

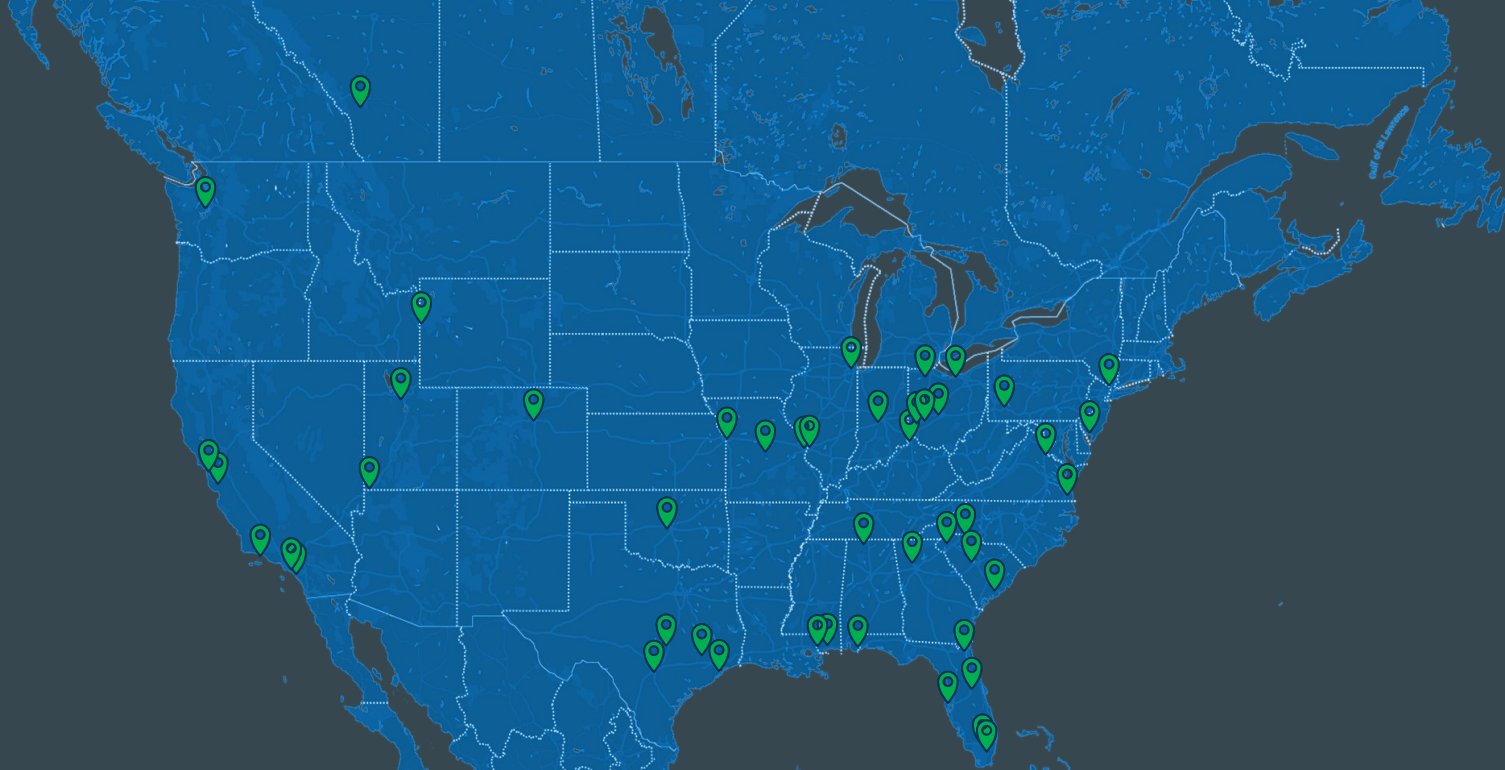
Subsea Laser Scanning Innovation in Cook Inlet

Presented by:
Adam Taylor, C.H.

...

eTrac
A WOOLPERT COMPANY


WOOLPERT



Woolpert North American Offices

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 Austin, TX
 Bay St. Louis, MS
 Charlotte, NC
 Chicago, IL
 Cincinnati, OH

