

Kongsberg Maritime – Subsea

BRING CLARITY TO THE WORLD BELOW

15th SAHIC Seychelles 2018



KONGSBERG

Presented by

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Commander RNoN (Rtd)

Area Sales Manager – Subsea

Kongsberg Maritime

Presentation overview

- This is KONGSBERG
- Kongsberg Maritime
- Subsea Division
- Kongsberg Maritime Hydrographic Portfolio

> 200 Years of Technology Innovation From Deep Sea to Outer Space



Advanced solutions and applications for the maritime, oil & gas, defence and space industry.

- Extreme Performance for Extreme Conditions -

The KONGSBERG organisation

Our business areas



KONGSBERG MARITIME

Efficiency and safety throughout the whole maritime technology spectrum.



KONGSBERG DEFENCE & AEROSPACE

Norway's premier supplier of defence and aerospace-related systems.



KONGSBERG DIGITAL

We aim to be an industry leader in the digitized industry of tomorrow.

Presentation overview

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Kongsberg Maritime

- Offshore Oil & Gas, Seaborne Transportation, Energy Management, Aquaculture and Subsea & Marine Robotics
- 58 offices in 21 countries
- 4000 employees
- Installed on more than 18.000 vessels
- Dynamic positioning, navigation, automation, simulation, seismic instrumentation, hydrographic and scientific systems.

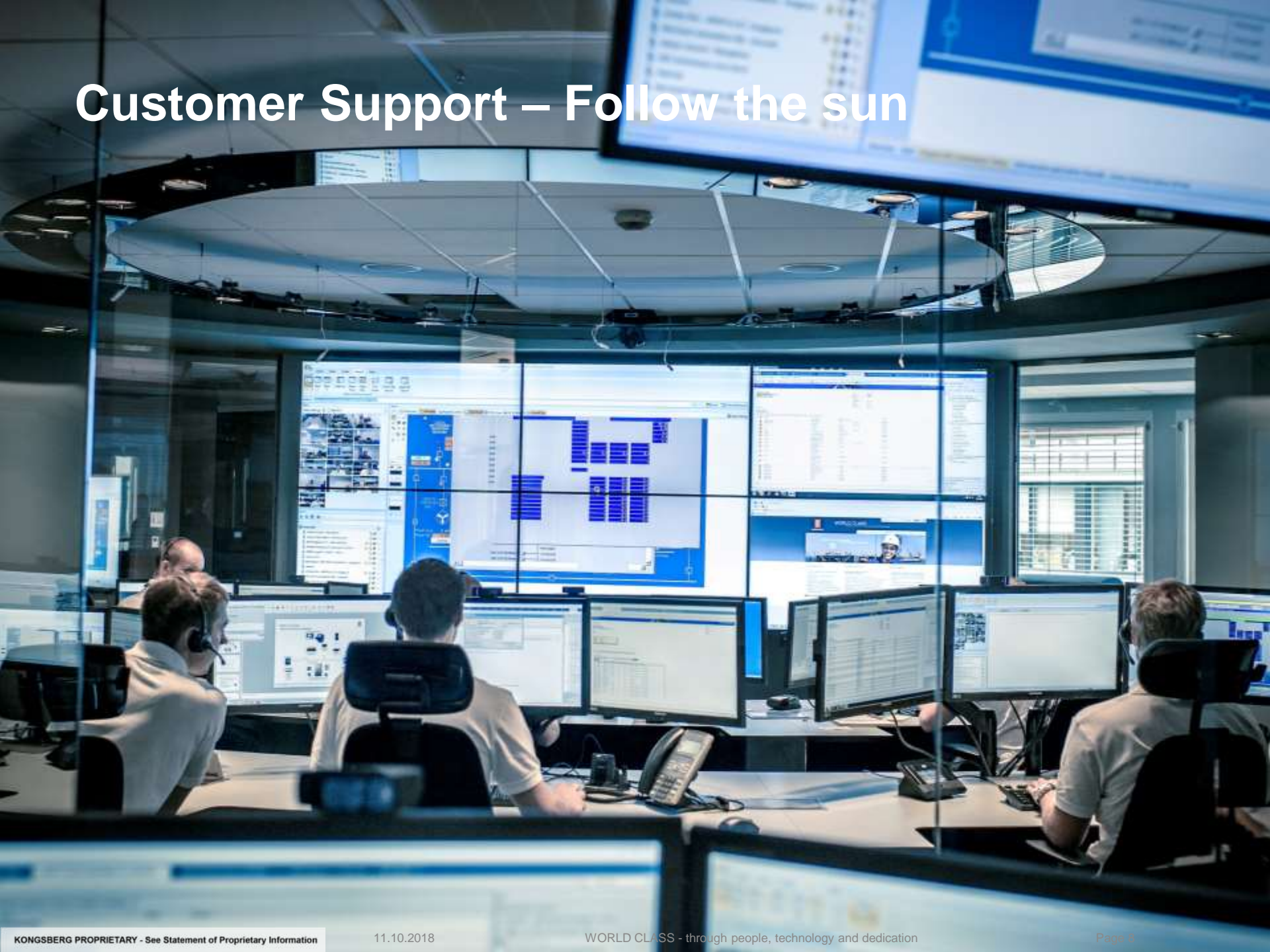


Our global business system

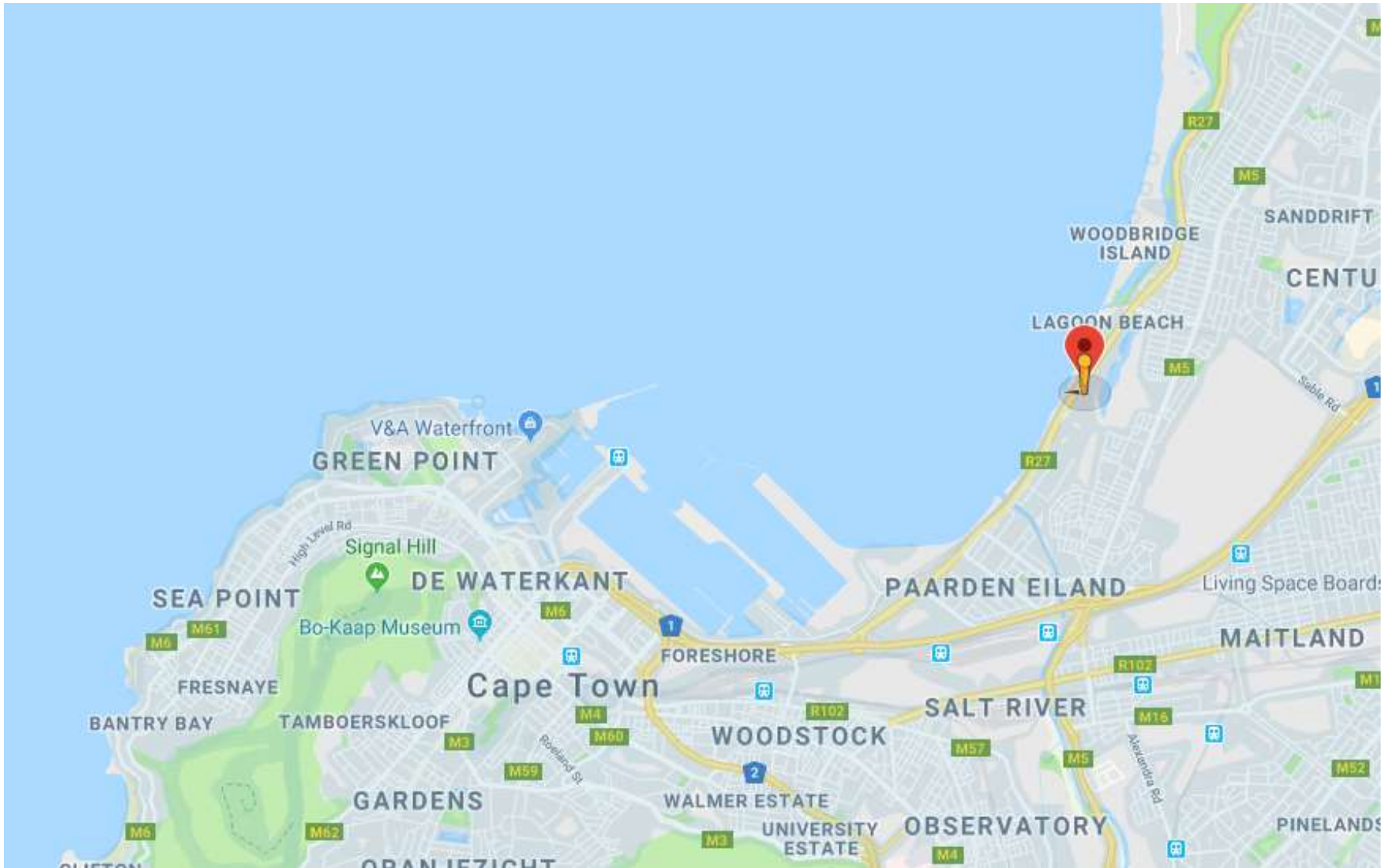


International sales organization – life cycle support – production hubs – global value chains – global sourcing

Customer Support – Follow the sun



Kongsberg Maritime South Africa (Pty) Ltd





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Kongsberg Maritime AS - Subsea



KONGSBERG



Kongsberg Maritime Subsea Division

Leading technology



KM Subsea – Main Product Line



Underwater Navigation



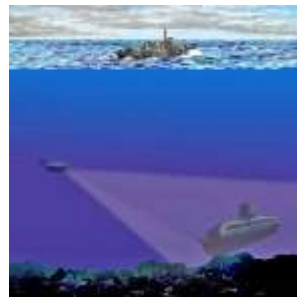
Acoustic Communication, Monitoring & Control Systems



