KONGSBERG

BRIEF FOR AAPA

FACILITIES ENGINEERING COMMITTEE

Maritime Civil Engineering Applications and Solutions

13/06/2022

Konrad Mech

KONGSBERG

Developing Advanced Technologies Enabling Extreme Performance for Extreme Conditions

KONGSBERG MARITIME

KONGSBERG DIGITAL

KONGSBERG DEFENCE & AEROSPACE

Kongsberg Maritime

The broadest portfolio of products for the maritime industry

SENSORS & ROBOTICS

DECK MACHINERY & MOTION CONTROL

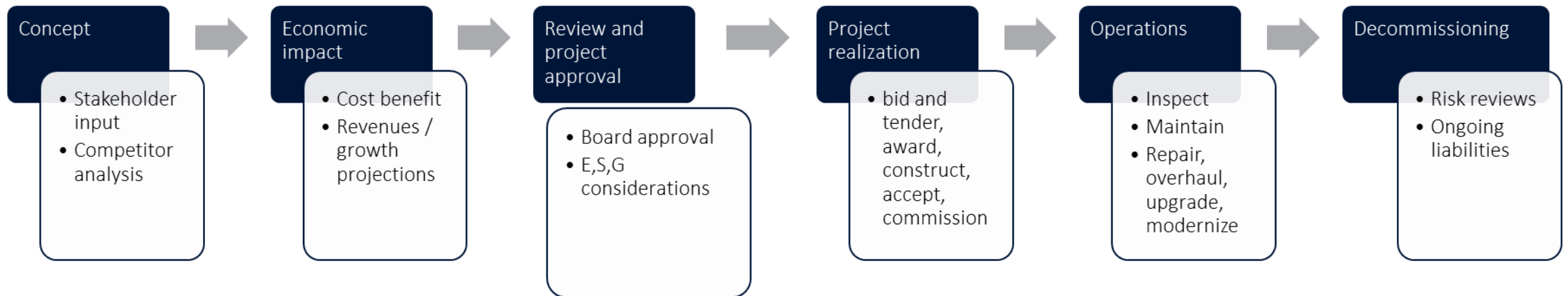INTEGRATED SOLUTIONS

GLOBAL CUSTOMER SUPPORT

PROPULSION & ENGINES

Marine Civil Engineering Activities

- Construction and maintenance projects
- Scheduled and unscheduled infrastructure inspection
- Scheduled and unscheduled hydrographic / bathymetric survey
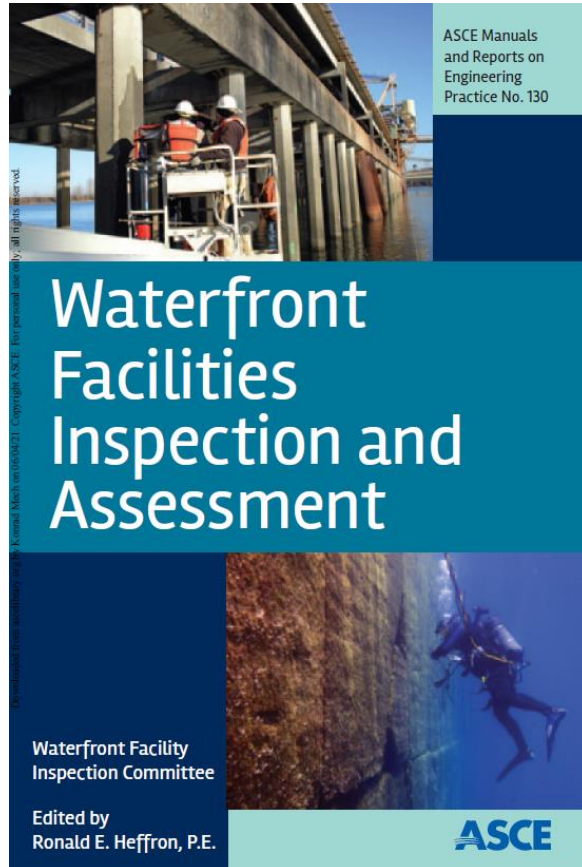- Navigation channel and berth maintenance
- Dredging

Concept
- Stakeholder input
- Competitor analysis

→

Economic impact
- Cost benefit
- Revenues / growth projections

→

Review and project approval
- Board approval
- E,S,G considerations

→

Project realization
- bid and tender, award, construct, accept, commission

→

Operations
- Inspect
- Maintain
- Repair, overhaul, upgrade, modernize

→

Decommissioning
- Risk reviews
- Ongoing liabilities

We have market tenure…

1171 Sonar with MS1000 Software: Real-Time Mosaicking

Customer Focus: Civil Engineers

Customer Benefits:

- Faster image processing

- Better mosaics

- Feature I.D.
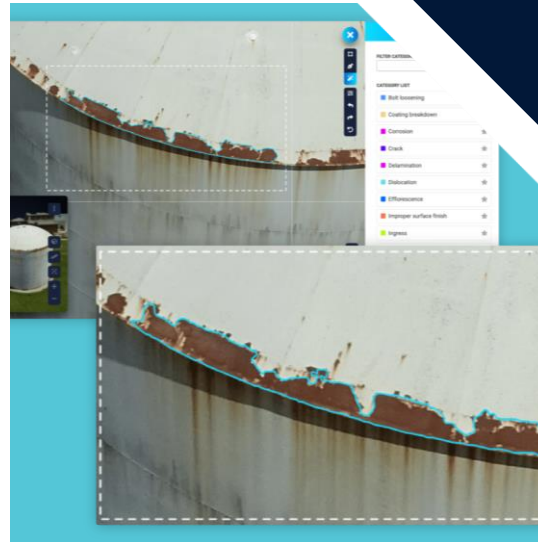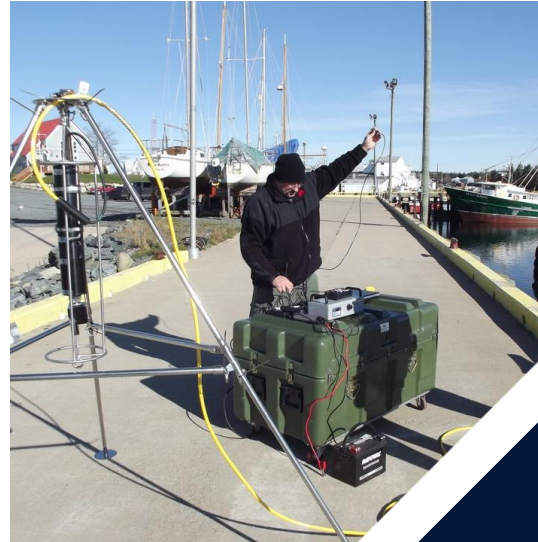
Top Slide: AI. Bottom slide: manual splicing

Bridges

- Bridge Pier scour
  - Real-time monitoring with DAS with K-Observer
  - Periodic inspection with Hi-res sonar

- Bridge structural inspection
  - High Res Sonar; Multibeam sonar
  - ScanFuse powered by Qii.AI

Scanning Sonar Used to Identify Scour, and Structural Deterioration of Bridge Piers and Docks

