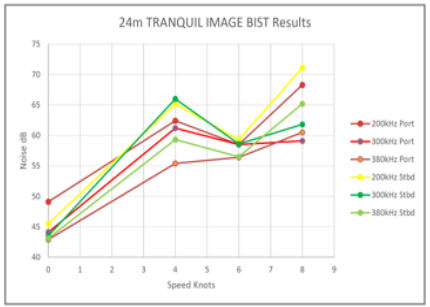


Other USV
Long endurance
Length 5m
(Hull mounted in France)



Elaine
(Gondola in NZ)

Tranquil Image
(Gondola in NZ)



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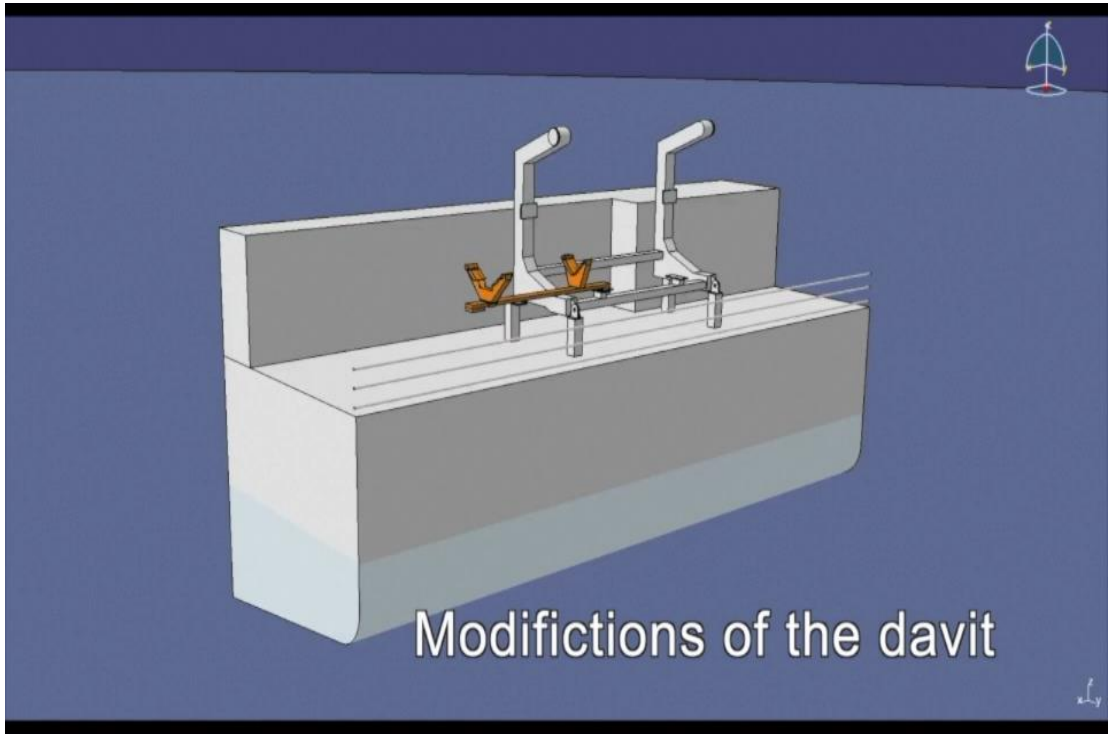
A user friendly, sea proven, Launch And Recovery System

The corner stone of any unmanned solution operating from an asset at sea



DriX for NOAA - davit modification

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An easy handling

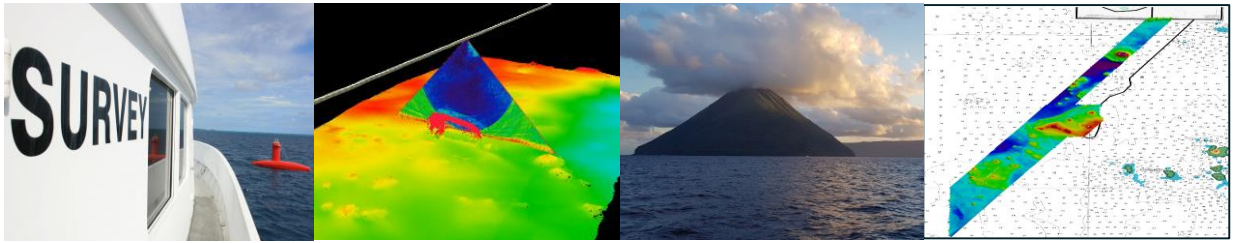
One of the key points

- Lifting devices: A-Frame, Crane, Davit.
- Export control: Considered as a stand-alone solution (Ease the shipping of dual-use sensors)

