

## Collecting Subsea Point Clouds

Wilbert Brink – 8 December 2015 – NCG/OGh Point Cloud Seminar

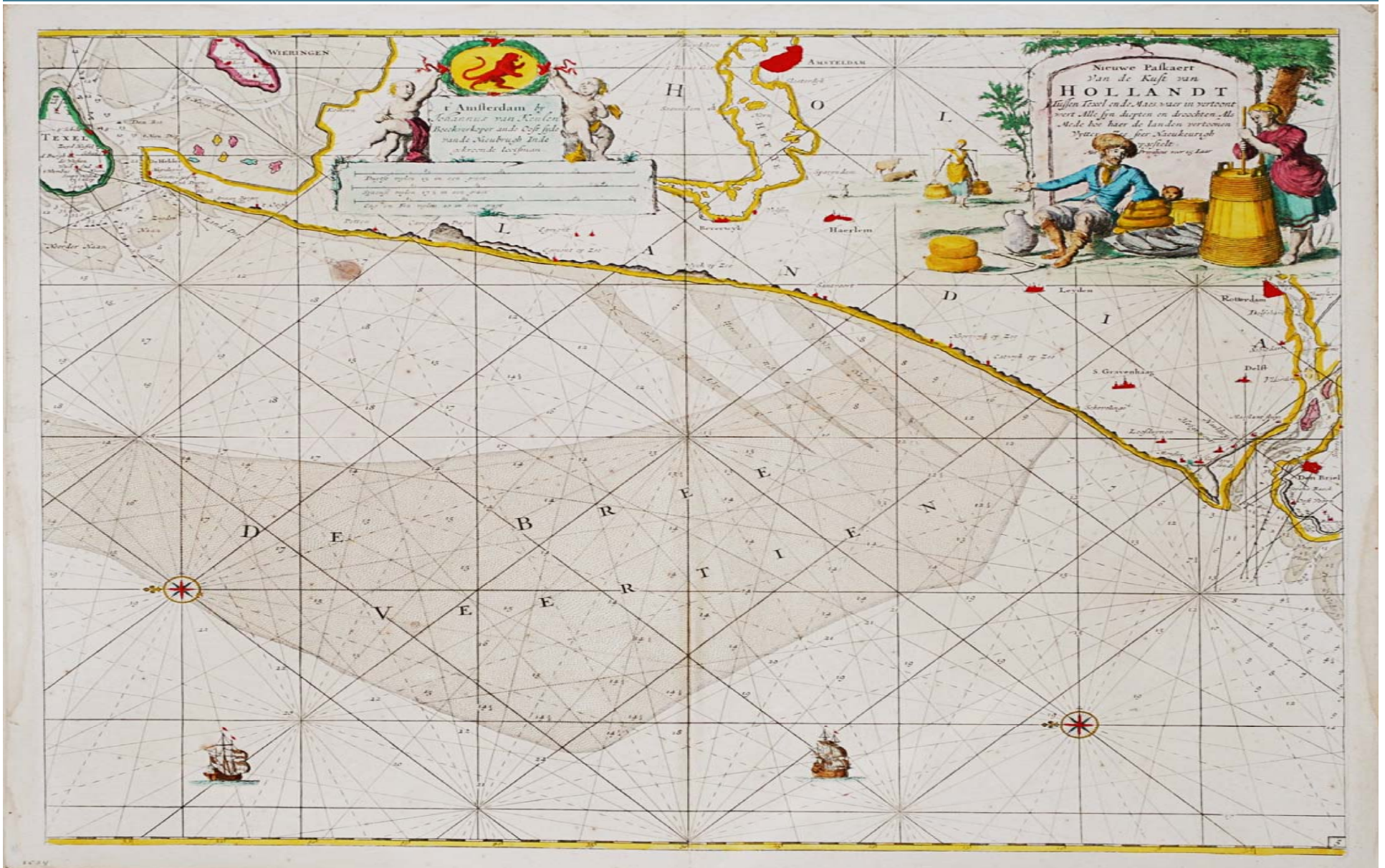
# The First Subsea Point Clouds



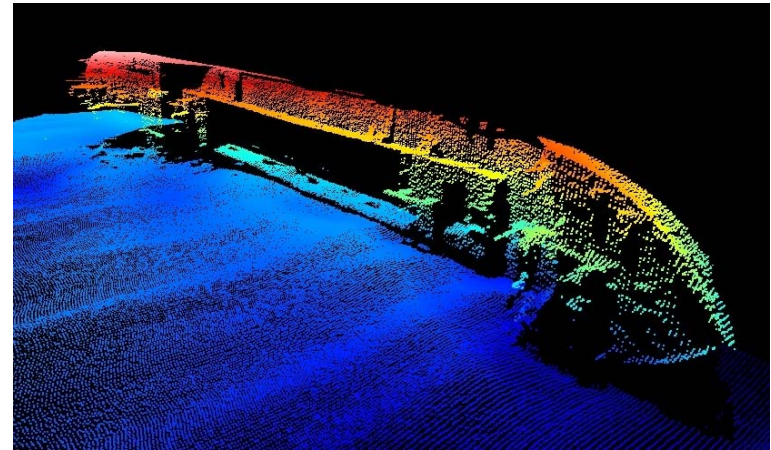
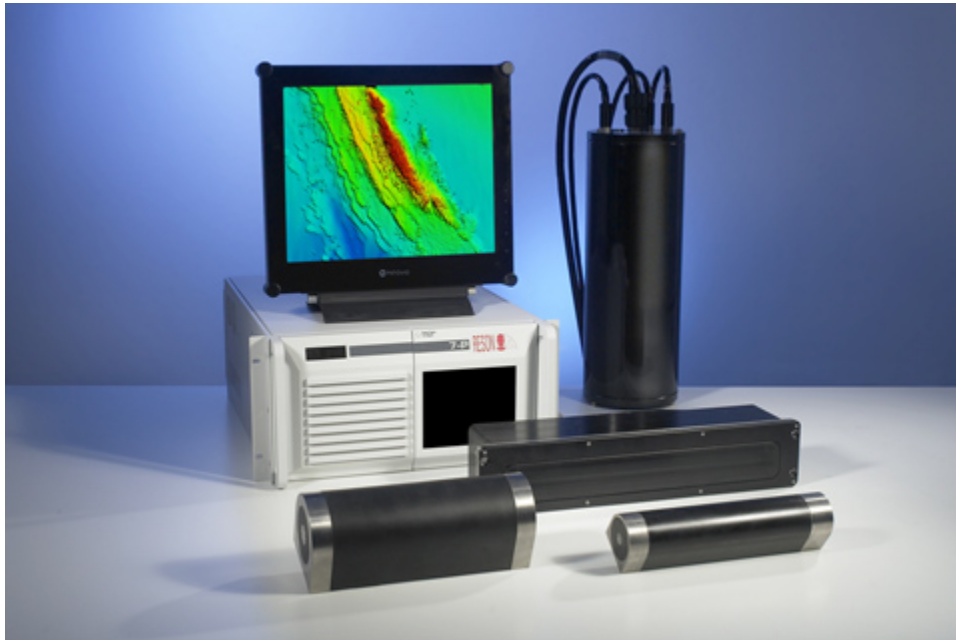
TERRE DE DIEU, TERRES DES HOMMES  
WWW.POMPANON.FR