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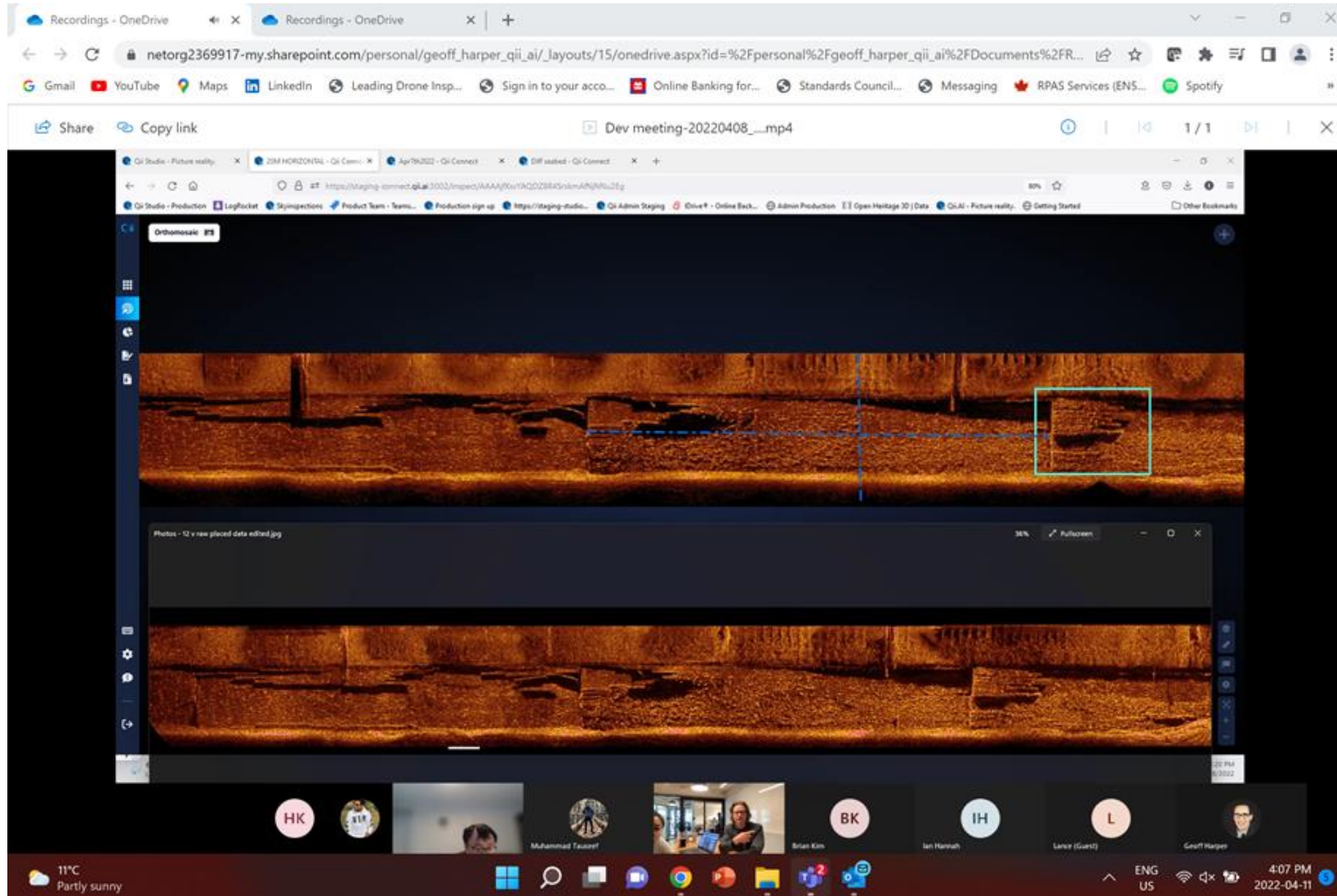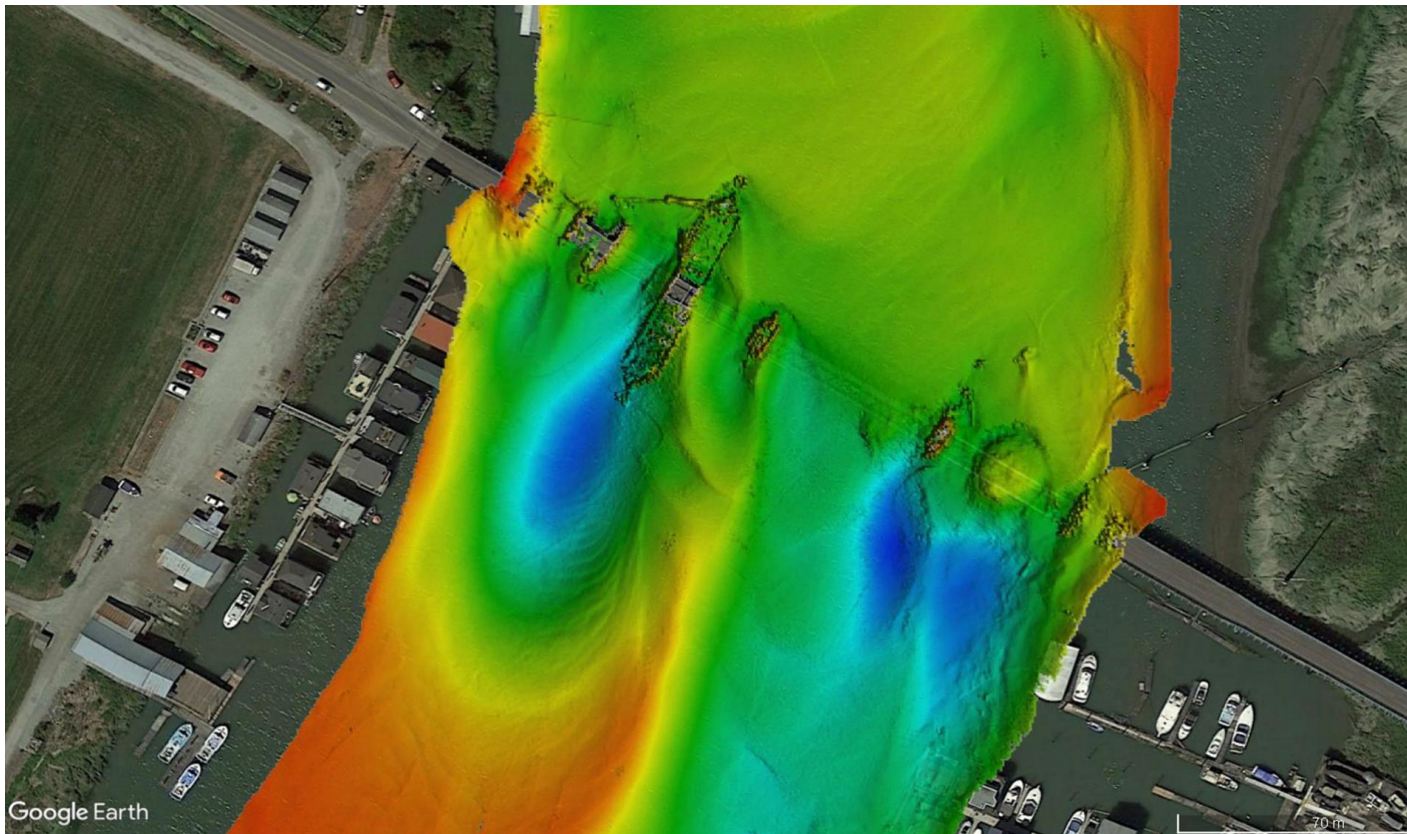1892 Rail Bridge, Center Turn Pier