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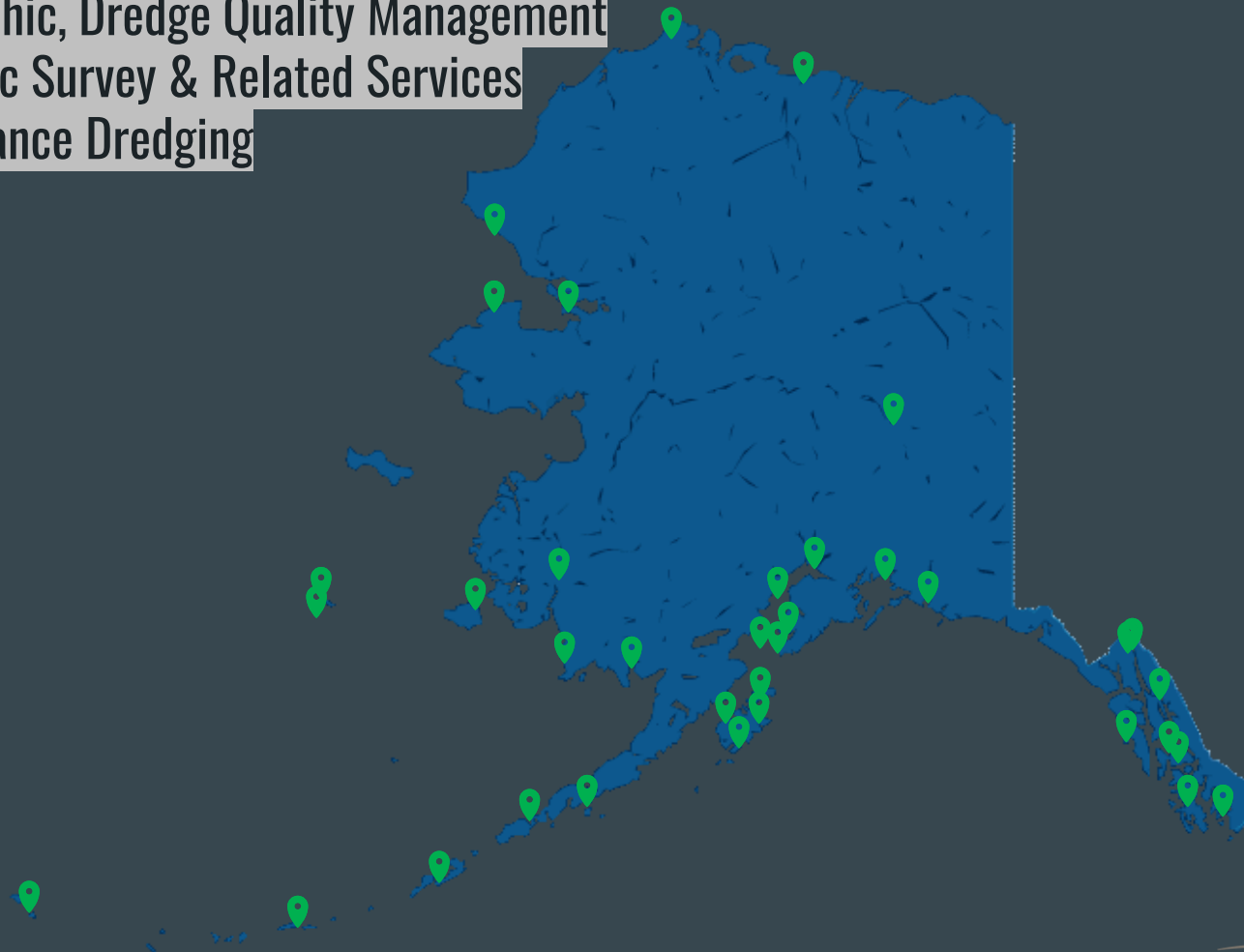
Jackson Hole, WY
 Jacksonville, FL
 Jefferson City, MO
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 LaPorte, TX
 Long Beach, CA
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 New York City, NY
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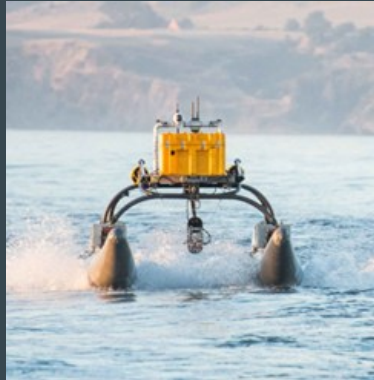
Salt Lake City, UT
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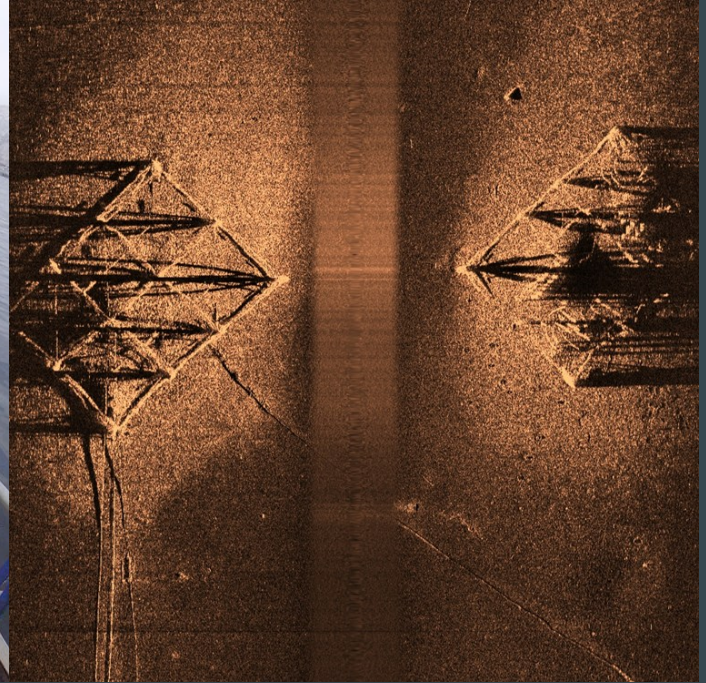
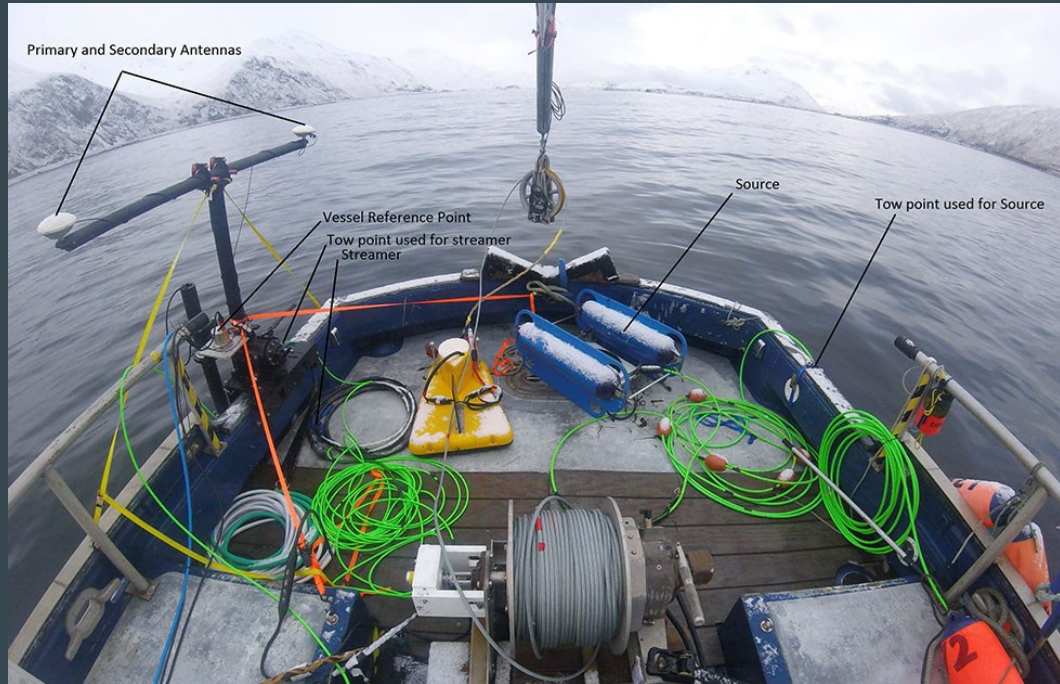
Geophysical, Hydrographic, Dredge Quality Management
USACE IDIQ Hydrographic Survey & Related Services
Port of Alaska Maintenance Dredging



