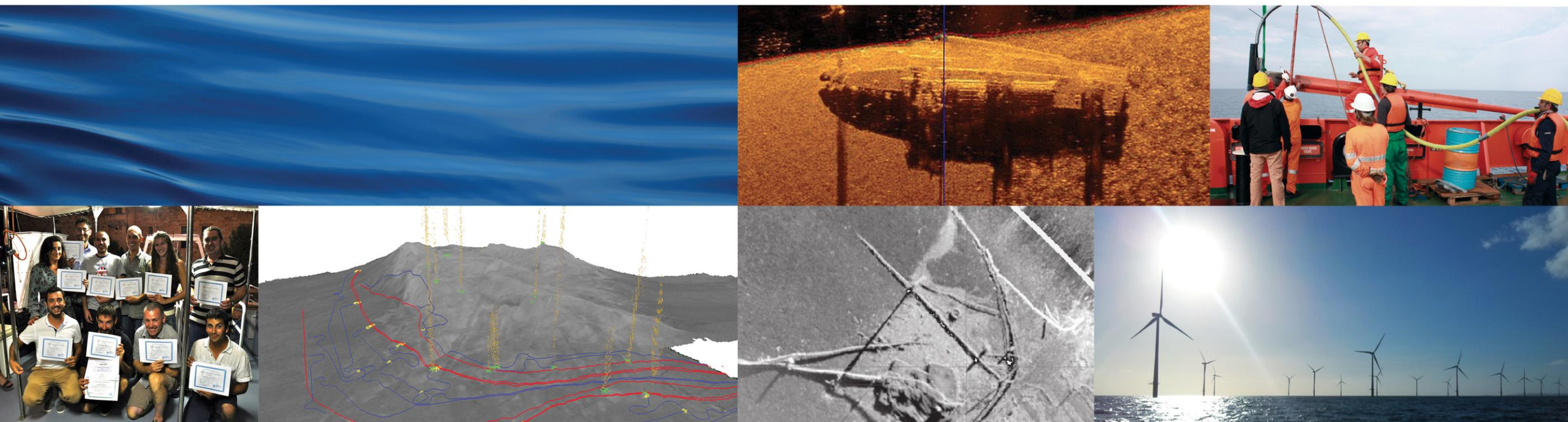




NORBIT Training iWBMS & iLIDAR



Haifa, Israel
September 2017

Chiara Tessarolo, *Senior Marine Geologist*
Alessandro Nemola, *Senior Surveyor & Data Processor*

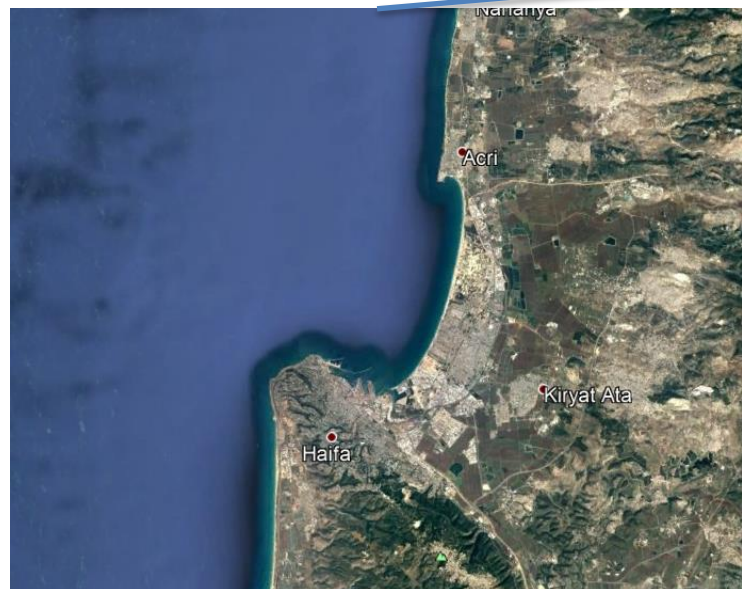
Geological & Biological Team
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NORBIT
- explore more -



In September 2017 GBT Ltd carried out a Training with the NORBIT iWBMS system ($0.9^\circ \times 0.95^\circ$ Tx) and the NORBIT iLIDAR for LIA Engineering and AXIS-GPS (clients).
The Survey area was inside Haifa Port, Israel.



The NORBIT iWBMS System was installed on a T-Bar pole on Port side of a 24 ft vessel. Once the mounting flange was ready, the mobilization of the whole system took about 1 hour (Pole, NORBIT iWBMS Applanix integrated, Primary and Secondary GPS antenna, NORBIT iLIDAR)



Data Acquisition Software:

- QPS QINSy v8.16
- NORBIT GUI 10.2

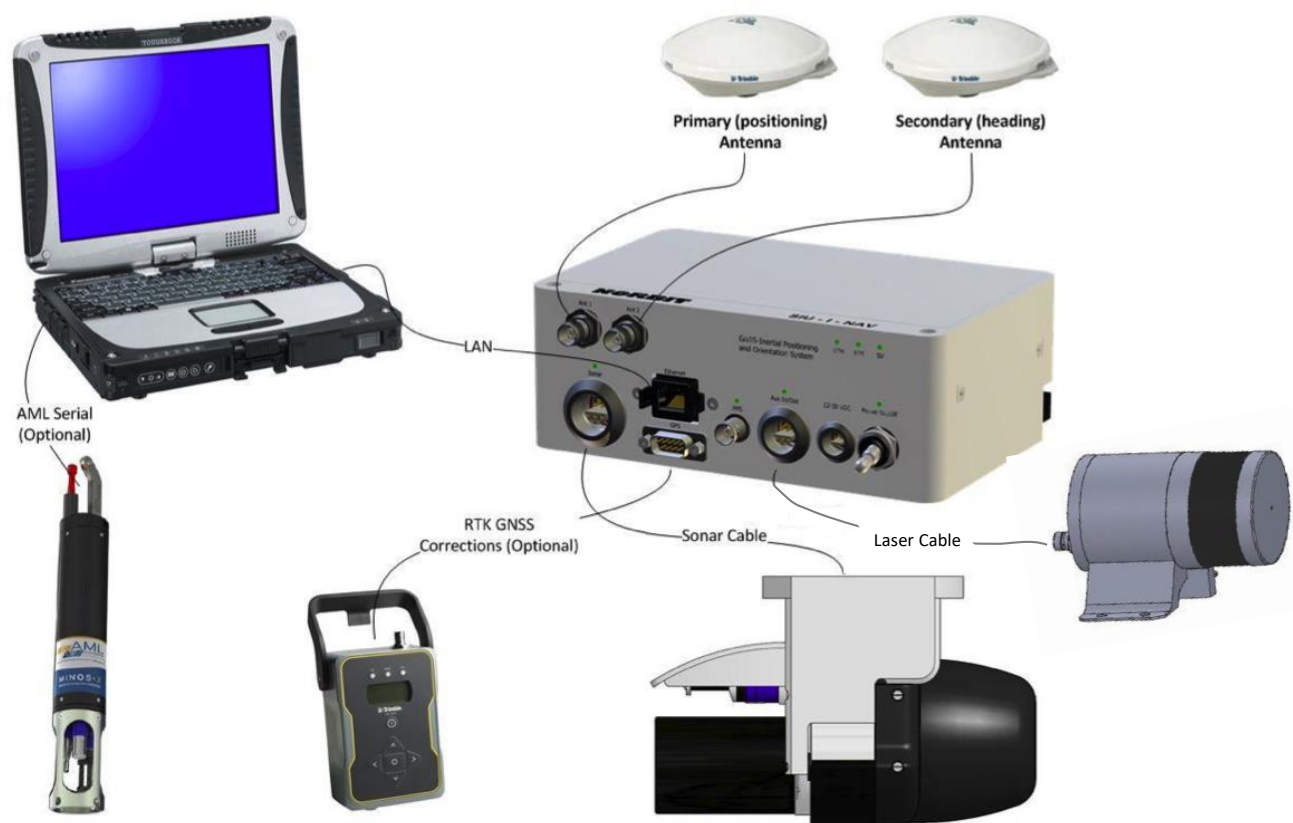


•Data Processing Software:

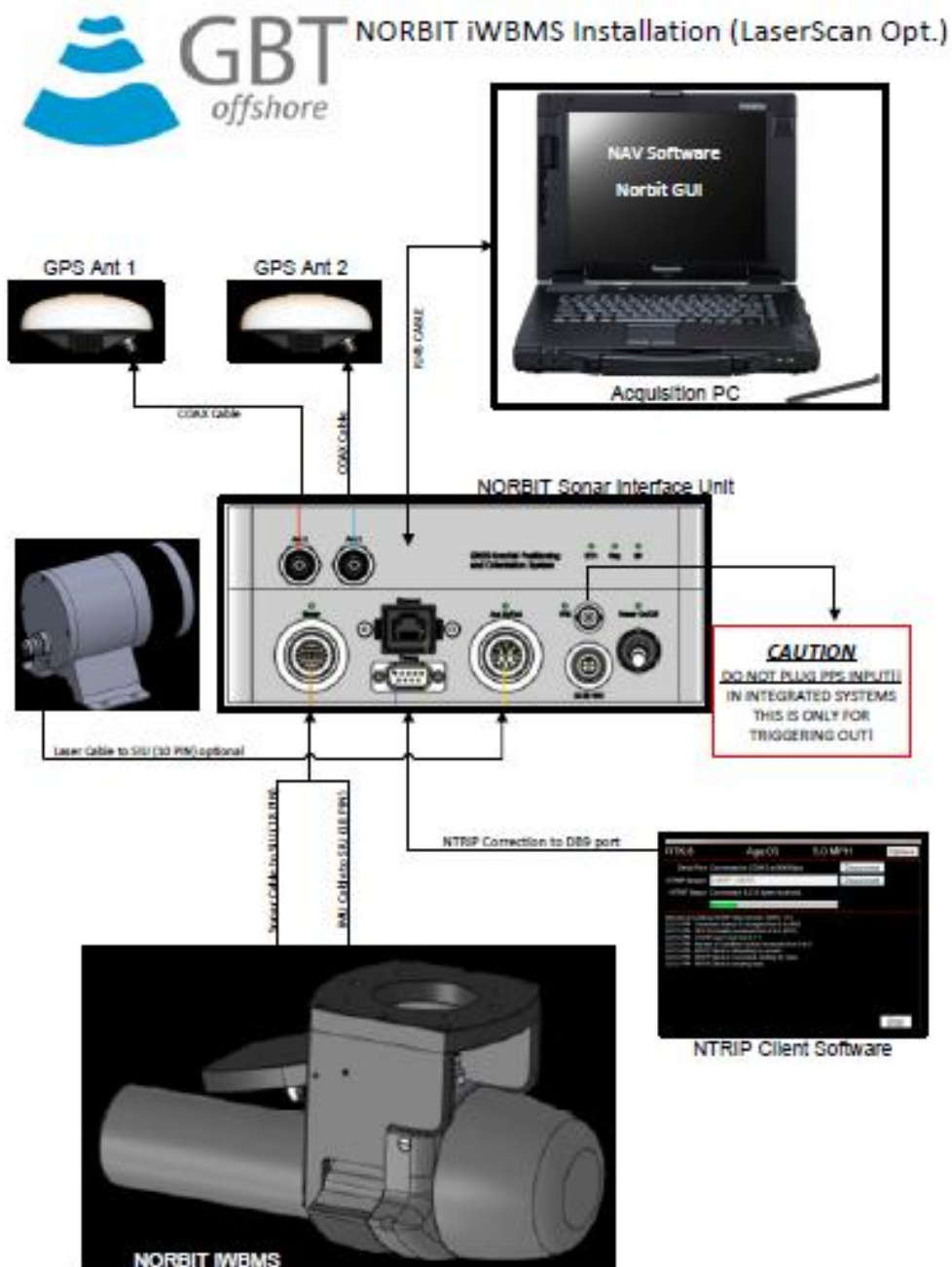
- QPS QIMERA v1.5



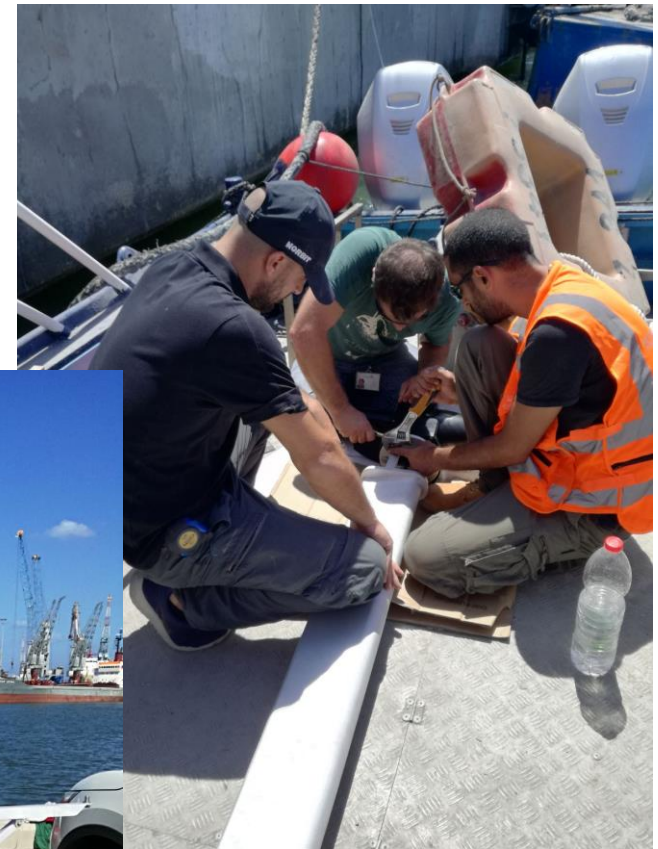
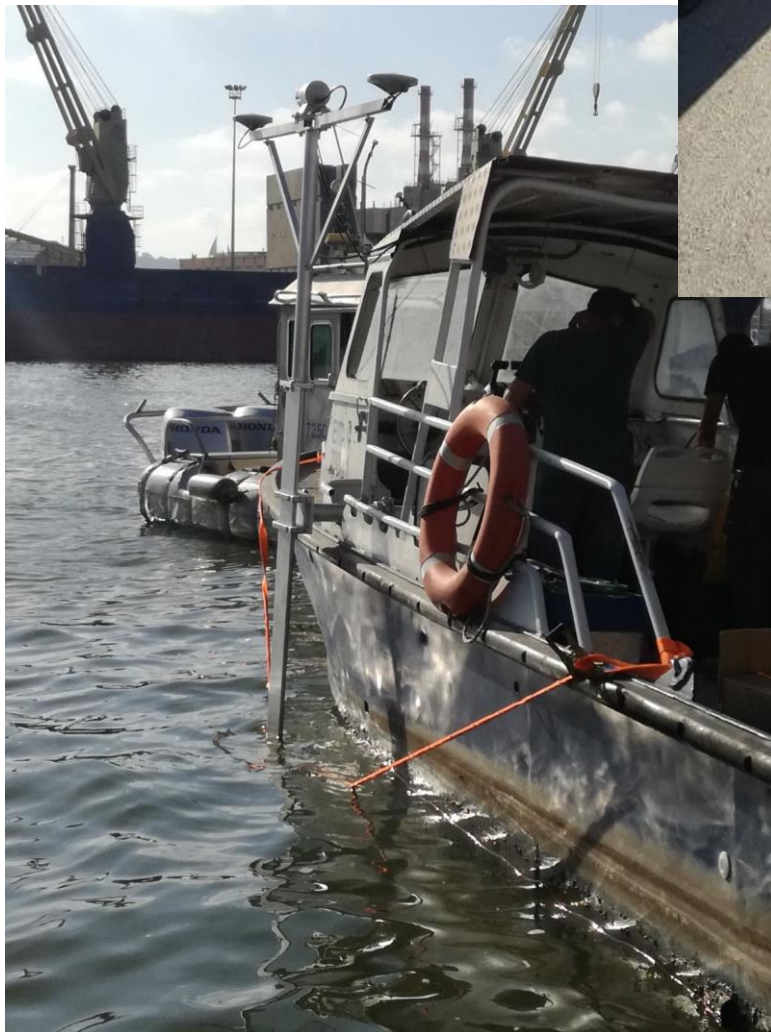
Survey Configuration



GBT Survey Configuration



Pole Mounting

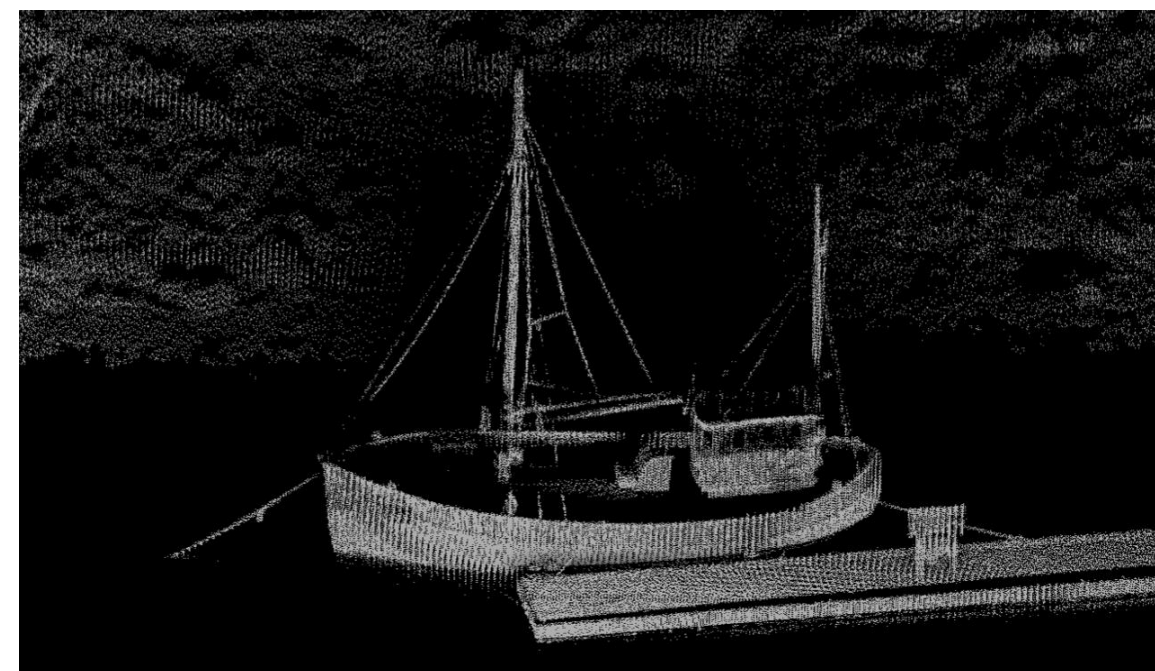
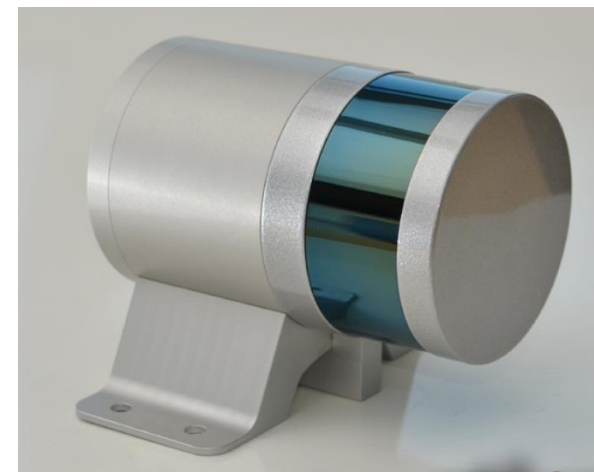


iLiDAR Specs

TECHNICAL SPECIFICATION

INFRARED LASER MODULE	1-20Hz-TIME OF FLIGHT MEASUREMENTS WITH DUAL RETURNS
WAVE LENGTH PEAK	905nm (TYPICALLY)
FRAME RATE	5-20Hz (10Hz DEFAULT)
WAVE LENGTH PEAK	905nm (TYPICALLY) CLASS 1 EYE SAFE
OUTPUT	UP TO 300.000 POINTS PER SEC
ANGULAR RESOLUTION	2° BETWEEN EVERY OF THE 16 LASER/HORIZONTAL
ANGULAR RESOLUTION	0.1°-0.4° VERTICAL
FIELD OF VIEW	30° VER., 360° HOR
RANGE	100m
DATA I/O	NORBIT PROPIETARY SYNCHRONIZED TIME STAMPED
POWER	8W (TYPICAL)
VOLTAGE	10-29VDC OR 110/220VAC (POWERED DIRECTLY BY THE SIU)
ACCURACY	<2cm (OPTIONAL HIGH RES LASER MODULE, 1cm)
DIMENSIONS (DIA. x H x L)	103mm x 130mm x 150mm
WEIGHT	2.4kg

SERVO DRIVEN GEAR SYSTEM IN BOTH AXES WITH MANUAL CLUTCH OVERRIDE SYSTEM 3-AXIS
FLUXGATE MAGNETOMETER + 3-AXIS ACCELEROMETER

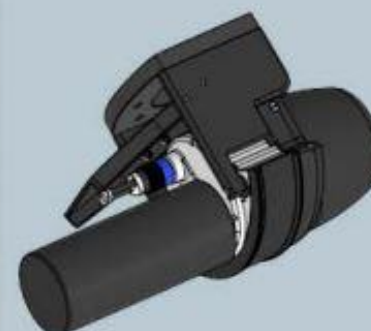
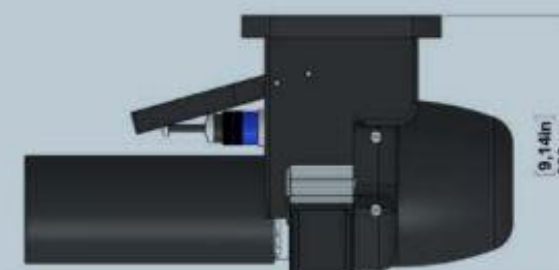


BROCHURE ONLINE

https://norbit.com/media/PS-150008-3_iLiDAR_A4.pdf

NORBIT iWBMS Specs (0.9° x 0.95° Tx)