2

CASE STUDY

Large Scale Survey for LINZ - TONGA



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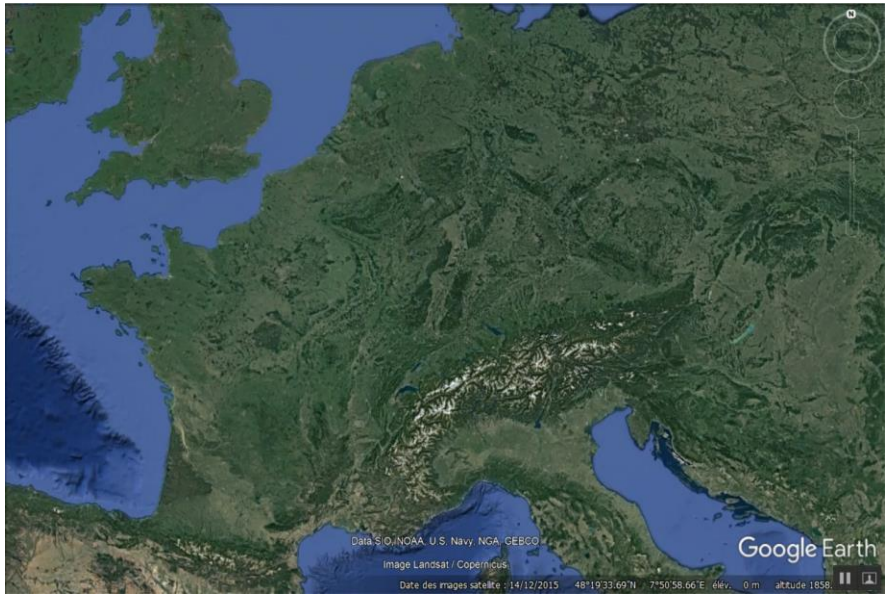
CASE STUDY #2 : PROJECT CONTEXT

Surveying the south pacific waters – Tonga Islands

- Project context
  - Survey location : Kingdom of Tonga (archipelago of 170 islands)
  - Client: LINZ (Land Information New Zealand)



- Survey specifications
  - Survey area oriented North/South, 200km long
  - Multiplatform approach:
    - Airborne LIDAR to cover areas 0 to 18m WD
    - Mother ship + USV to cover 694km2

      7500 Line km

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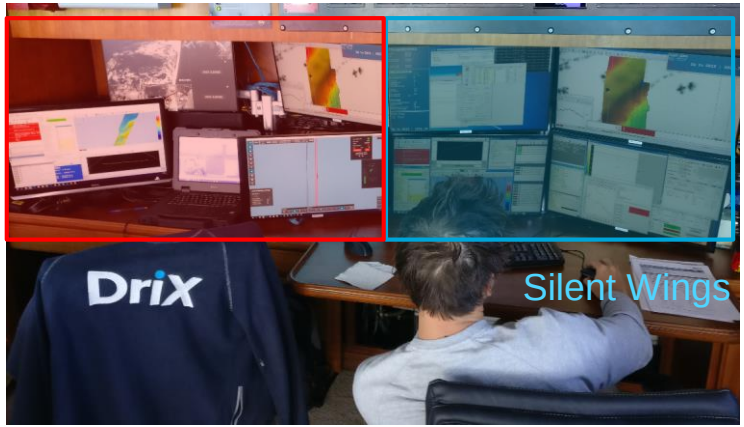
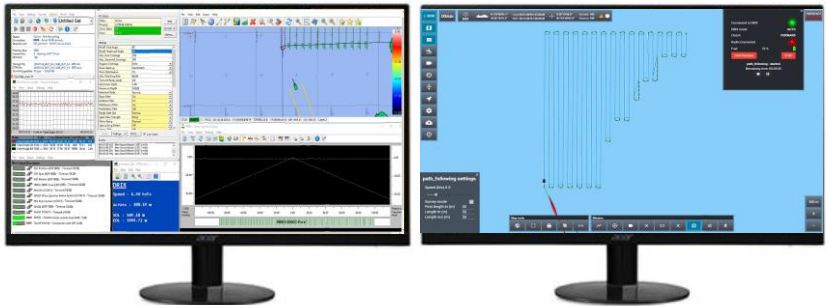
CONDUCT OF SURVEY OPERATIONS