Courtesy *Nautilus Marine Group*, Lansing, MI
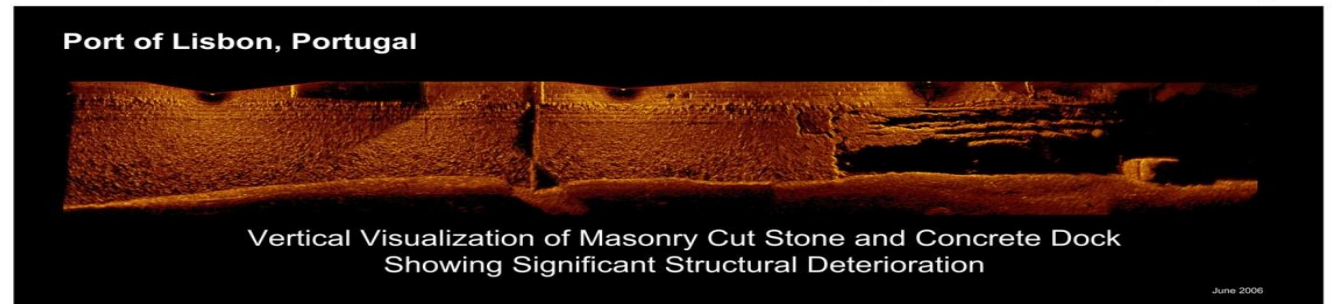
Port of Lisbon, Portugal

Vertical Visualization of Masonry Cut Stone and Concrete Dock Showing Significant Structural Deterioration

June 2006

Courtesy *3P-Consultores*, Portugal
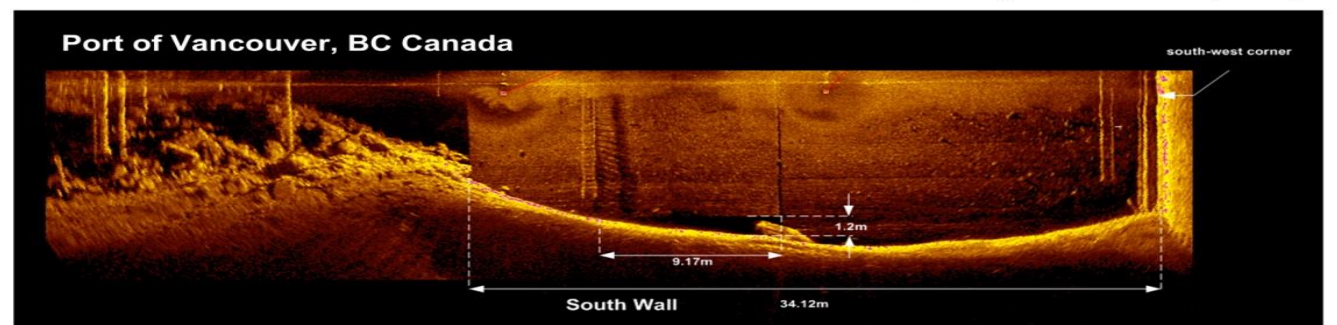
Port of Vancouver, BC Canada

south-west corner

1.2m

9.17m

South Wall   34.12m

Rail Bridge Pier, Russia

Courtesy *Peter Diving*, Russia

Data Collection by *Kongsberg Mesotech Ltd.*, Port Coquitlam, BC, Canada

Data Collected Using MS 1000 and 675 kHz High Resolution Scanning Sonar Head with 30 Degree Fan Beam Transducer

Kongsberg Mesotech Ltd.

Real-Time Dredge Monitoring

Customer Focus: Dredge Operators

Customer Benefits:

- Contract Compliance

- Time Savings

- Eliminate Excess Dredging

Series 1270 Dragon® Dredge
18" Cutter Suction Dredge
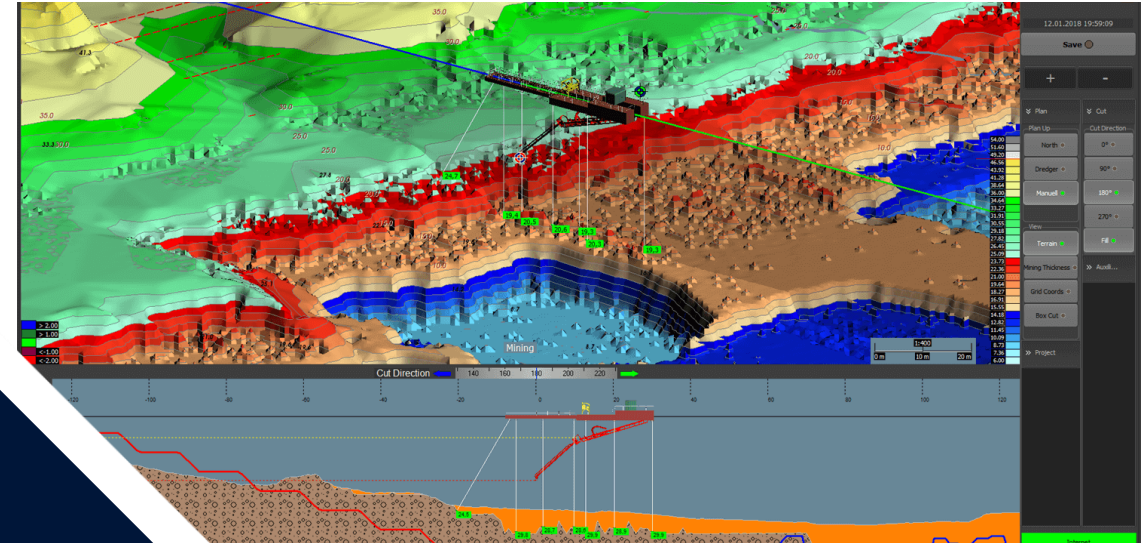
Total Awareness during Dredging Ops
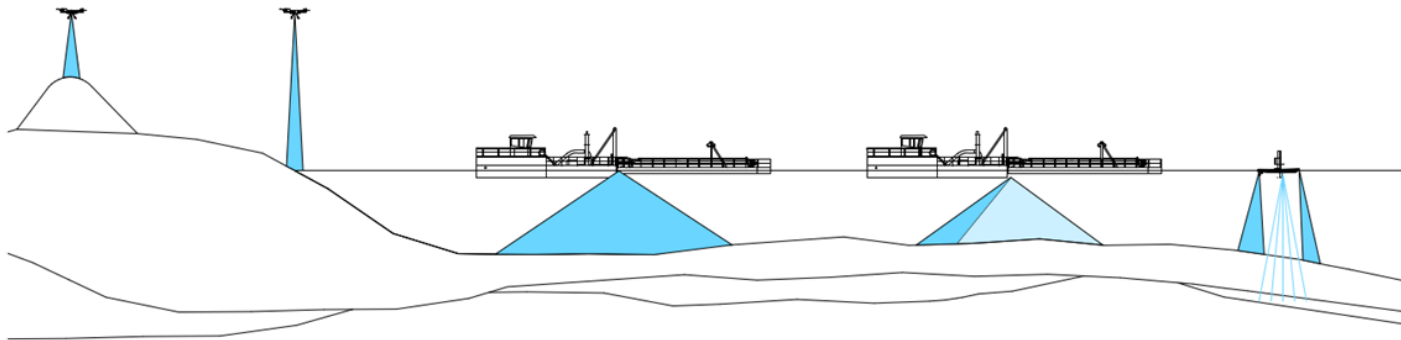
- Pre- and Post-Dredge QA Survey
  - Manned or unmanned bathymetric survey
  - Sub-bottom profilers