TECHNICAL SPECIFICATION	
SWATH COVERAGE	7-210° (SHALLOW WATER IHO SPECIAL ORDER >155°)
RANGE RESOLUTION	<10mm (ACOUSTIC)
NUMBER OF BEAMS	256-512 EA & ED
OPERATING FREQUENCY	400kHz w/80kHz BANDWIDTH (FREQ. AGILITY 200-700kHz) (LOW FREQ MODE AND HIGH FREQ ULTRA RESOLUTION MODE)
DEPTH RANGE	0.2-275m (160m TYPICAL)
PING RATE	UP TO 50Hz, ADAPTIVE
RESOLUTION	0.9° ACROSS, 1.9° ALONG @400kHz, OPTION: 0.9° ALONG 0.5° ACROSS, 0.9° ALONG @700kHz
POSITION	HOR: ±(8mm +1ppm X DISTANCE FROM RTK STATION) VER: ±(15mm +1ppm X DISTANCE FROM RTK STATION) (ASSUMES 1m GNSS SEPARATION)
HEADING ACCURACY	0.02° (RTK) WITH 2m ANTENNA SEPARATION
PITCH/ROLL ACCURACY	0.01° INDEPENDENT OF ANTENNA SEPARATION
HEAVE ACCURACY	5cm or 5% (2.5cm or 2% TrueHeave)
WEIGHT	APPROX. 9.2kg (AIR) LESS THAN 6kg (WATER)
INTERFACE	ETHERNET
CABLE LENGTH	STD 8m, OPTIONS: 25m, PIGTAIL, CUSTOM UP TO 50m
POWER CONSUMPTION	60W (75W MAX) (10-28VDC, 110-240VAC)
OPERATING TEMP.	-4°C to +40°C (TOPSIDE -20°C to +55°C)
STORAGE TEMP.	-20°C to +60°C
ENVIRONMENTAL	TOPSIDE: IP67: DUST TIGHT, PROTECTED AGAINST THE EF- FECT OF IMMERSION UP TO 1m/WET-END: 100m



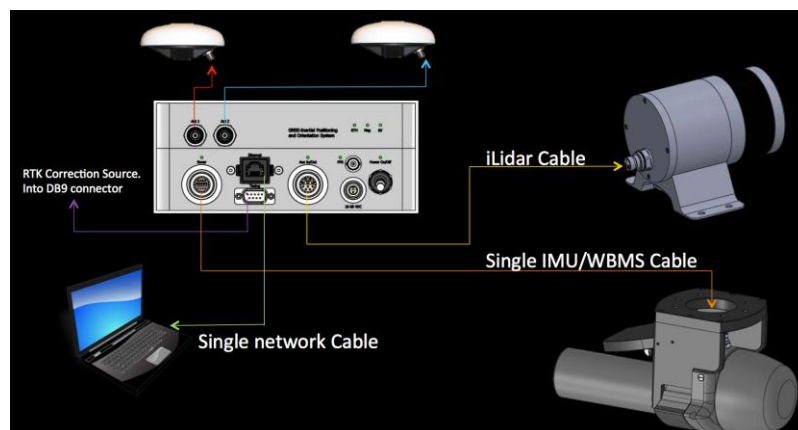
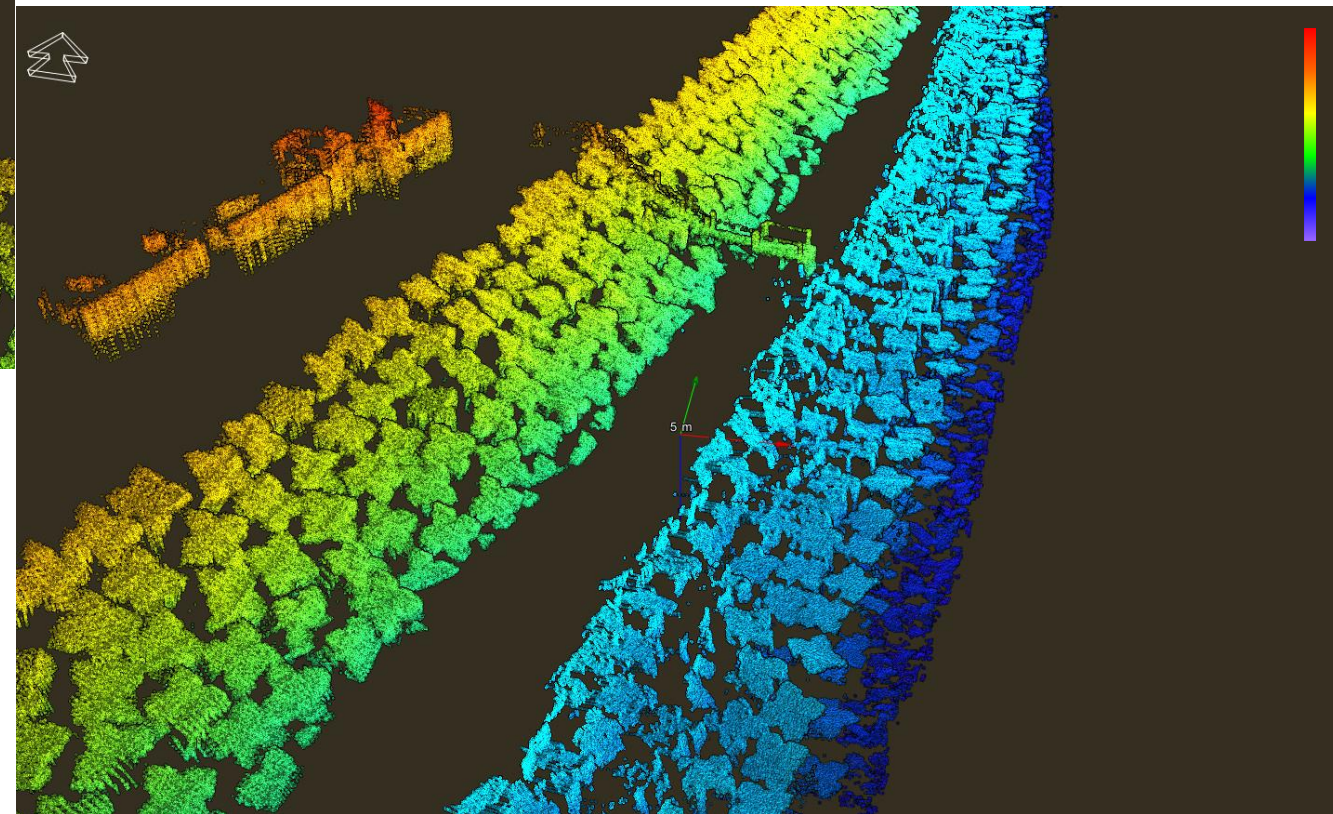
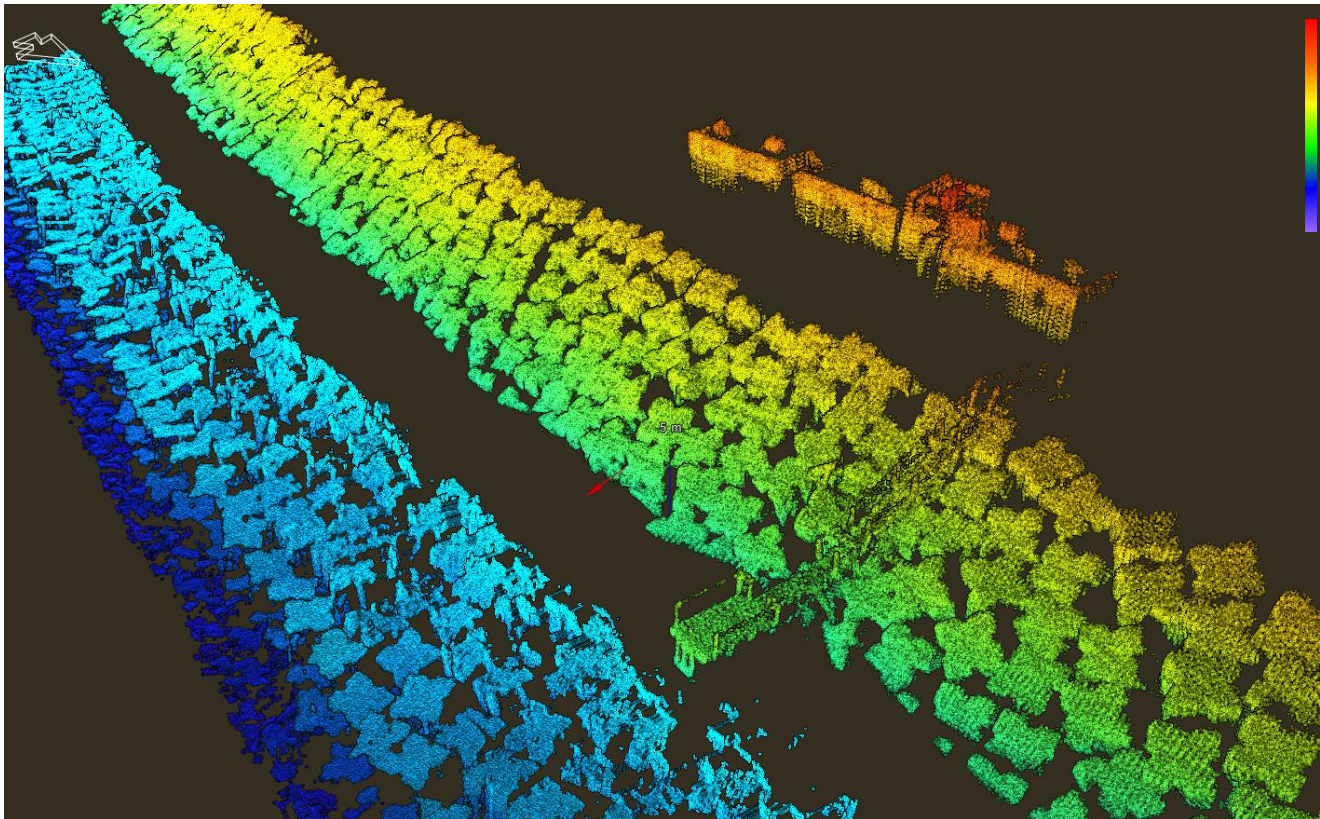
Part #12006