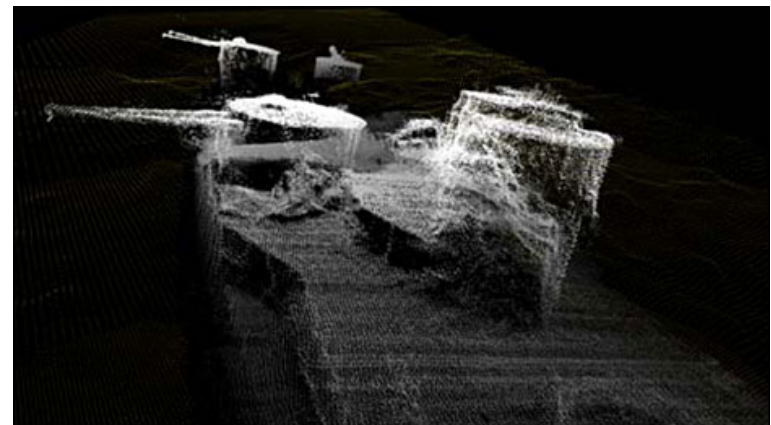
# The First Subsea Point Clouds



# Multibeam Echo Sounding

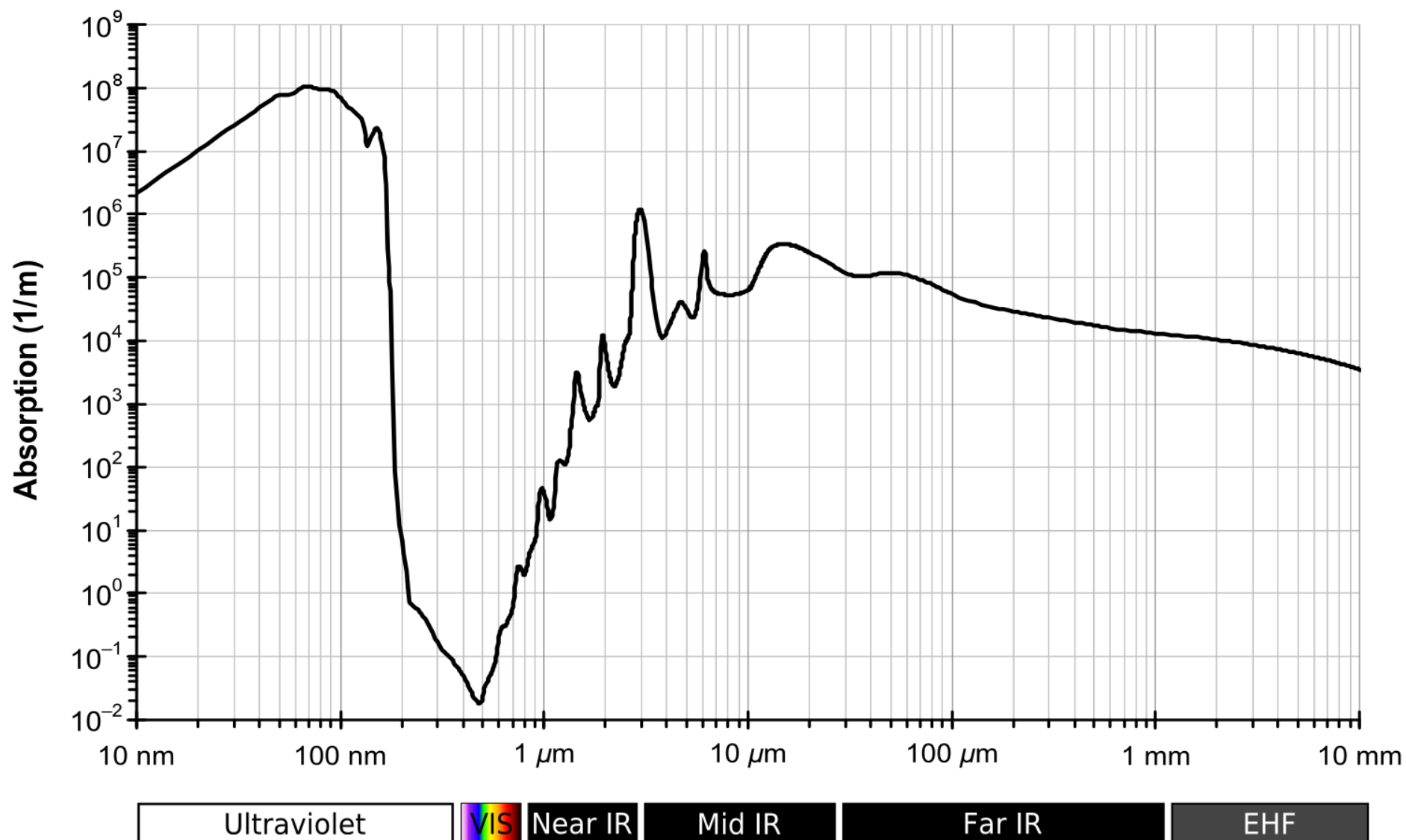


The Maggie



Battleship Danton

# Absorption of Electromagnetic Waves in Water



## Sound

vs