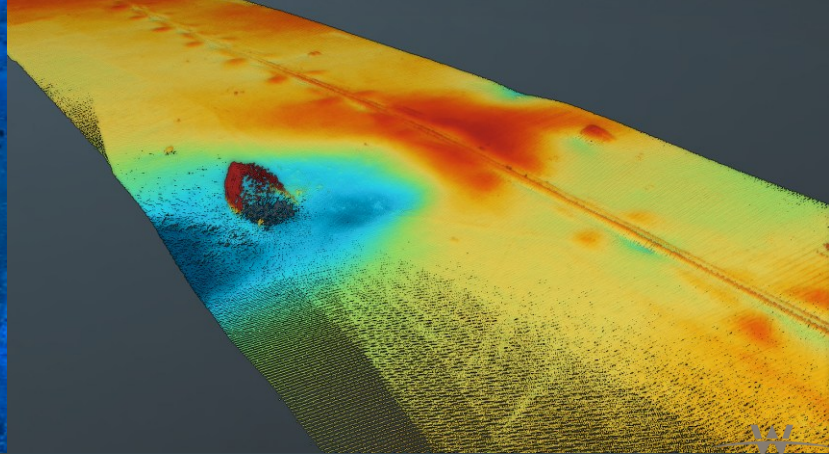
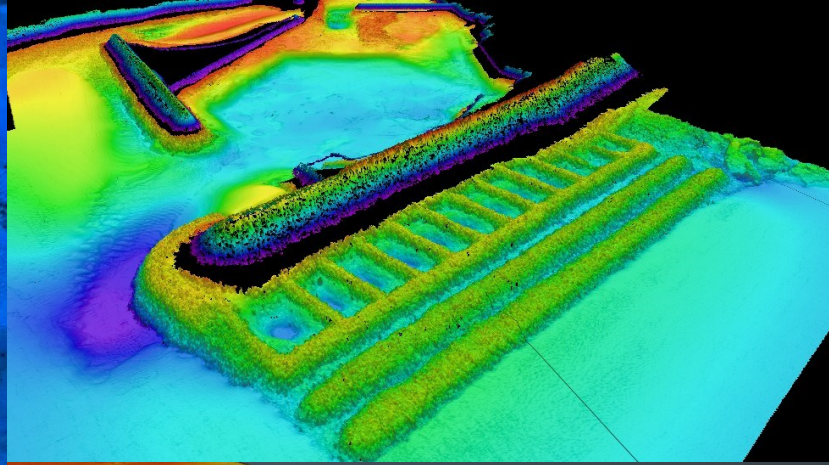
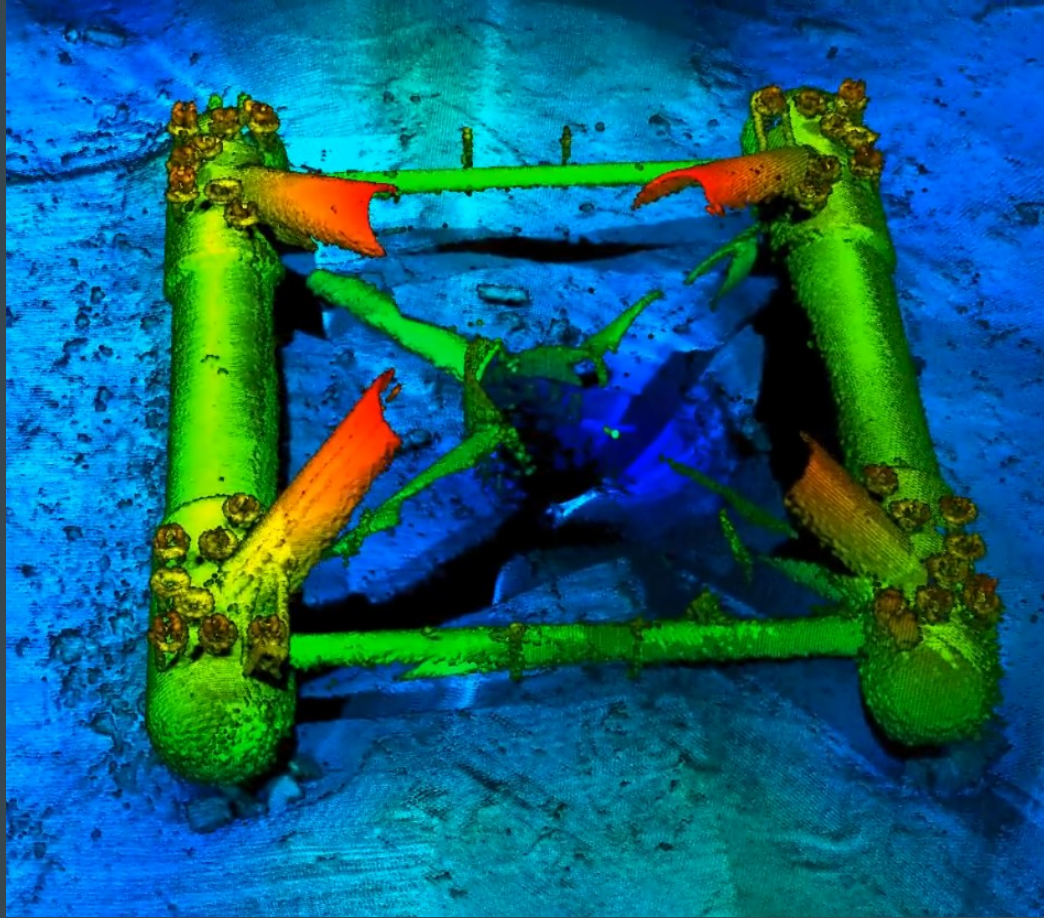
Vessel Fleet



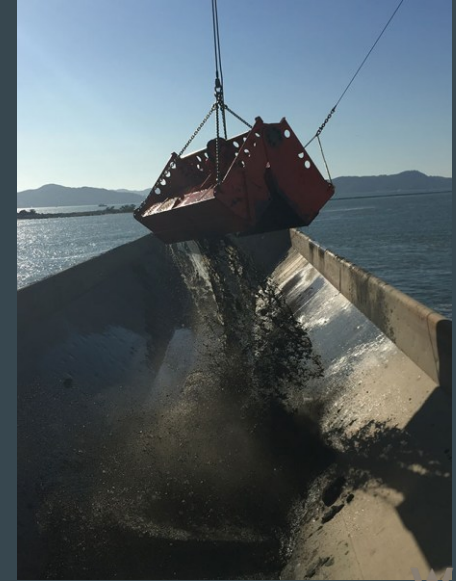
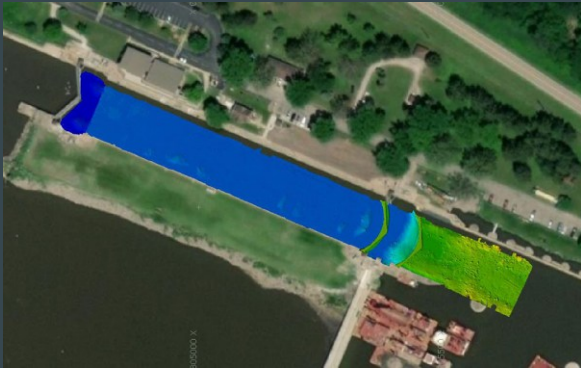
Geophysical Services