- Drix fitted on our support vessel without preliminary work
- 24/7 survey operations

- DRIX operating range from the Mother Ship: up to 3,5km

- Drix surveyed with a max water height of 1,6m (sea state 4)
- Mother Ship with a max water height of 2m (sea state 4/5)





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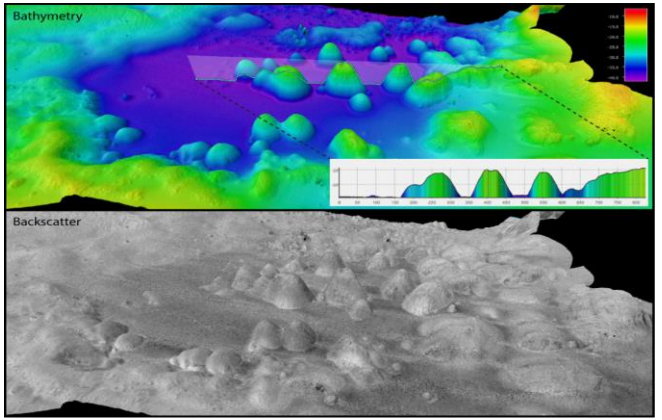
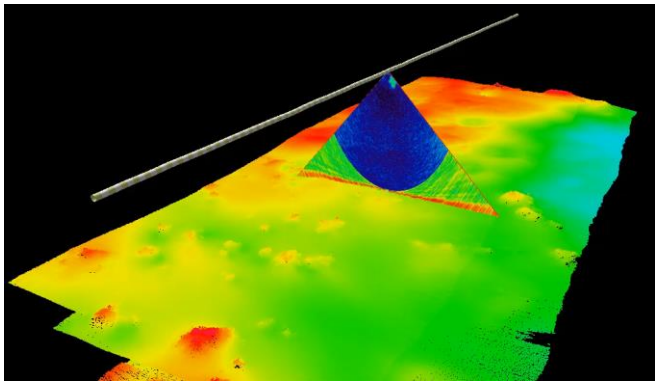
CONDUCT OF SURVEY OPERATION

- Online
  - Acquisition of Mother Ship survey Data
  - Sending missions / monitoring QC data of DRIX
  - Sound Velocity casts
  - Download of DRIX's bathymetric data
- Post-processing of INS data using ixblue APPS software
- Post-processing of bathymetric data in Caris
  - Merge and Process of Drix and Mother Ship data (real time)
  - Applying tide, squat and smart heave solution
- Post processing of backscatter and water column data





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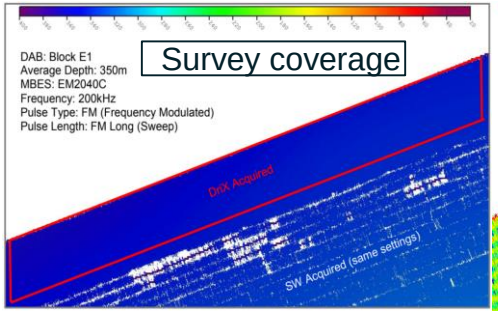
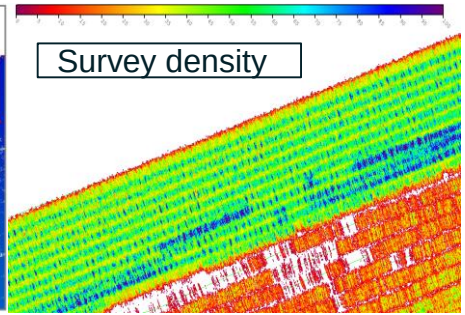
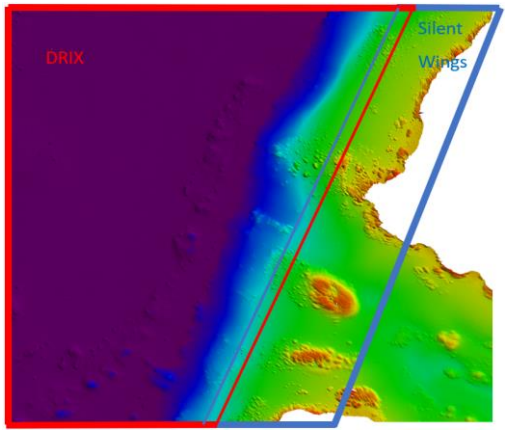
RESULTS