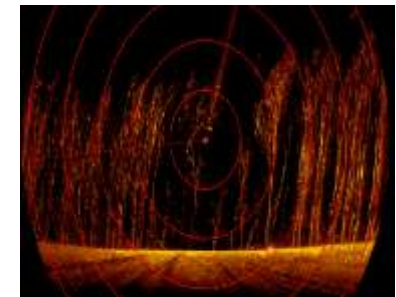
Hydrography Systems



Fish Finding and Fishery Research



Naval Sonars



Inspection and Detection Sonars



Marine Robotic Systems





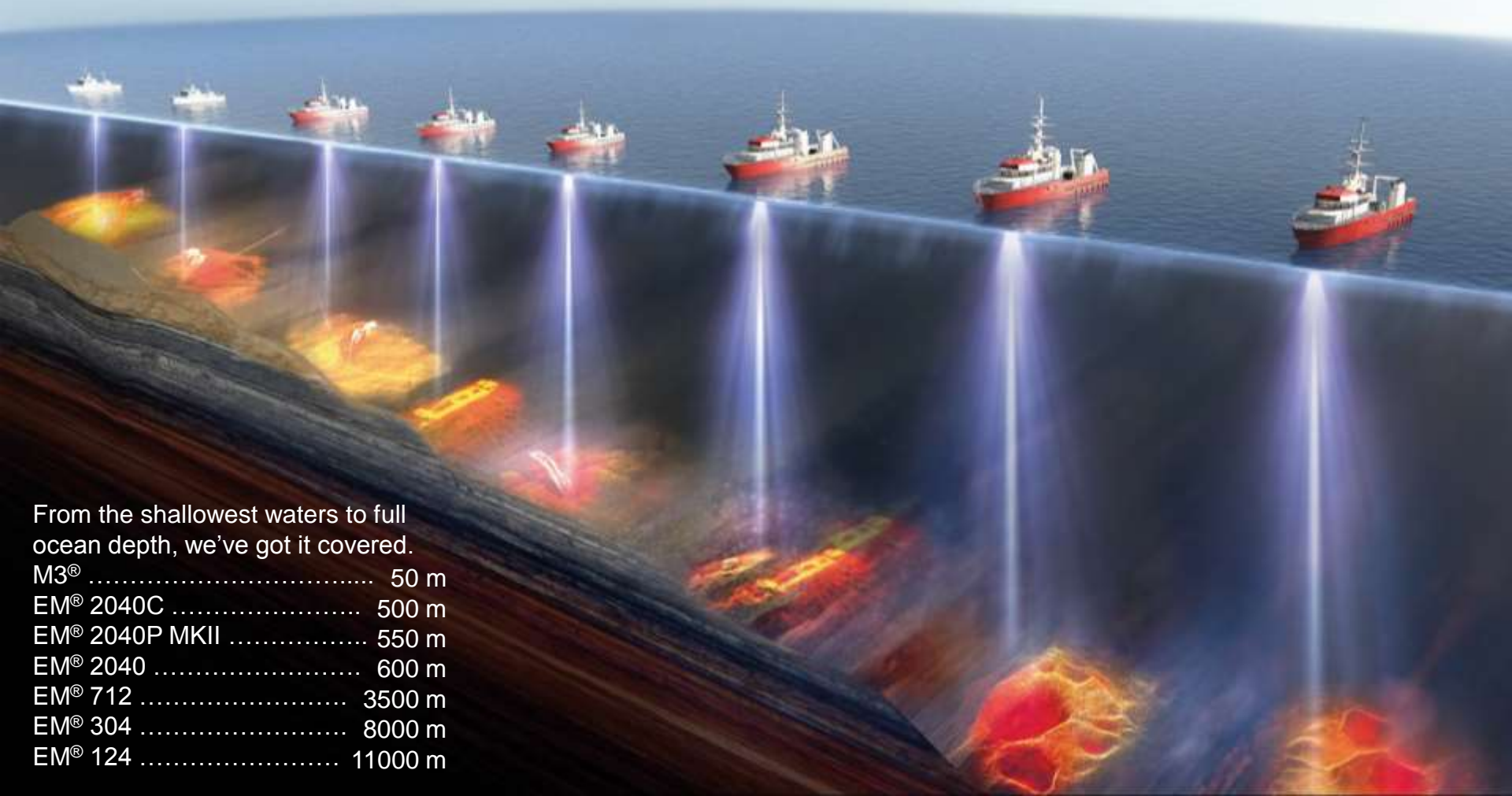
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Kongsberg Multibeam Echo Sounder Portfolio



THE COMPLETE MULTIBEAM ECHO SOUNDER RANGE



From the shallowest waters to full ocean depth, we've got it covered.

M3®	50 m
EM® 2040C	500 m
EM® 2040P MKII	550 m
EM® 2040	600 m
EM® 712	3500 m
EM® 304	8000 m
EM® 124	11000 m

EM[®] 2040C – Installation

Very high resolution Multibeam Echo Sounder



Applications from very high resolution inspection to shallow water surveys.

EM[®] 2040P MKII – Installation

Very high resolution Multibeam Echo Sounder



KONGSBERG



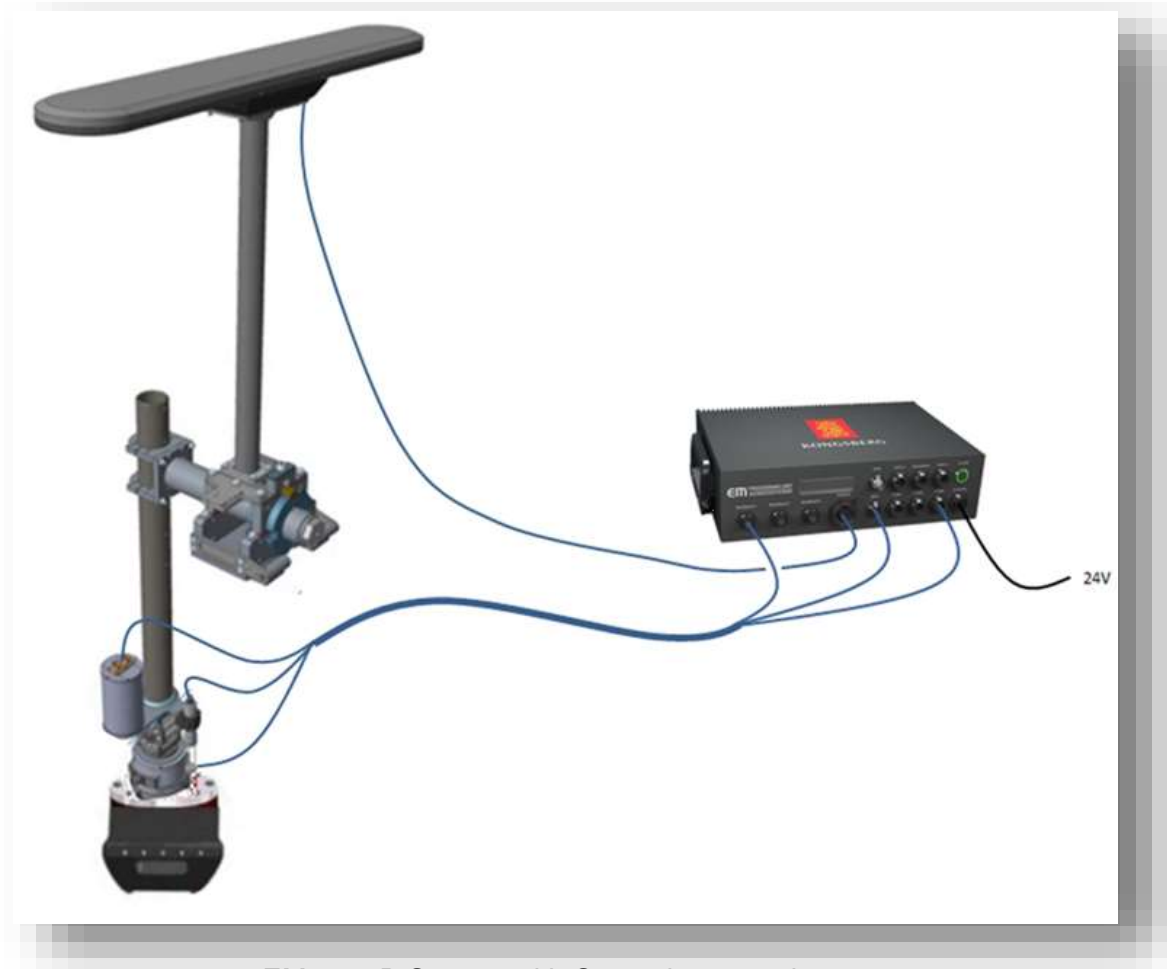
Images courtesy of
SHOM @ Noumea,
New Caledonia



Applications from very high resolution inspection to shallow water surveys.

EM[®] 2040P – Setup

Very high resolution Multibeam Echo Sounder



EM 2040P System with Seapath 130-series

Applications from very high resolution inspection to shallow water surveys.

EM[®] 2040C/EM[®] 2040 – Installation

Very high resolution Multibeam Echo Sounder



Applications from very high resolution inspection to shallow water surveys.