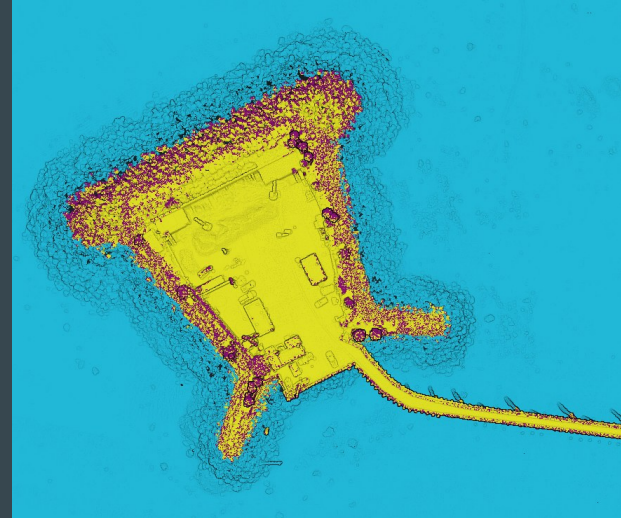
Bathymetric Mapping



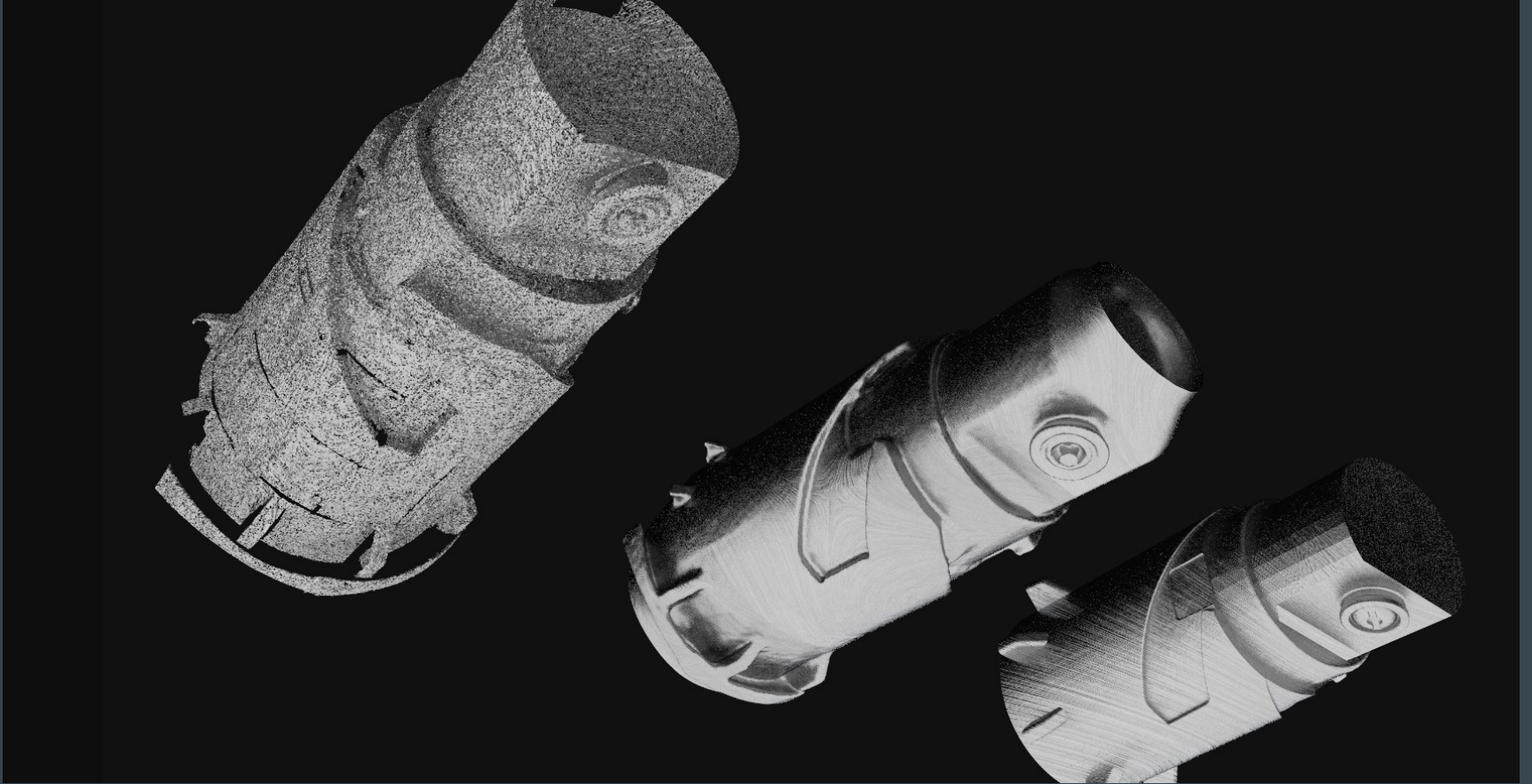
Dredge Quality Management



LiDAR Services



Subsea Laser Survey



- Who: *Coordinated effort with Global Diving and eTrac*
- What: *Acquire & Model subsea asset*
- When: *Summer 2022*
- Where: *Cook Inlet*
- Why: *Needed to accurately fabricate adapter*
- How: *Newton Subsea Laser Scanning System*

- **Who:** *Coordinated effort with Global Diving and eTrac*

- **What:**

- **When:**

- **Where:**

- **Why:**

- **How:**

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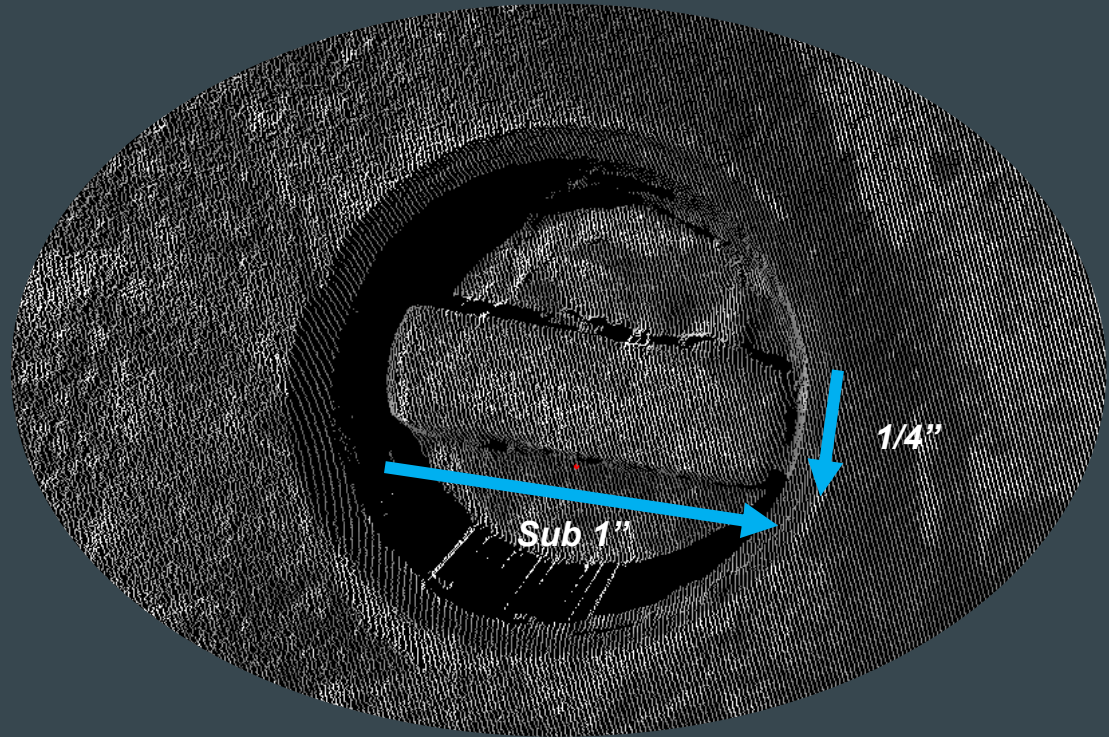
GLOBAL
a moran company



