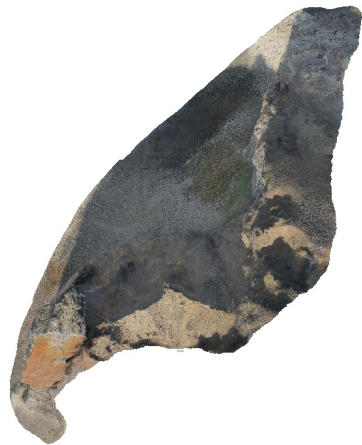


FortetNorth_processing_report

Processing Report
22 February 2021



Survey Data

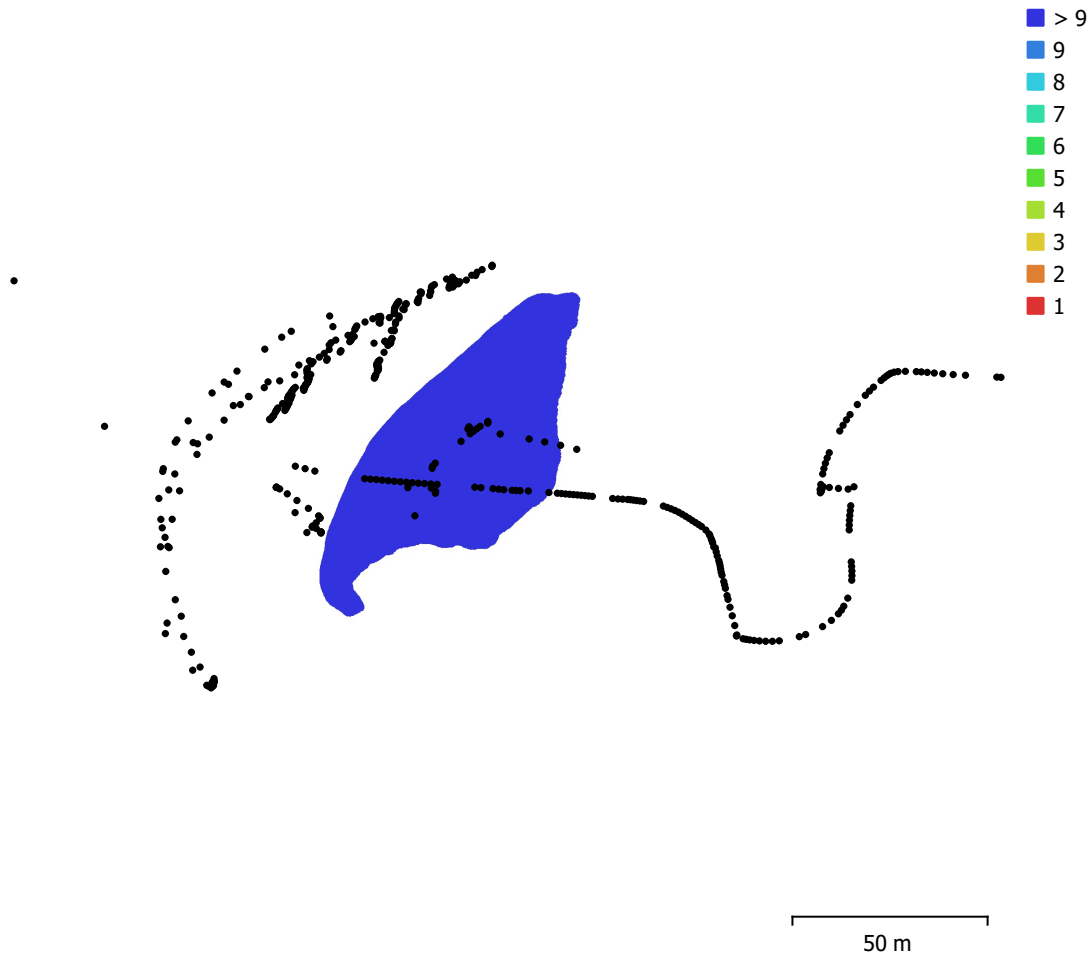


Fig. 1. Camera locations and image overlap.