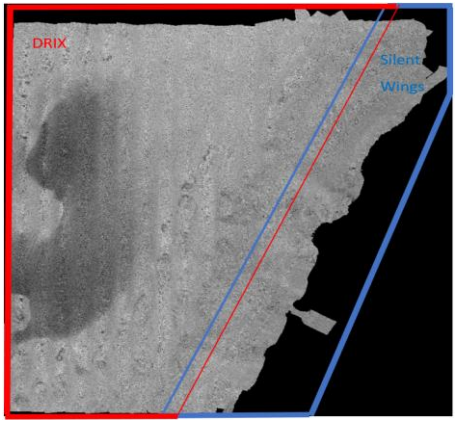
On Data Quality

- Drix low noise level implies higher Data Qualitiy
  - 100% coverage @ 400m deep for DRIX
    Lost seabed @ 320m deep for Vessel
  - DRIX Improves backscatter interpretation
    water column analysis
- Perfect complementarity between the two datasets
  - Average mean depth difference of 1.4cm
    on SW and Drix overlapping surfaces
  - Complete Merging of backscatter data









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RESULTS

On Productivity

- Using DRIX saved
  - 33% survey duration
  - 20% cost
  - 34% carbon footprint

- Limitation on this project
  - Impossibility to use DDS
    (Drix Deployment System)

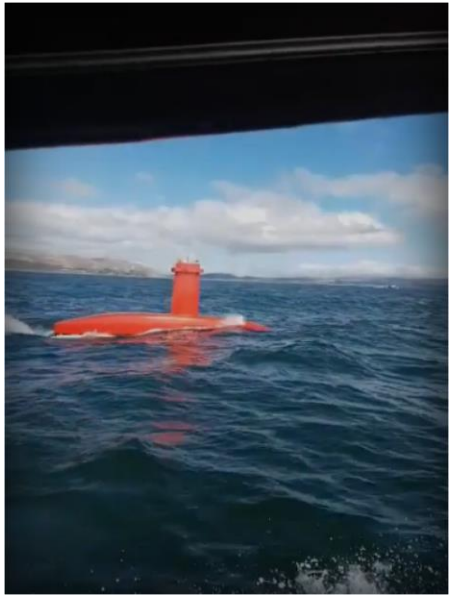
Parameters	Drix	Mother Ship
Overall Line km	7450	
Line km	2360	5090
Effective survey time (Hours)	166	358
% of total line km	32	68
Total use (days)	19	37
Average Survey Speed (knts)	7.6	7.6
Average transit speed	10	10
Autonomy	4-5	7
Fuel consumption	2,4	66

OPERATIONAL EFFICIENCY – Hydrographic survey

DriX Vs. Conventional Survey Platform

VS a Survey Launch

- **Up to 4 x faster / 5 x cheaper**
  - Faster line change
  - Unparalleled line keeping & endurance
  - No crewchanges
  - Capacity to survey in marginal weather



VS an Oceanographic Vessel

- **1.3 x faster / 3 x cheaper**
  - Unparalleled line change
  - Unparalleled line keeping
  - Low fuel consumption
  - little manning

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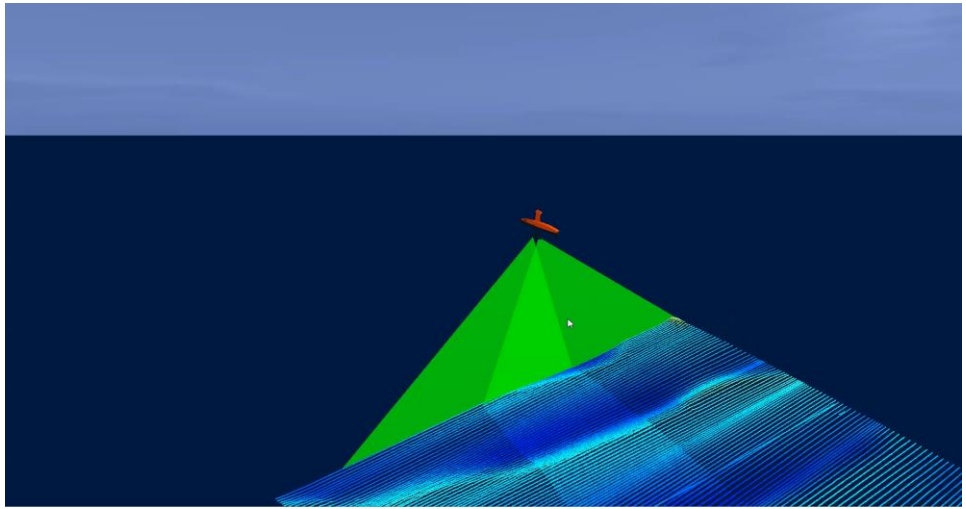
iXblue investing to raise hydrographic awareness