- **Who:** *Coordinated effort with Global Diving and eTrac*
- **What:**
- **When:**
- **Where:**
- **Why:**
- **How:**



- Who:
- **What:** *Acquire & Model subsea asset to within 1/16" resolution (1.5mm)*
- When:
- Where:
- Why:
- How:

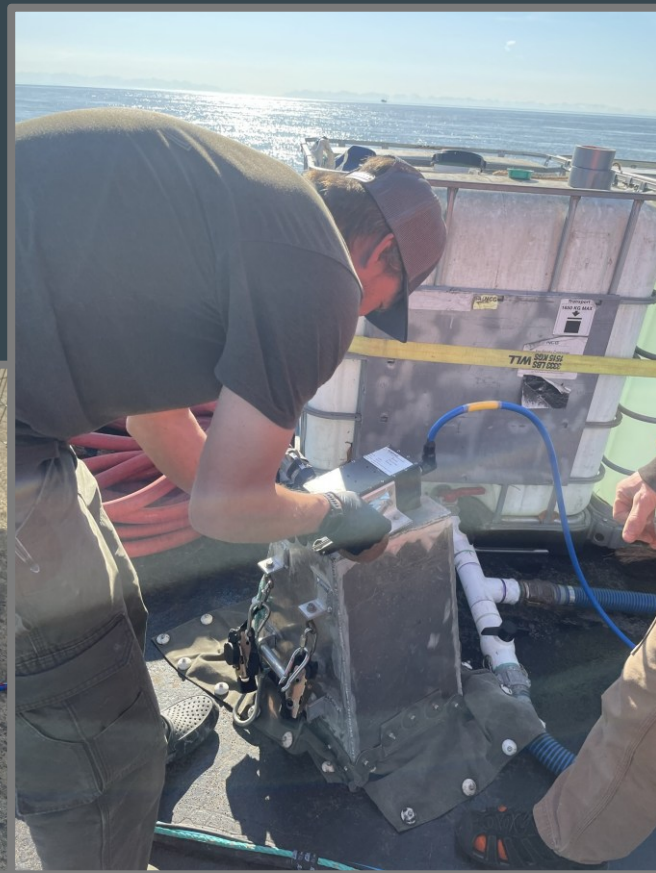


- Who:
- What:
- **When:** *Design Late 2021*
- Where: *Fabrication Early 2022*
- Why: *Testing March 2022*
- How: *Acquisition May 2022*
Processing through August 2022

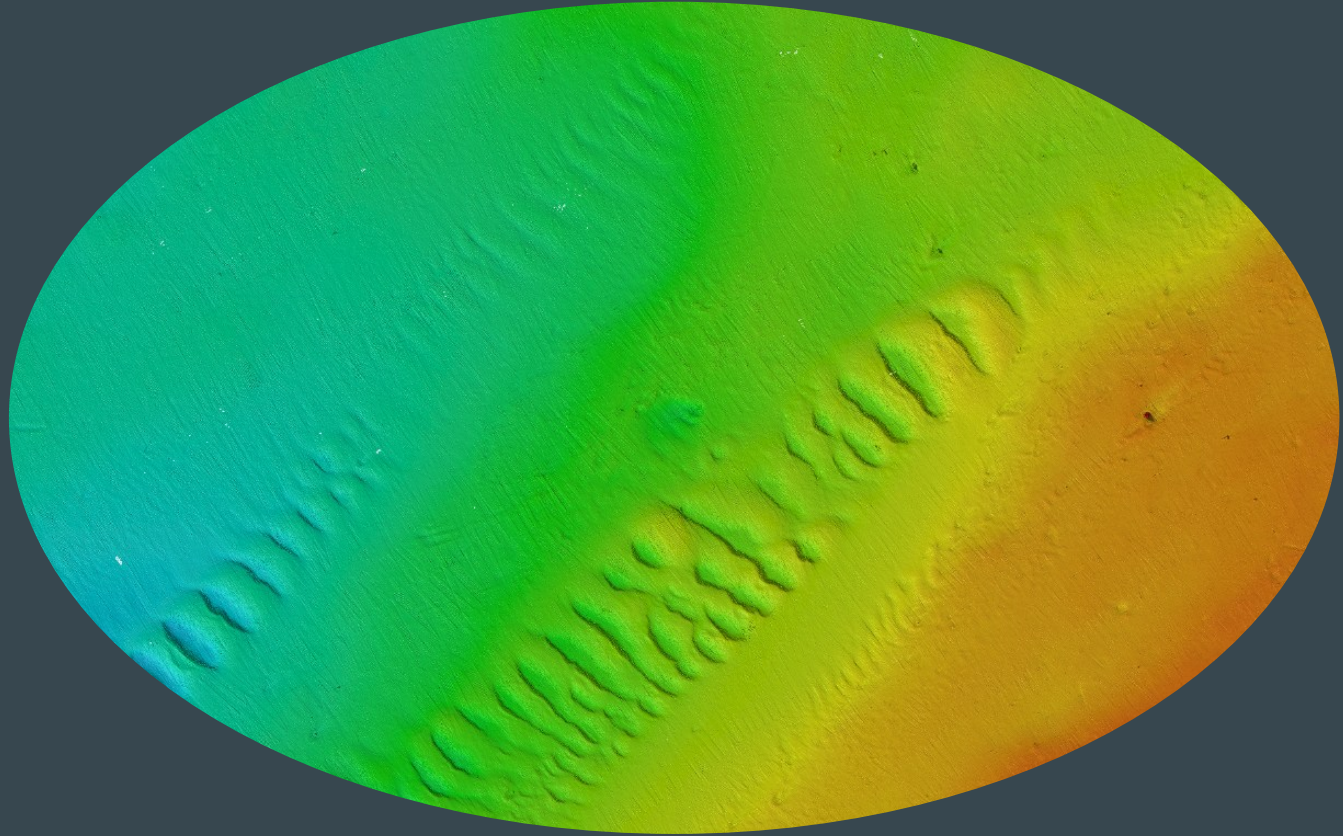


- Who:
- What:
- When:
- **Where:**
- Why:
- How:

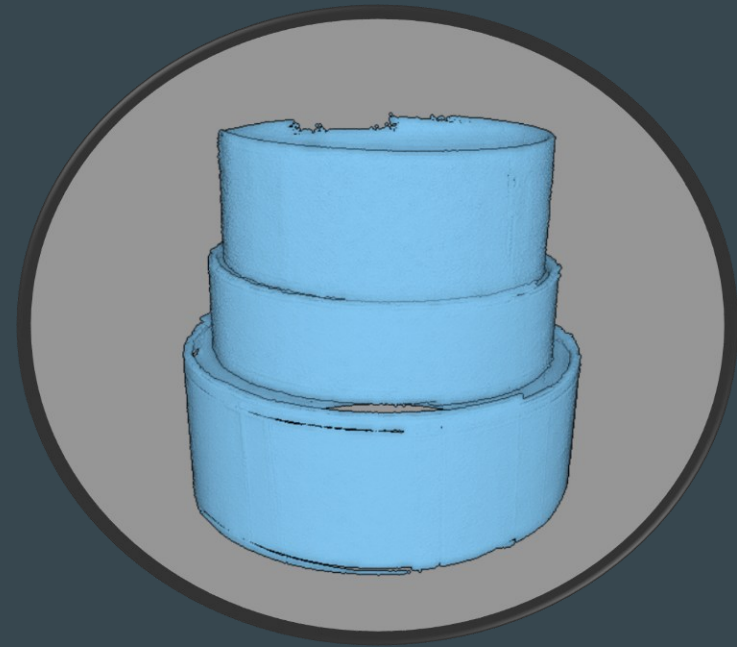
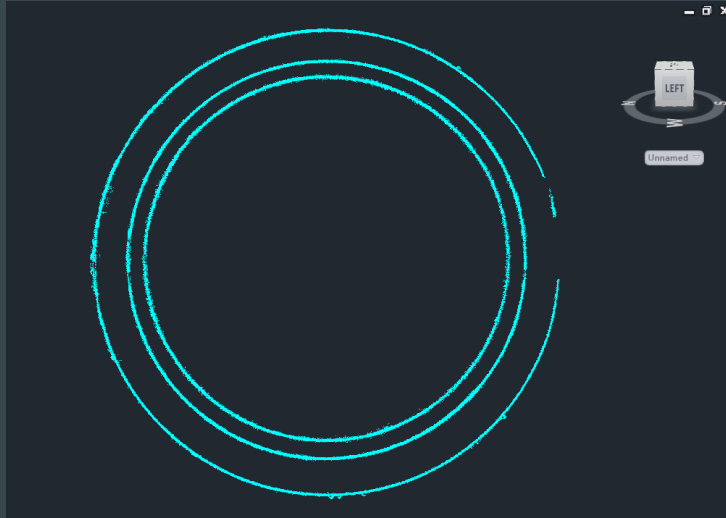
*Cook Inlet; 120ft Water Depth
Turbid, Silt, Zero-visibility*



- Who: *Multibeam over same area...would not*
- What: *produce detail required for fabrication*
- When:
- Where:
- Why:
- How:



- Who: *Needed to accurately fabricate*
- What: *adapter to secure subsea asset.*
- When:
- Where:
- Why:
- How:



- **Top Section OD: 13.38"**
- **Middle Section OD: 14.98"**
- **Lower Section OD: 17.59"**

- Who:

Design of Acquisition System: Late 2021 to Early 2022

- What:

Initial shop testing

- When:

- Where:

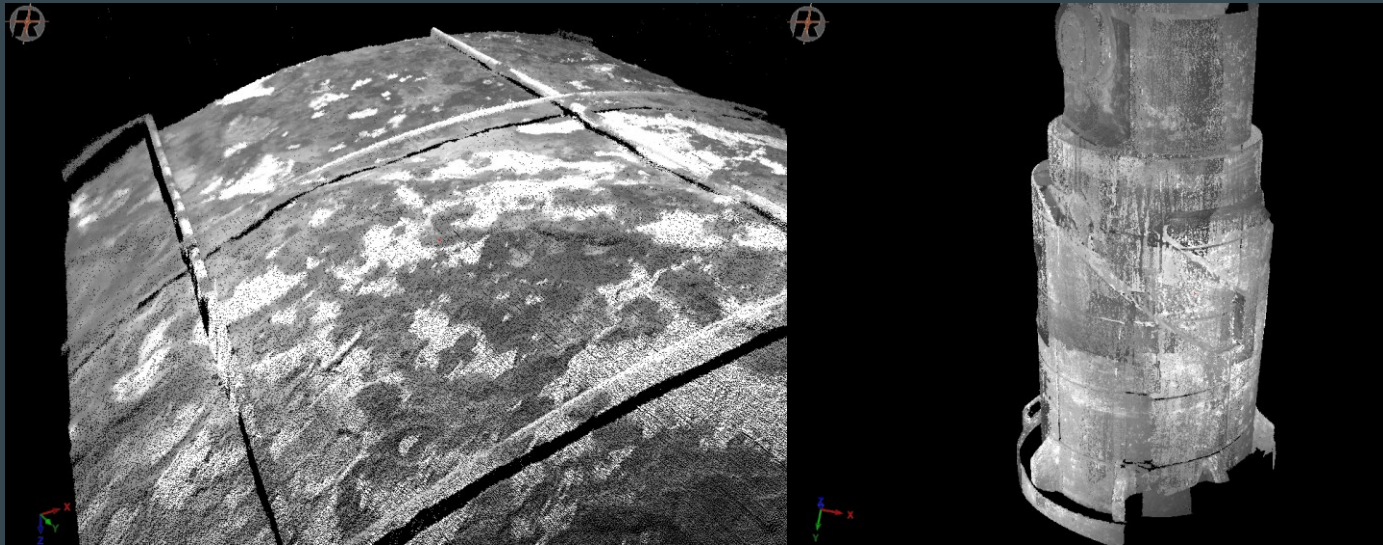
Field testing in similar conditions

- Why:

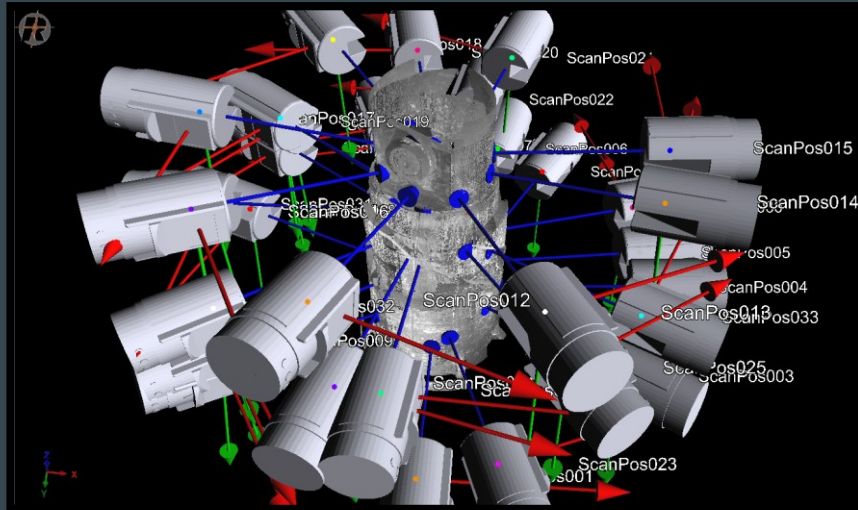
- How:



- Who: *Acquisition: May 2022*
- What: *Newton Laser Scanning System – Optical triangulation with green laser*
- When: *At 900mm from object; CAD resolutions of 0.15mm; Single scan surpasses project*
- Where: *requirements, but registration of multiple scans closer to 1.5mm in final design*
- Why:
- How:



- Who: *Single Scan Process: Diver secures*
- What: *sensor to subsea asset, flush with clean*
- When: *water, camera/green laser on to confirm*
- Where: *visibility requirements achieved, perform*
- Why: *scan of asset, move Newton to next scan*
- How: *position.*



- Who:

Processing: Summer 2022

- What:

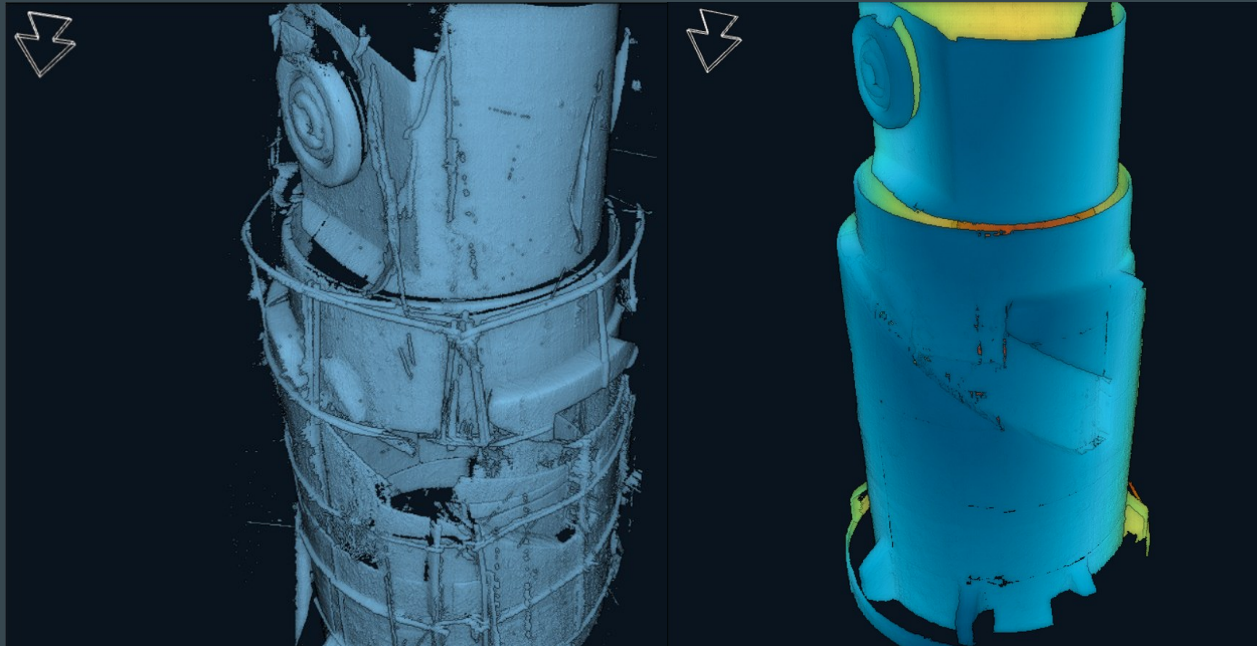
Sanitize point cloud, Registration of Scans, and Modeling of asset

- When:

- Where:

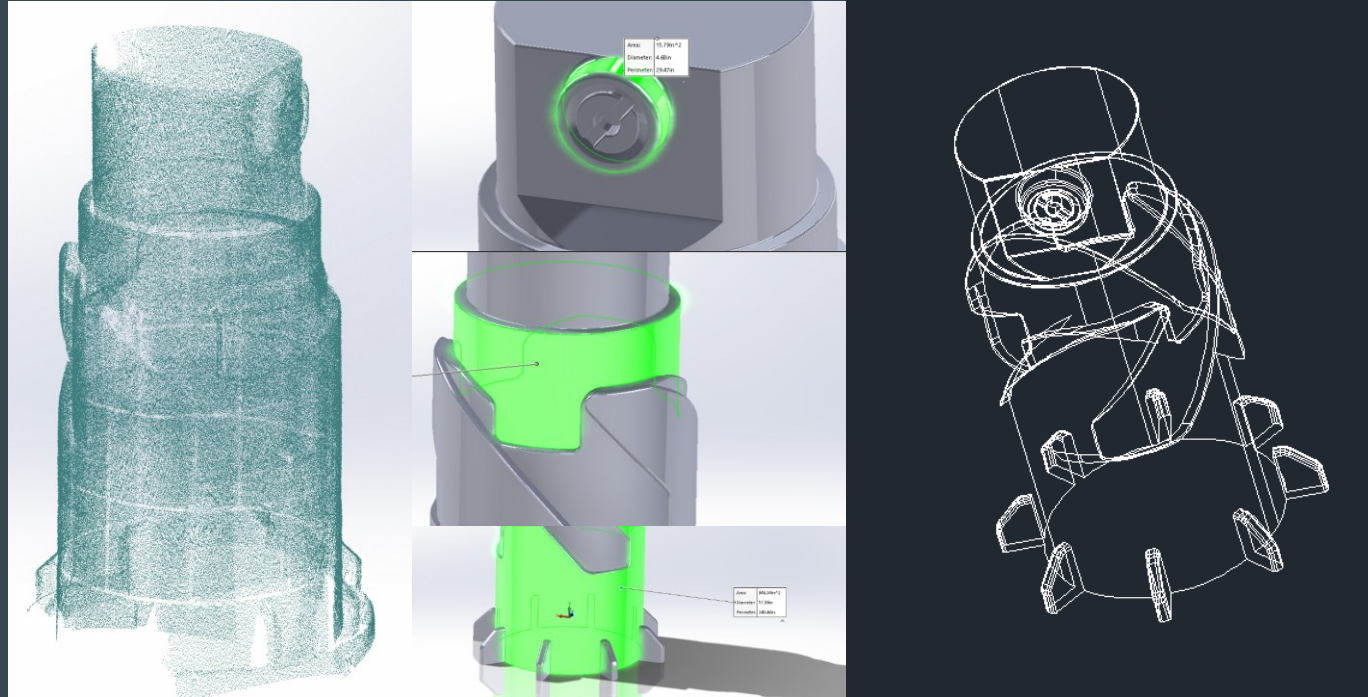
- Why:

- How:



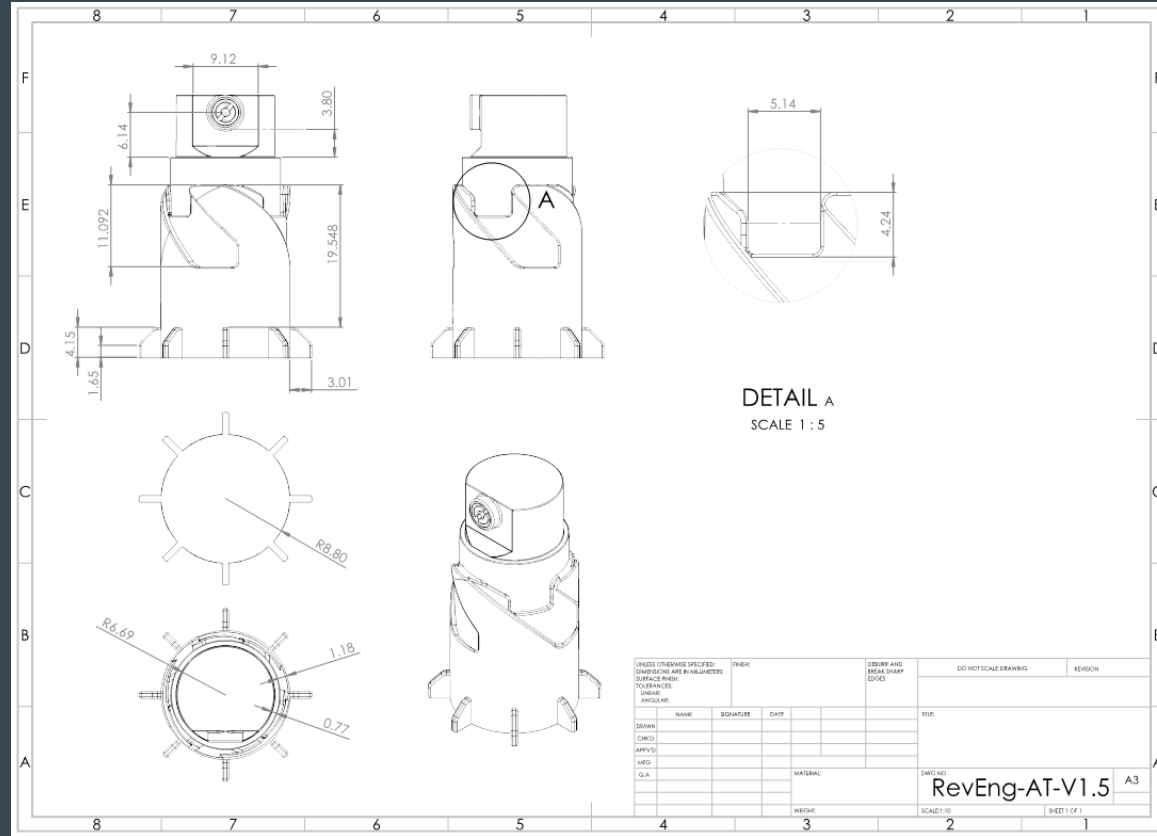
- Who:
- What:
- When:
- Where:
- Why:
- How:

*RiScan – **LAS** – ReCap – **Mesh** – Solidworks – **Step***

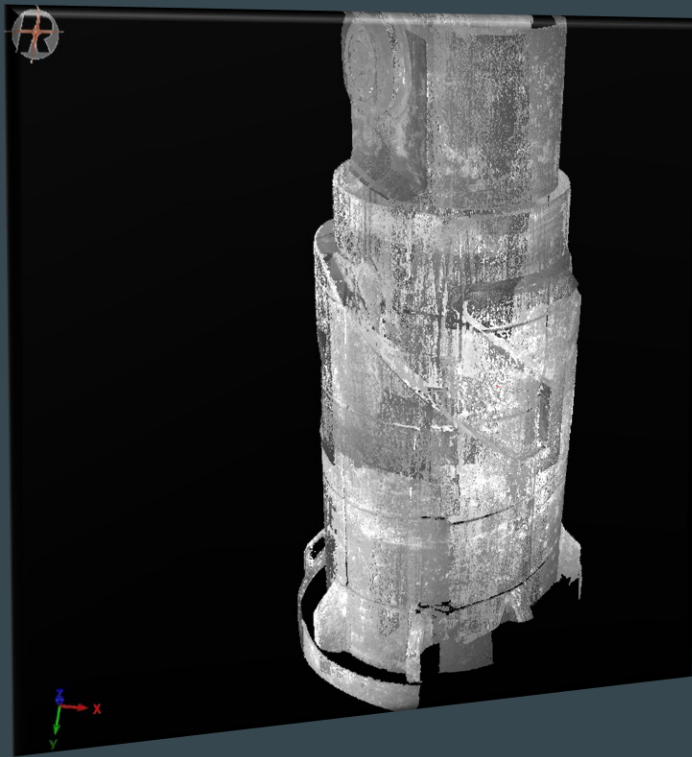


Model with Dimensions

- Who:
- What:
- When:
- Where:
- Why:
- How:



And?



3D Model

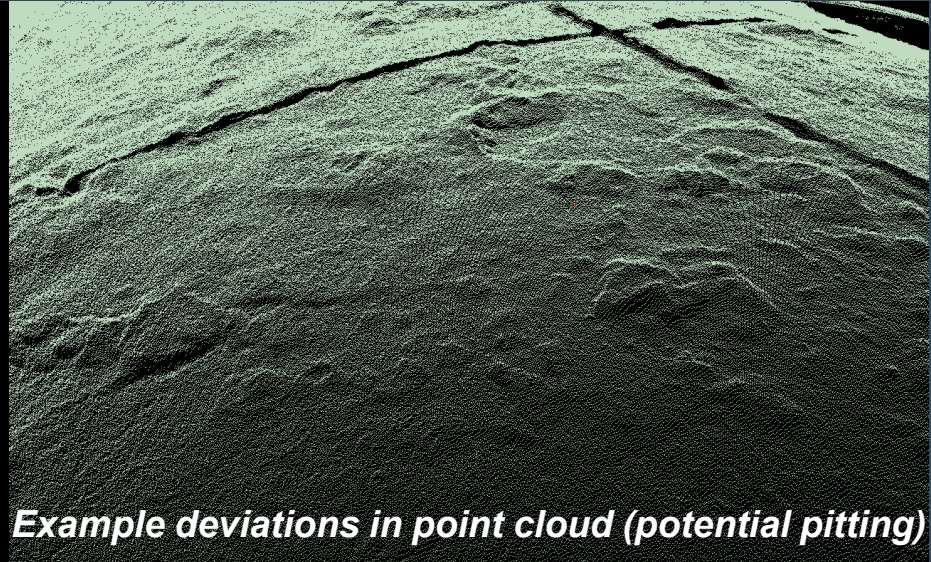
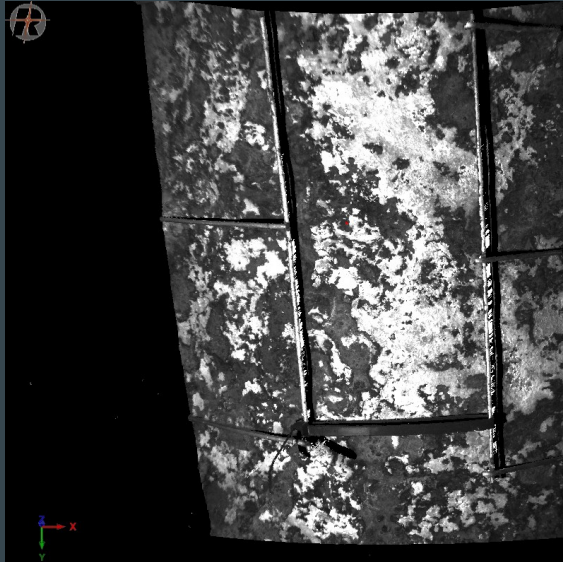
It fit!

And?

Applicability to subsea infrastructure

Inspection or design for assets

Another tool for evaluation



Example deviations in point cloud (potential pitting)

Questions?

Adam Taylor

Program Director

C: (907) 521-3370

Adam.Taylor@Woolpert.com

www.woolpert.com