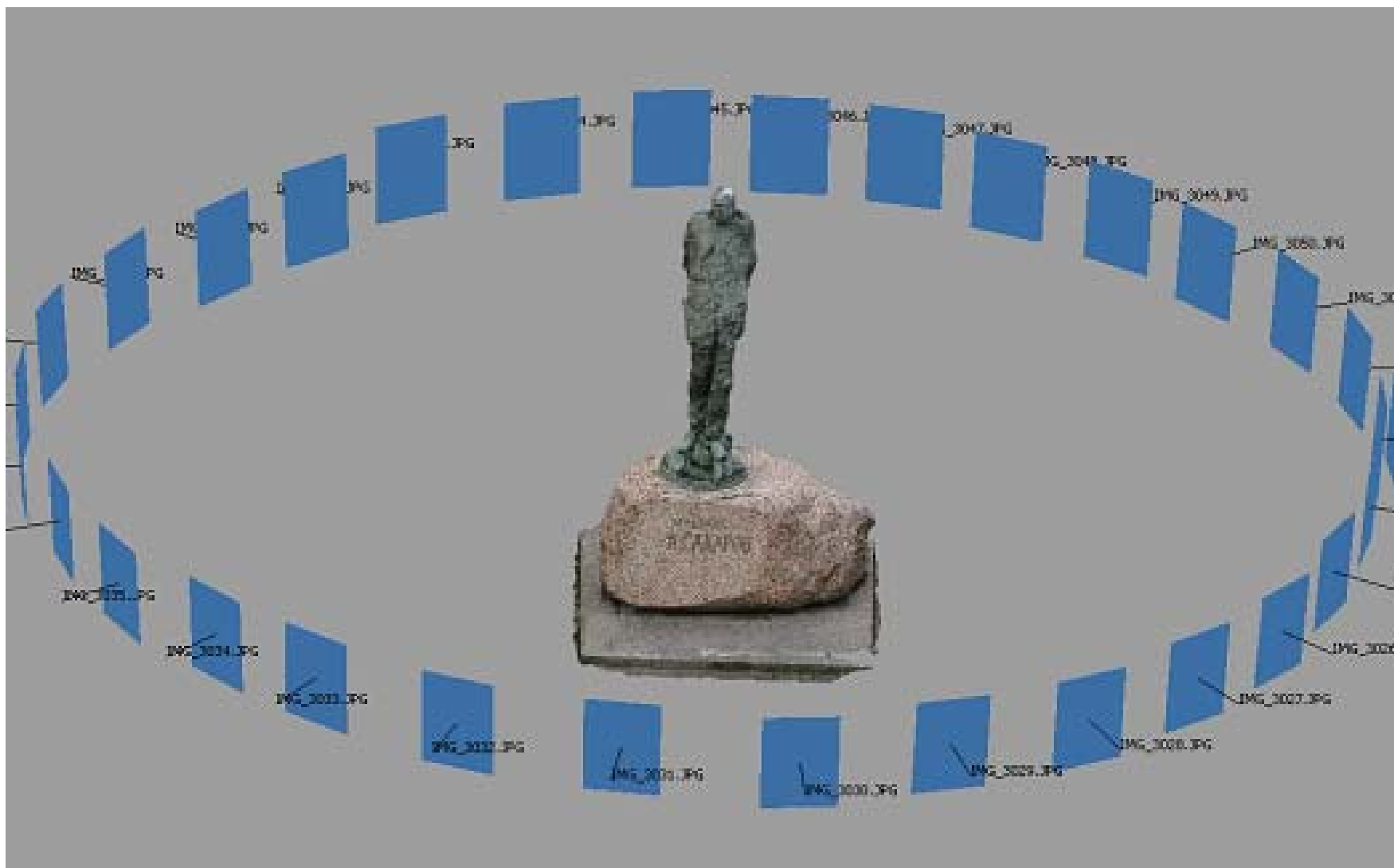
## Light

- Longer range
- Lower velocity
- Lower accuracy
- Susceptive for acoustic noise

- Shorter range
- Higher velocity
- Higher accuracy
- Susceptive for visual noise