Number of images:	462	Camera stations:	462
Flying altitude:	91 m	Tie points:	172,712
Ground resolution:	1.43 cm/pix	Projections:	753,956
Coverage area:	2.7e+03 m ²	Reprojection error:	3.75 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
L1D-20c (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 μm	No
unknown	2688 x 1512	unknown	unknown	No

Table 1. Cameras.

Camera Calibration

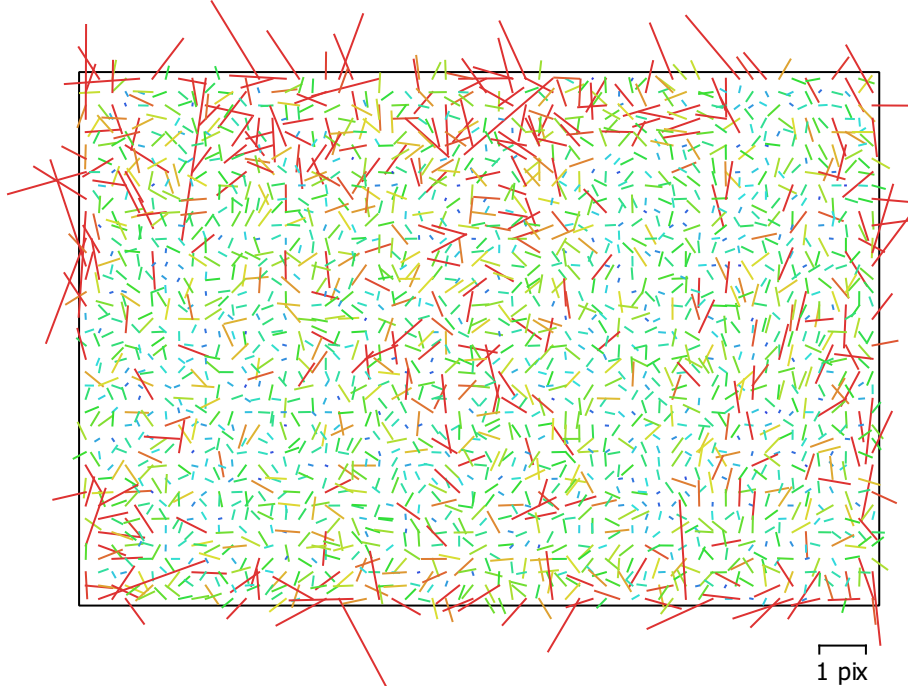


Fig. 2. Image residuals for L1D-20c (10.26mm).

L1D-20c (10.26mm)

24 images

Type	Resolution	Focal Length	Pixel Size
Frame	5472 x 3648	10.26 mm	2.41 x 2.41 μm
F:	4348.08		
Cx:	14.2421	B1:	0
Cy:	-42.2099	B2:	0
K1:	0.00844993	P1:	3.59889e-05
K2:	0.0124721	P2:	-0.00146085
K3:	-0.0147205	P3:	0
K4:	0	P4:	0

