MB1 System Architecture

MACHC

December 2013

Presented by

TELEDYNE
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Design Features

- Reduce Mobilization Errors
- Reduce Mobilization Time
- Reduce Acquisition Errors
- Reduce Acquisition Time
- Fix Acquisition Errors
- Fix Hardware in the Field

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Multibeam Acquisition ~10 years ago

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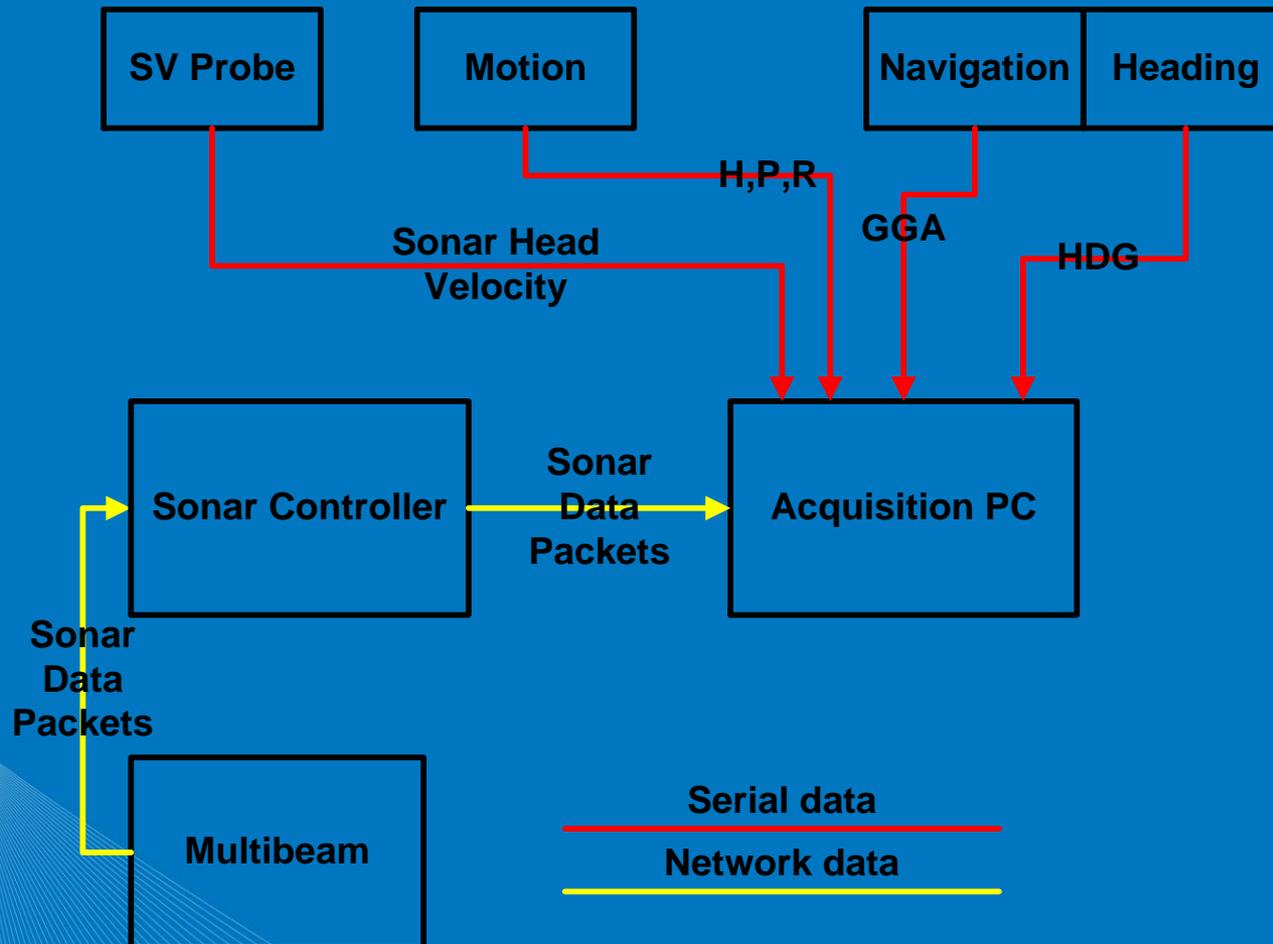
Multibeam Acquisition Today
(Most systems)