- photogrammetry
- stereo-vision
- subsea Lidar

# Photogrammetry Underwater

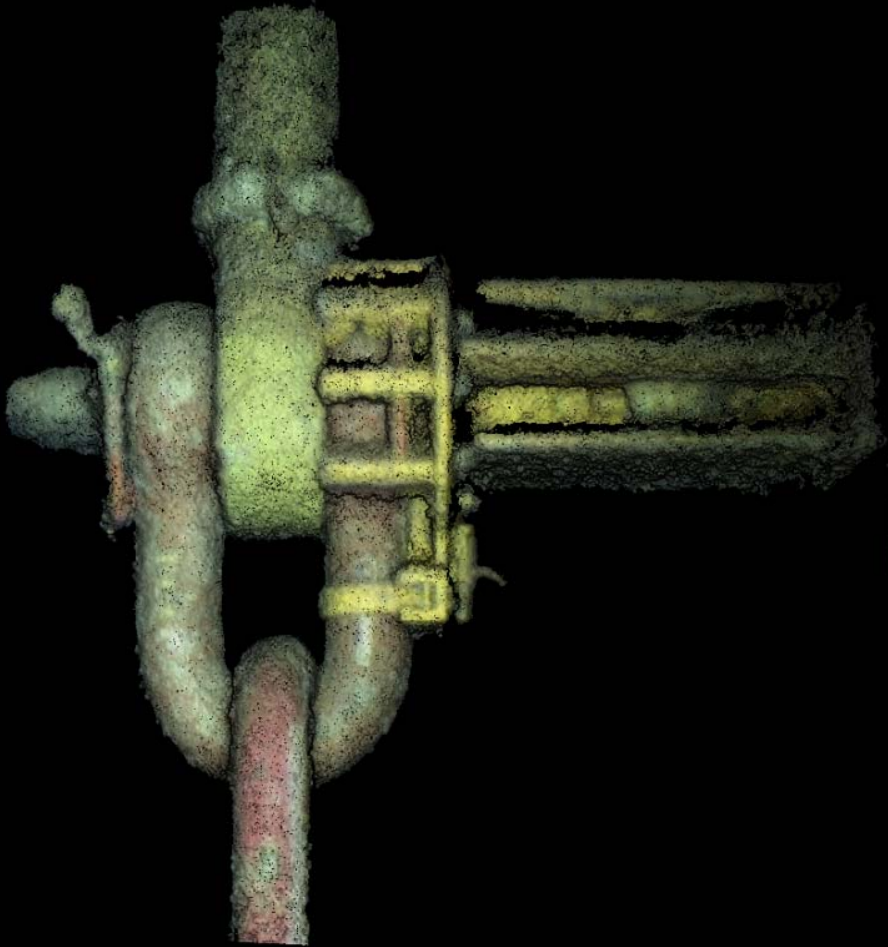


# Photogrammetry Underwater

Cascade1.MTS - VLC media player

Media Playback Audio Video Subtitle Tools View Help

CAGE  
THR: 595 '  
DPT: 752 '  
HDG: 113  
TRN: -0.6



Millennium 46

OCEANEERING

01:47 09:14

9

fugro.com

The image shows a screenshot of a VLC media player window displaying an underwater video. The video shows a complex metal structure, likely part of an offshore oil or gas rig, heavily encrusted with white and grey sediment. The structure is primarily yellow and red. The video is titled 'Millennium 46' and features the 'OCEANEERING' logo. On the left side of the video frame, there is a data overlay for 'CAGE' (Cathodic Anode Gauge) with the following values: THR: 595', DPT: 752', HDG: 113, and TRN: -0.6. The VLC player interface includes a menu bar (Media, Playback, Audio, Video, Subtitle, Tools, View, Help), a progress bar at the bottom showing 01:47 / 09:14, and standard playback controls. The slide number '9' is in the bottom left corner, and the website 'fugro.com' is in the bottom right corner.