- Real-time dredge monitoring
  - DAS sonar with MARPO-Dredger software
  - M3 sonar on rotator with MARPO-Dredger software
  - EK80 real-time turbidity monitoring with MARPO-Dredger software

- Dredging mission asset assessment and planning
  - MARPO Dredger software

Shallow Survey

Customer Focus: Shallow Survey and Inspection

Customer Benefits:

- Small form factor

- High performance for Low Price

- Integrated with Hypack, EIVA, Qinsy, Sonarwiz

Wasserdrohne im Hamburger Hafen

Image © 2019 DigitalGlobe

All Scan
INSPECTIONS LTD.
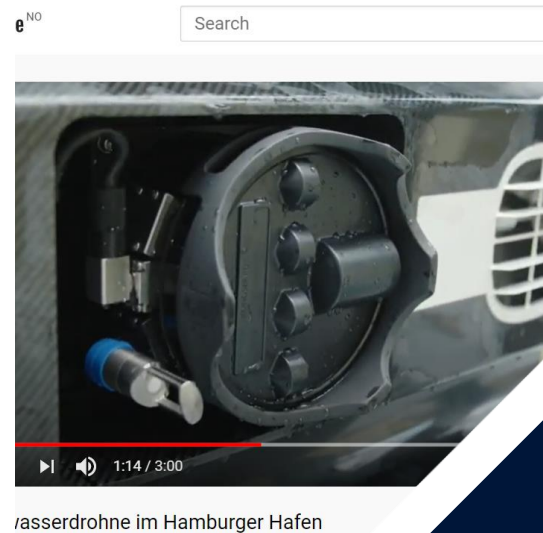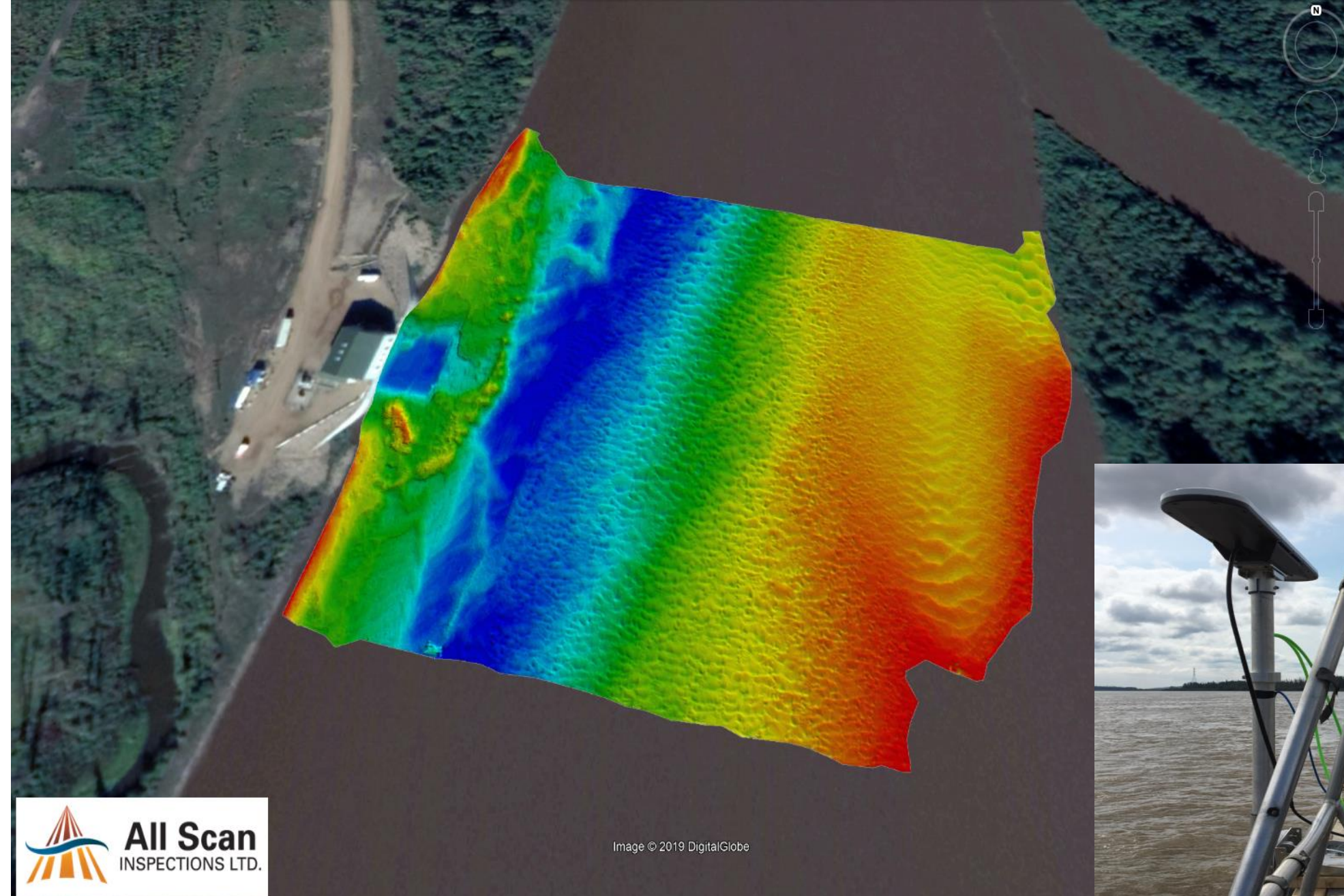
USV/ASVs already integrated with the M3 Sonar

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Real-Time Berth Depth Monitoring: MarineLabs