MB1 Integrated System

Sonar Control and Acquisition

ALL
Data Packets

Navigation & Hdg

Interface Box

Serial data

Network data

Sonar, SV, & HPR
Data Packets

Motion

Sonar Head

SV Probe

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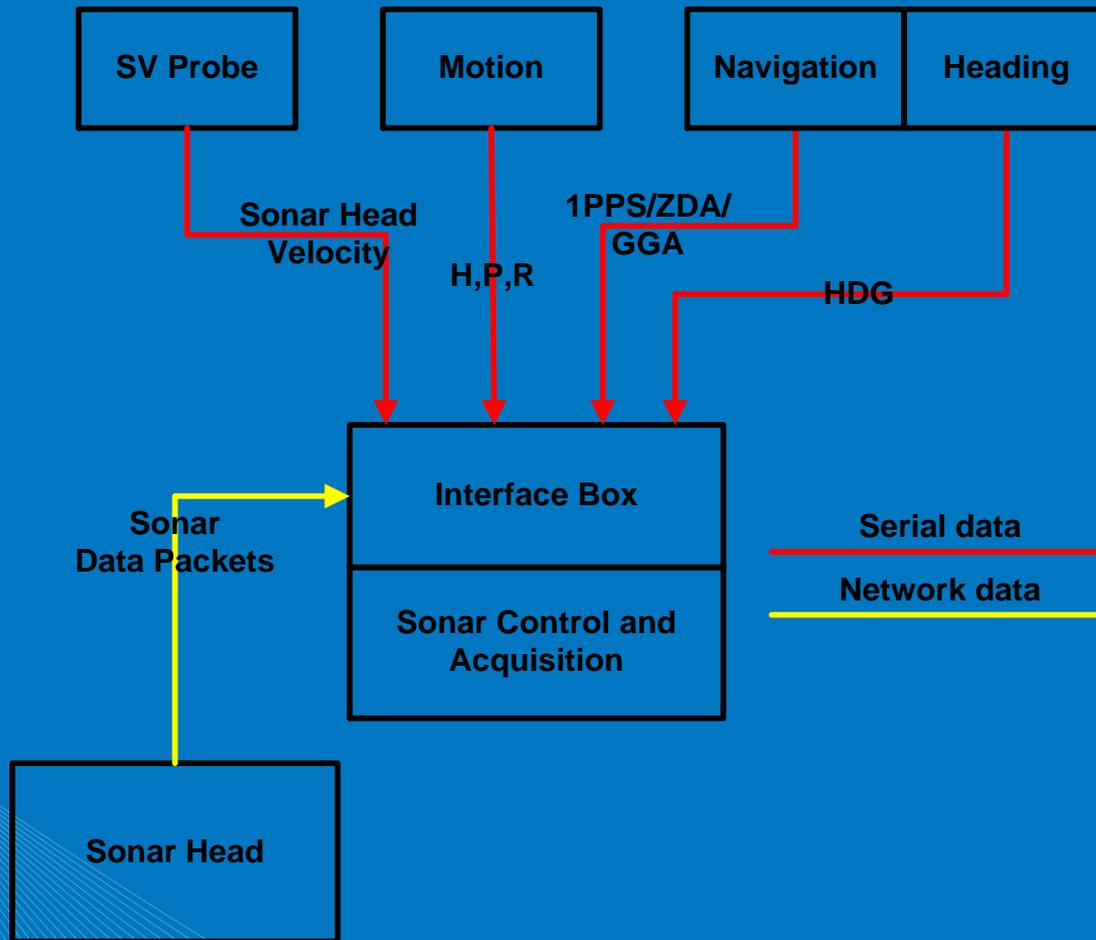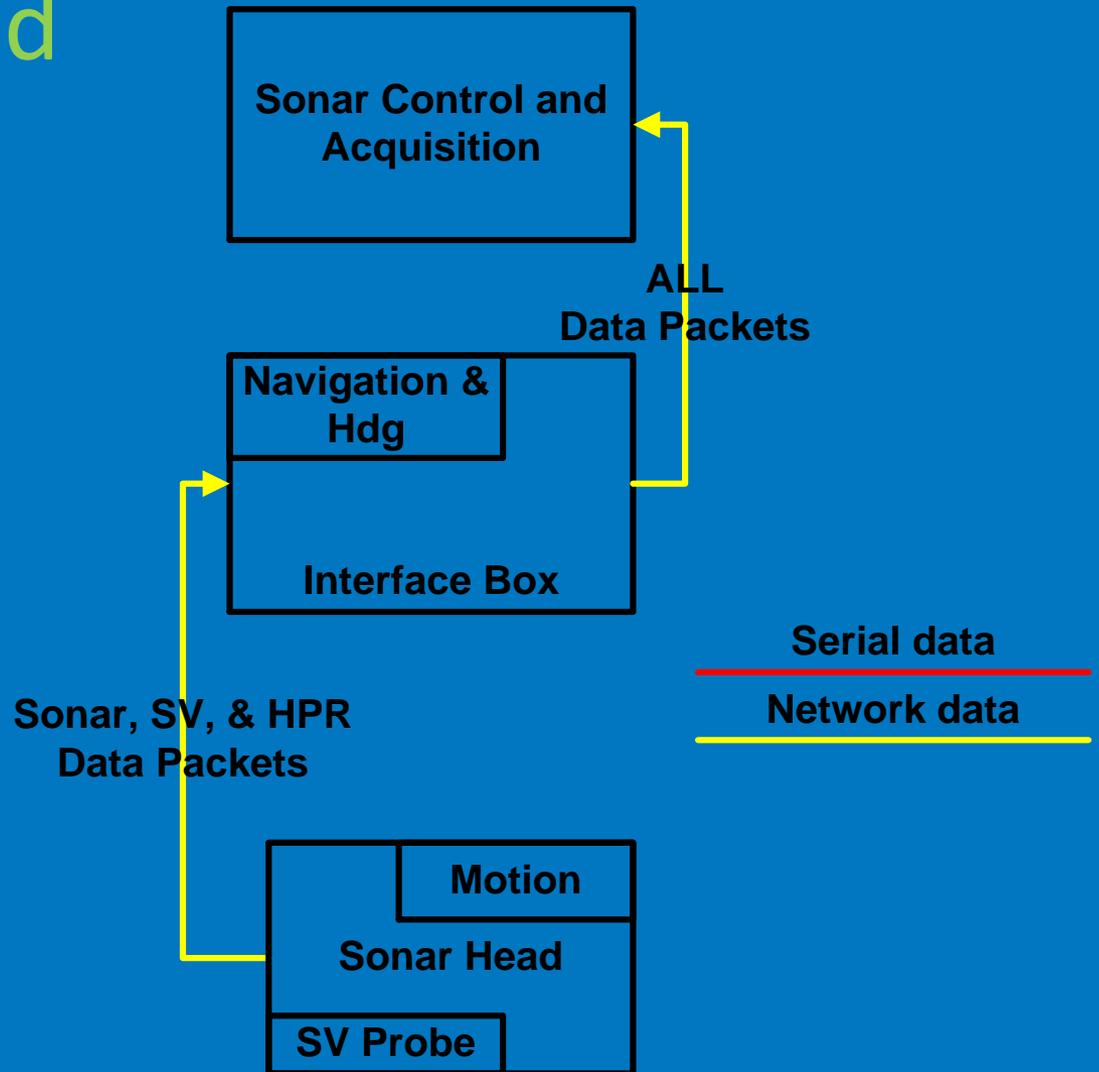
Reduce Mobilization Errors

- Integrate a Sound Velocity Probe in the Sonar Head
  - Fewer cables
- Integrate a Heave, Pitch and Roll Sensor in the Sonar head
  - Fewer cables
  - Easier offset measurements
  - Repeatable patch tests
- Integrate a GPS (Position and Heading) in the Deck box
  - Fewer Cables
  - Easier configuration

