

Report

Processing Report
16 January 2025



Survey Data

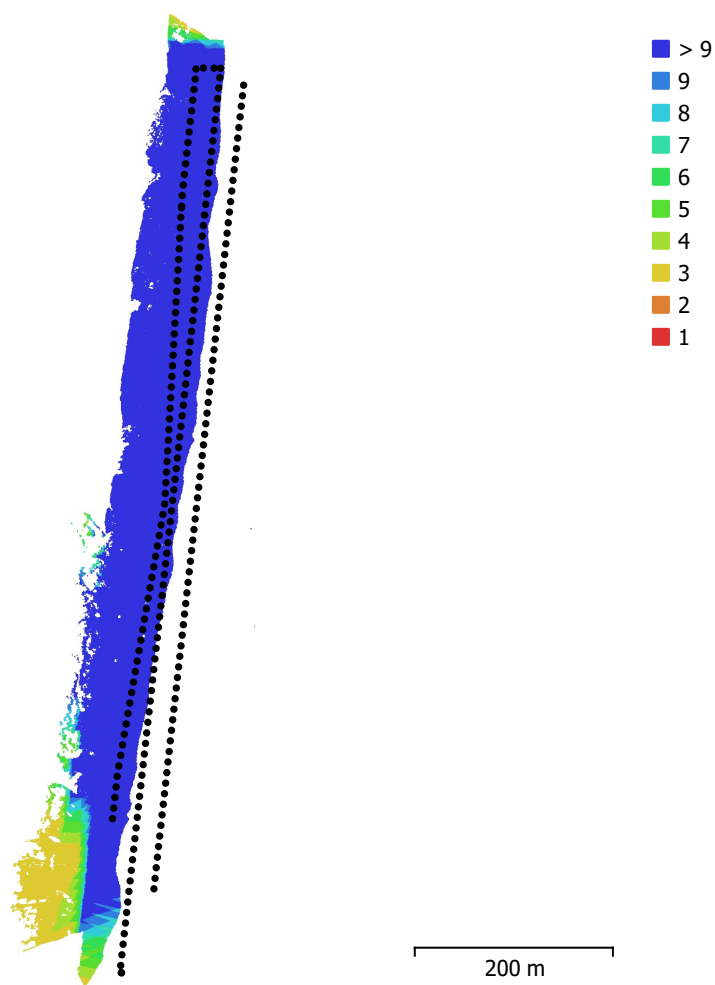


Fig. 1. Camera locations and image overlap.

Number of images:	240	Camera stations:	240
Flying altitude:	56.5 m	Tie points:	168,145
Ground resolution:	1.57 cm/pix	Projections:	874,922
Coverage area:	0.0677 km ²	Reprojection error:	0.953 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310R (8.8mm)	5472 x 3648	8.8 mm	2.41 x 2.41 μm	Yes

Table 1. Cameras.

Camera Calibration

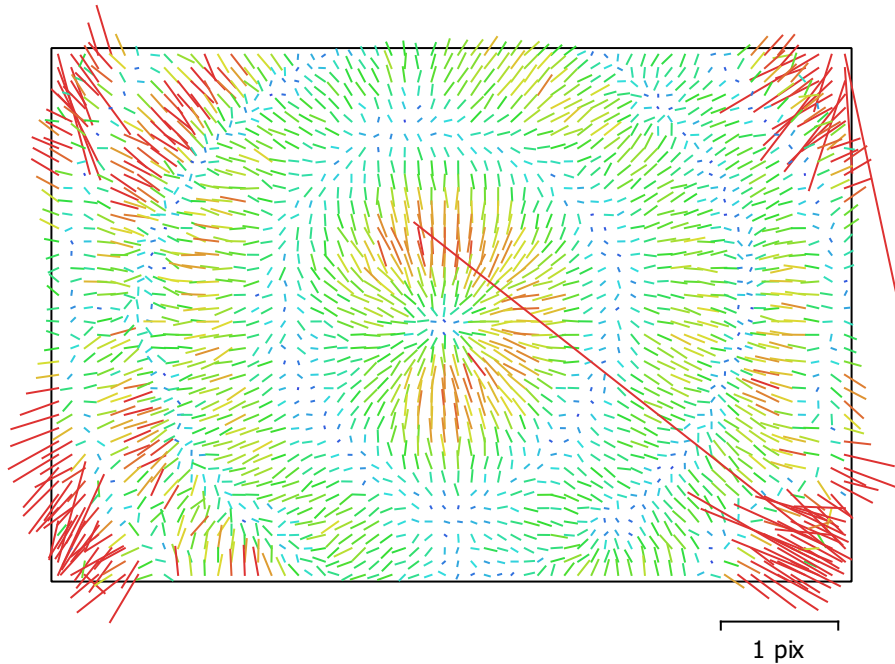


Fig. 2. Image residuals for FC6310R (8.8mm).