Camera Calibration

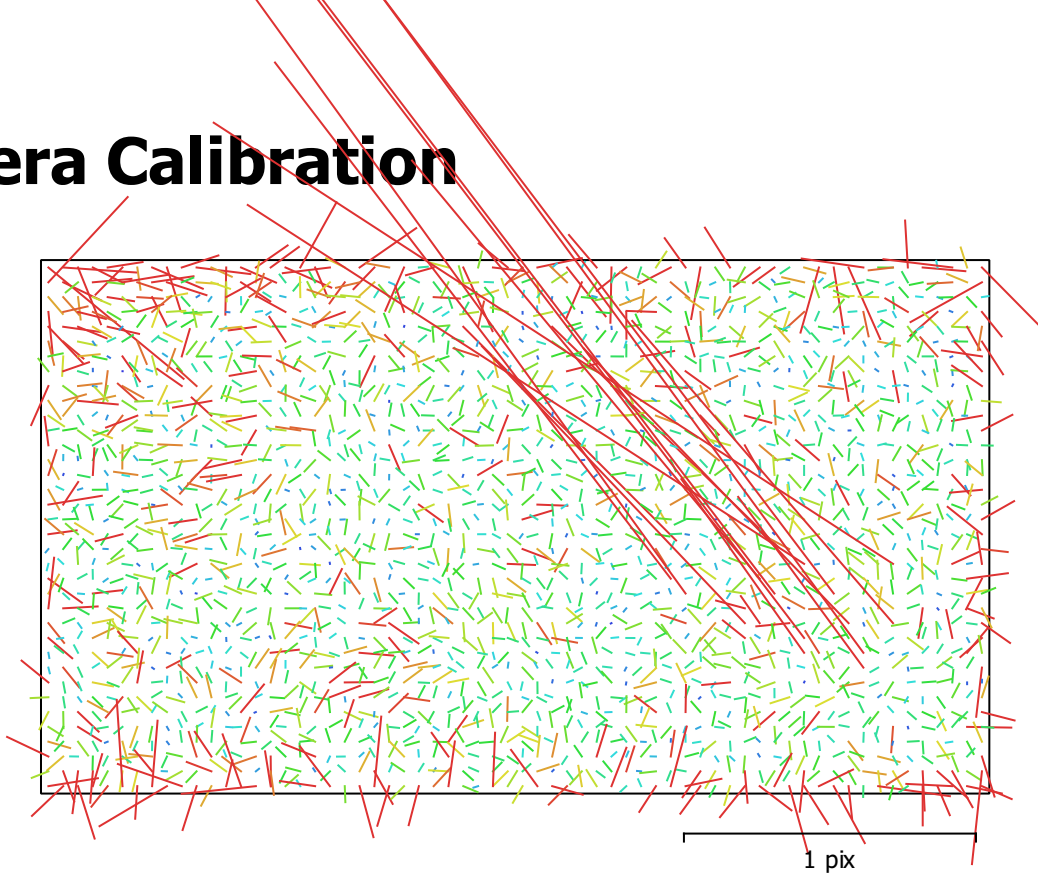


Fig. 3. Image residuals for unknown.

unknown

438 images

Type	Resolution	Focal Length	Pixel Size
Frame	2688 x 1512	unknown	unknown
F:	2202.15		
Cx:	-1.20584	B1:	0
Cy:	-20.5162	B2:	0
K1:	0.00365845	P1:	-0.000586771
K2:	0.0336818	P2:	-0.00274803
K3:	-0.0340448	P3:	0
K4:	0	P4:	0