Integrated SVP

Integrated GPS/Heading

Integrated Motion
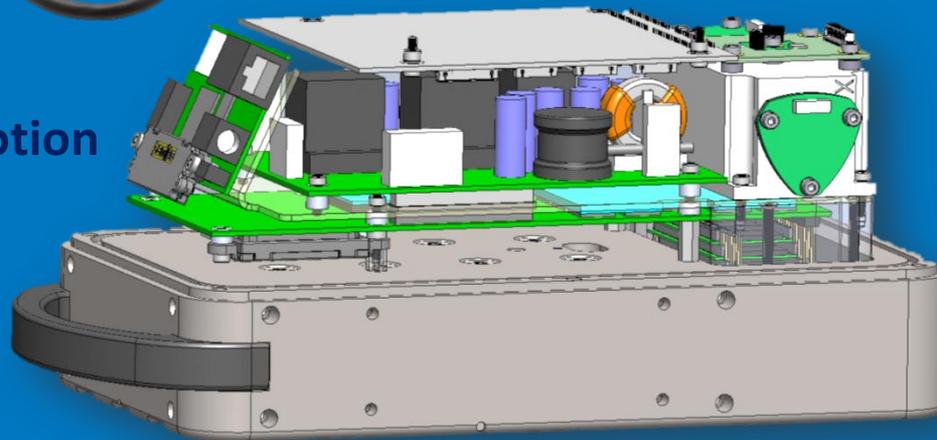
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Reduce mobilization time

- Connect the head to the deck box with a single cable
  - Sonar power, control and data share a cable with SV, heave, pitch and roll
- Connect the deck box to the acquisition PC with a single data
 - All data shares one cable

Reduce Acquisition Errors

- Time stamp all data with a single clock at sub-millisecond accuracy

- Save all raw data (if desired)

- Use 24 bit AD to remove the need for operator defined gain

- Show operator when data is out of spec or missing

Simple user interface

- Runs on a common laptop

- Intuitive controls

- Warning boxes around sensors

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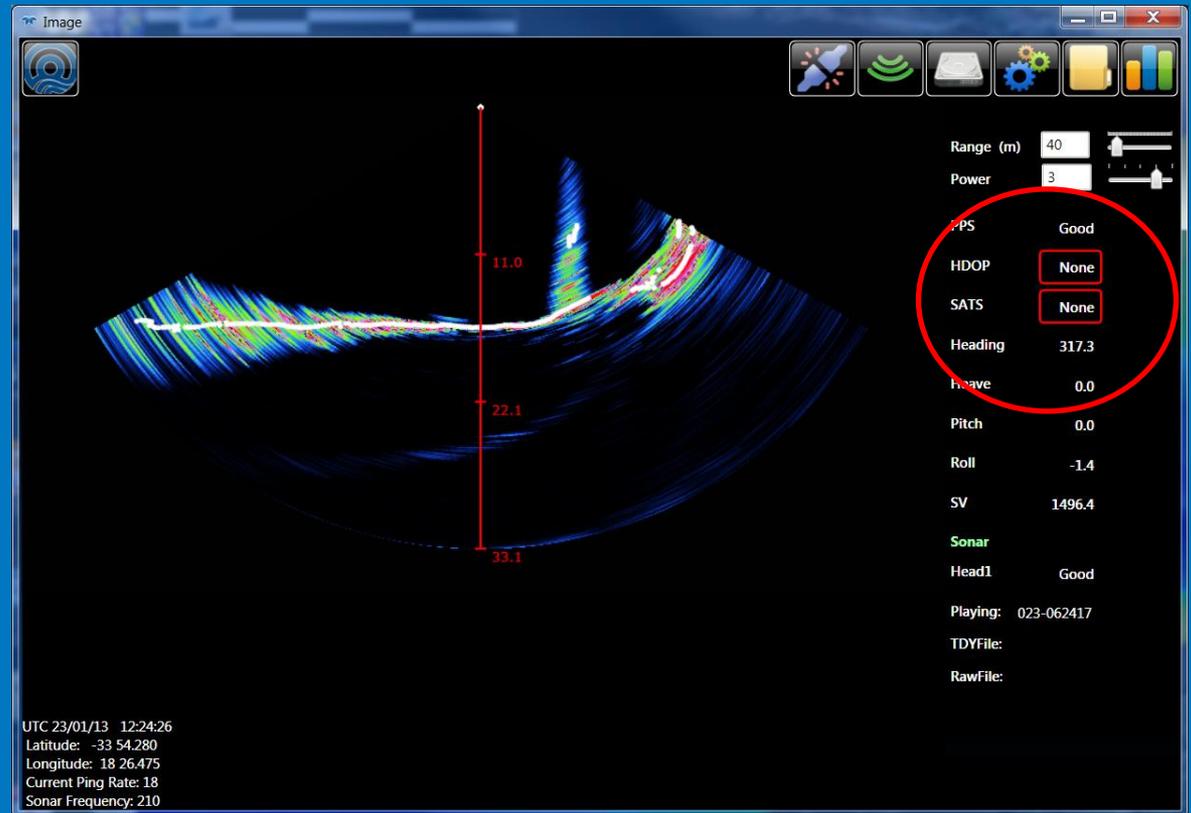
Reduce Acquisition Time

- Allow dual head operation

- Reduce reruns through playback
  - Recording of raw data allows replaying, re-beam forming and new filters to be applied
  - Raw Data also helps customer service and technical support
   - We can see what you see

MB1 Dual head

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Post Survey Raw Data replay in Image
Provide output data to Hypack or other packages