DriX – USV to support increasing demand for HR data

Scouring survey within a windfarm – Observed efficiency 3 to 4 times faster to conduct box survey



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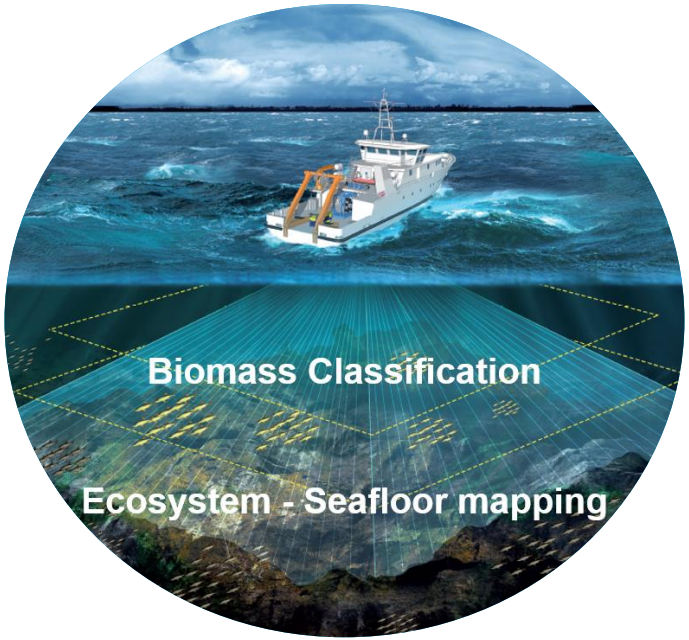

SEAPIX
Hydro grade environmental Multibeam

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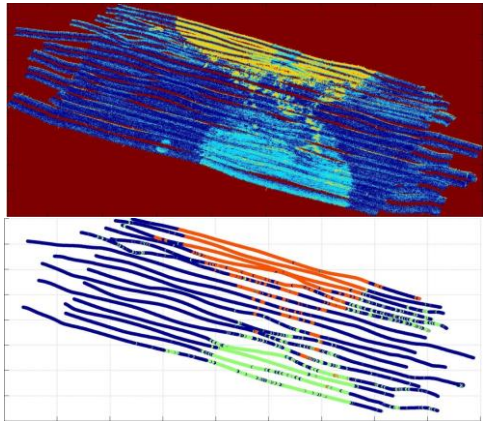
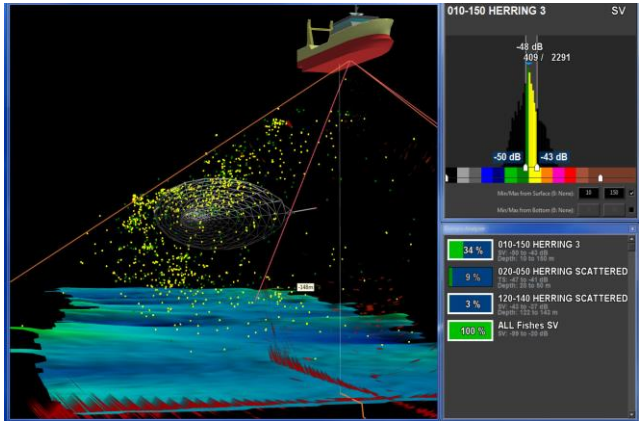
SEAPIX – Hydro grade environmental sonar

An Environmental sonar
- Fish discrimination
- GBA – Global Biomass assessment
- Seabed Classification
- All data stored in built-in database
- GIS