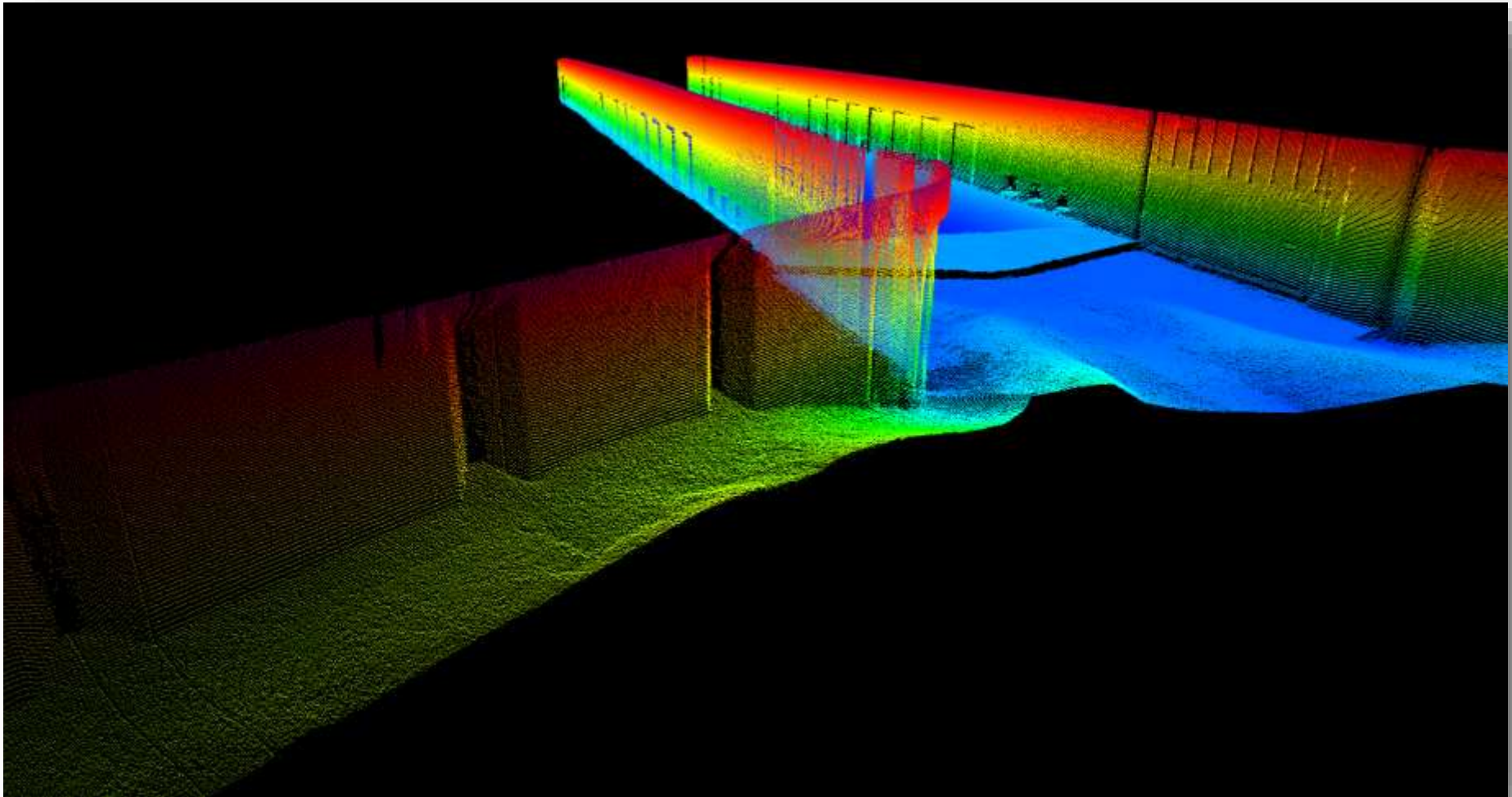
Deep Water System – Installation



Applications from very high resolution inspection to shallow water surveys.

EM[®] 2040 – Results

Very high resolution Multibeam Echo Sounder



Courtesy of Port of London

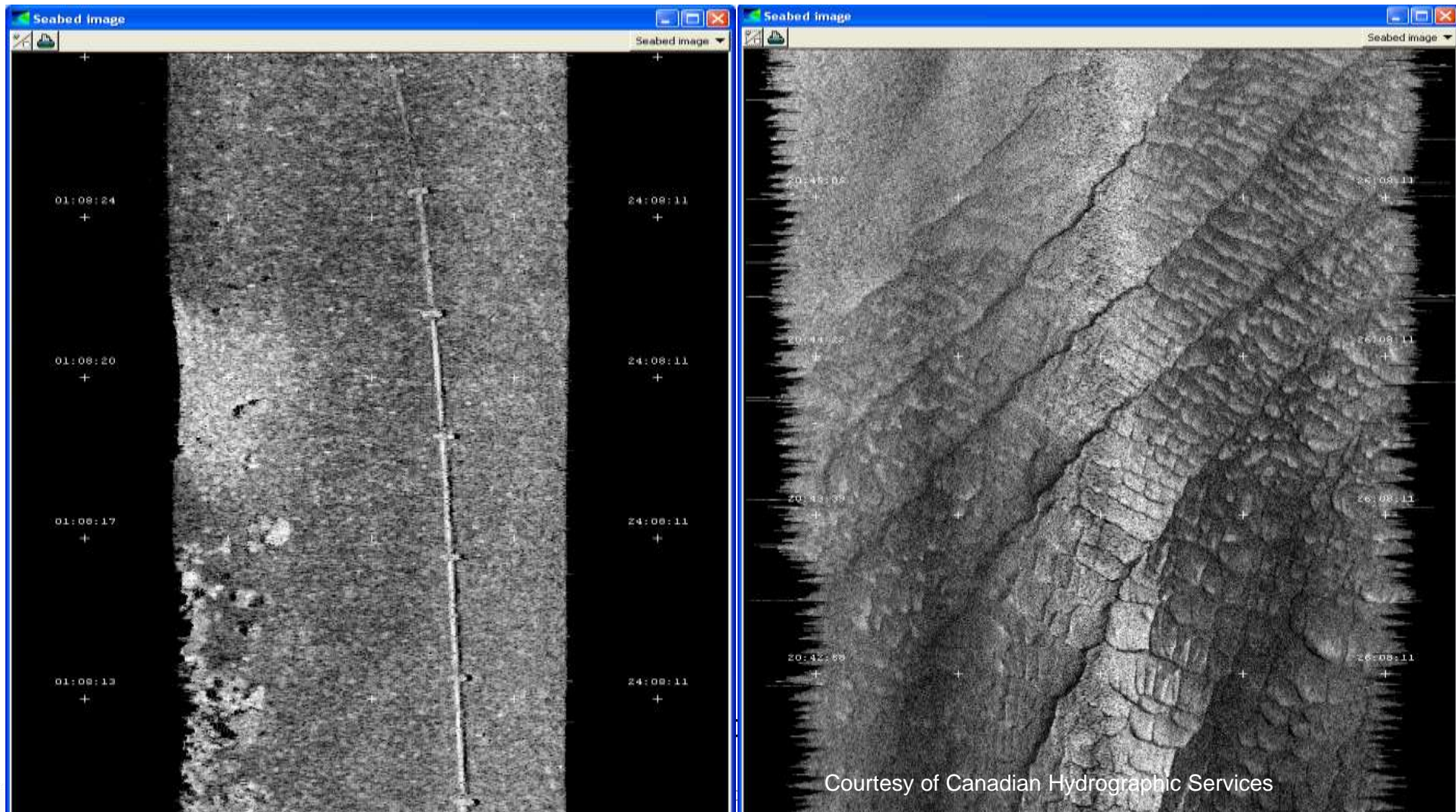
Applications from very high resolution inspection to shallow water surveys.