FC6310R (8.8mm)

240 images, precalibrated

Type	Resolution	Focal Length	Pixel Size
Frame	5472 x 3648	8.8 mm	2.41 x 2.41 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	3689.99	0.027	1.00	-0.36	-0.46	-0.48	0.27	-0.21	0.34	0.45
Cx	-41.5689	0.02		1.00	0.23	0.09	-0.02	-0.00	-0.19	-0.23
Cy	-7.89456	0.019			1.00	0.12	-0.04	0.02	-0.32	-0.59
K1	-0.282997	1e-05				1.00	-0.95	0.88	-0.13	-0.16
K2	0.122487	2e-05					1.00	-0.98	0.04	0.06
K3	-0.0330226	1.2e-05						1.00	-0.04	-0.04
P1	-0.000241292	5.7e-07							1.00	0.28
P2	0.000344585	7.9e-07								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

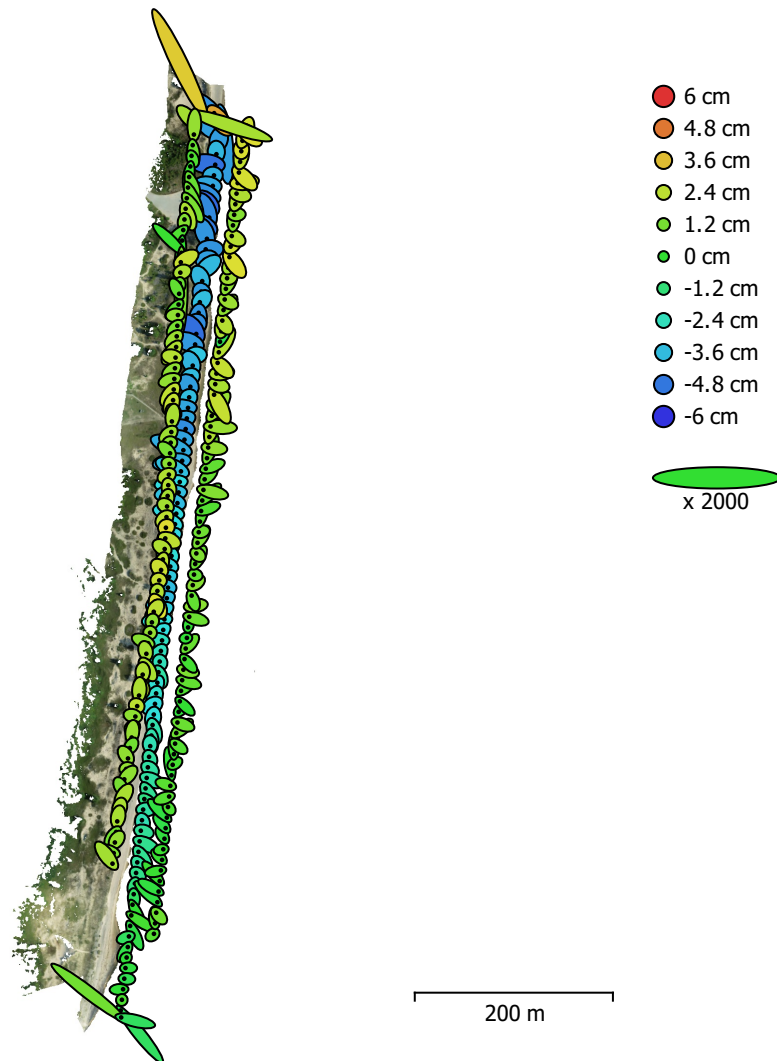


Fig. 3. Camera locations and error estimates.

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 (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total error (cm)
0.563968	0.678832	2.34699	0.882538	2.50743

Table 3. Average camera location error.

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

Ground Control Points



Fig. 4. 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)
9	7.35287	20.3458	4.87801	21.6337	22.1769

Table 4. Control points RMSE.

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

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
3	4.6893	2.04949	6.18529	5.11761	8.02793

Table 5. Check points RMSE.

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
point 1_2	2.28879	-15.0599	12.062	19.4301	18.270 (3)
point 5_2	7.70205	15.9056	1.6592	17.75	9.781 (4)
point 9_2	-3.03893	15.9003	-1.7484	16.2822	5.846 (5)
point 14_2	11.0332	18.4842	-3.22758	21.7672	7.116 (6)
point 18_2	4.58309	26.1716	0.954998	26.587	7.821 (6)
point 23_2	3.95786	21.4317	-3.67738	22.1021	6.388 (6)
point 26_2	9.70655	20.6904	3.41208	23.1074	6.919 (6)
point 32_2	8.61304	28.2149	-4.58786	29.8549	16.967 (3)
point 35_2	9.27276	16.8187	-2.30458	19.3433	14.666 (2)
Total	7.35287	20.3458	4.87801	22.1769	9.941

Table 6. Control points.
X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
12	1.86836	1.62691	-8.62538	8.97411	1.092 (4)
13	7.17881	-2.97272	-3.10374	8.36693	0.486 (5)
14	3.30794	1.05702	-5.54463	6.54238	0.002 (2)
Total	4.6893	2.04949	6.18529	8.02793	0.736