Camera Locations

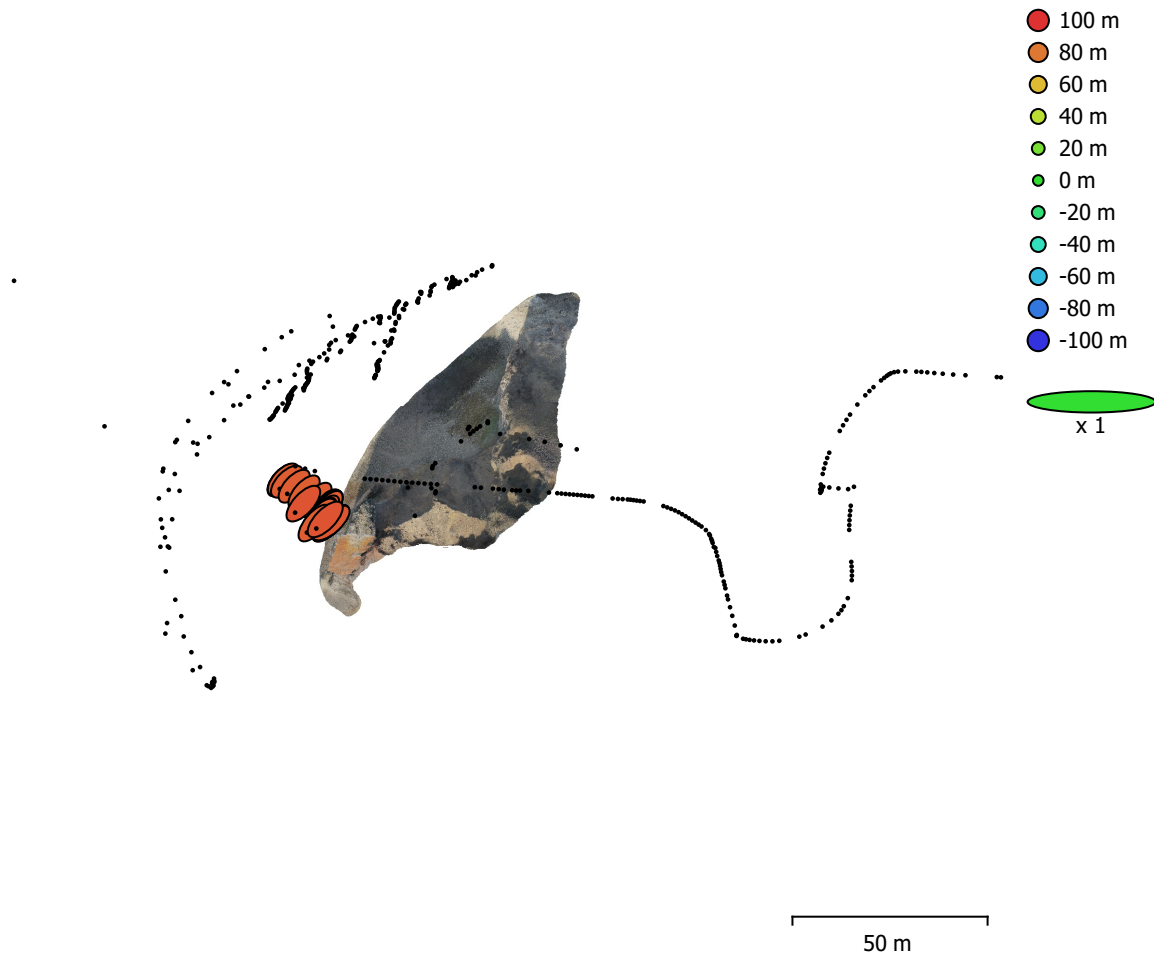


Fig. 4. Camera locations and error estimates.

Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.

Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
4.04287	4.52835	88.0639	6.07048	88.2728

Table 2. Average camera location error.

X - Easting, Y - Northing, Z - Altitude.