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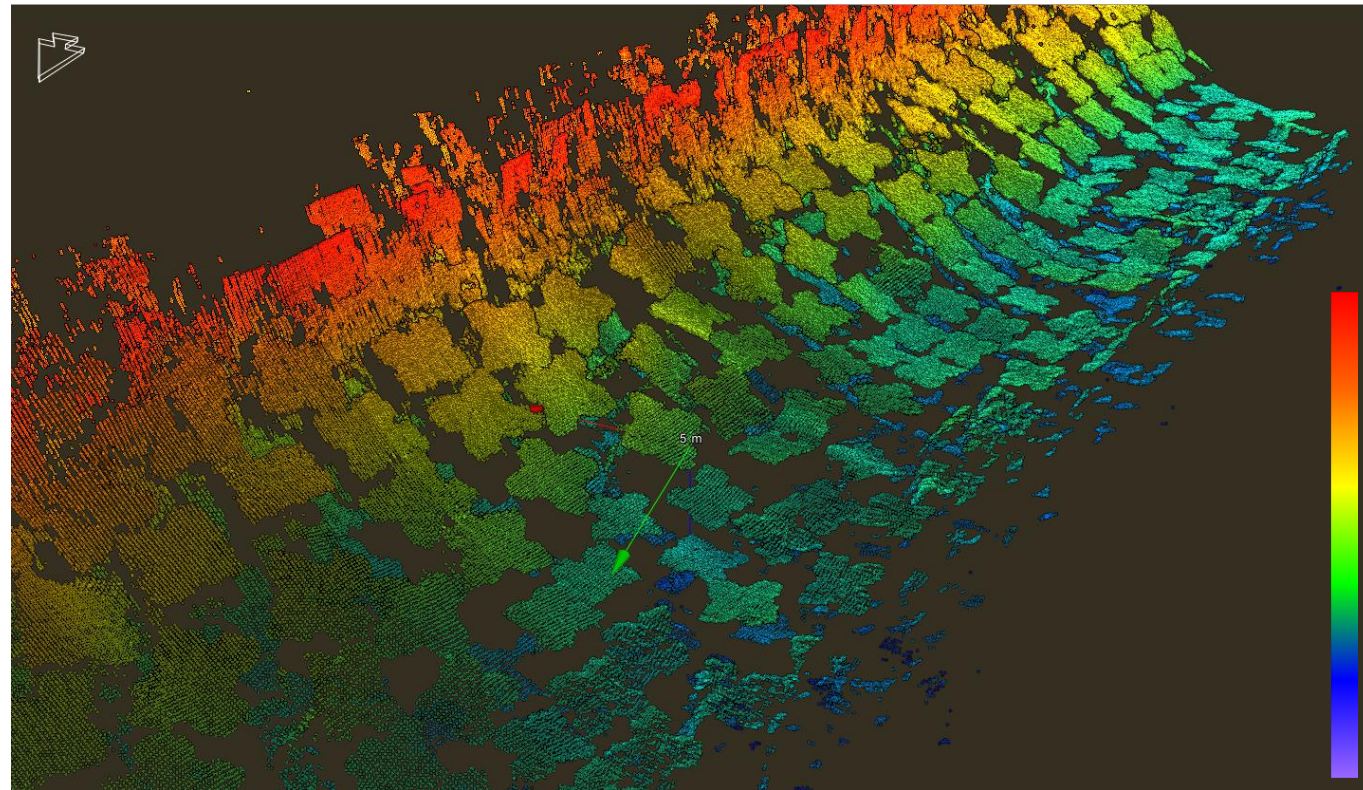
https://norbit.com/media/PS-120006-13_iWBMS_Pn_12004_A4.pdf

Multibeam & Laser Scan Data
MB Head Tilt 30° - Swath angle 100°
Frequency 400 kHz FM 80kHz BW