EM[®] 2040C – Results

Very high resolution Multibeam Echo Sounder

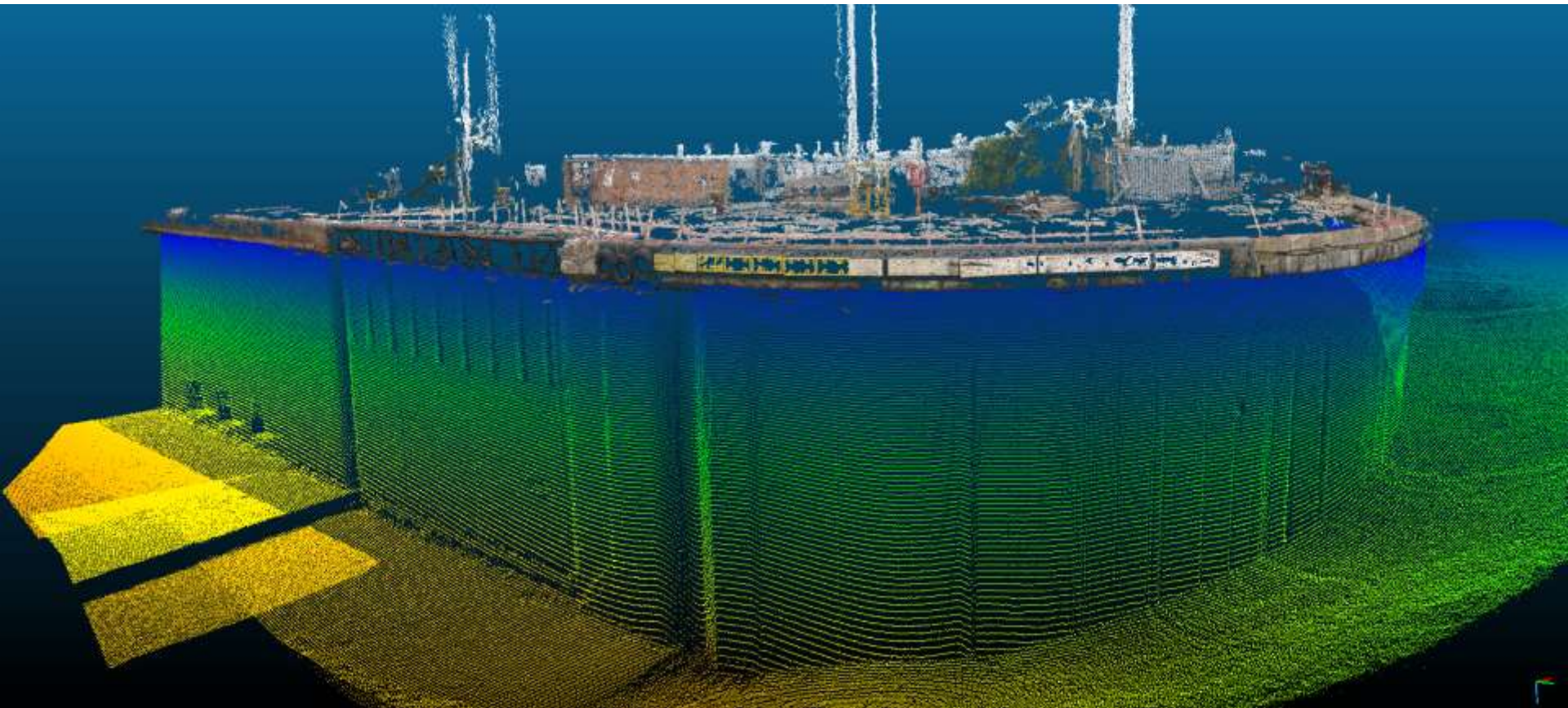
Pipeline – Sydney Marina, 400kHz / 50us

Sandwaves, 90 - 100m depth, 300kHz / 70us



EM[®] 2040C – Results

Very high resolution Multibeam Echo Sounder



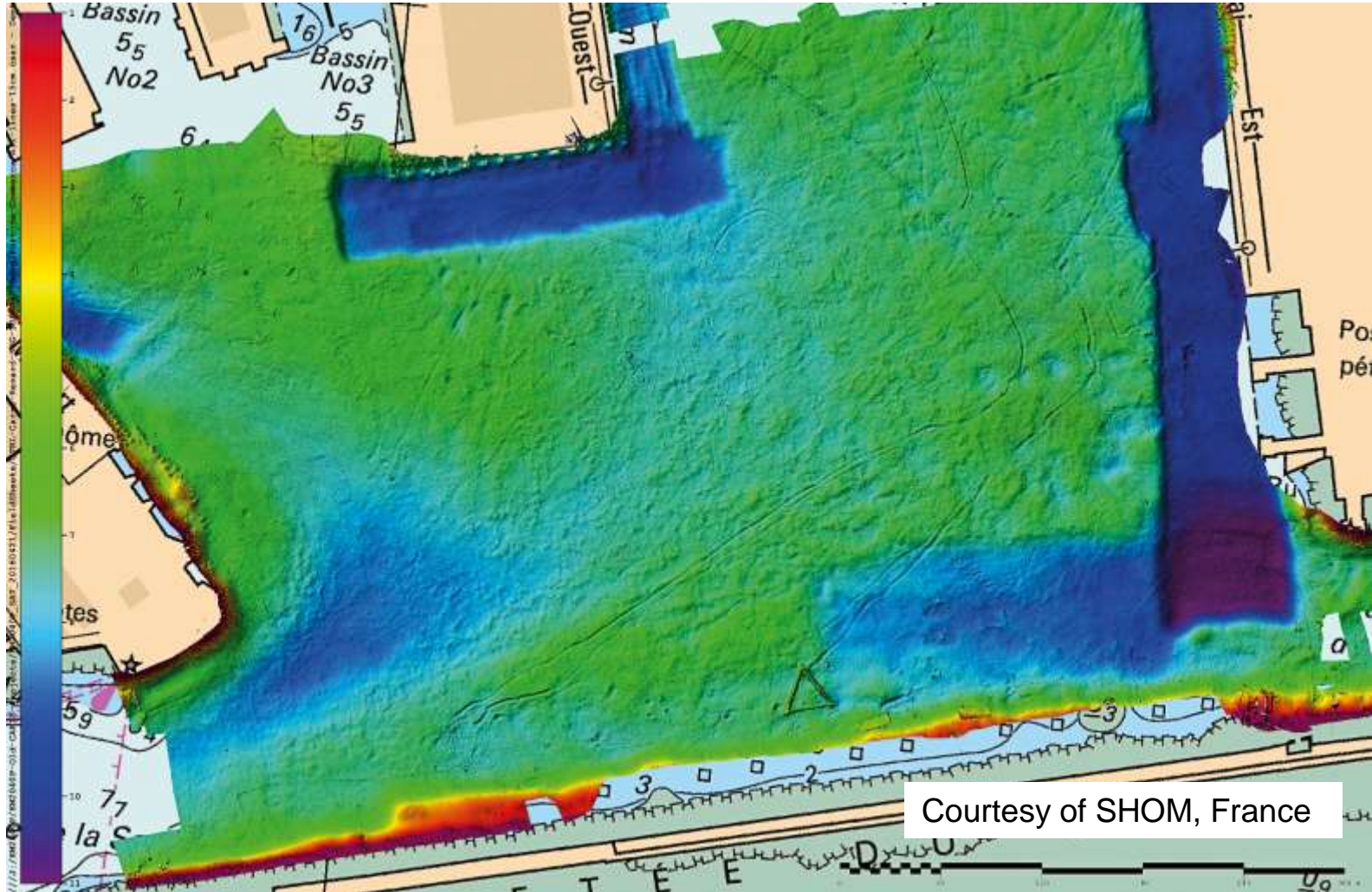
Applications from very high resolution inspection to shallow water surveys.

EM[®] 2040P – Results

Very high resolution Multibeam Echo Sounder



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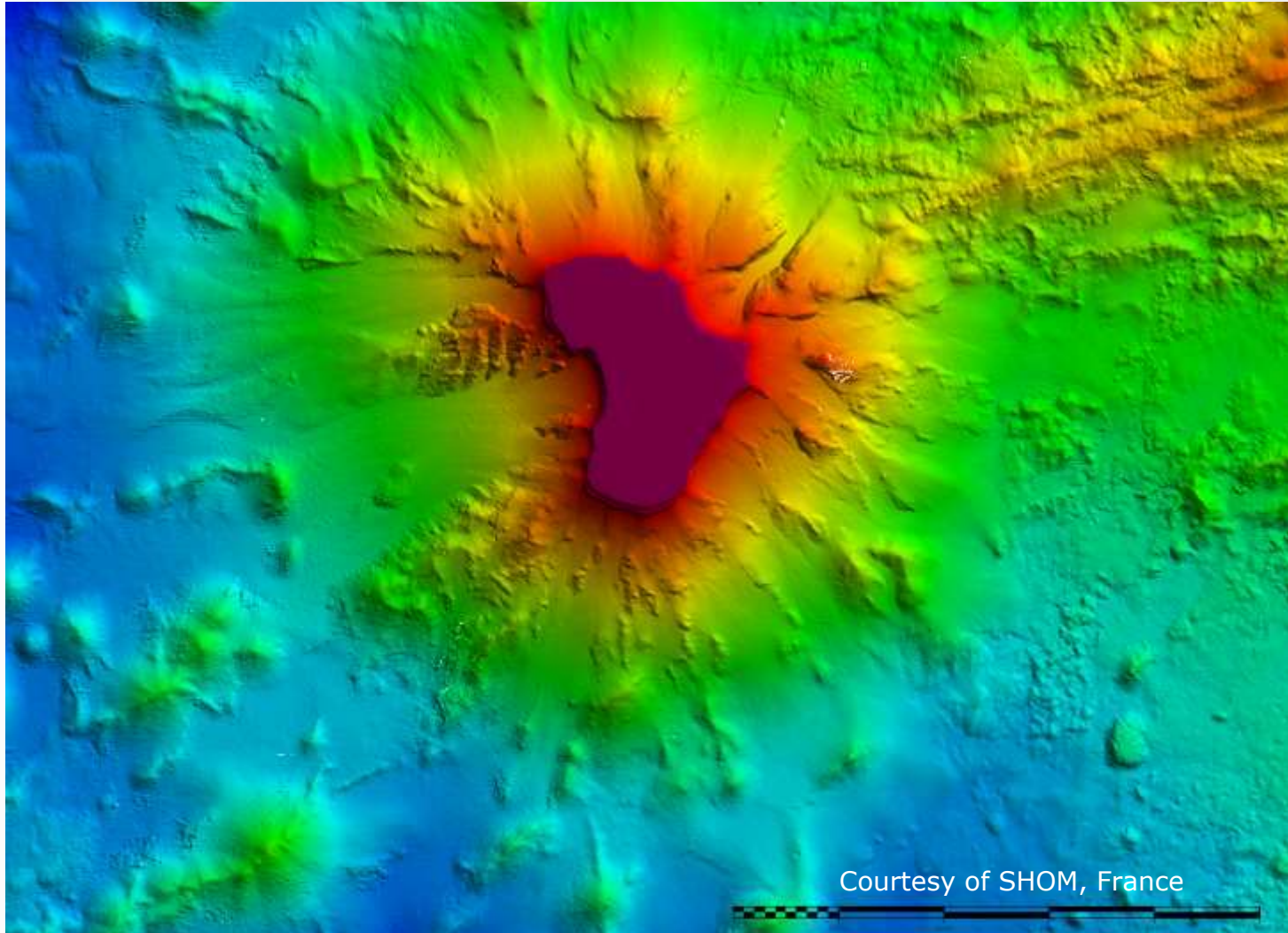
Applications from very high resolution inspection to shallow water surveys.

