Playas Carrasco - Miramar

Processing Report

13 September 2021

Survey Data

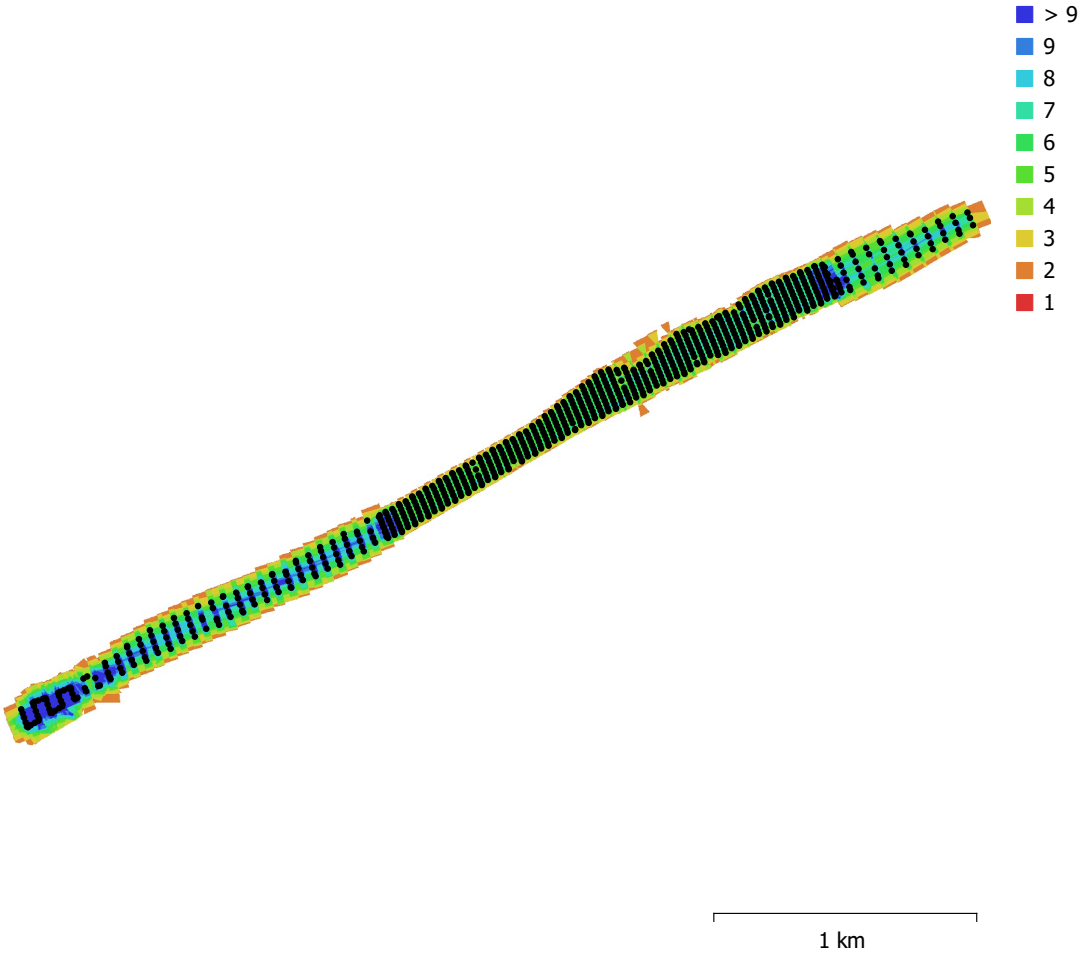

Fig. 1. Camera locations and image overlap.

Number of images:	848	Camera stations:	848
Flying altitude:	63.4 m	Tie points:	868,814
Ground resolution:	1.6 cm/pix	Projections:	3,140,087
Coverage area:	0.725 km²	Reprojection error:	0.767 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310 (8.8mm)	4864 x 3648	8.8 mm	2.61 x 2.61 µm	No
FC6310 (8.8mm)	4864 x 3648	8.8 mm	2.61 x 2.61 µm	No

Table 1. Cameras.

Camera Calibration

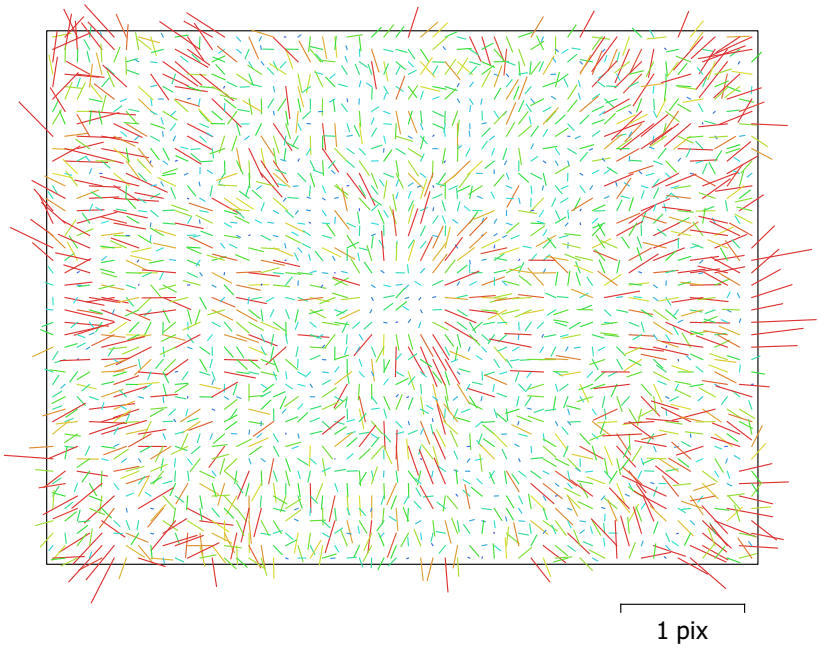

Fig. 2. Image residuals for FC6310 (8.8mm).