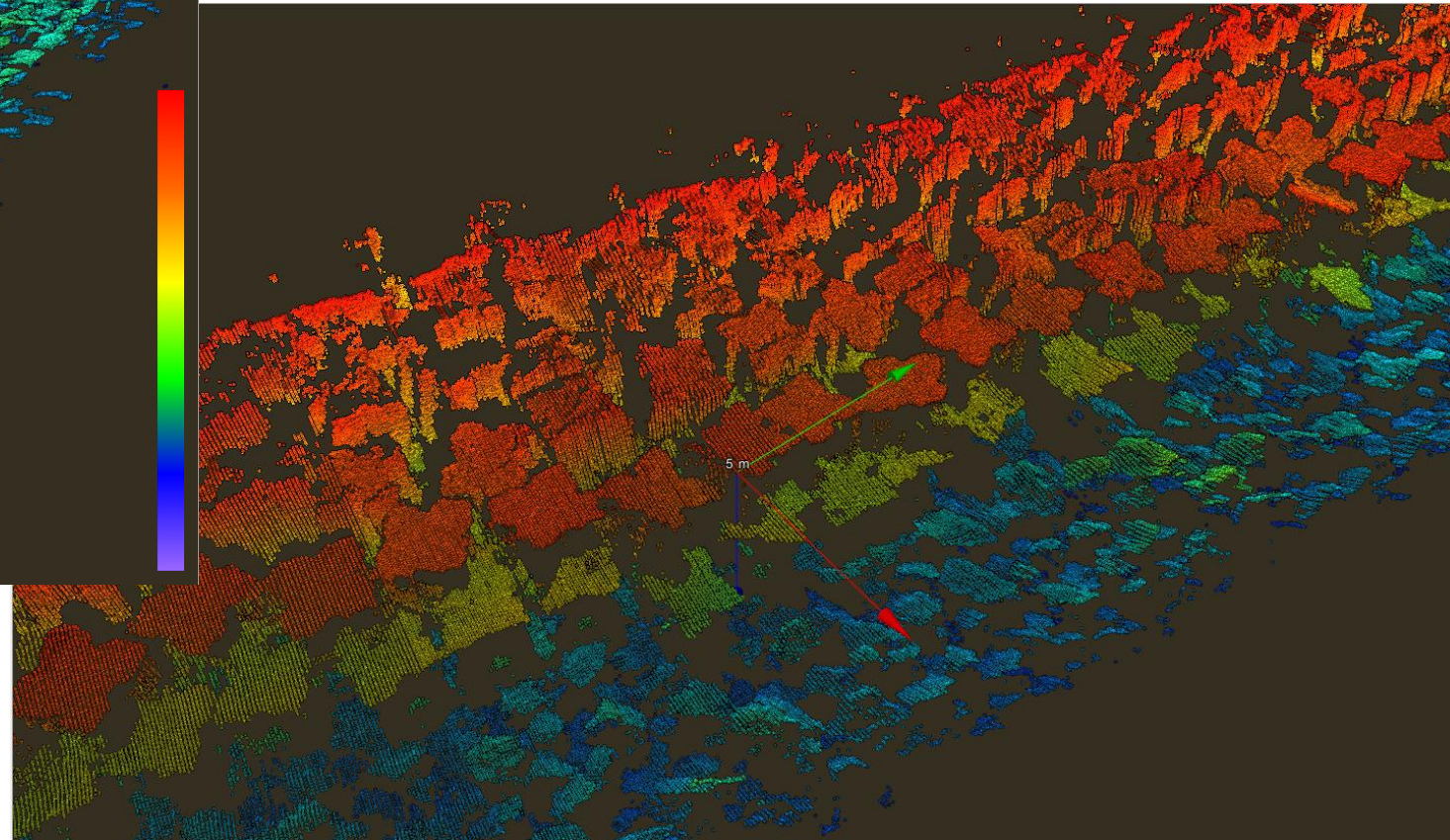
Vertical Exaggeration 1.00



Details Comparison Between Different Multibeam Data Frequencies



FM 700kHz Equidistance 512



FM 400kHz Equidistance 512

Multibeam Data

MB Head Tilt 20° - Swath angle 120°

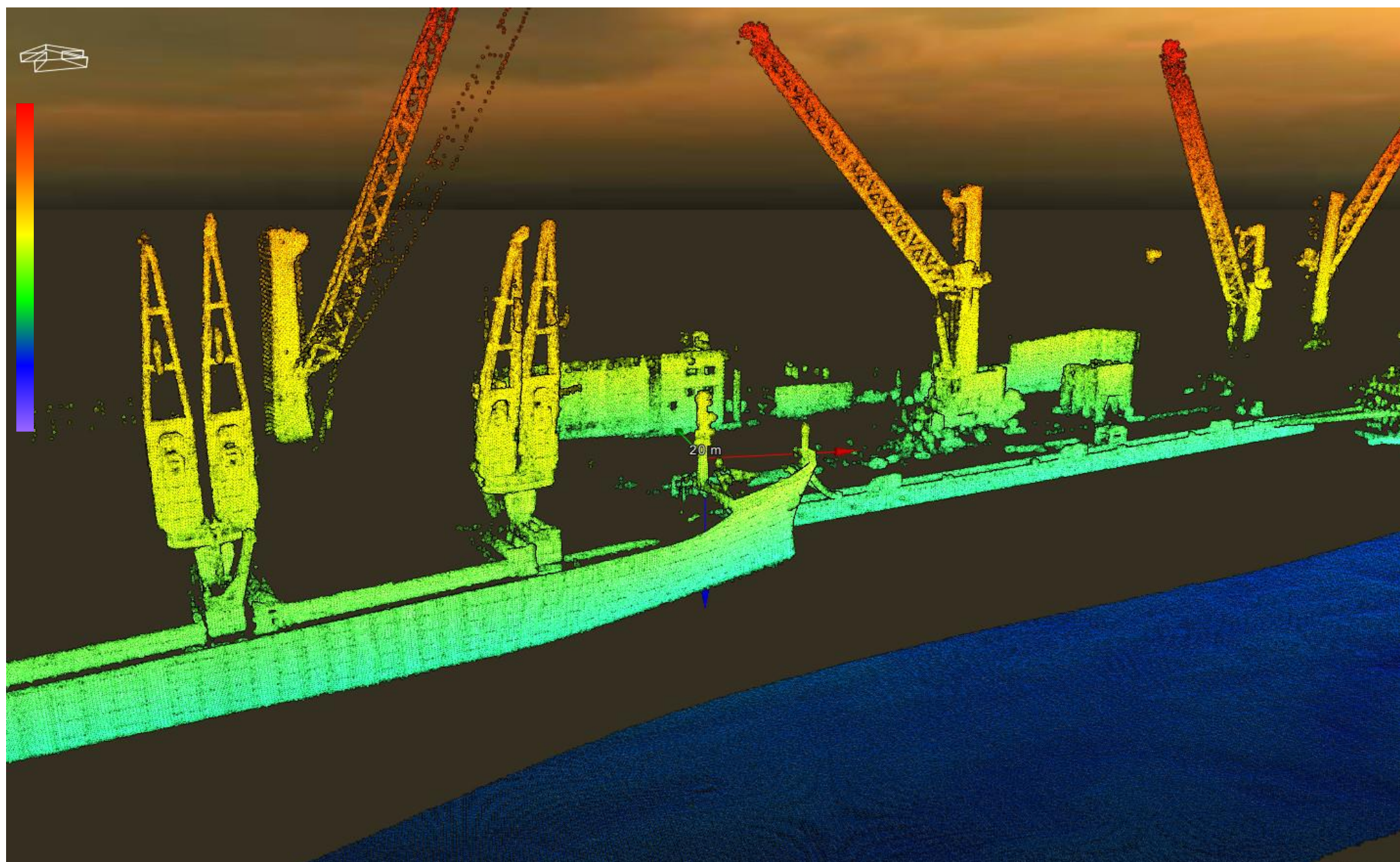
Frequency 700/400kHz FM 80kHz BW

Vertical Exaggeration 1.00

Multibeam & Laser Scan Data

Frequency 400 kHz
FM 80kHz BW
Swath angle 120°

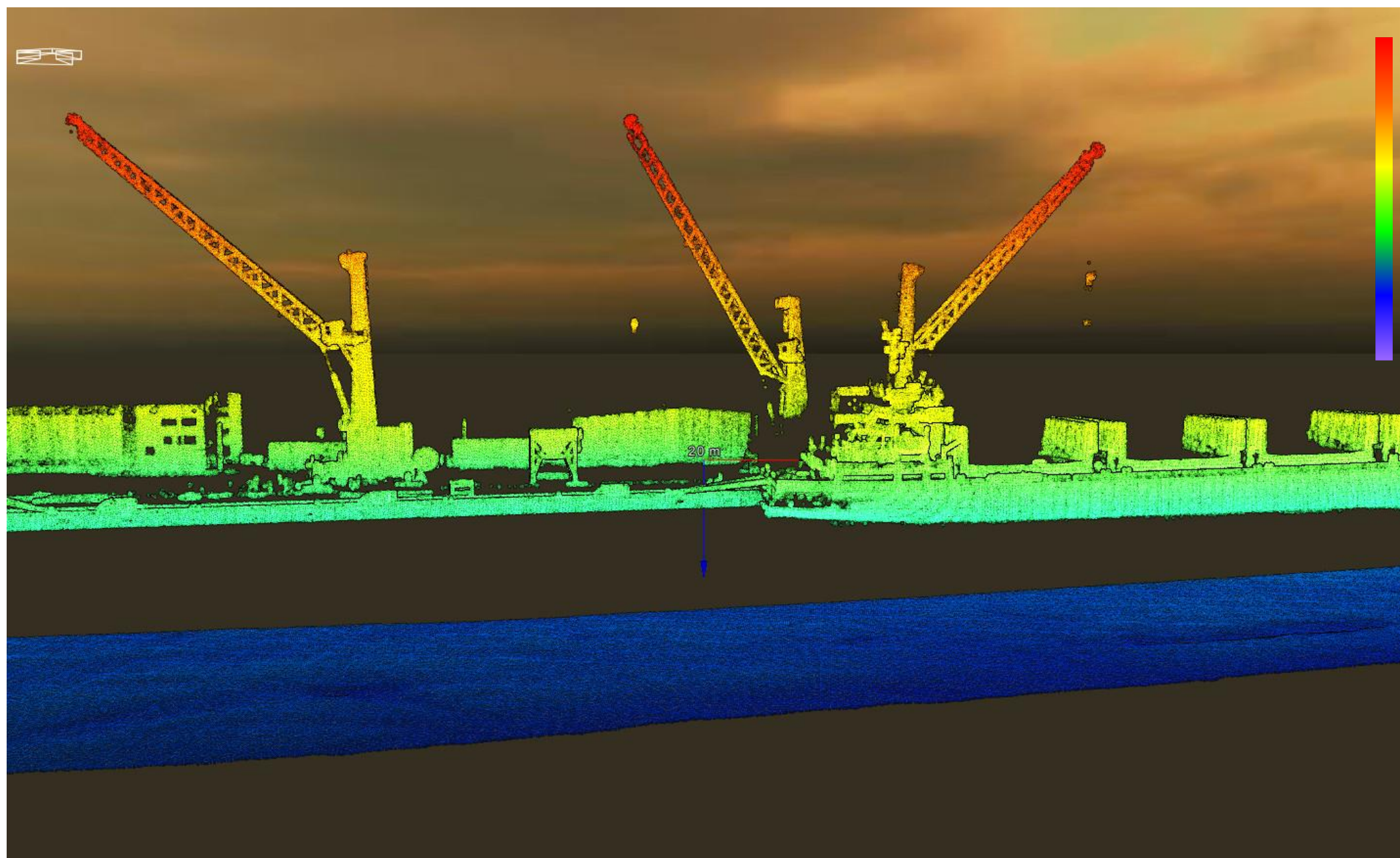
Vertical
Exaggeration 1.00



Multibeam & Laser Scan Data

Frequency 400 kHz
FM 80kHz BW
Swath angle 120°

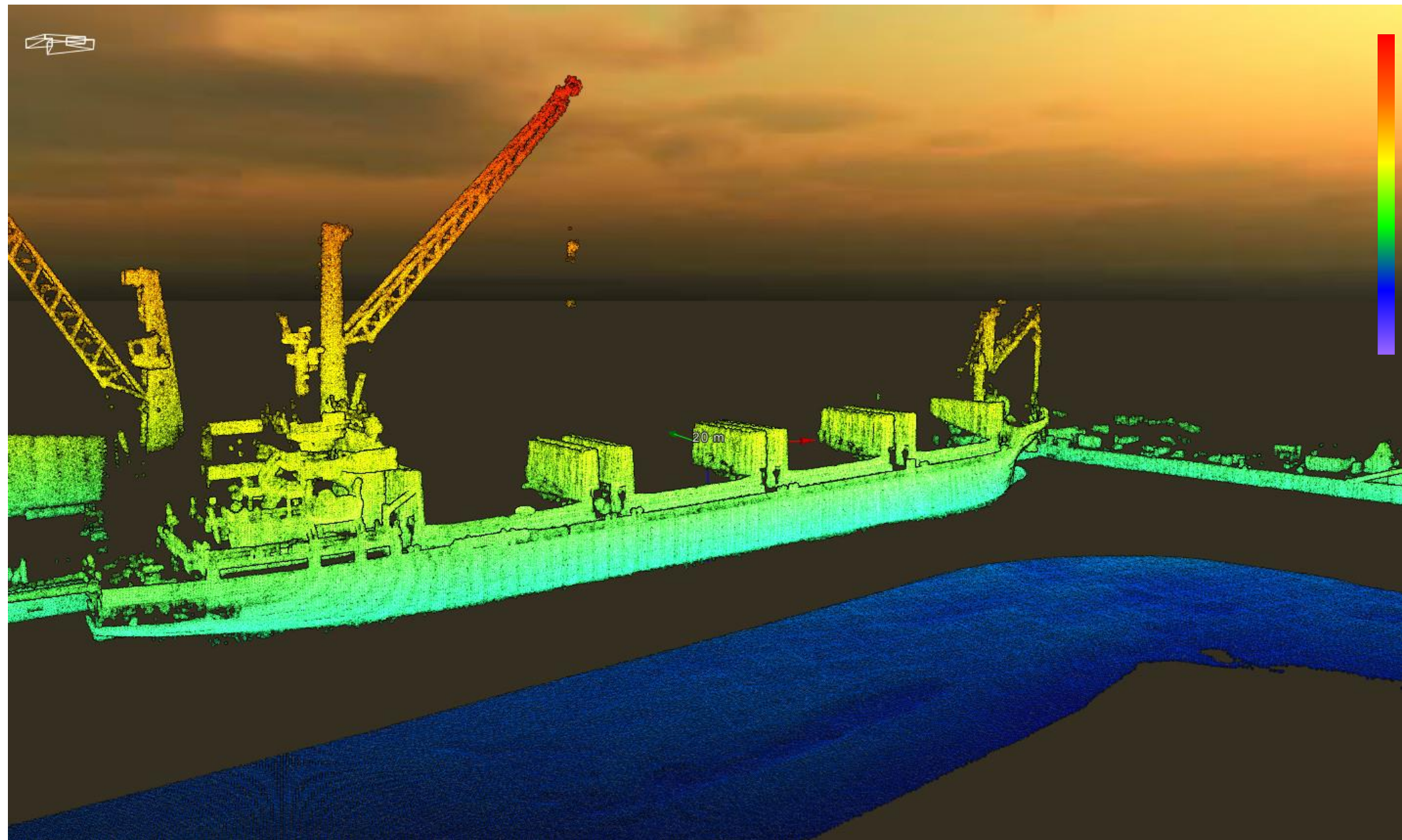
Vertical
Exaggeration 1.00



Multibeam & Laser Scan Data

Frequency 400 kHz
FM 80kHz BW
Swath angle 120°

Vertical
Exaggeration 1.00

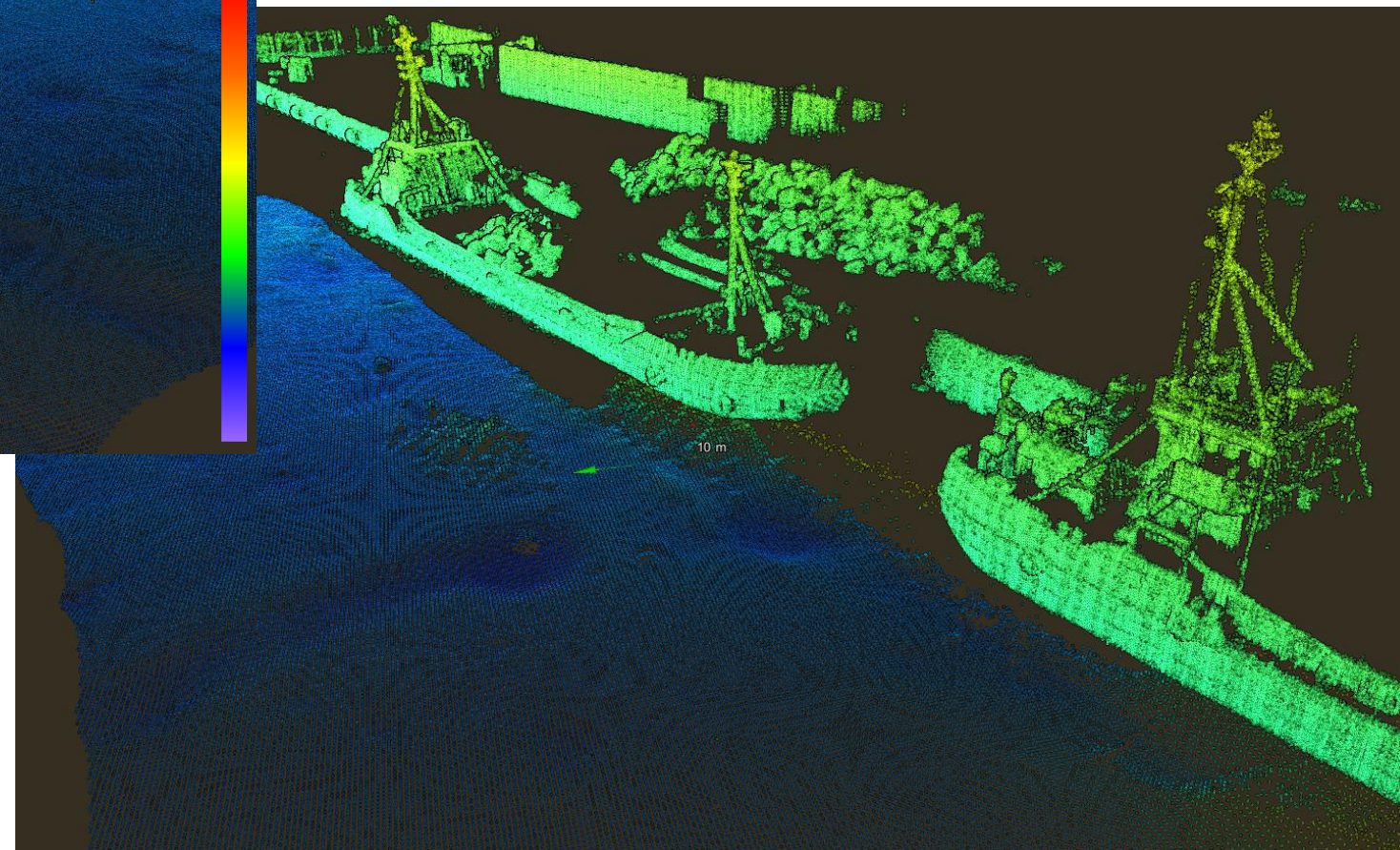
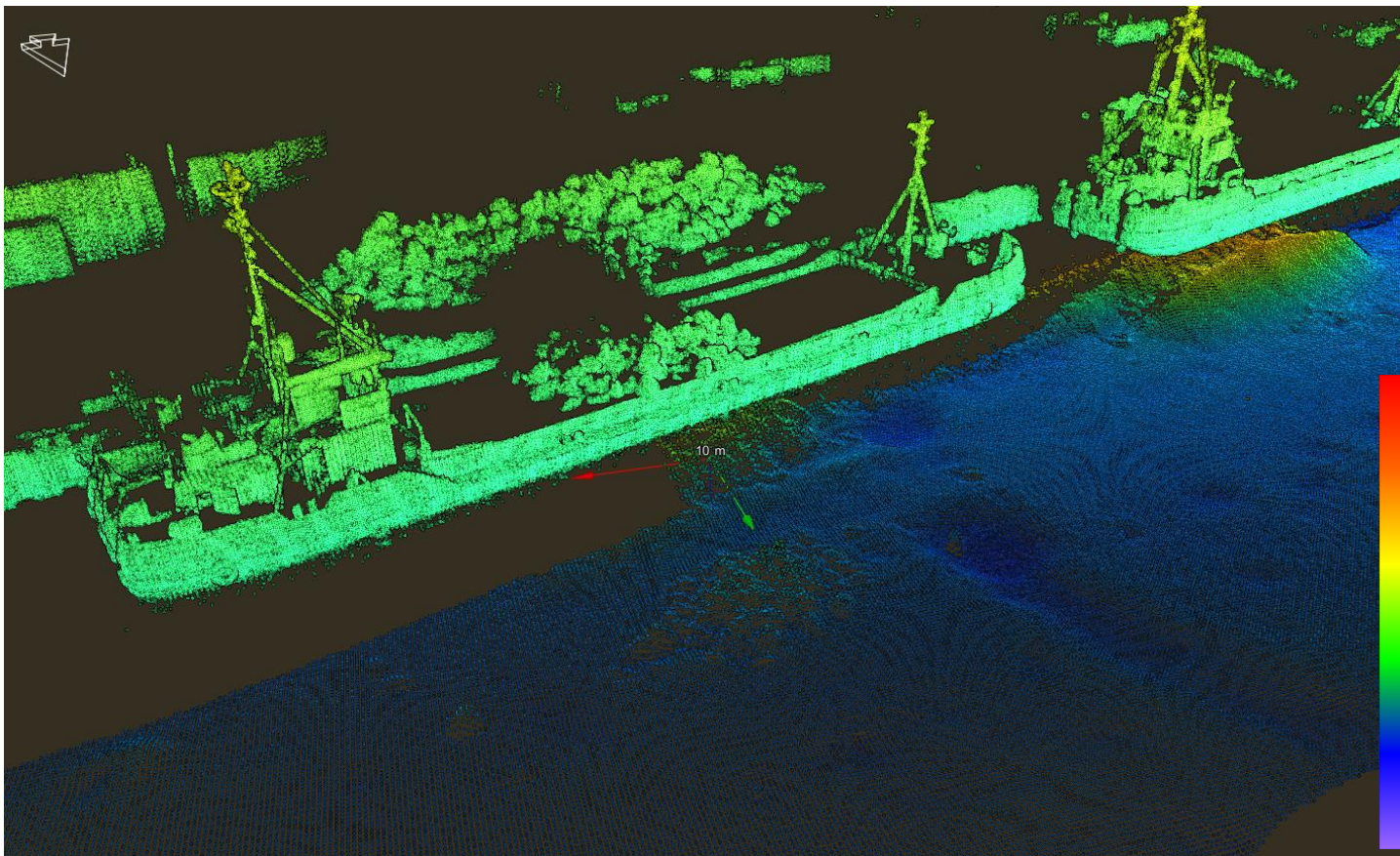