Sonar Head
SV Adjusted

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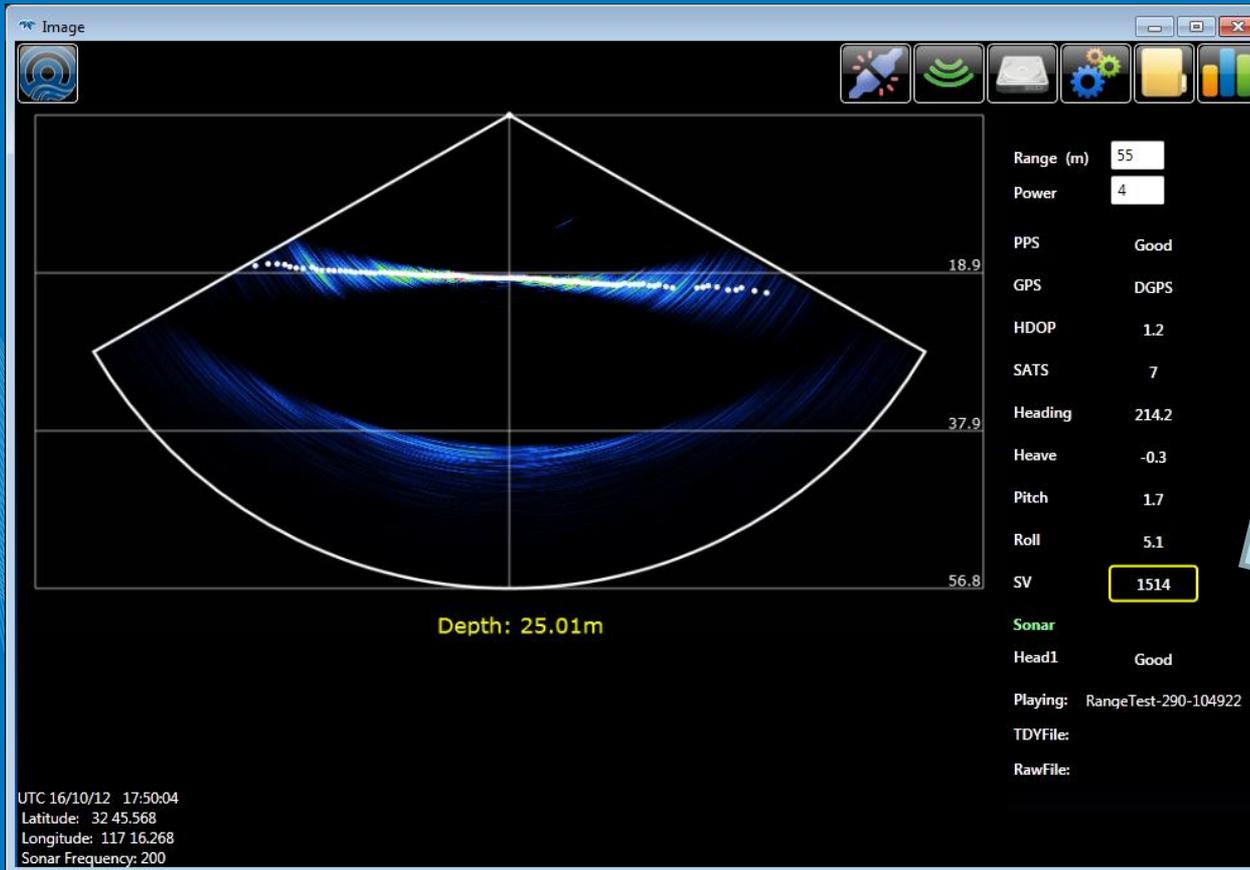
Fix Acquisition Blunders After the Survey
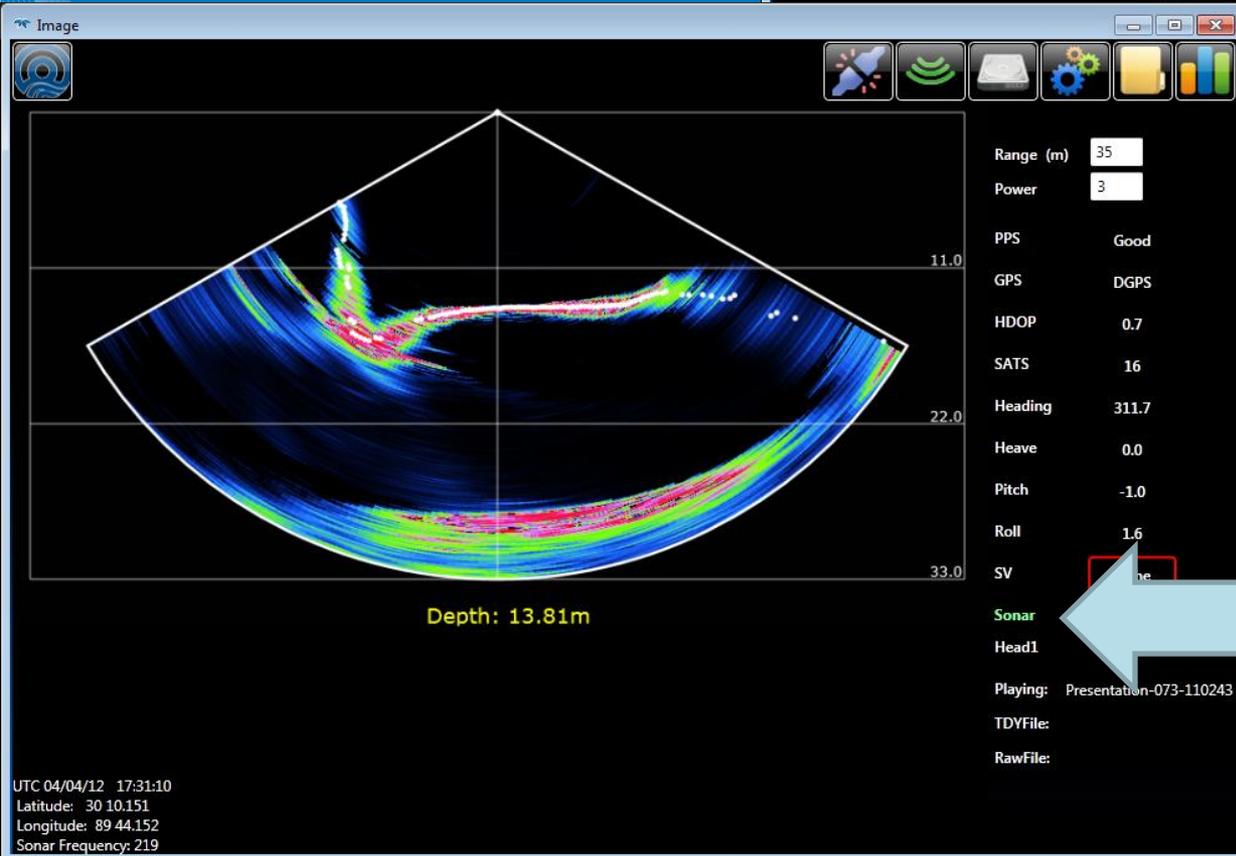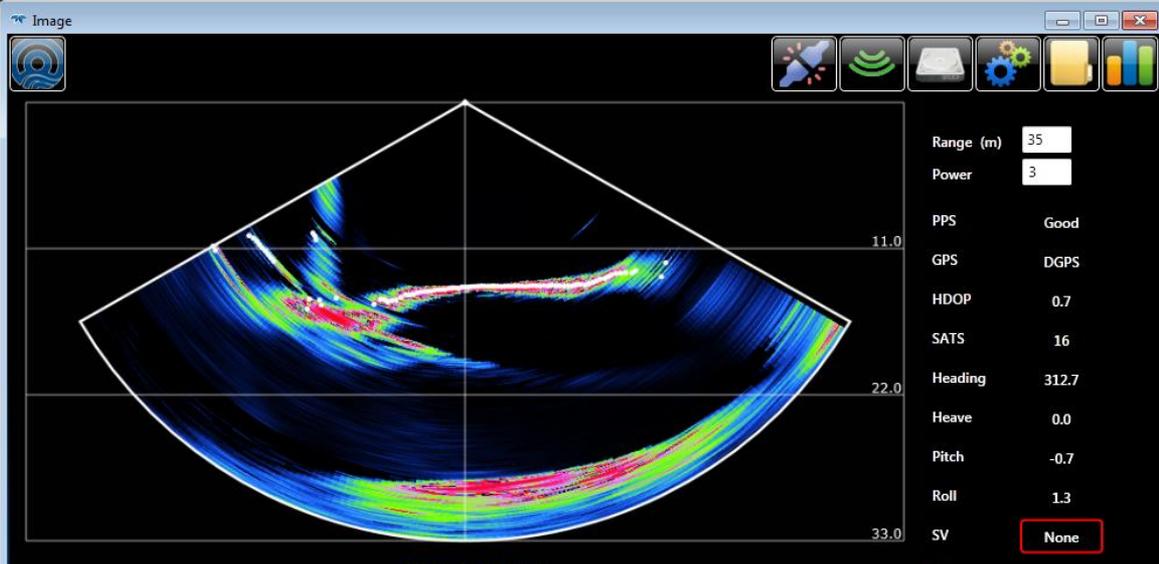