Recent successes
- Feroe x 15
- Turkey x 6
- Japan x 4





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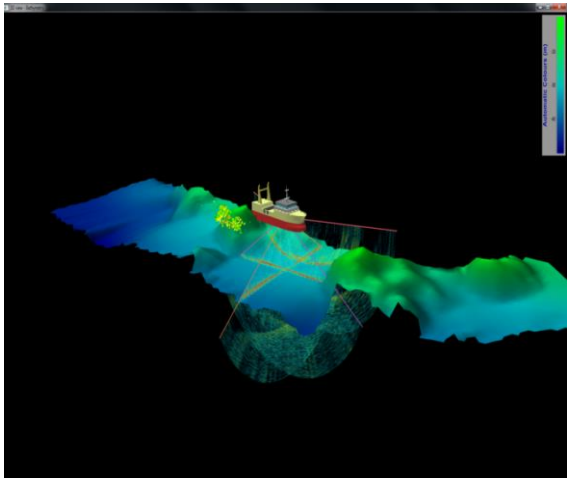
SEAPIX – Hydro grade environmental sonar

ALSO an Hydrographic sonar
- Motion stabilized
- IHO order 1A or 1B capability
- Static bathymetry



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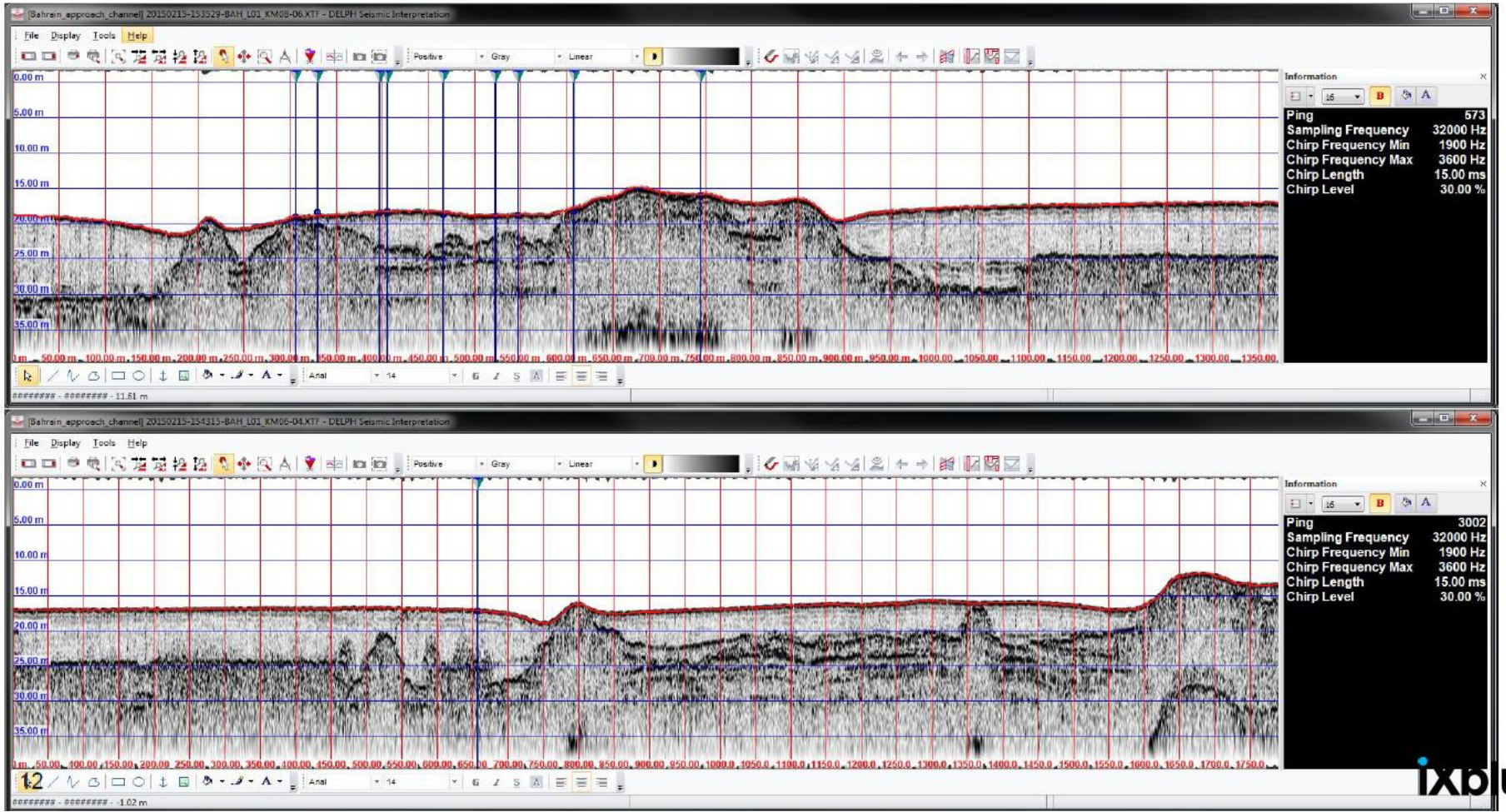
Sub-bottom Profiler – Echoes series