Customer Focus: Pilots and Bulk Cargo Carriers
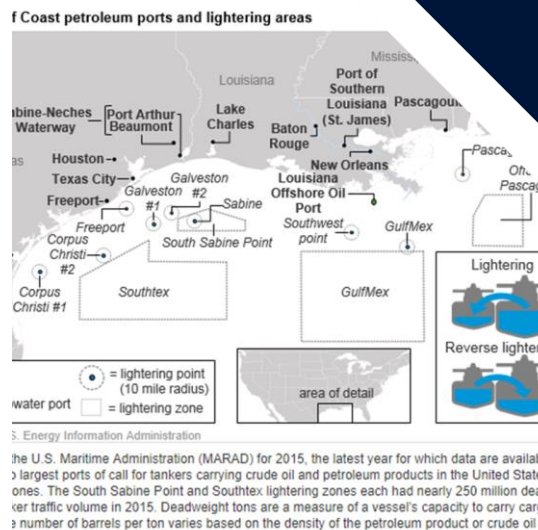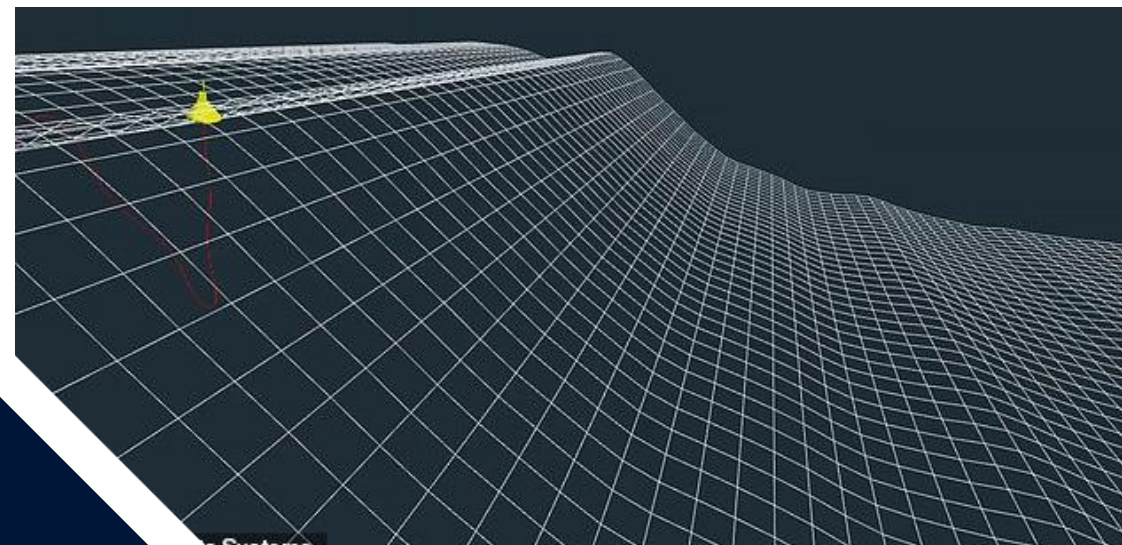
Dual Axis Scanning Sonar
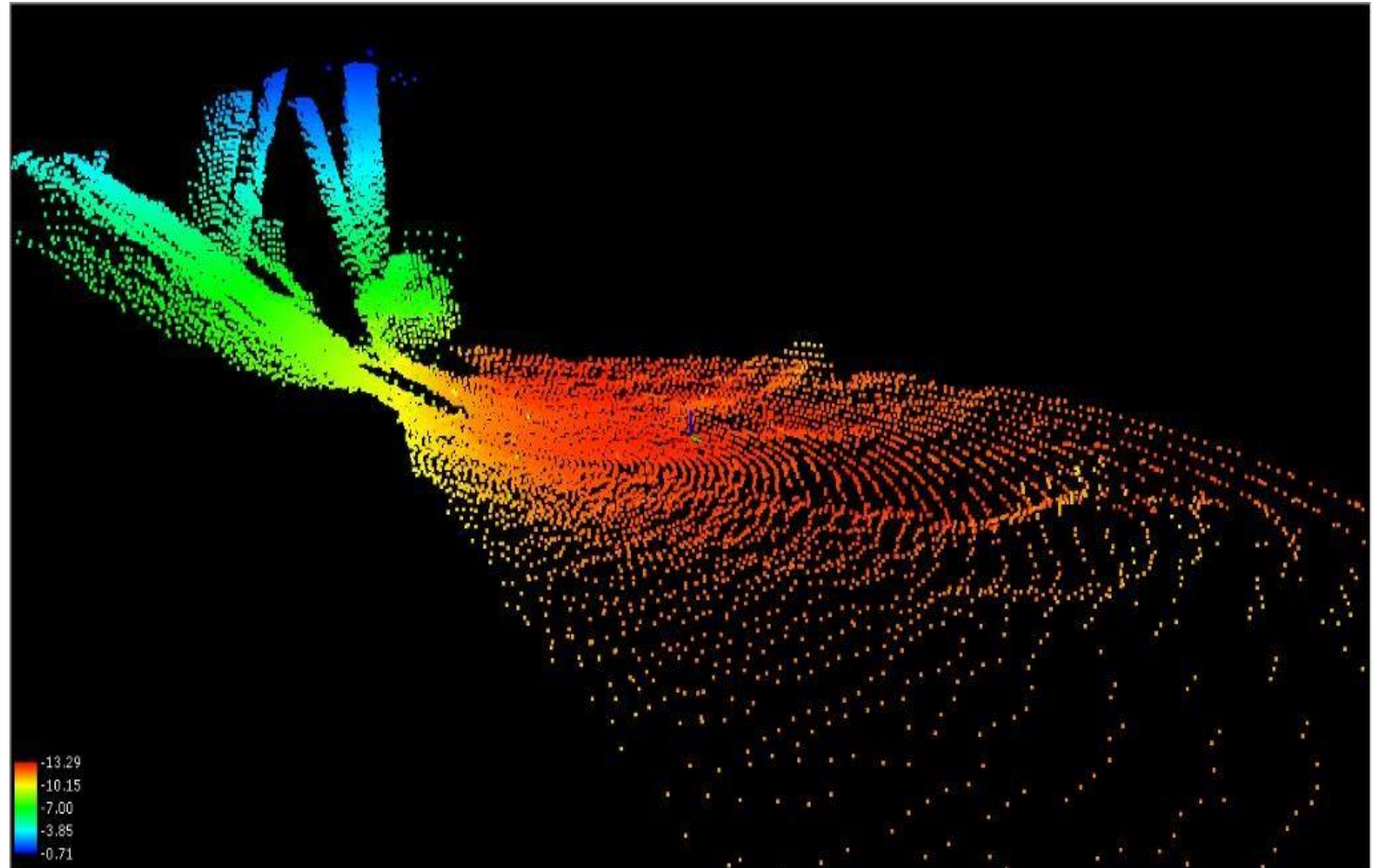
BerthWatch
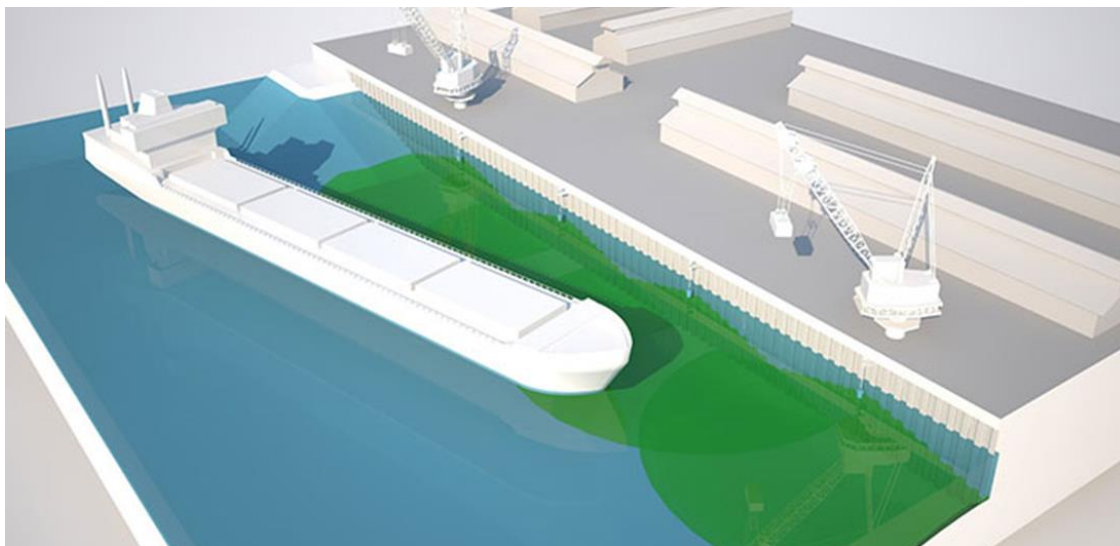
Plus Vicente C – Parana!
Plus Seatex AIS Base Stations!