- Depth filter at 10-15m

- No Depth Filter

Work on a wide range of projects

- Traditional Hydrographic Survey

- Water column targets
  - Raw data is smaller than water column data

- Seafloor backscatter
  - Snippets
  - Sidescan
  - Variable length water column.

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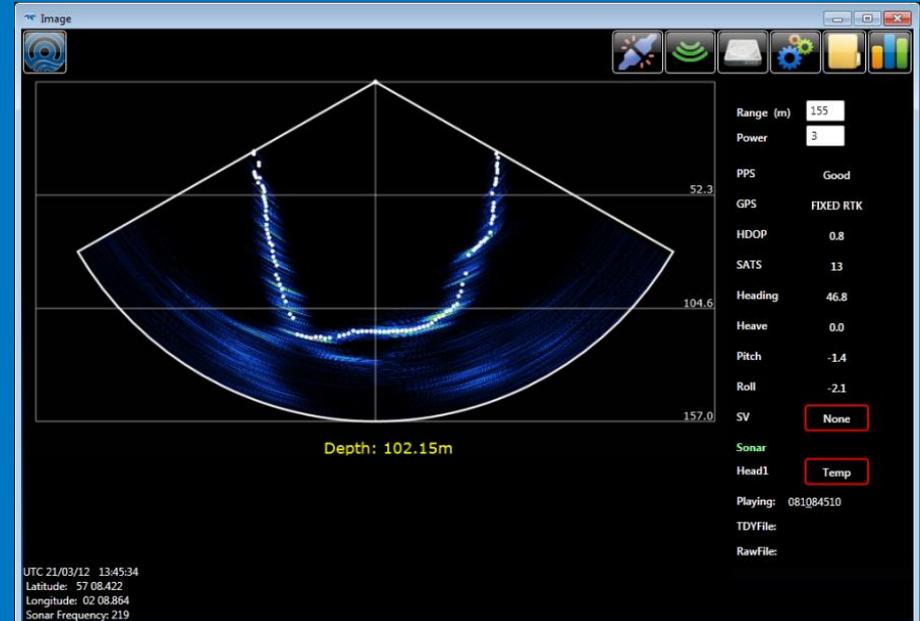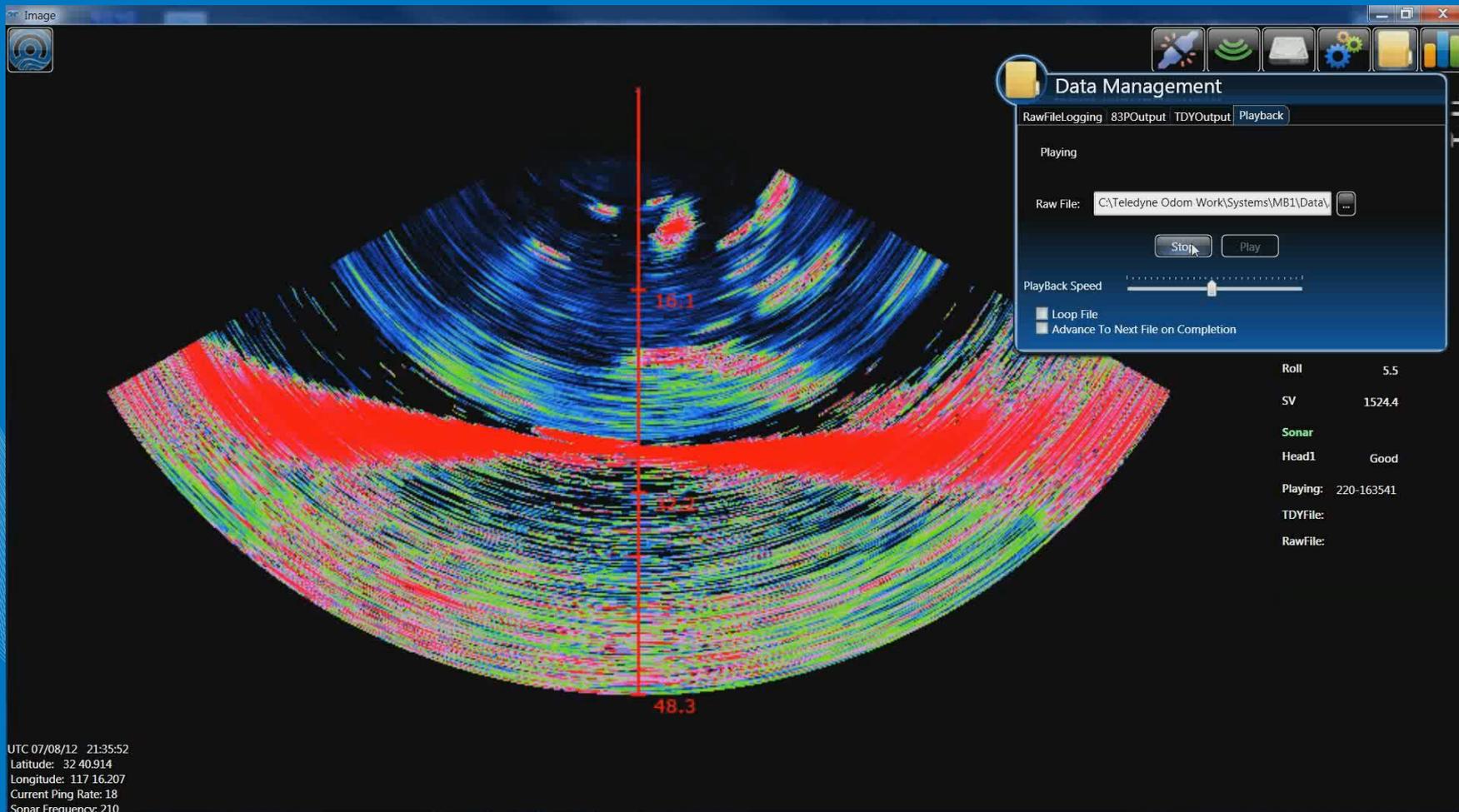
MB1 sonar data showing Kelp in the mid water column