EM[®] 122 – Results

Full Ocean Depth Multibeam Echo Sounder



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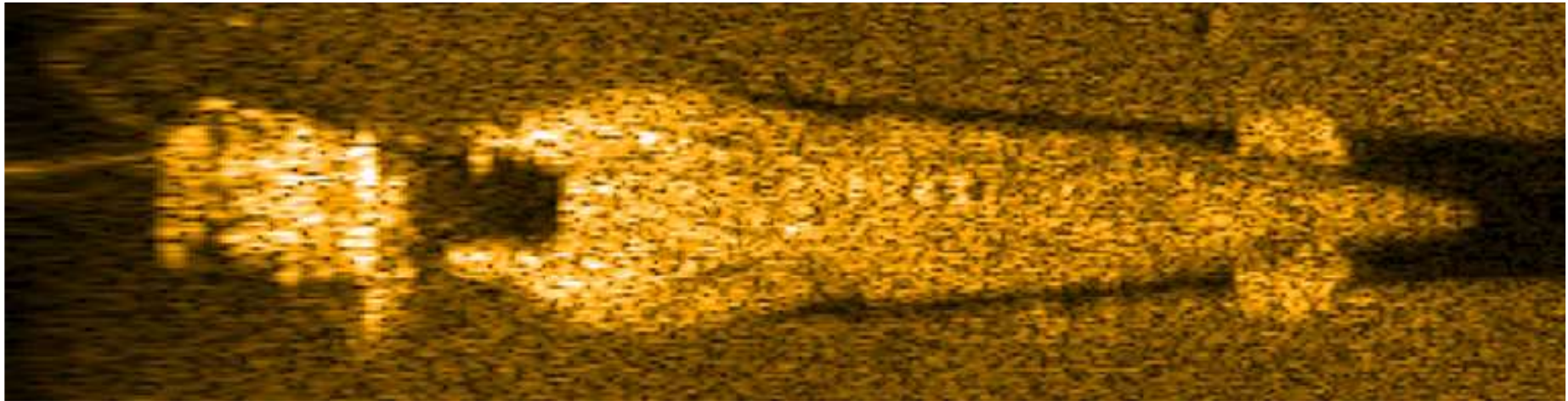


Courtesy of SHOM, France

HiSAS 1032 - Results

Resolution Matters

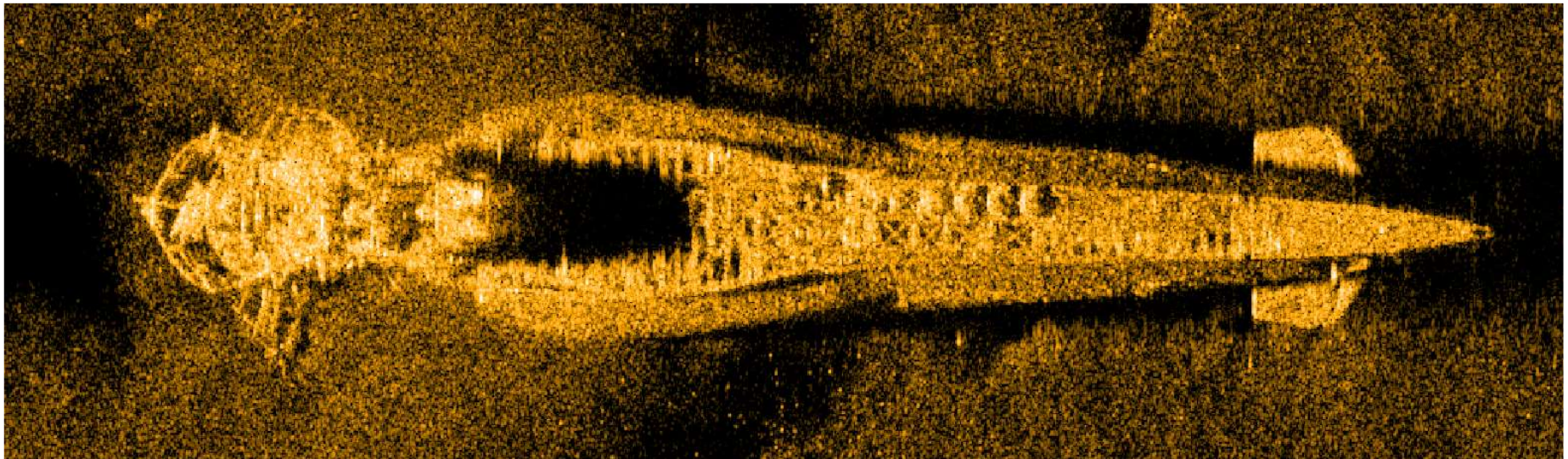
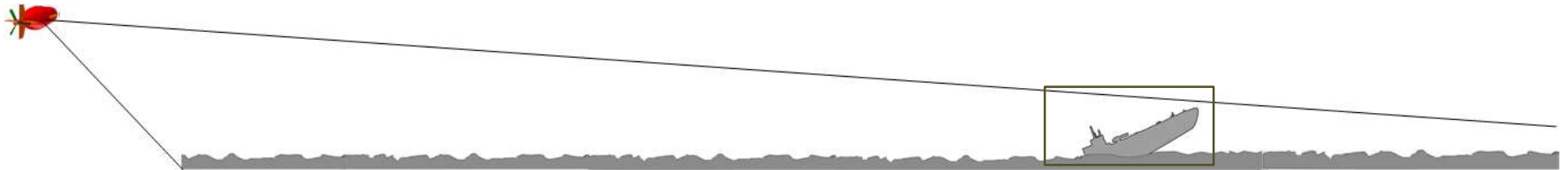
Existing Multi-ping SSS, (370 - 420 kHz) - Range 10-50 m



HiSAS 1032 - Results

Resolution Matters

HiSAS 1032 (85 – 115 kHz) - Range 205 - 245 m

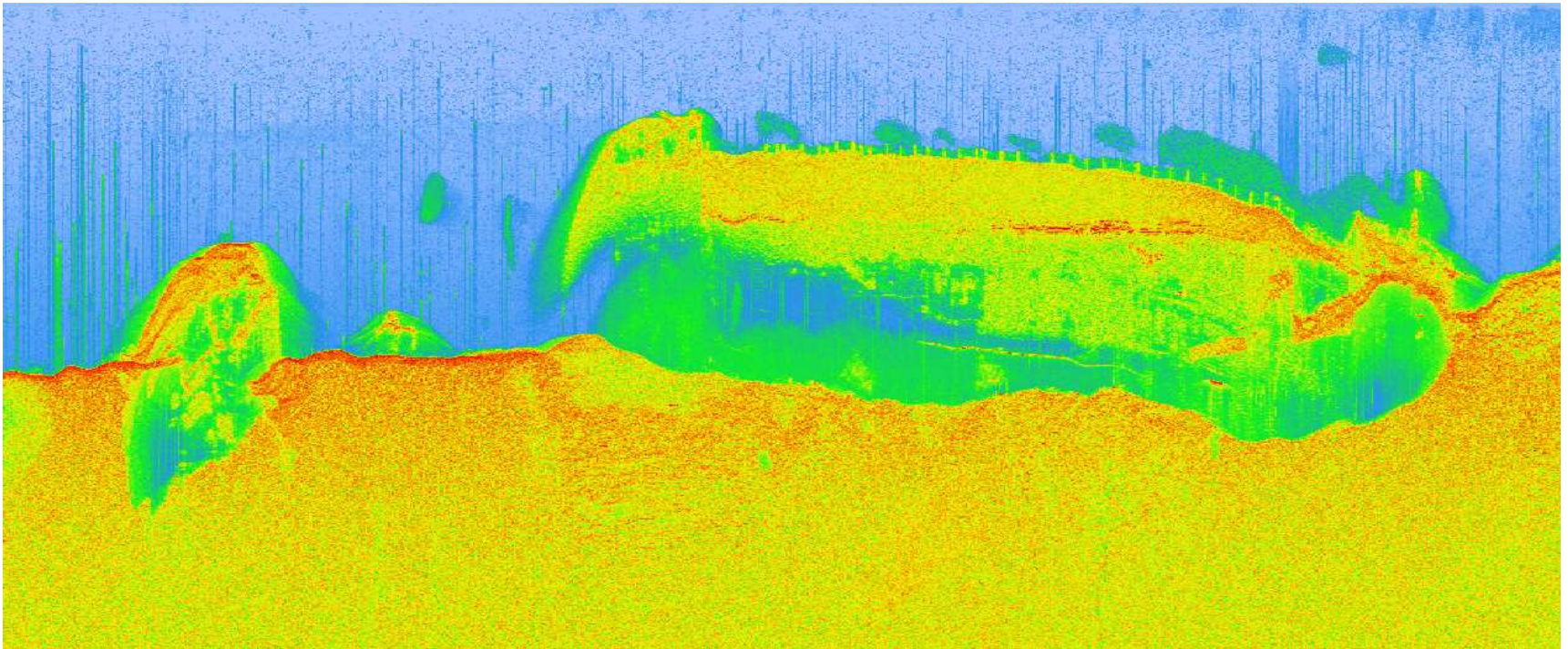




Extra Detections

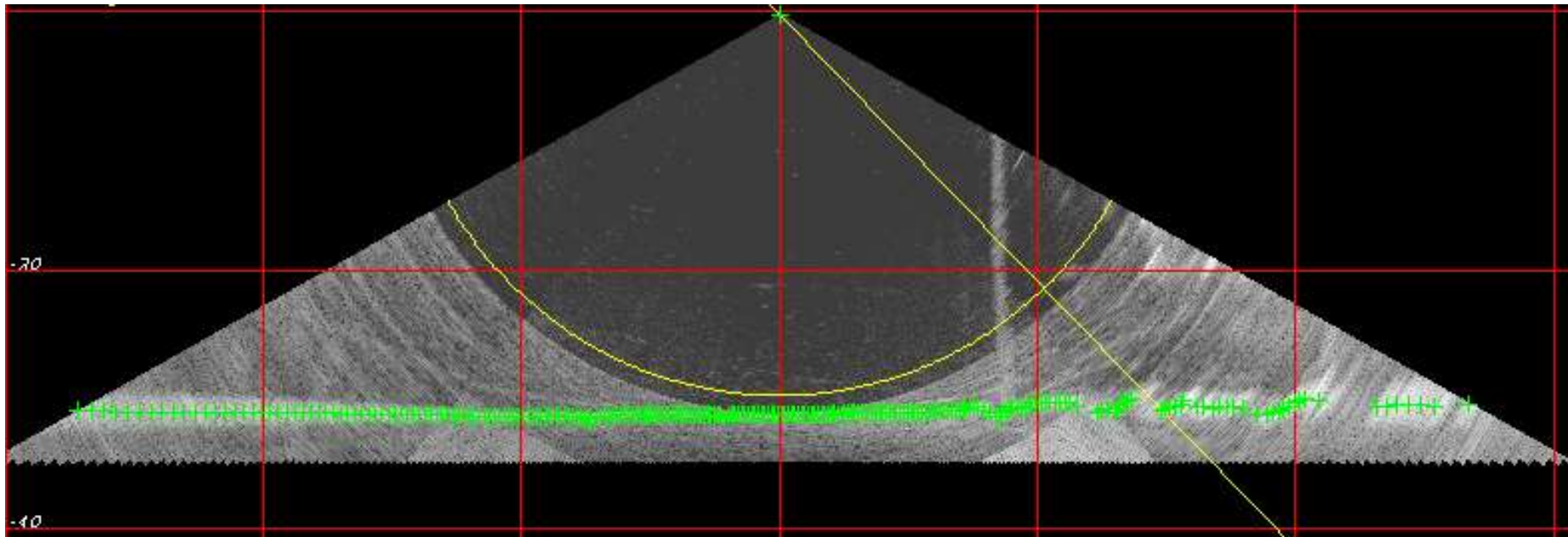
Water Column

- Provides lots of information
- Can be converted to points but only based on amplitude
- Requires considerable processing power to analyze
- 10 times or more data storage needed