Multibeam & Laser Scan Data

Frequency 400 kHz FM 80kHz BW

Swath angle 120°

Vertical Exaggeration 1.00



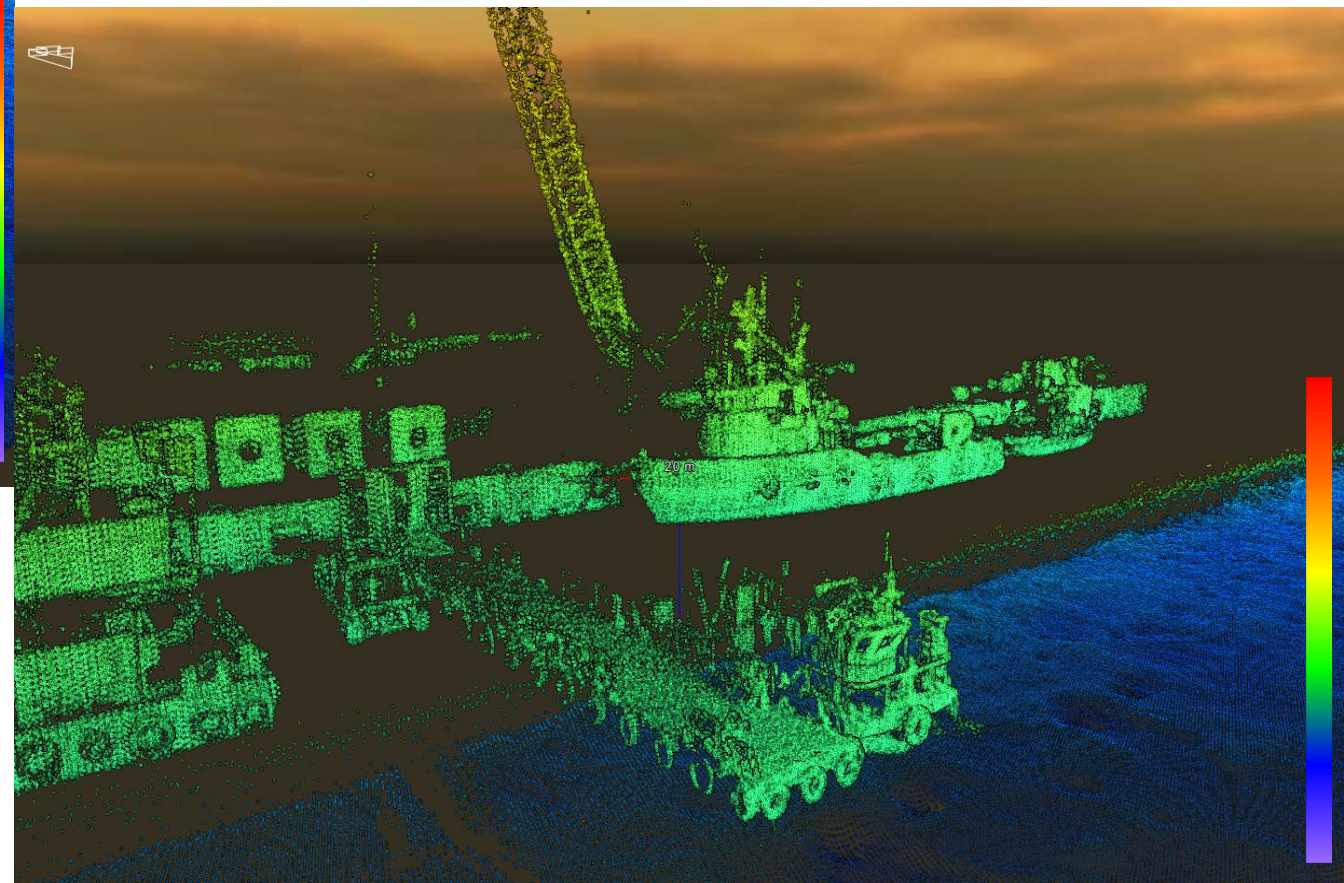
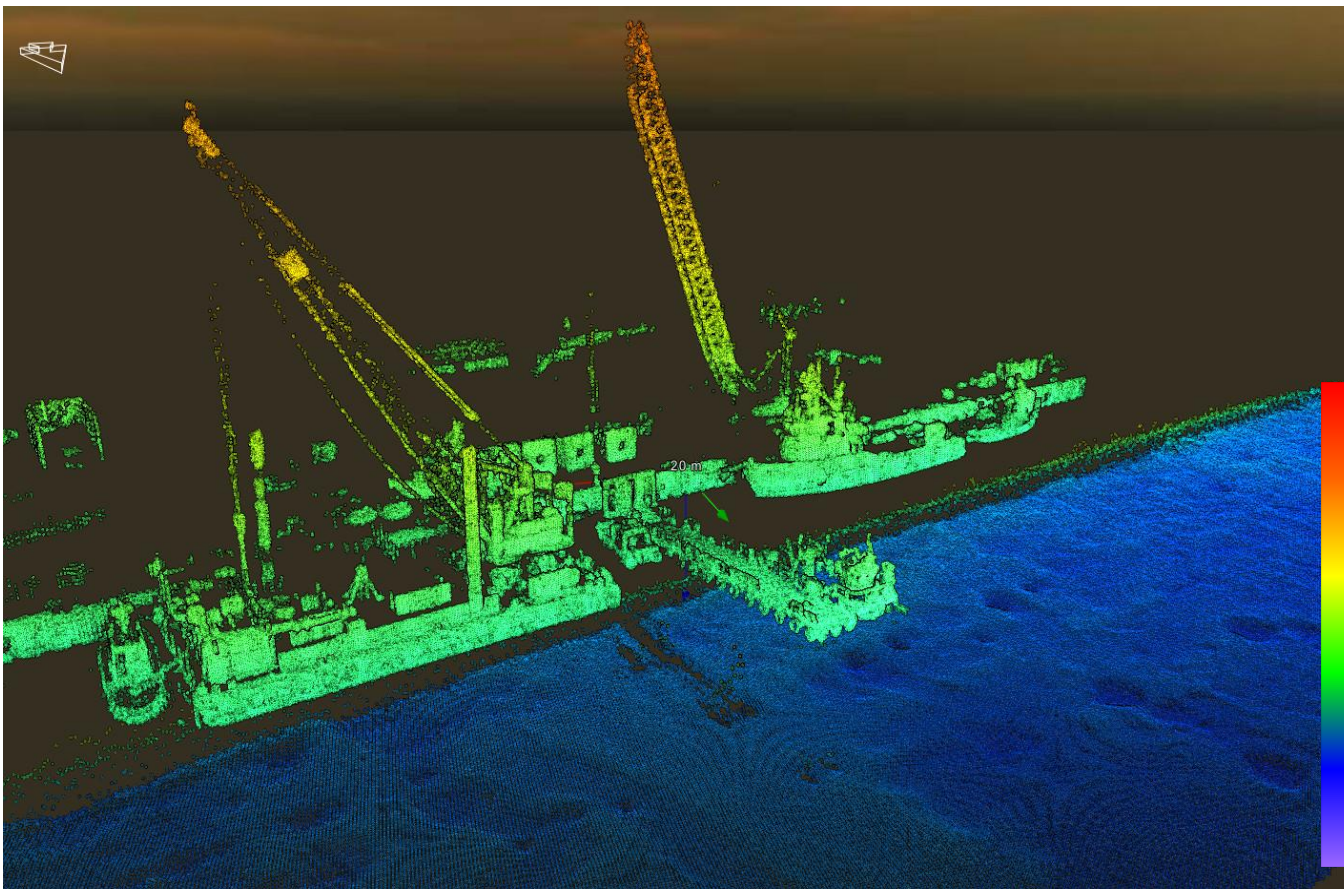
Looking at the rocks loaded on this vessel and their shadow behind it's clear how the Laser Scan is accurate.