Allow User Repairs

- Most Multibeam Systems need to be returned to the manufacturer for even simple repairs
- The MB1's modular design allows for testing in the field
- This eliminates the need for down time, shipping, customs etc.

Field Repair: User Case history
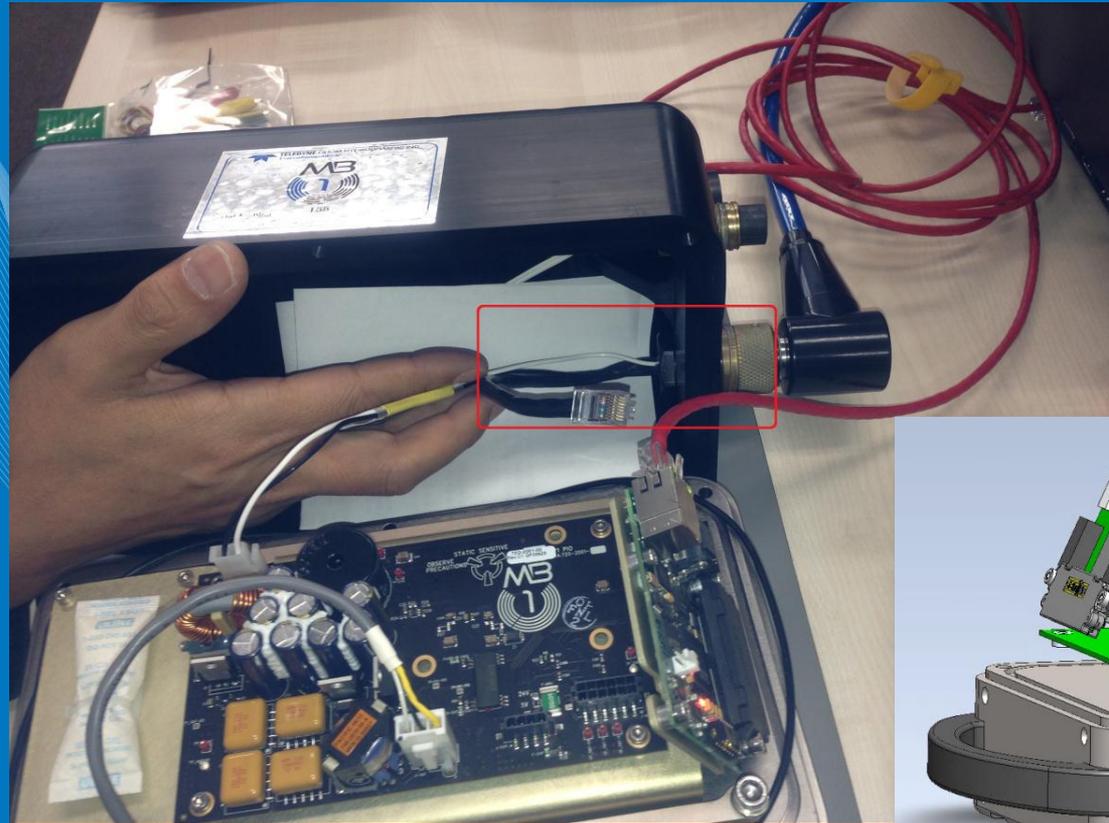