Extra Detections

- Beam 200 shown in yellow with detections in green
- Beam width greater than structure so reflection from both it and seafloor
- Humans can see it, but previously the multibeam had to choose
- Extra detections can utilize phase and amplitude information to generate 9 extra soundings per beam



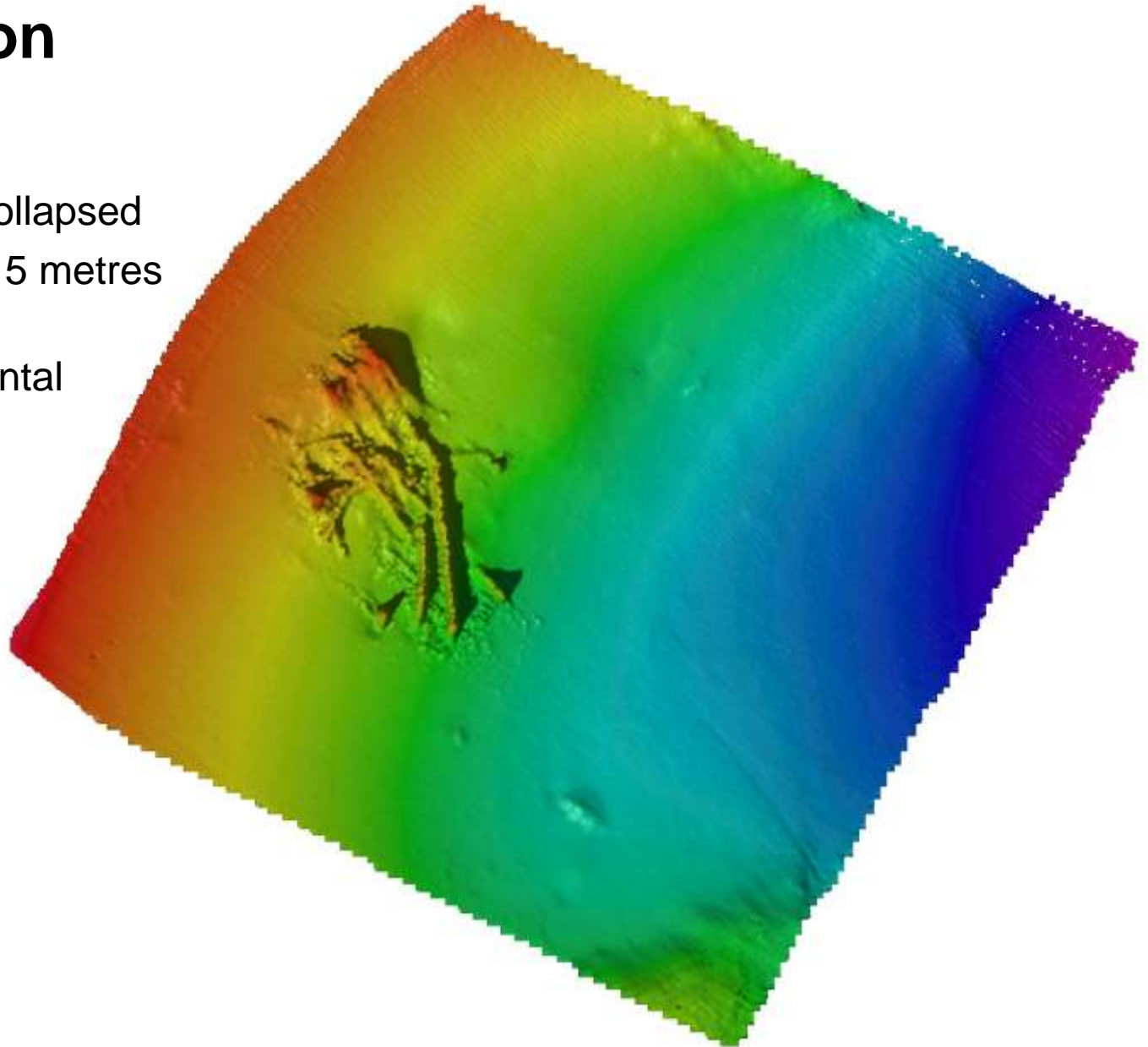


Tests on WW2 landing jetty



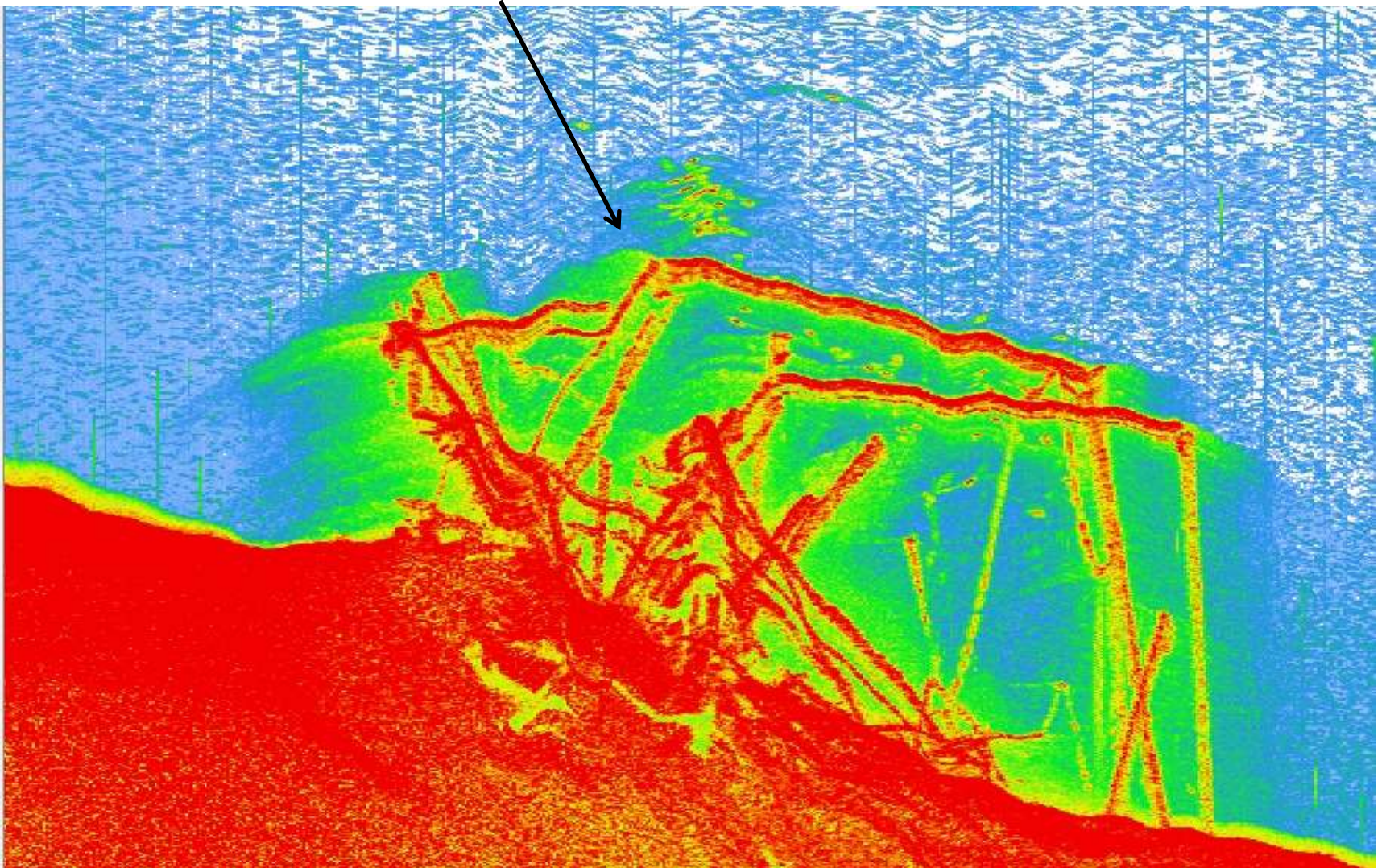
75 years on

- Structure badly damaged and collapsed
- 4 – 30 metres, 15 metres mean depth
- Apparent horizontal beams