Multibeam & Laser Scan Data

Frequency 400 kHz FM 80kHz BW

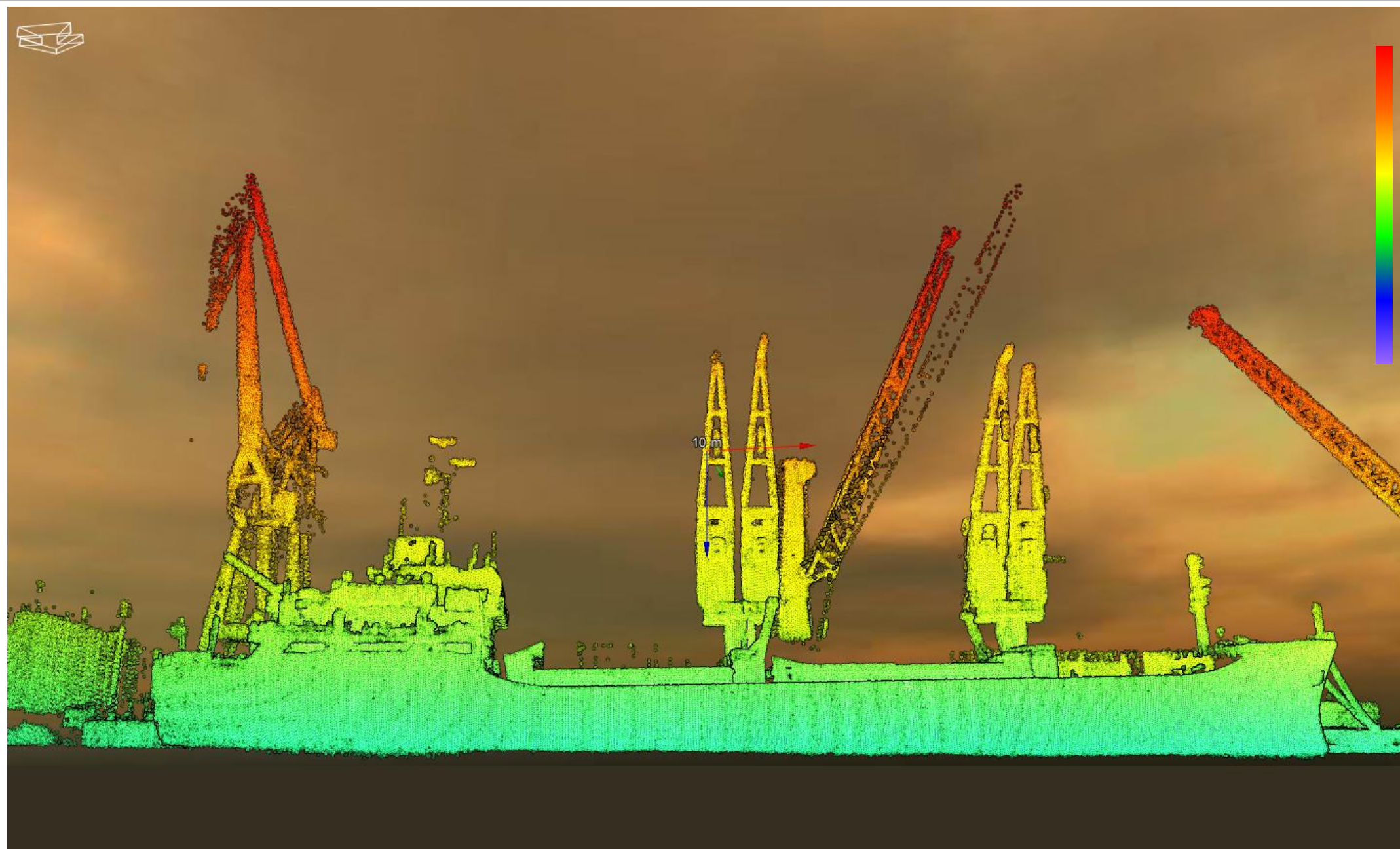
Swath angle 120°

Vertical Exaggeration 1.00



Laser Scan Data

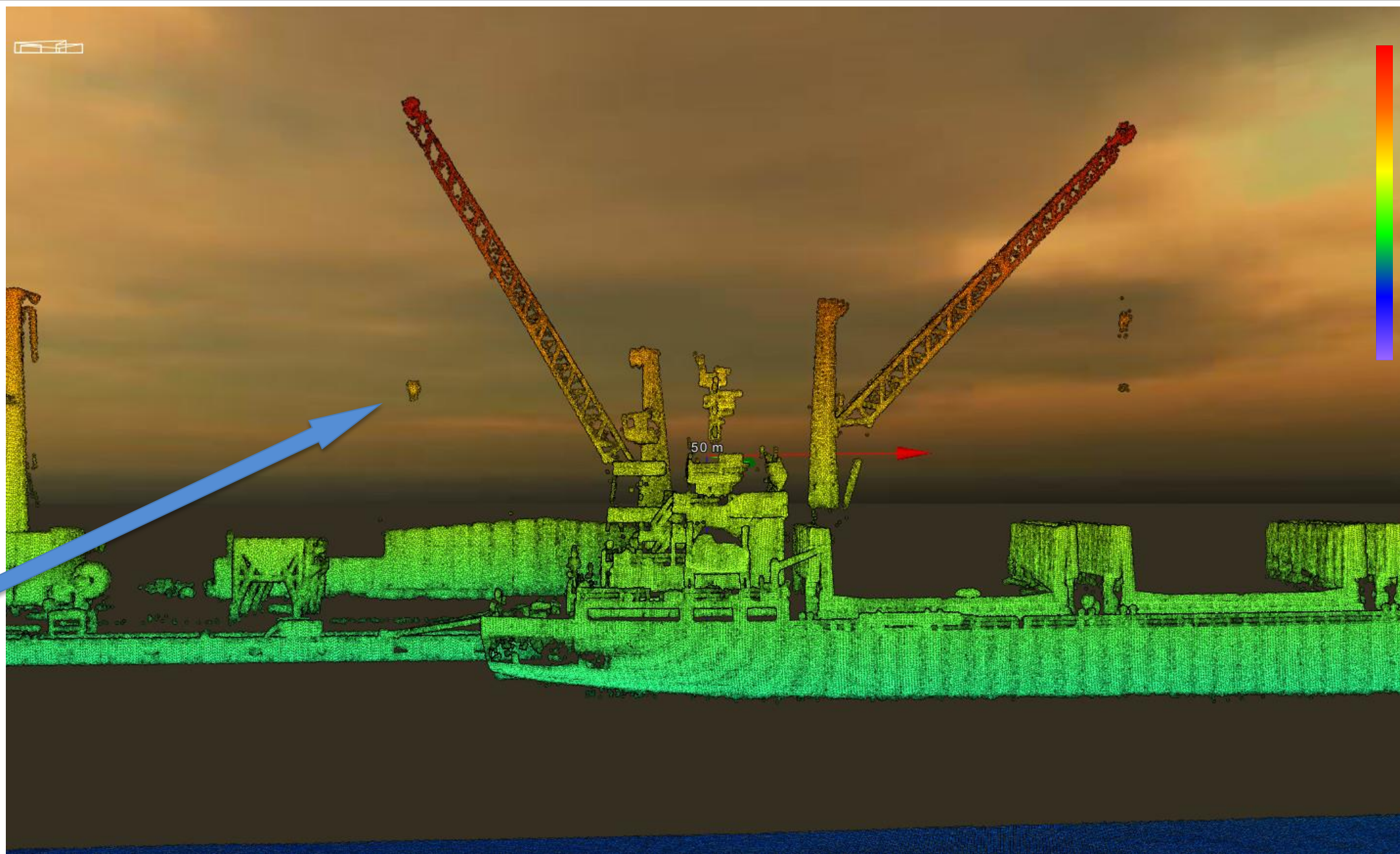
Vertical
Exaggeration 1.00

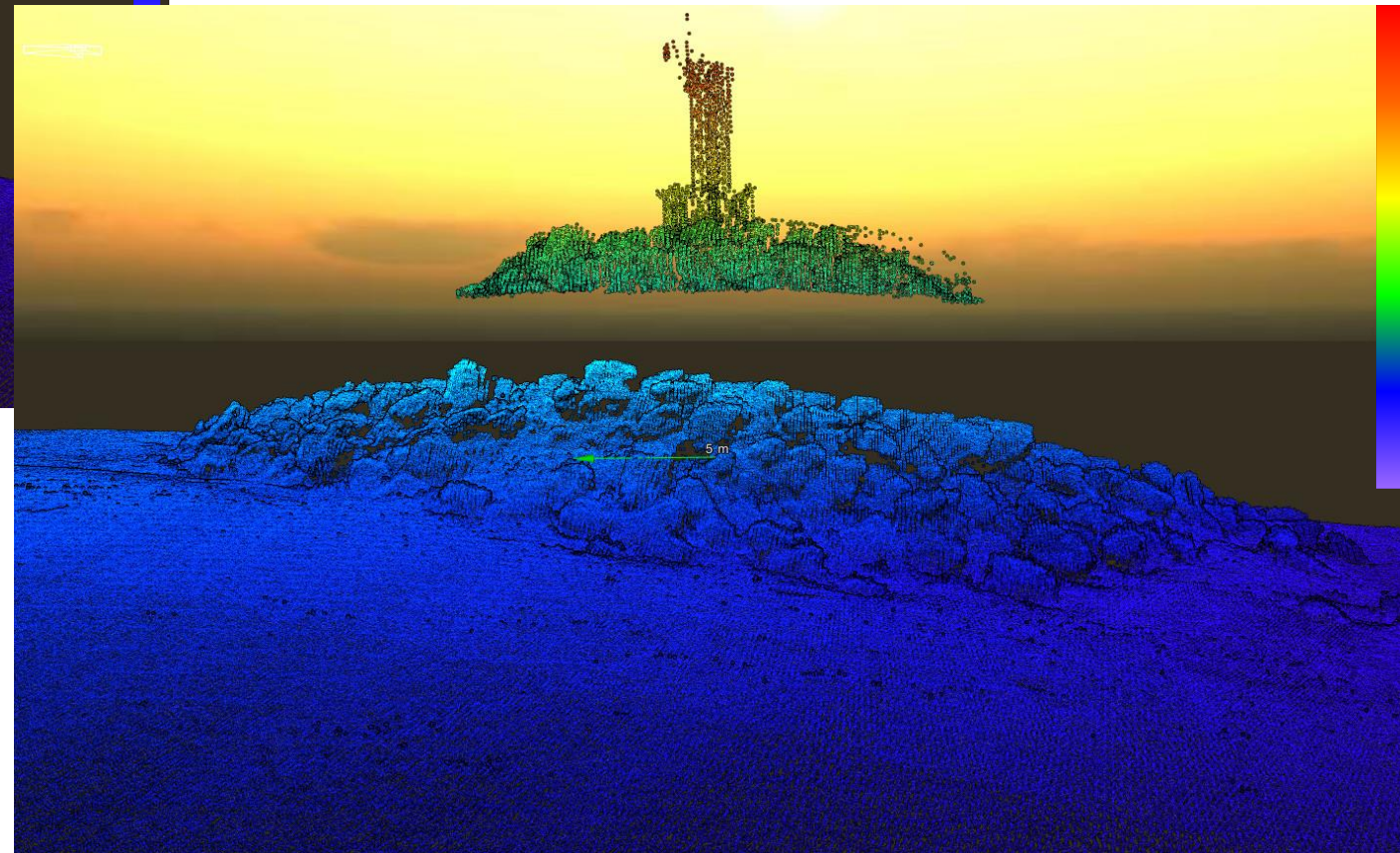
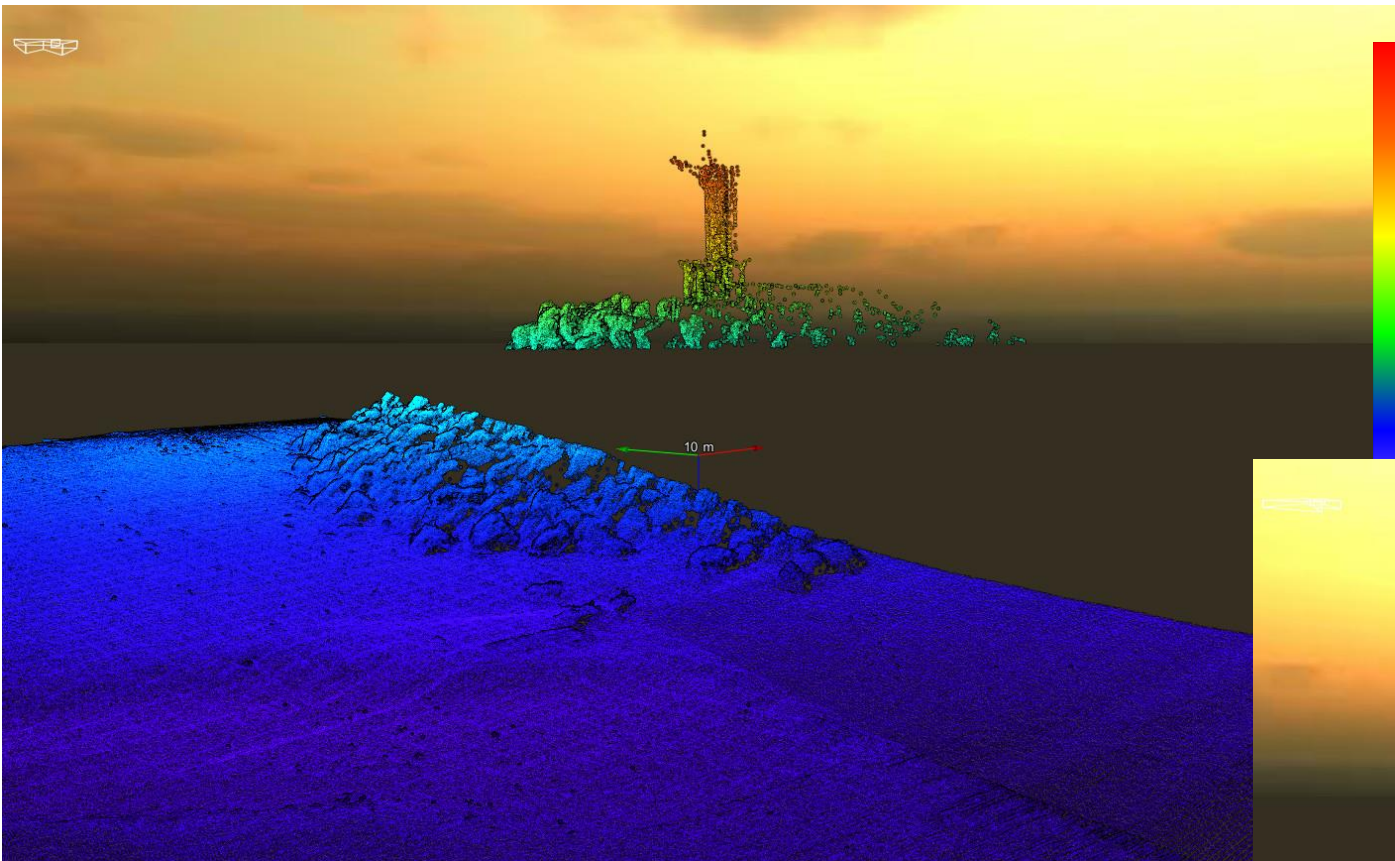