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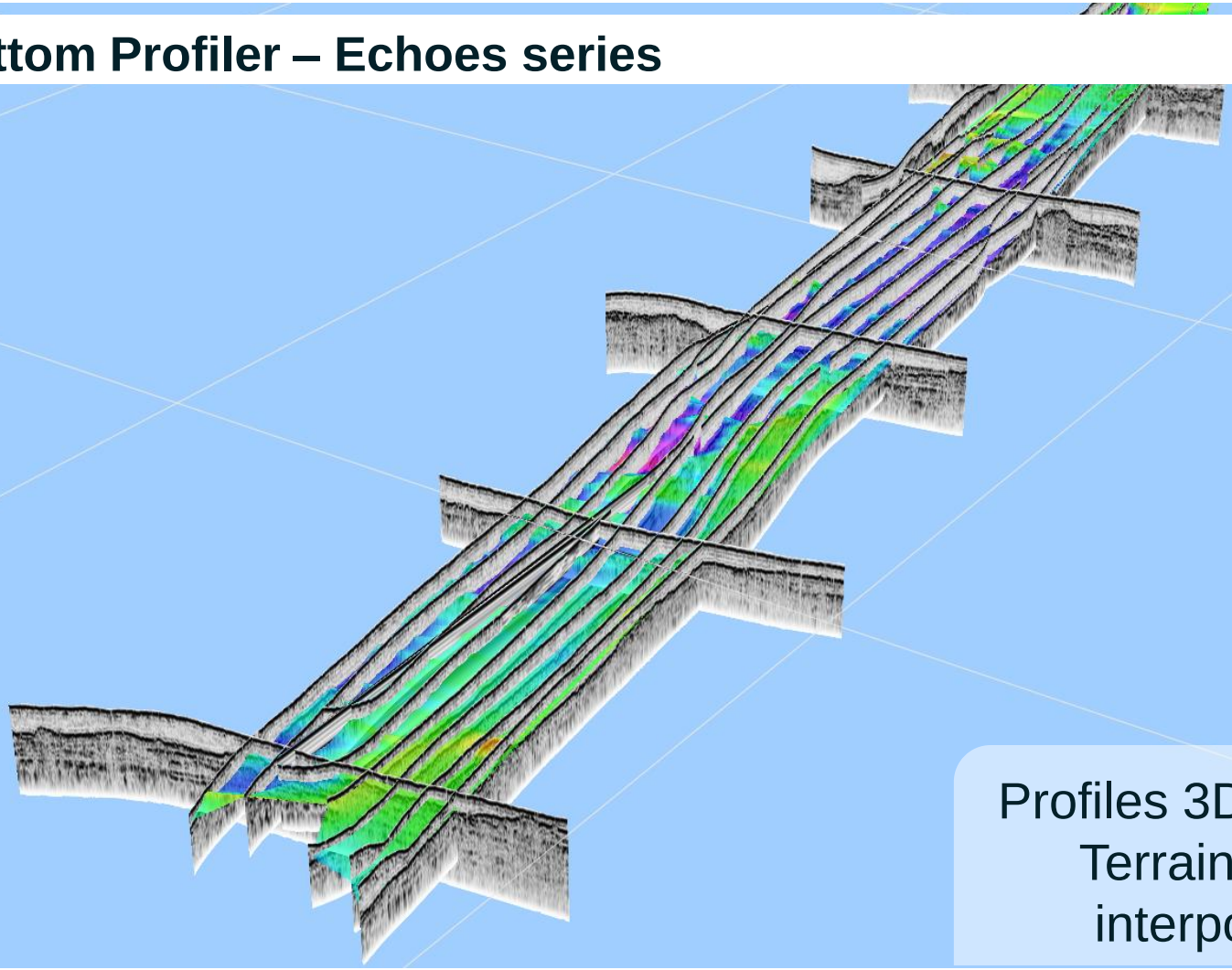

Profiles 3D display & Terrain Model interpolation

Building on in-house Expertise

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