A defective RJ45 connector on the MB1 being repaired via remote assistance
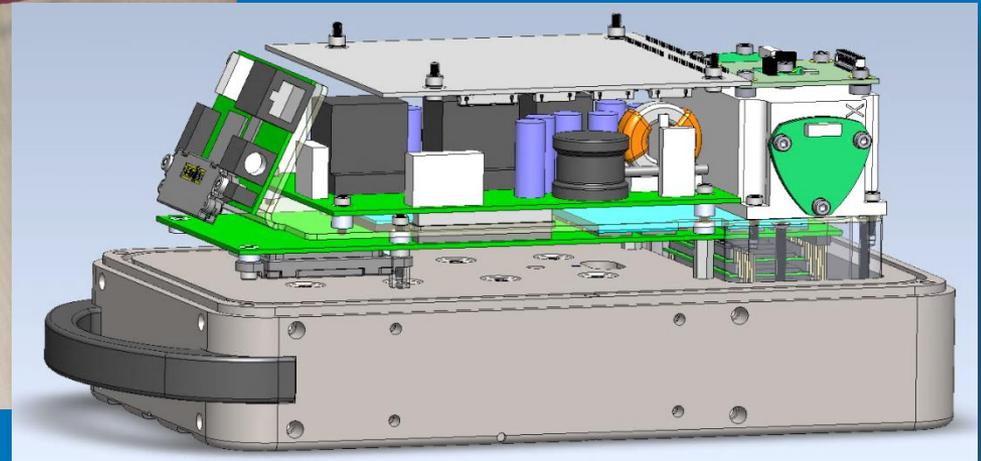
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Savannah Dredge tooling marks
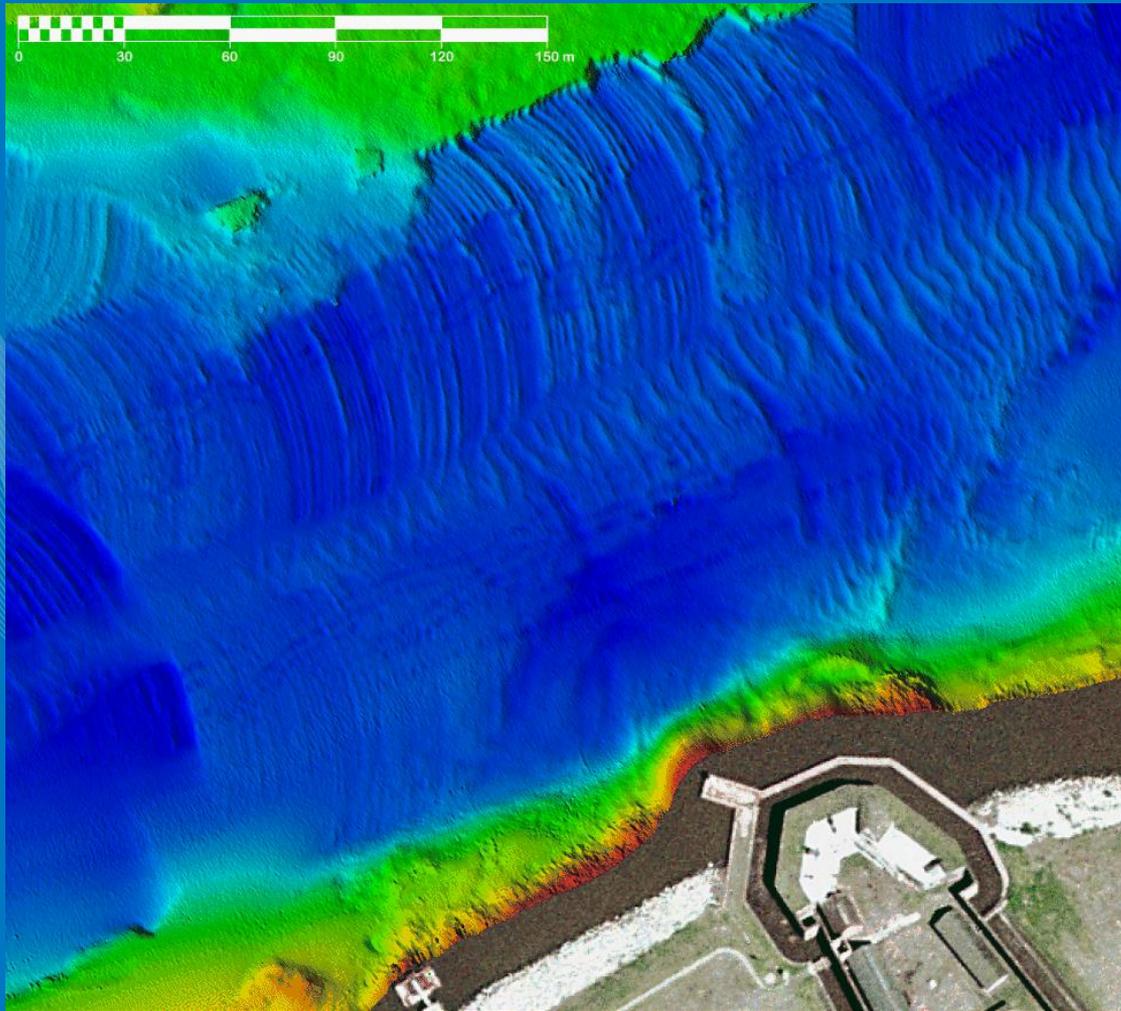
Dredge Spoil
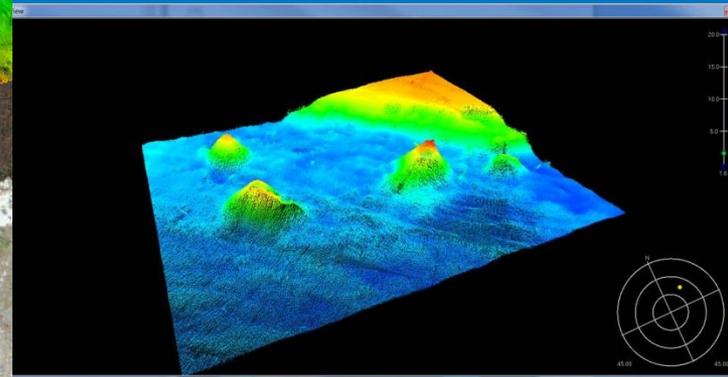
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Wet Infrastructure