- Value Proposition

  - Maximize cargo based on true depth under keel

  - Minimize lightering / reverse lightering

  - Mitigate allision risk with sunken objects

  - Recover from storm events faster

  - Trigger dredging operations when needed

- Why BerthWatch?

  - Real depth under keel

  - Real time data adjusted for SV, wave and tide data

  - Easy user and desk-top interfaces for pilots and vessel masters

BerthWatch – Desktop view

- **Check beside the berth data you want**

- **Click on a berth pocket**

- **Mouse over the report you want**

BerthWatch – High-res panel
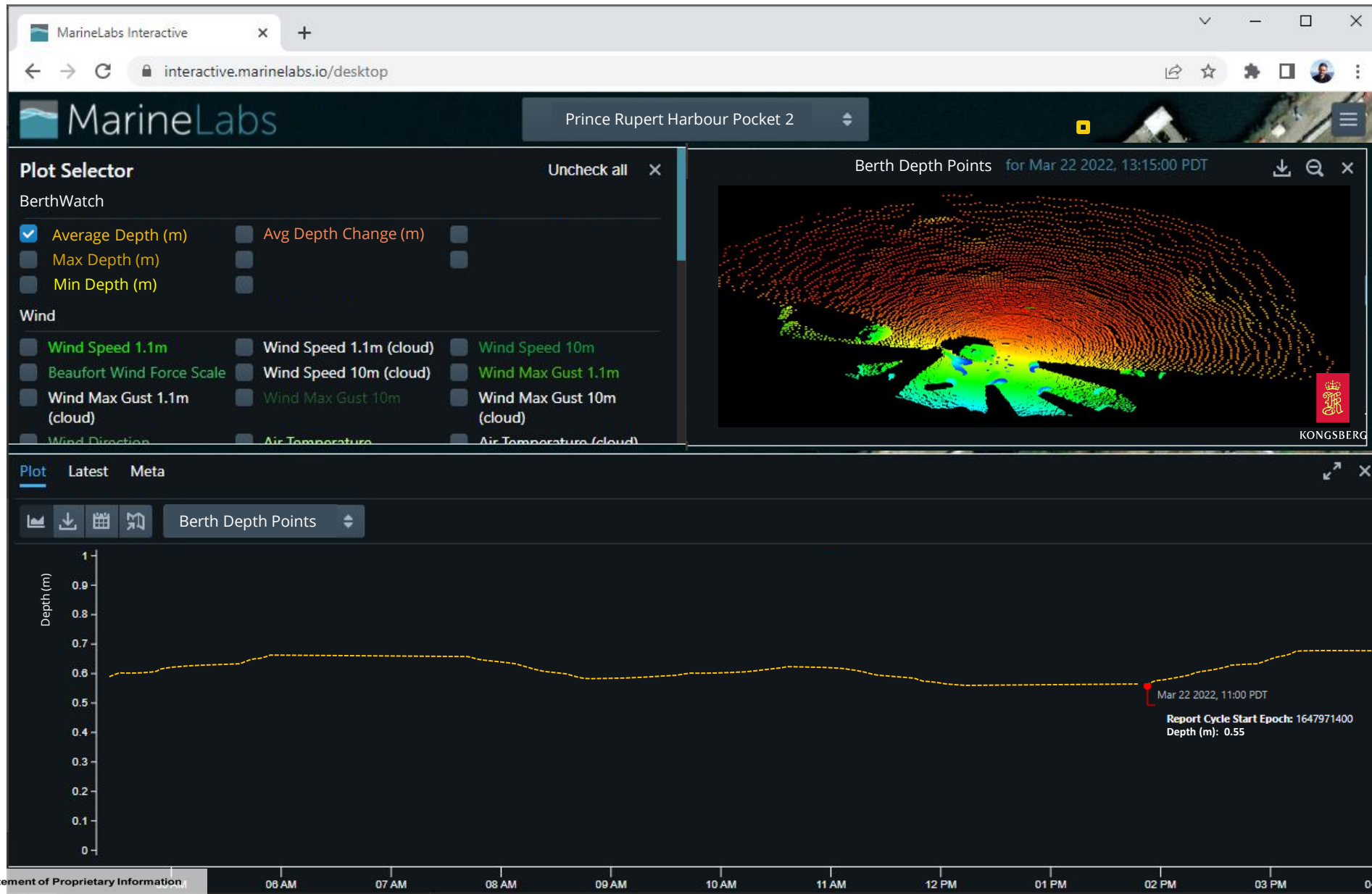
- **3D pan and zoom depth points, coloured as a function of depth or Δ***