Water Column

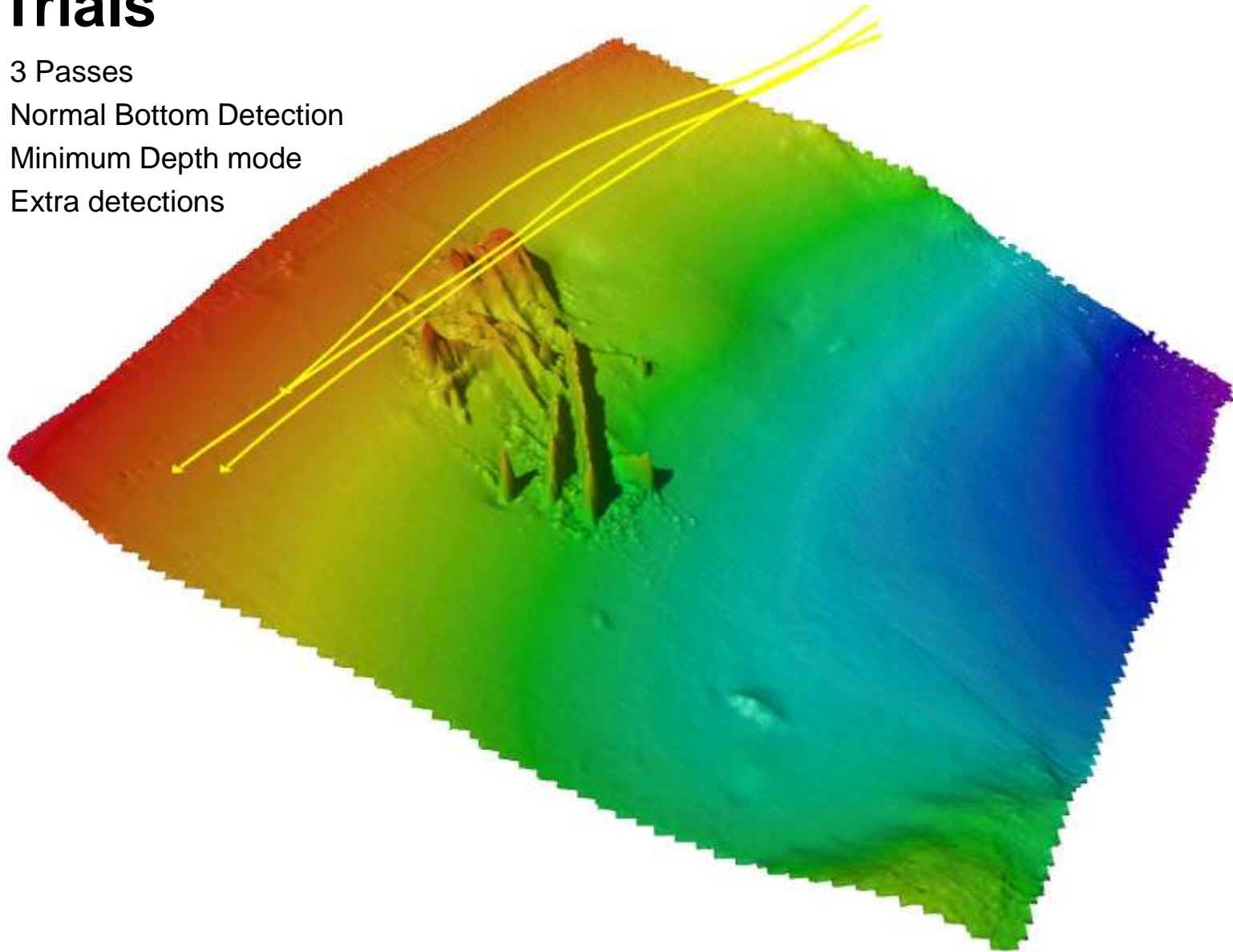
- Beams in suspension
- Clearly shows most shallow point





Trials

- 3 Passes
- Normal Bottom Detection
- Minimum Depth mode
- Extra detections

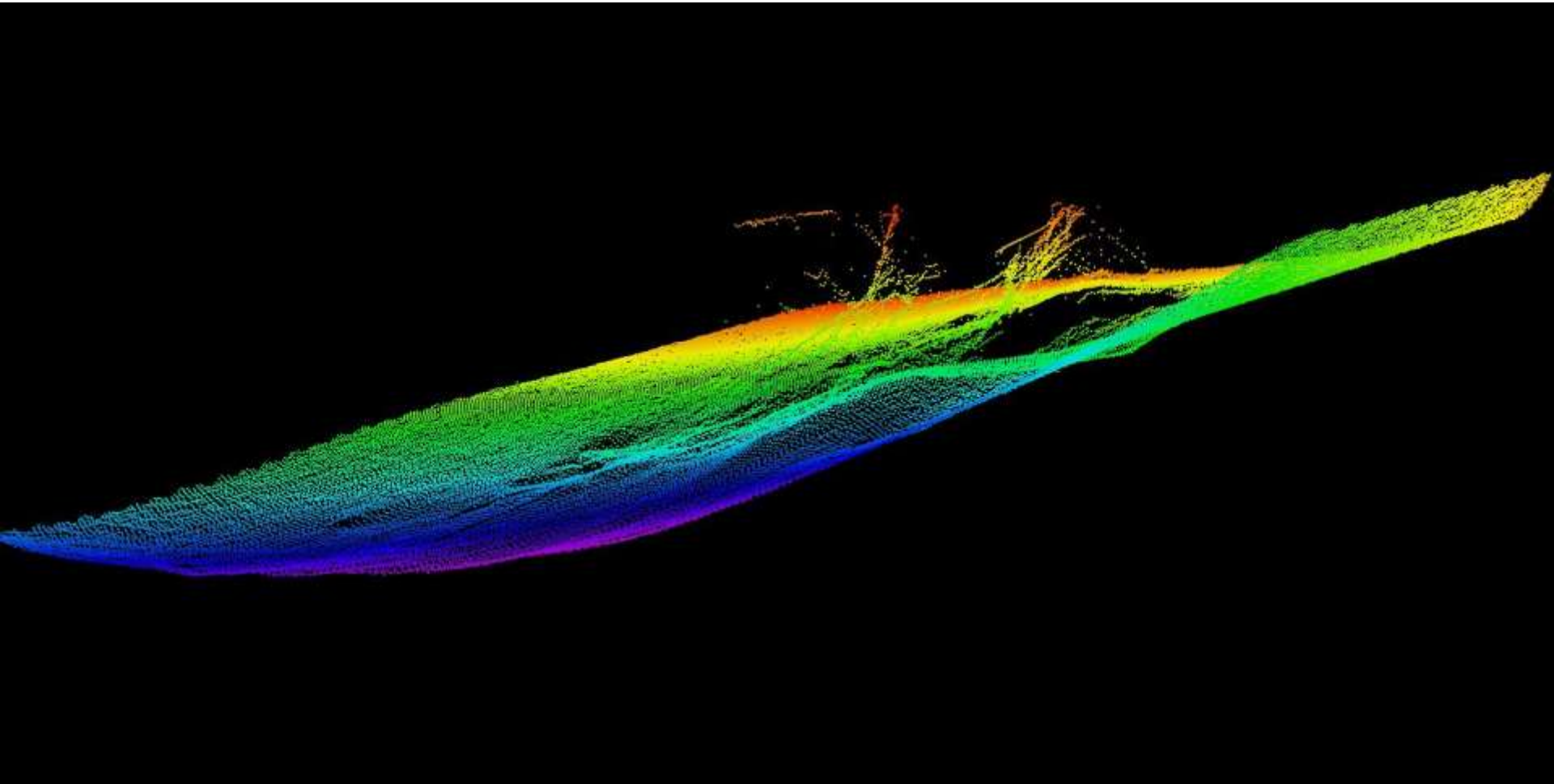


Normal Bottom Detector



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- Clean seafloor
- Limited Structure
- Does detect most shallow point!