Folsom Lake, CA
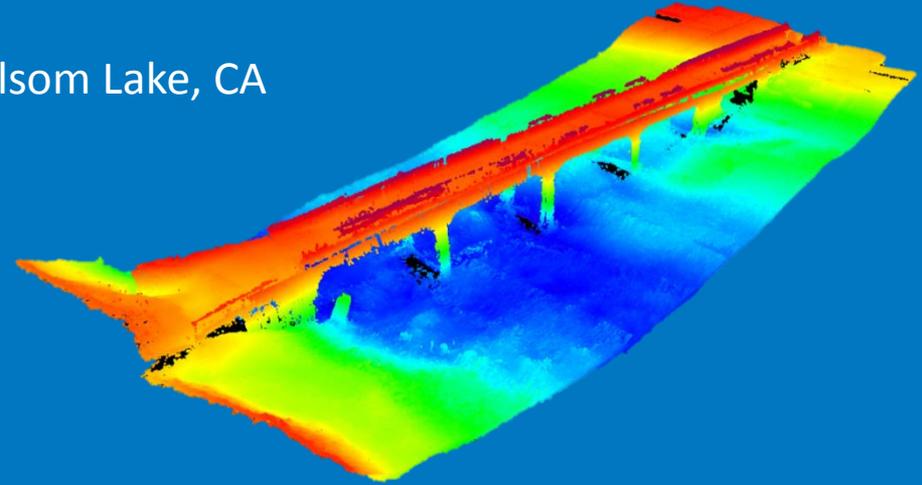
Pier and Pilings,
South Africa
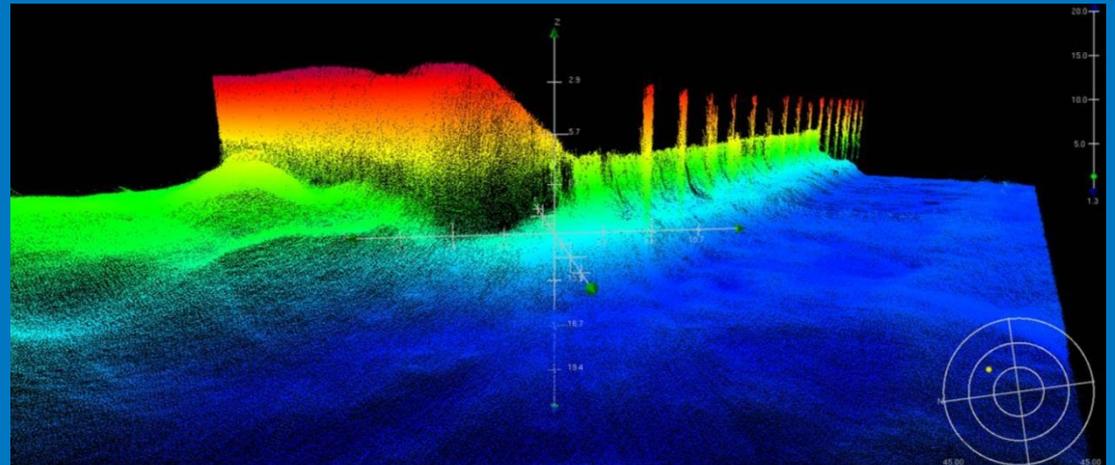
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Bed Forms Channel Scour

Survey of the Rigolets waterway in Louisiana
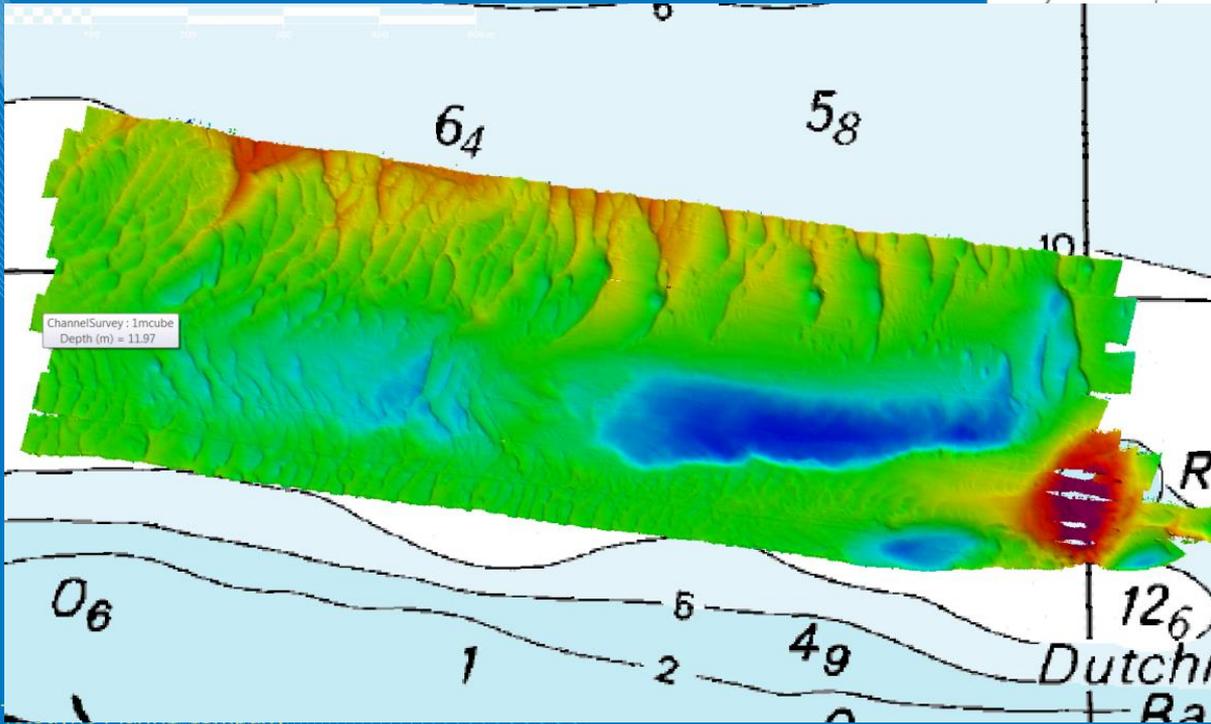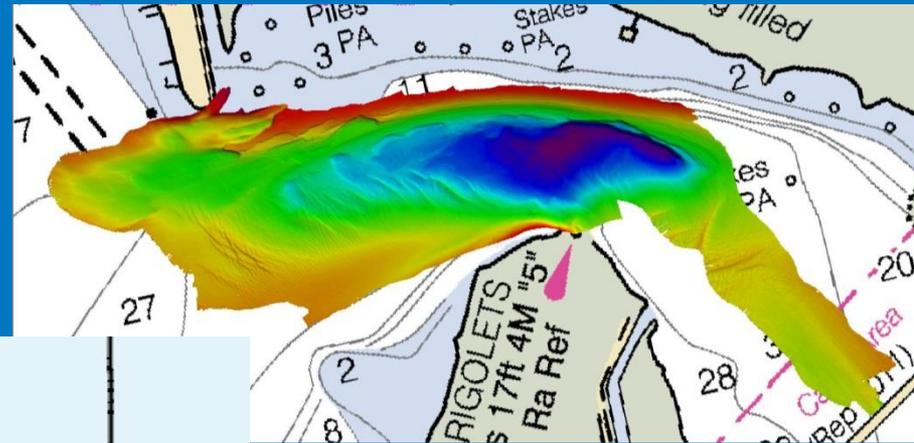
Water way in Port Nelson, Australia