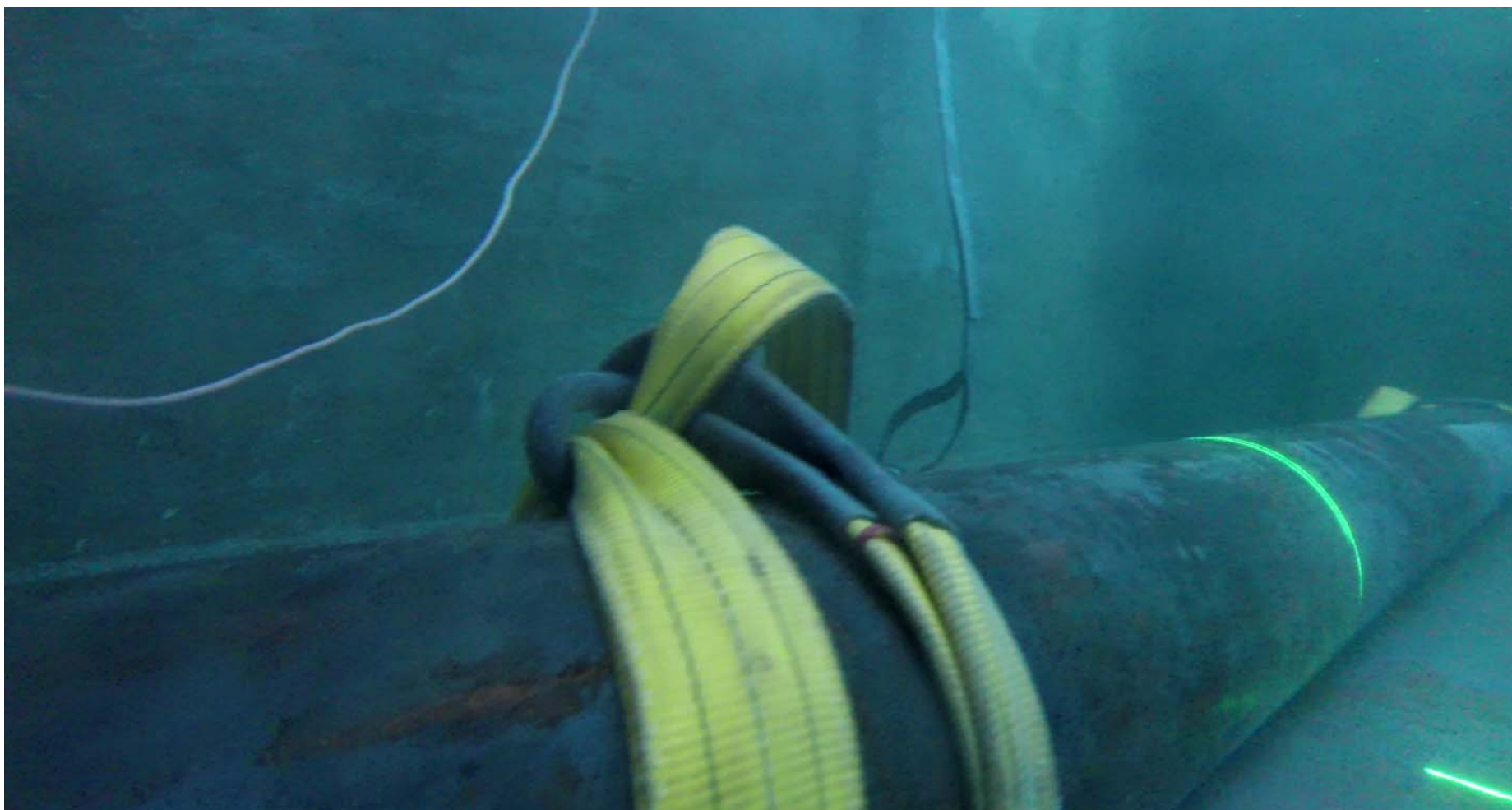


## Point Cloud Reconstruction based on Stereo-vision and Laser Striping

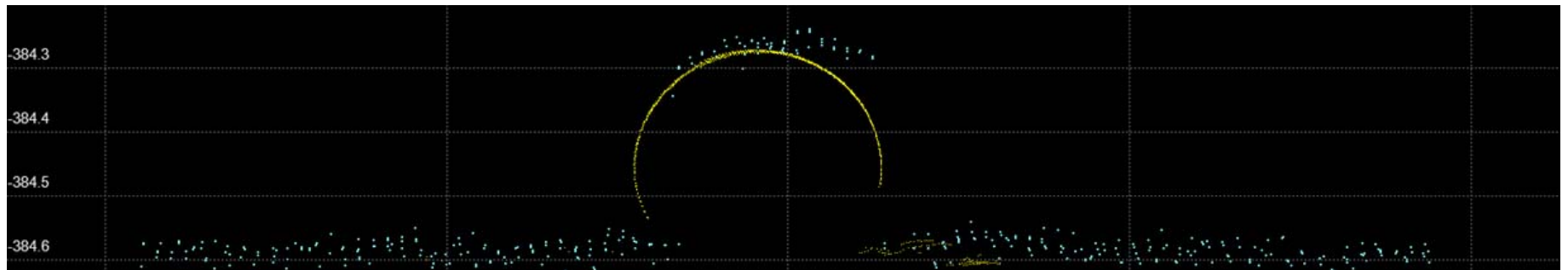
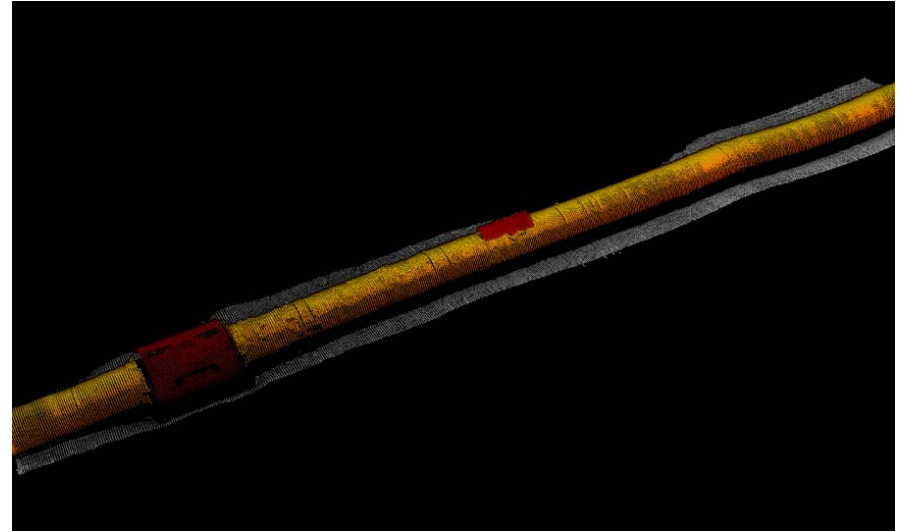
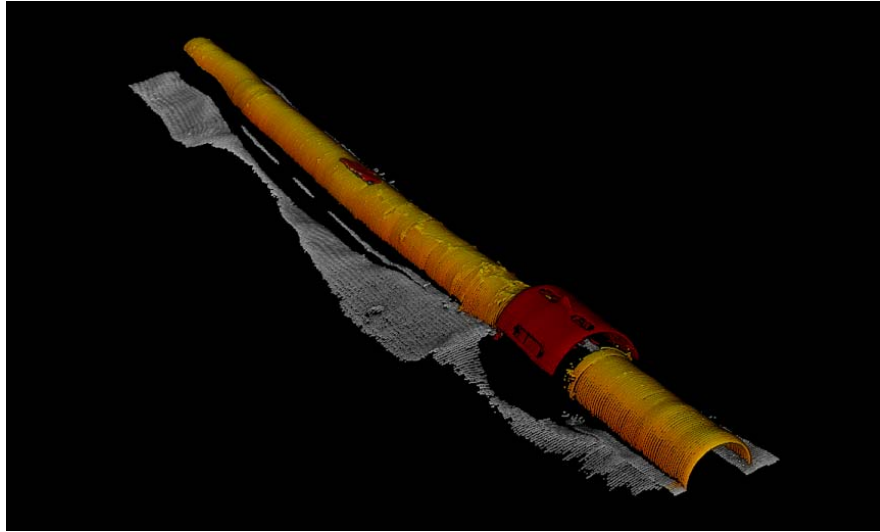
- Much higher density and accuracy comparing to MBES
- Free of acoustic interference, high reliability
- Easy to calibrate underwater
- Any configuration available:
  - Single or dual camera (higher accuracy and robustness)
  - Fixed or rotating laser (ability to cover the complete camera view from one location)