Table 7. Check points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

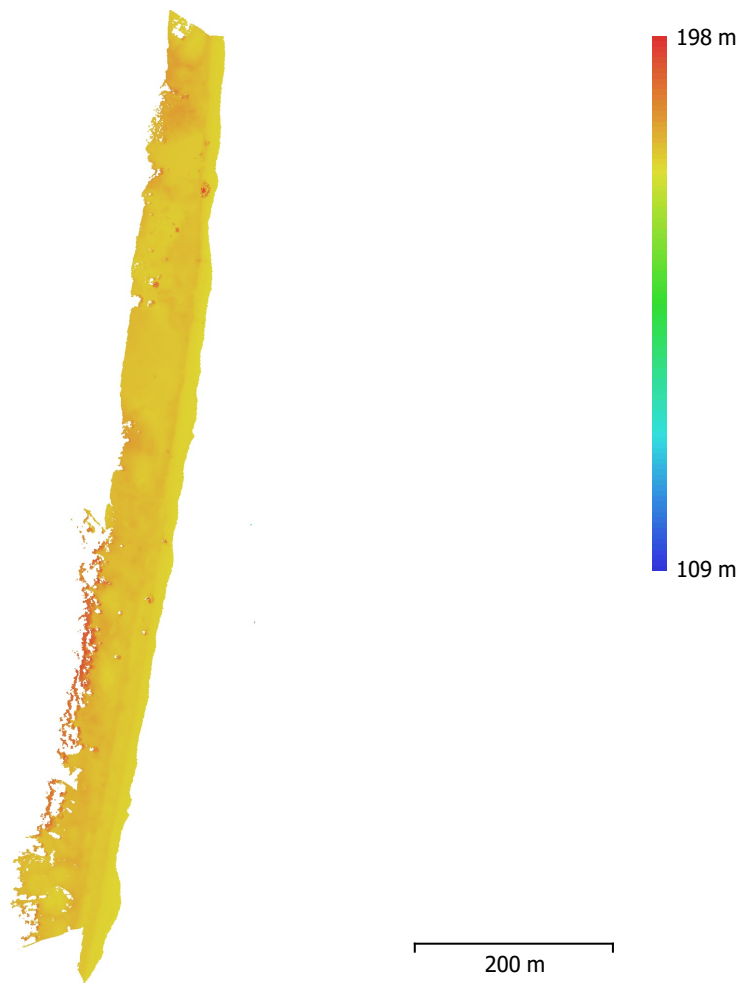


Fig. 5. Reconstructed digital elevation model.

Resolution: 3.15 cm/pix
Point density: 0.101 points/cm²

Processing Parameters

General

Cameras	240
Aligned cameras	240
Markers	12
Coordinate system	WGS 84 / UTM zone 16N (EPSG::32616)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	168,145 of 191,094
RMS reprojection error	0.168043 (0.952575 pix)
Max reprojection error	0.509687 (44.5382 pix)
Mean key point size	3.80079 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	5.43994

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	40,000
Key point limit per Mpx	1,000
Tie point limit	4,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	3 minutes 7 seconds
Matching memory usage	504.05 MB
Alignment time	1 minutes 19 seconds
Alignment memory usage	77.32 MB
Date created	2025:01:17 02:38:52
Software version	2.0.3.16960
File size	28.19 MB

Depth Maps

Count	240
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	18 minutes 41 seconds
Memory usage	4.30 GB
Date created	2025:01:17 03:01:12
Software version	2.0.3.16960
File size	1.86 GB

Point Cloud

Points	80,153,909
Point attributes	
Color	3 bands, uint8
Normal	
Point classes	
Created (never classified)	80,153,909
Depth maps generation parameters	

Quality	High
Filtering mode	Mild
Max neighbors	16
Processing time	18 minutes 41 seconds
Memory usage	4.30 GB
Point cloud generation parameters	
Processing time	24 minutes 23 seconds
Memory usage	10.26 GB
Date created	2025:01:17 03:25:36
Software version	2.0.3.16960
File size	1.65 GB
Model	
Faces	39,609,277
Vertices	19,809,237
Vertex colors	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	3 hours 40 minutes
Memory usage	1.42 GB
Reconstruction parameters	
Surface type	Height field
Source data	Point cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	23 minutes 41 seconds
Memory usage	5.59 GB
Date created	2023:04:17 20:05:00
Software version	1.6.2.10247
File size	906.65 MB
DEM	
Size	7,833 x 31,658
Coordinate system	WGS 84 / UTM zone 16N (EPSG::32616)
Reconstruction parameters	
Source data	Point cloud
Interpolation	Disabled
Processing time	1 minutes 12 seconds
Memory usage	316.20 MB
Date created	2025:01:17 03:34:05
Software version	2.0.3.16960
File size	229.83 MB
Orthomosaic	
Size	15,666 x 63,316
Coordinate system	WGS 84 / UTM zone 16N (EPSG::32616)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	21 minutes 33 seconds
Memory usage	2.92 GB
Date created	2025:01:17 03:48:33
Software version	2.0.3.16960
File size	5.49 GB
System	

Software name	Agisoft Metashape Professional
Software version	2.0.3 build 16960
OS	Windows 64 bit
RAM	191.97 GB
CPU	Intel(R) Xeon(R) CPU E5-2660 v2 @ 2.20GHz
GPU(s)	Quadro RTX 8000