- **Select 'Berth depth points'**

BerthWatch – Dashboard

- **Select berth pocket**
- **Check for Δ warnings**
- **View latest pocket depth summary**
- **3d pan rotate point cloud**
- **Check another berth pocket**
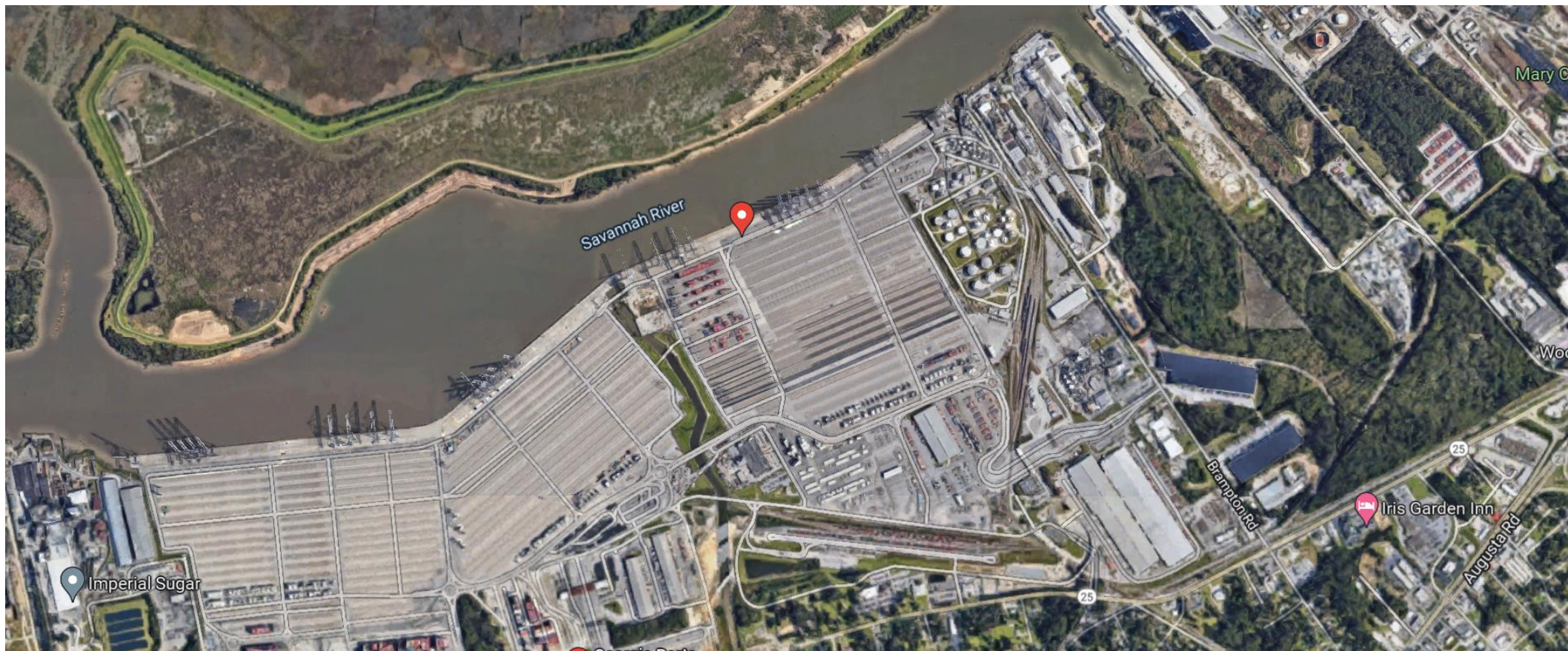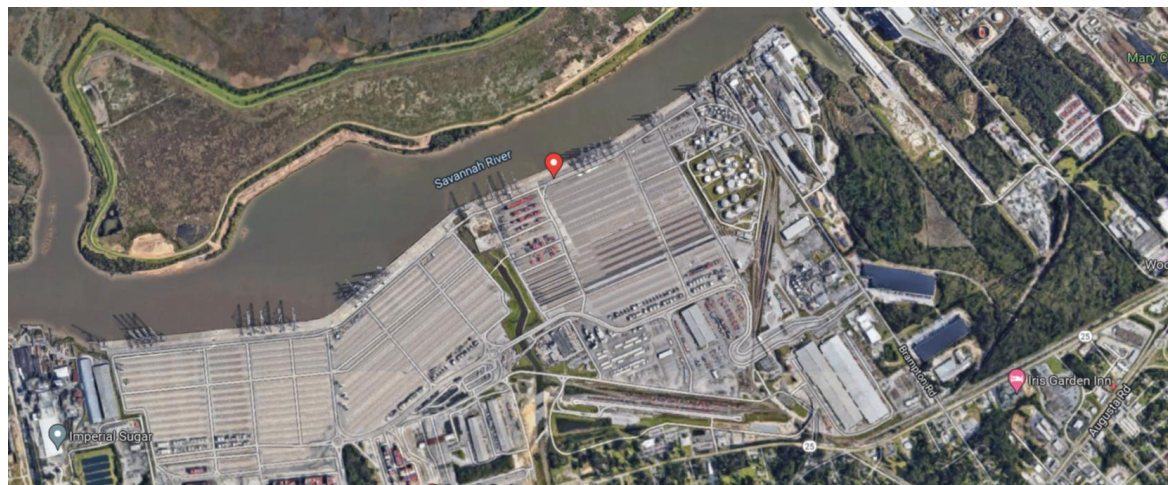
Georgia Port Authority Garden City Terminal
$600,000,000 per year through 9 berths

BerthWatch
Bulk Terminal or Container Terminal – Values and Benefits

BerthWatch Installation: 4 DAS heads + 1 Power/Telemetry Box

- $22,000 USD per month, minimum 1 year installation

- Case study: Panamax Bulker
  - 1 cm of additional draft = 80 metric tonnes of added cargo
  - 15 cm additional sulphur @ $426 USD/tonne = $511,000USD additional cargo. Per vessel.

- Case study: Container Vessel Terminal
  - Georgia Port Authority tariff per TEU = $100 USD
  - Garden City Terminal = 9 berths (90% of total traffic)
  - Over 2,000 vessel calls / year
  - TEUs handled = 5,400,000 TEUs
  - Revenue per Berth = $540,000,000/9 = $60,000,000 USD/berth
  - Berthwatch investment as % of revenue = 0.0044%

The Marine Center

Professional training and micro credentials for the marine industry

The Marine Center
Northwestern Michigan College

KONGSBERG

World class instruction for the application of marine technologies needed for ports, dams, waterways, locks, and marine transportation infrastructure.

Marine Bridge & Infrastructure Inspection Certification:
A Marine Bridge & Infrastructure Inspection certificate will be issued upon the completion of the three course series.

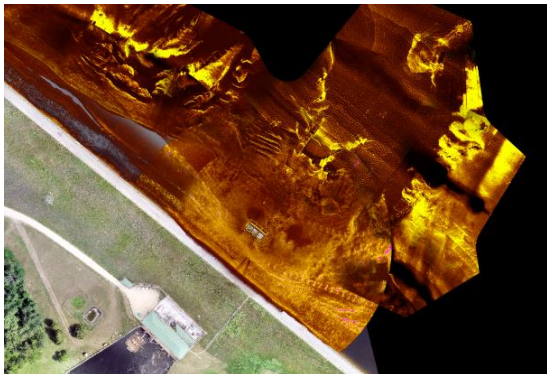| Marine Bridge & Infrastructure Inspection Certification Courses	Duration	Delivery / Location
Fundamentals of SONAR systems & acoustics	16 hours	Online
Inspection technologies & application	8 hours	Online
Underwater Bridge & Infrastructure inspection	4 days	Traverse City, MI

Contact Information

SCAN FOR PROGRAM BROCHURE
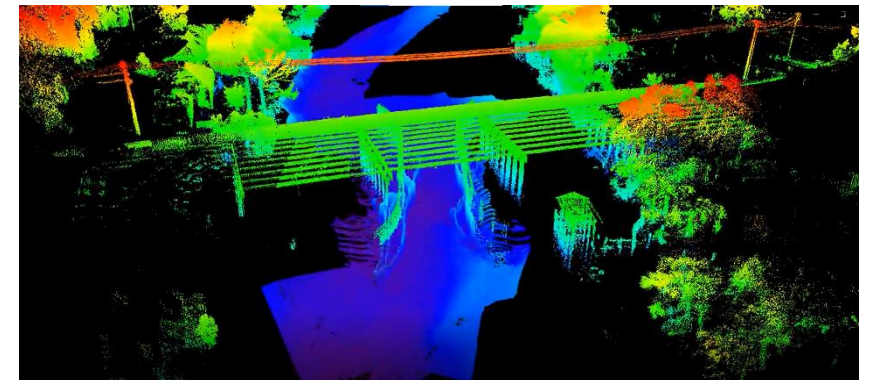

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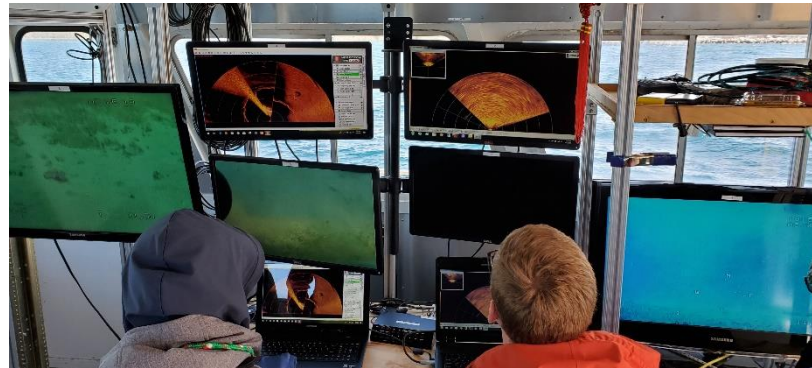
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Thank you for your attention!