# SeaSeastriper



# SeaSeastriper



# Subsea Lidar - Basic Operation

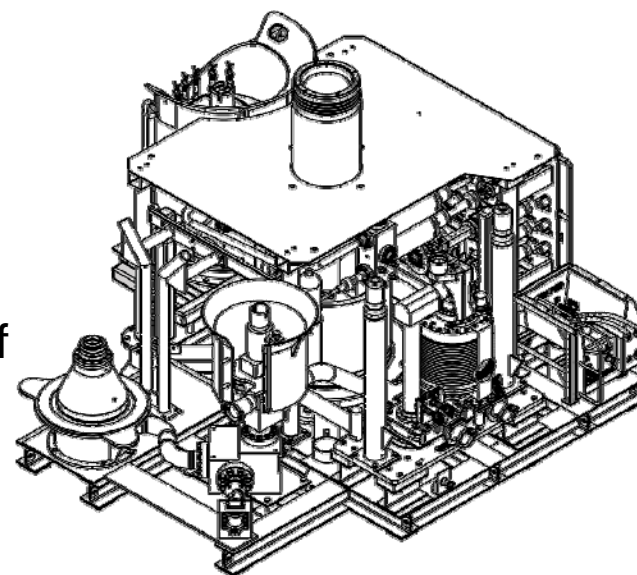
Beam Is Scanned To  
Provide Spatial  
Coverage