Ground Control Points

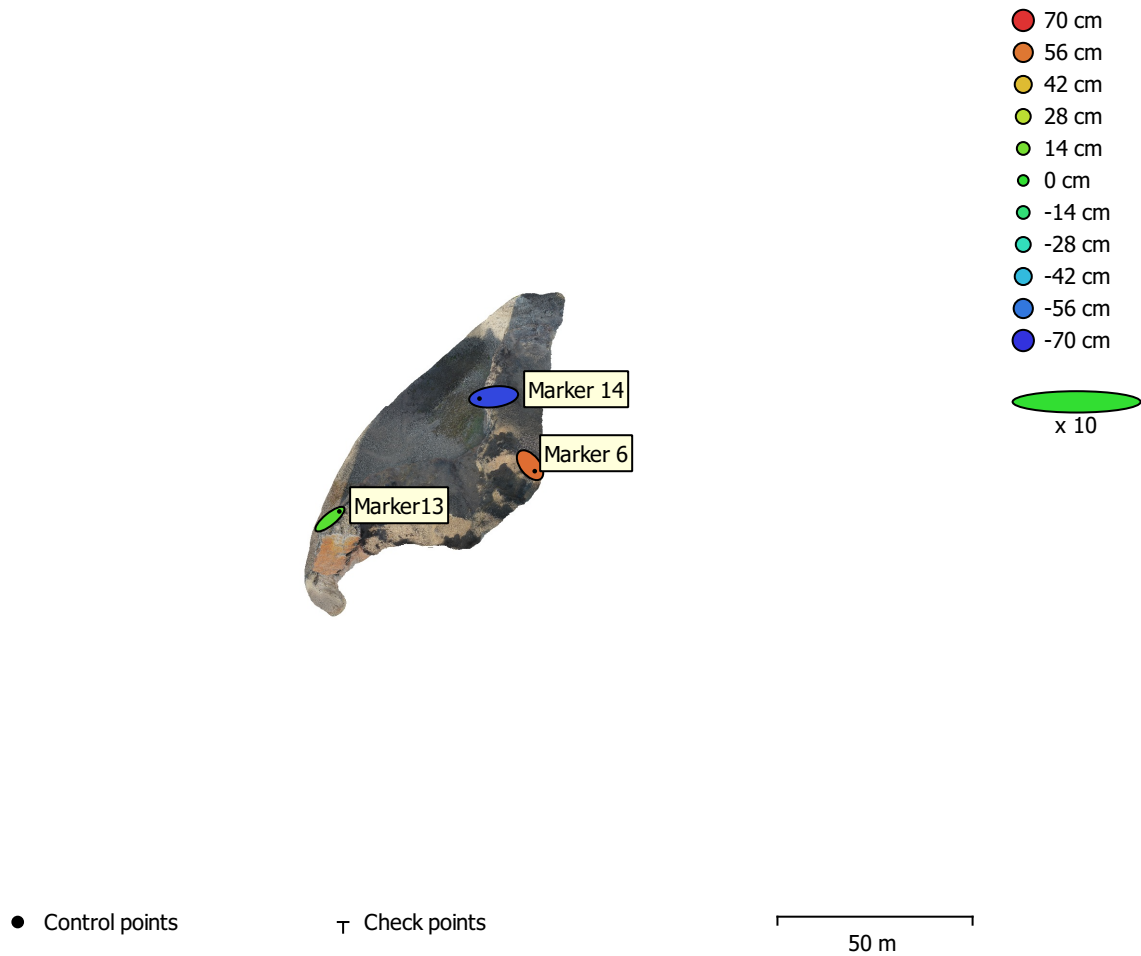


Fig. 5. GCP locations and error estimates.

Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.

Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
3	52.2842	29.2834	50.897	59.9262	78.6235

Table 3. Control points RMSE.

X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
Marker 14	-72.5881	-8.84911	-65.8824	98.4268	4.874 (56)
Marker 6	24.1051	-30.6112	58.0569	69.9193	7.636 (19)
Marker13	48.4853	39.4613	7.77164	62.9953	3.074 (44)
Total	52.2842	29.2834	50.897	78.6235	4.897