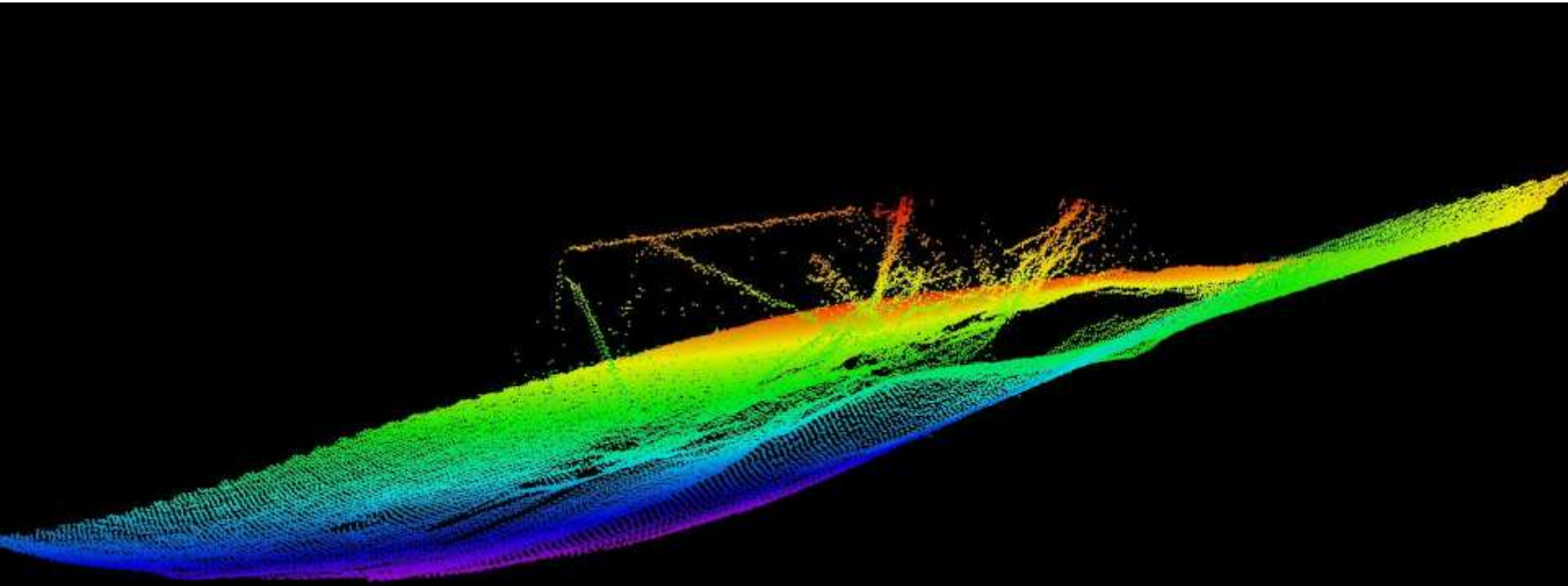


Minimum Depth Mode



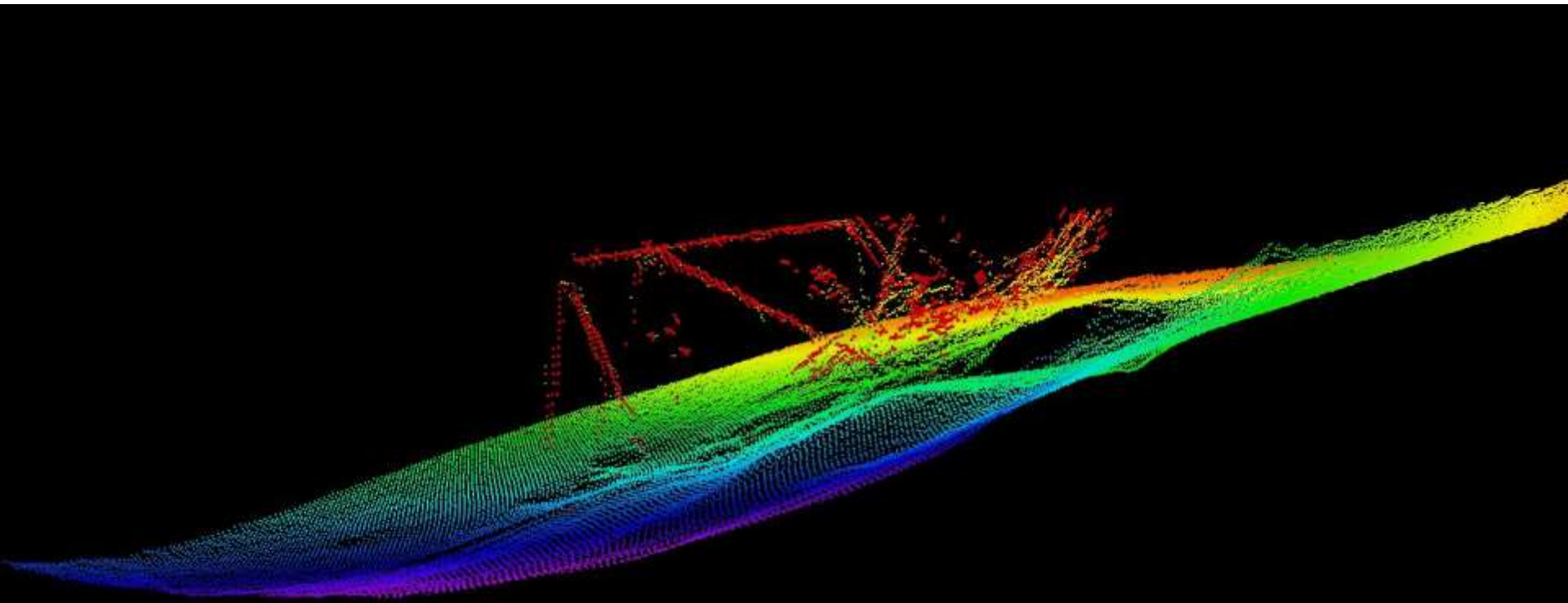
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- Missed Seafloor
- Complete Structure
- More noise

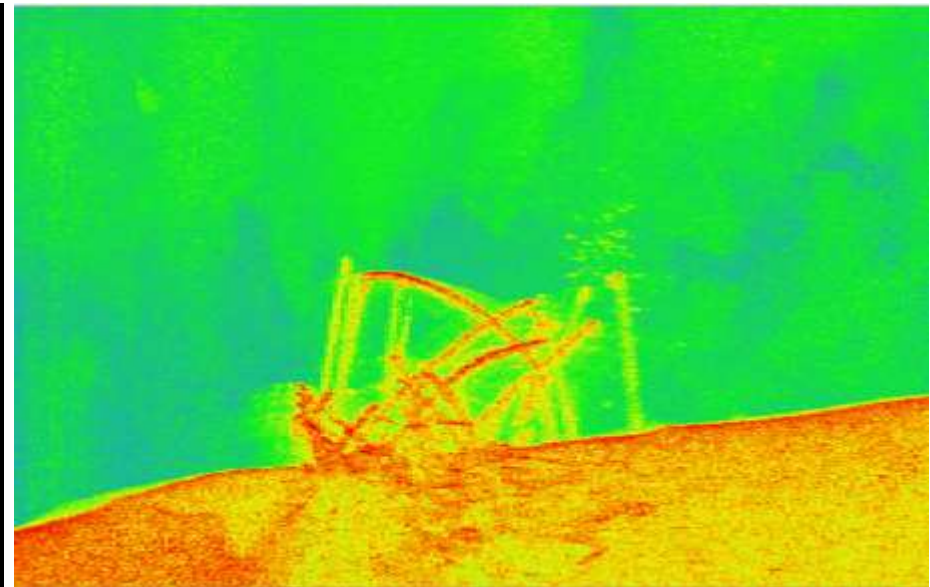
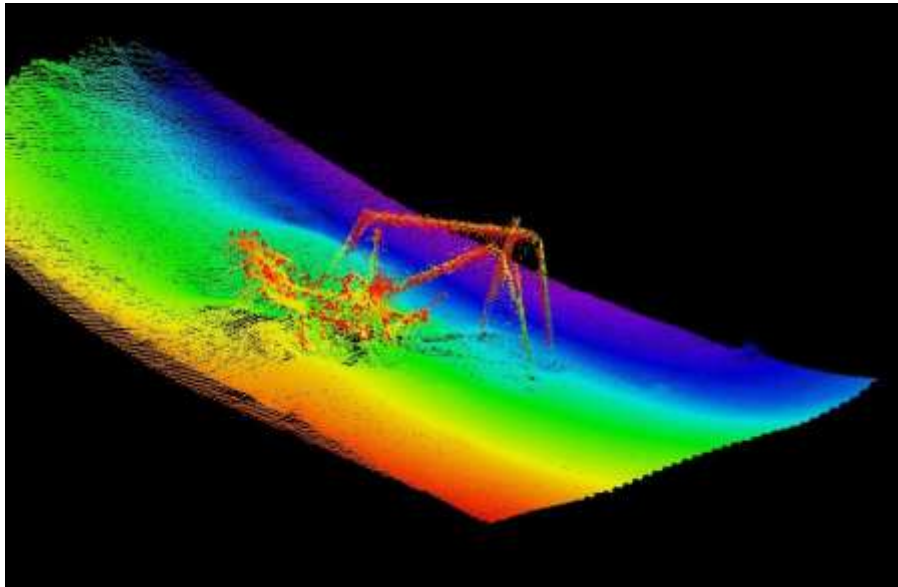


Extra Detections

- Complete Seafloor
- Complete Structure



Extra Detections vs Water Column Data Collection



Survey in 15 metres mean depth, 1 minute of collection	Normal Survey	With Water Column	Normal Survey + Extra Detections
Storage Required	5.4Mb	70.1Mb	6.6Mb
% Increase of Storage	100%	1300%	122%

Fishery Research Vessel “Baia Farta” – Ministry of Fisheries, Angola



Length 74.1m
Breadth of 16.4m
Max draft 8.7m
Gross tonnage 3,209t.
29 crew members and 22 scientists
Survey speed of 11kt and trial speed of 14.5kt.

- Simrad EK80
- Simrad ME70
- Simrad MS70
- Simrad SU90
- Simrad Trawl Monitoring

- EM[®] 122, 1 x 2 degree
- SBP 120-3 degree
- EM[®] 712, 0.5 x 1 degree
- HiPAP[®] 501
- ADCP, 38 and 150 kHz
- GeoPulse 3 x 3 degree

- Seapath[®] 330 w/ MRU-5+
- K-Sync, 16 Channels
- KVM Setup
- SVS and SVP
- CARIS HIPS/SIPS

- KM DP and Navigation

Fishery Research Vessel “Baia Farta” – Ministry of Fisheries, Angola



New Hydrographic Vessel – Moroccan Navy

Length 72m



Main Vessel

- EM[®] 302, 1 x 1 degree
- SBP 300-6 degree
- EM[®] 2040-04 Single RX, Dual Swath
- EA640, 12, 38 and 200 kHz
- HiPAP[®] 351P
- K-Sync, 8 Channels

Launches

- EM[®] 2040C, Single Head, Dual Swath
- EA440, 38/200 kHz

New Hydrographic Vessel – Moroccan Navy



New Hydrographic Vessel – Moroccan Navy



<https://www.youtube.com/watch?v=Dmrvlie250I>



Courtesy of Port of London

Other African Hydrographic Projects



Ocea will build a hydrographic building for Nigeria

Excellent news for the French shipyard Ocea.....has been awarded the winner of the international call for tenders launched by Nigeria for a hydrographic building.....The company, based in Les Sables d'Olonne, won with a proven solution, based on the OSV 190 design, already produced in duplicate for Indonesia. These vessels, KRI Rigel and KRI Spica, had been delivered in 2015 and have since been extremely active, with the Indonesian Navy expressing satisfaction with these boats and their capabilities.

Other African Hydrographic Projects



SAS Protea

Replacement of the South African Navy Hydrographic Capability. The South African Navy Hydrographic Service is currently undergoing a rejuvenation programme with the acquisition of a new hydrographic survey vessel, 3 x survey motor boats and an upgrade of the SANHO's production and training capabilities. This programme is well underway and is intended to be completed by middle 2022.

Other African Hydrographic Projects



FRV Algoa

Thank you for your attention!



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