Data Sample Rate Of  
40,000 Points/Second


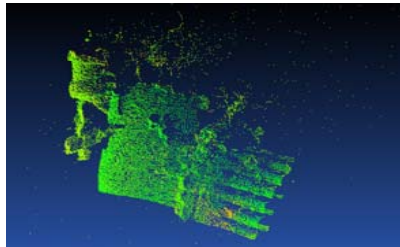

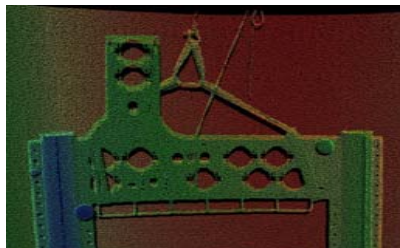

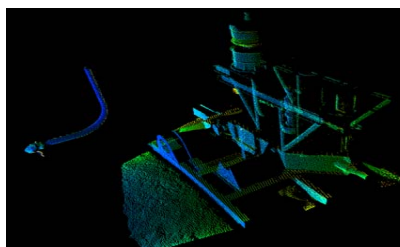

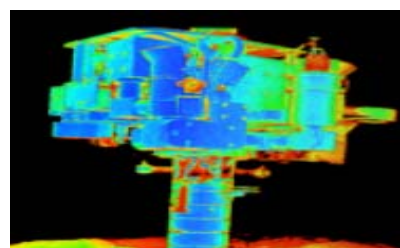


Portion Of Scattered  
Collected By Sensor

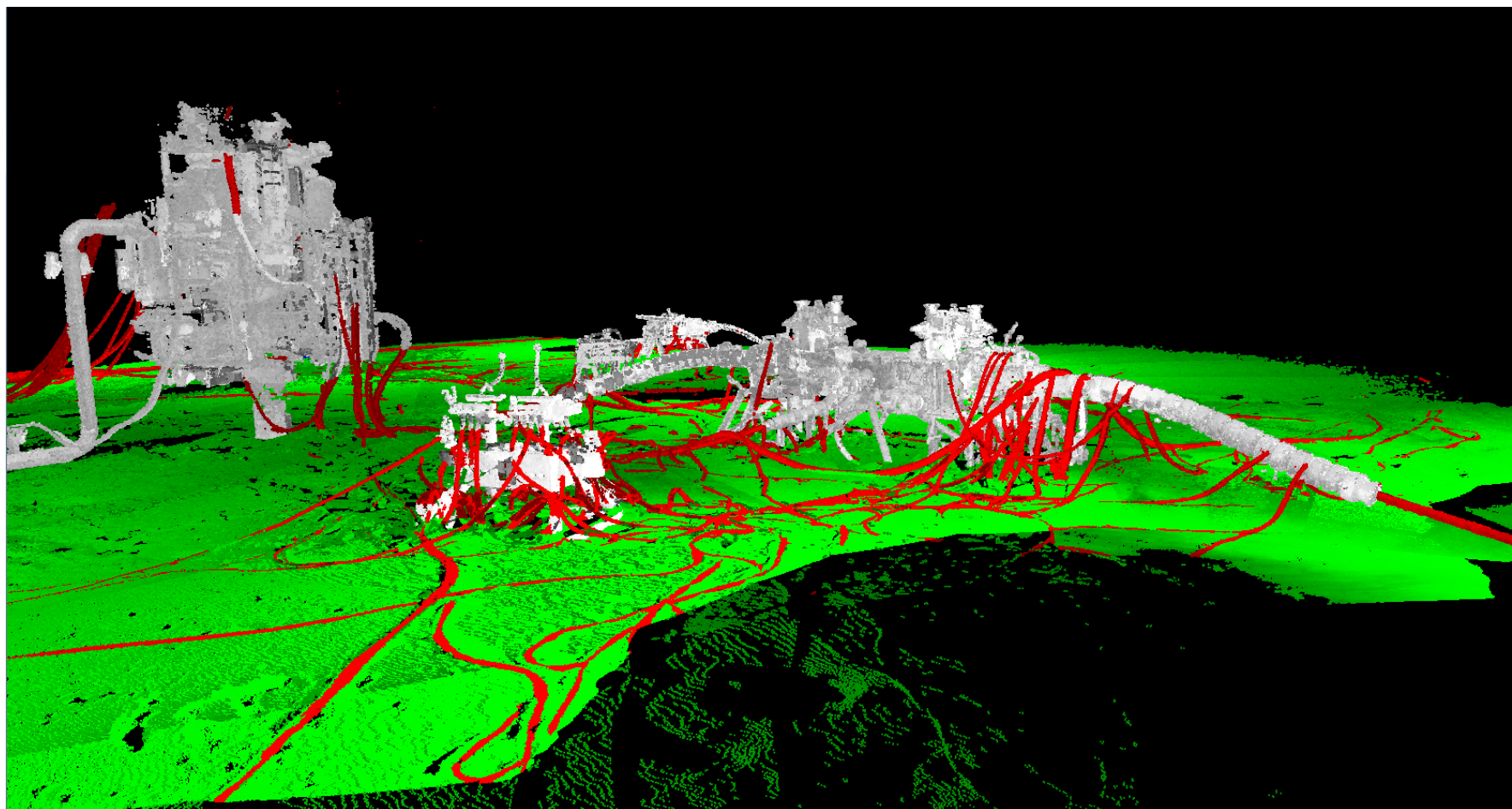
Light Scattered Off



# Subsea Lidar - Turbidity Performance

Visibility	Range	Data collection		
Poor	2-4 meters	Small areas of Interest from close range Difficult to register together		
Fair	5-10 meters	Multiple Setups		
Good	10-25 meters	Two Setups		
Very Good	25-45 meters	Single Setup		

Ability To Quickly & Accurately Map Flying Leads & Other Detailed Objects





The vision for your subsea point cloud is to use

# VISION