Table 4. Control points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

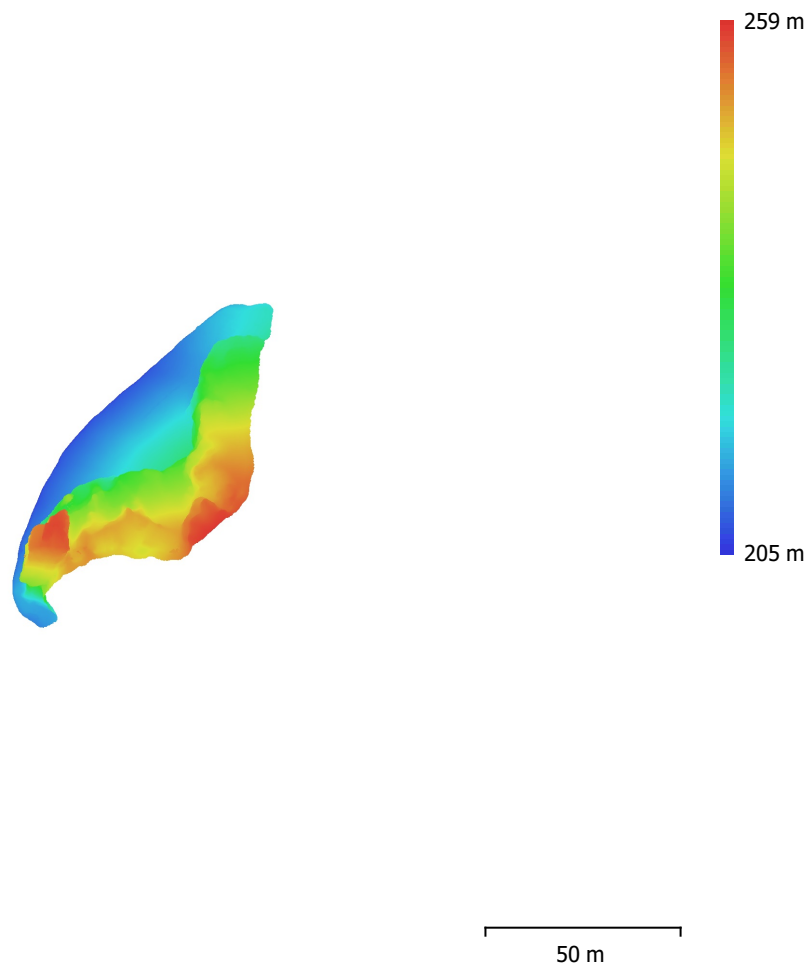


Fig. 6. Reconstructed digital elevation model.

Resolution: 5.7 cm/pix
Point density: 308 points/m²

Processing Parameters

General

Cameras	462
Aligned cameras	462
Markers	3
Coordinate system	WGS 84 / UTM zone 33N (EPSG::32633)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	172,712 of 197,562
RMS reprojection error	0.632879 (3.74774 pix)
Max reprojection error	233.195 (912.085 pix)
Mean key point size	8.10653 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	5.76718

Alignment parameters

Accuracy	Low
Generic preselection	Yes
Reference preselection	Source
Key point limit	40,000
Tie point limit	4,000
Guided image matching	No
Adaptive camera model fitting	No
Matching time	18 seconds
Matching memory usage	280.57 MB
Alignment time	1 minutes 51 seconds
Alignment memory usage	175.03 MB
Software version	1.6.1.10009
File size	21.96 MB

Depth Maps

Count	459
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Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	49 seconds
Memory usage	783.58 MB
Software version	1.6.1.10009
File size	192.51 MB

Dense Point Cloud

Points	2,536,366
Point colors	3 bands, uint8

Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	49 seconds
Memory usage	783.58 MB

Dense cloud generation parameters

Processing time	37 seconds
Memory usage	2.79 GB
Software version	1.6.1.10009
File size	179.31 MB

Model

Faces	169,090
Vertices	85,295
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096, 4 bands, uint8

Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	49 seconds
Memory usage	783.58 MB

Reconstruction parameters

Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	2 minutes 35 seconds
Memory usage	1.54 GB

Texturing parameters

Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	1 minutes 7 seconds
Blending time	16 minutes 19 seconds
Software version	1.6.1.10009
File size	33.30 MB

Tiled Model

Texture	3 bands, uint8
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Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	49 seconds
Memory usage	783.58 MB

Reconstruction parameters

Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	3 minutes 20 seconds
Memory usage	2.76 GB
Software version	1.7.1.11797
File size	49.21 MB

System

Software name	Agisoft Metashape Professional
Software version	1.7.1 build 11797
OS	Windows 64 bit
RAM	127.78 GB
CPU	Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
GPU(s)	GeForce RTX 2080