Laser Scan Data

Vertical
Exaggeration 1.00

The hooks from
the crane are
clearly visible





Multibeam & Laser Scan Data

Frequency 400 kHz FM 80kHz BW

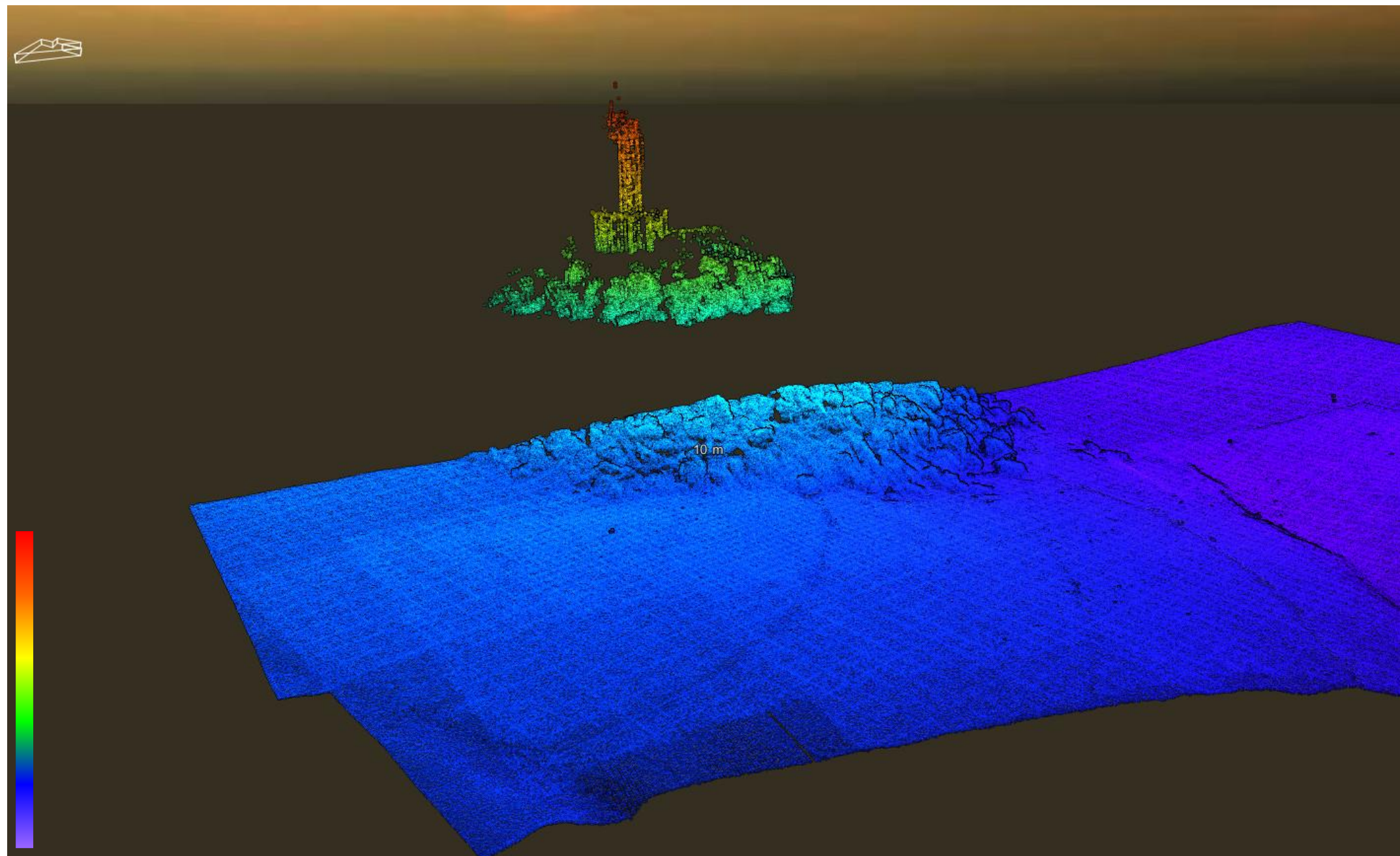
Swath angle 120°

Vertical Exaggeration 1.00

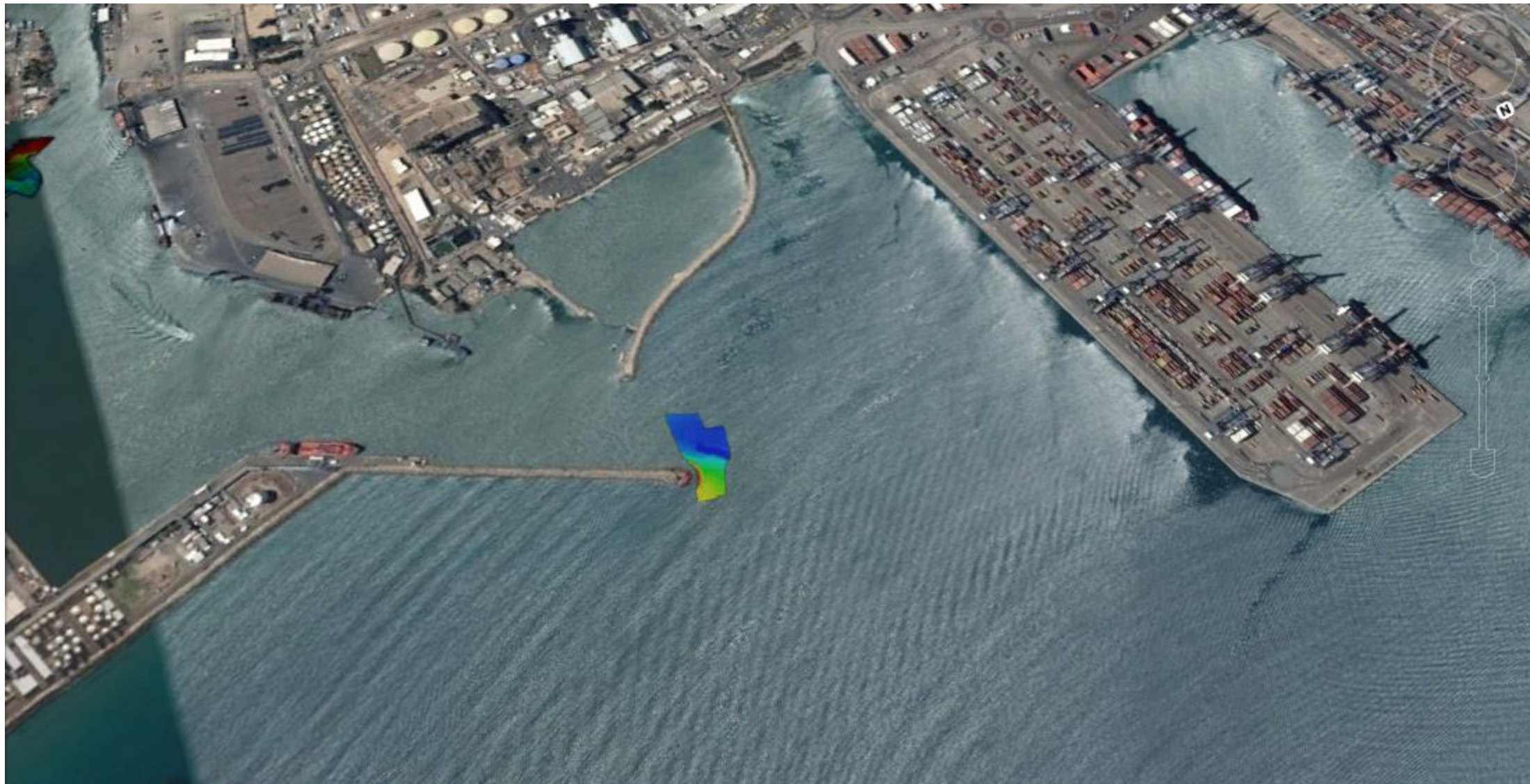
Multibeam & Laser Scan Data

Frequency 400 kHz
FM 80kHz BW
Swath angle 120°

Vertical
Exaggeration 1.00



Google Earth View



Google Earth View