konrad.mech@km.kongsberg.com

Inland Waterways

- Lock and canal bathymetric survey
  - Manned or unmanned bathymetric survey
- Lock and canal infrastructure inspection
  - Hi-res and multibeam sonar with USM pole mount
- Environmental monitoring of at-risk species
  - EK80 real-time turbidity monitoring with MARPO-Dredger software
- Real-time monitoring of lock doors
  - DAS with K-Observer
- Hull inspection for maritime security of critical commerce routes

REAL – TIME 3D POINT CLOUD

Scour Monitoring System
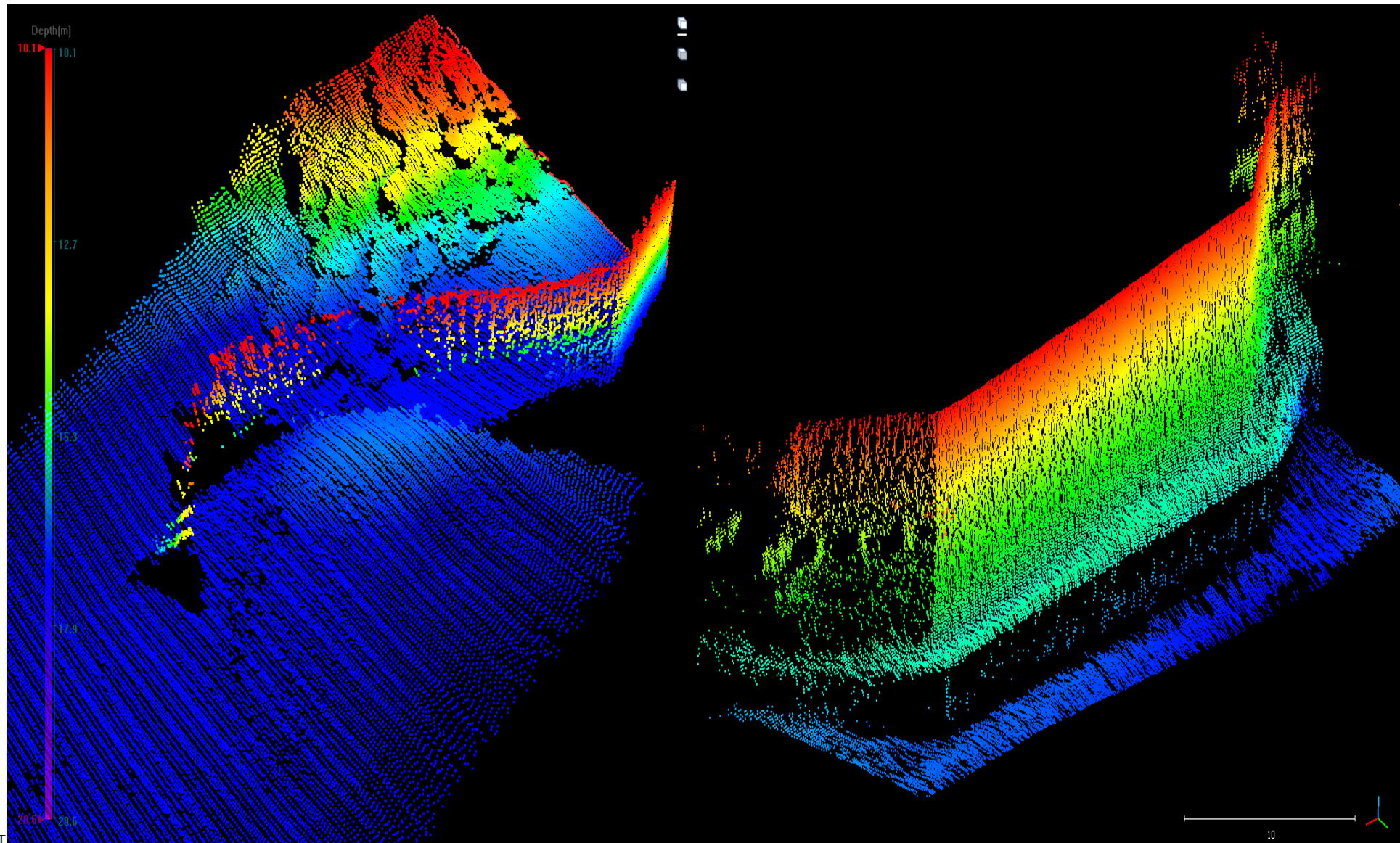
WORLD CLASS – Through people, technology and dedication   KONGSBERG PROPRIETARY - See Statement of Proprietary information

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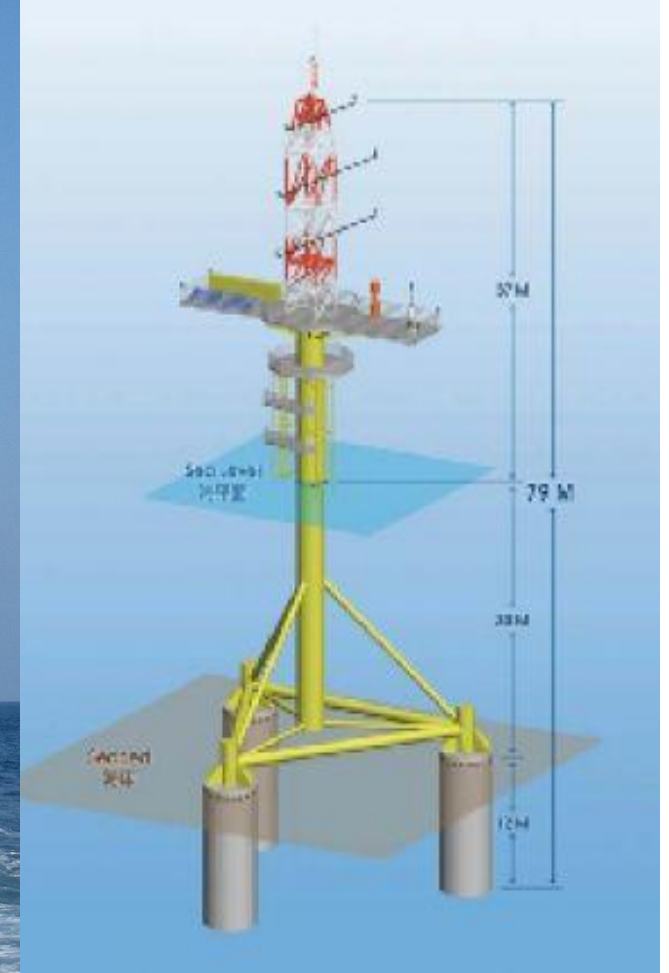
Set-up with 2 Dual Axis Scanning Sonars

KONGSBERG PROPRIETARY - See Statement of Proprietary information