FC6310 (8.8mm)

163 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4864 x 3648**	**8.8 mm**	**2.61 x 2.61 µm**

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2	P3	P4
F	**3659.37**	0.88	1.00	0.29	0.15	-0.18	-0.04	0.07	-0.16	0.21	-0.24	-0.03	-0.06	-0.00	-0.01
Cx	**-4.50943**	0.094		1.00	0.05	-0.21	-0.06	0.03	-0.05	0.07	-0.08	0.26	0.05	0.06	-0.05
Cy	**17.2712**	0.09			1.00	0.01	-0.19	0.02	-0.04	0.05	-0.05	0.06	0.35	0.12	-0.09
B1	**-0.412115**	0.0094				1.00	0.01	0.01	0.01	-0.02	0.03	0.06	0.02	0.01	-0.00
B2	**-0.512557**	0.0097					1.00	-0.00	0.01	-0.01	0.01	-0.03	-0.03	-0.03	0.02
K1	**0.0170536**	9.1e-05						1.00	-0.97	0.92	-0.87	0.00	-0.00	0.01	-0.01
K2	**-0.0985305**	0.00054							1.00	-0.99	0.96	-0.00	0.00	-0.01	0.01
K3	**0.195091**	0.0012								1.00	-0.99	0.00	-0.01	0.01	-0.01
K4	**-0.129791**	0.00097									1.00	-0.00	0.00	-0.02	0.02
P1	**-0.000217766**	4e-06										1.00	0.50	0.59	-0.53
P2	**-0.000470639**	5.8e-06											1.00	0.80	-0.72
P3	**0.0529955**	0.046												1.00	-0.98
P4	**-0.328784**	0.062													1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Calibration

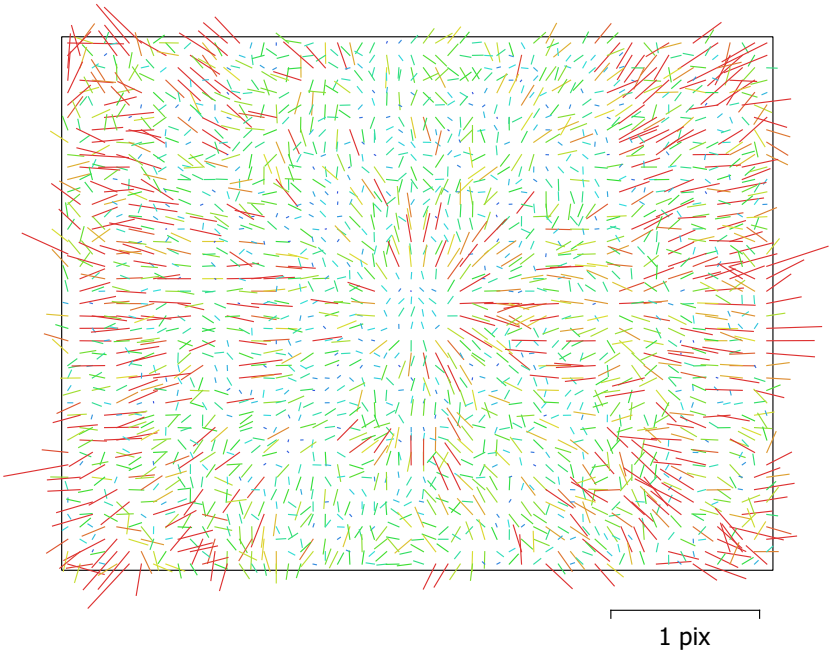

Fig. 3. Image residuals for FC6310 (8.8mm).

FC6310 (8.8mm)

685 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4864 x 3648**	**8.8 mm**	**2.61 x 2.61 µm**

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2	P3	P4
F	**3624.49**	0.46	1.00	0.11	0.10	-0.06	0.01	0.09	-0.19	0.24	-0.28	-0.02	-0.01	0.00	-0.01
Cx	**-5.90732**	0.051		1.00	0.00	-0.07	0.01	0.01	-0.02	0.03	-0.03	0.23	0.02	0.05	-0.05
Cy	**14.774**	0.048			1.00	-0.00	-0.09	0.02	-0.02	0.03	-0.03	0.01	0.31	0.05	-0.04
B1	**-0.788015**	0.033				1.00	0.05	0.00	-0.00	-0.00	0.00	0.02	0.01	-0.00	-0.00
B2	**-0.278321**	0.032					1.00	0.01	-0.00	0.00	-0.00	-0.02	0.00	0.00	0.00
K1	**0.0164164**	4.1e-05						1.00	-0.97	0.92	-0.86	-0.00	-0.01	-0.01	0.01
K2	**-0.0917648**	0.00024							1.00	-0.99	0.95	0.00	0.01	0.01	-0.01
K3	**0.176362**	0.00053								1.00	-0.99	-0.00	-0.00	-0.01	0.01
K4	**-0.114539**	0.00041									1.00	-0.00	-0.00	0.00	-0.00
P1	**-0.000216353**	2.1e-06										1.00	0.43	0.59	-0.55
P2	**-0.000458417**	2.7e-06											1.00	0.73	-0.68
P3	**-0.0853926**	0.021												1.00	-0.98
P4	**-0.34702**	0.028													1.00

Table 3. Calibration coefficients and correlation matrix.

Camera Locations

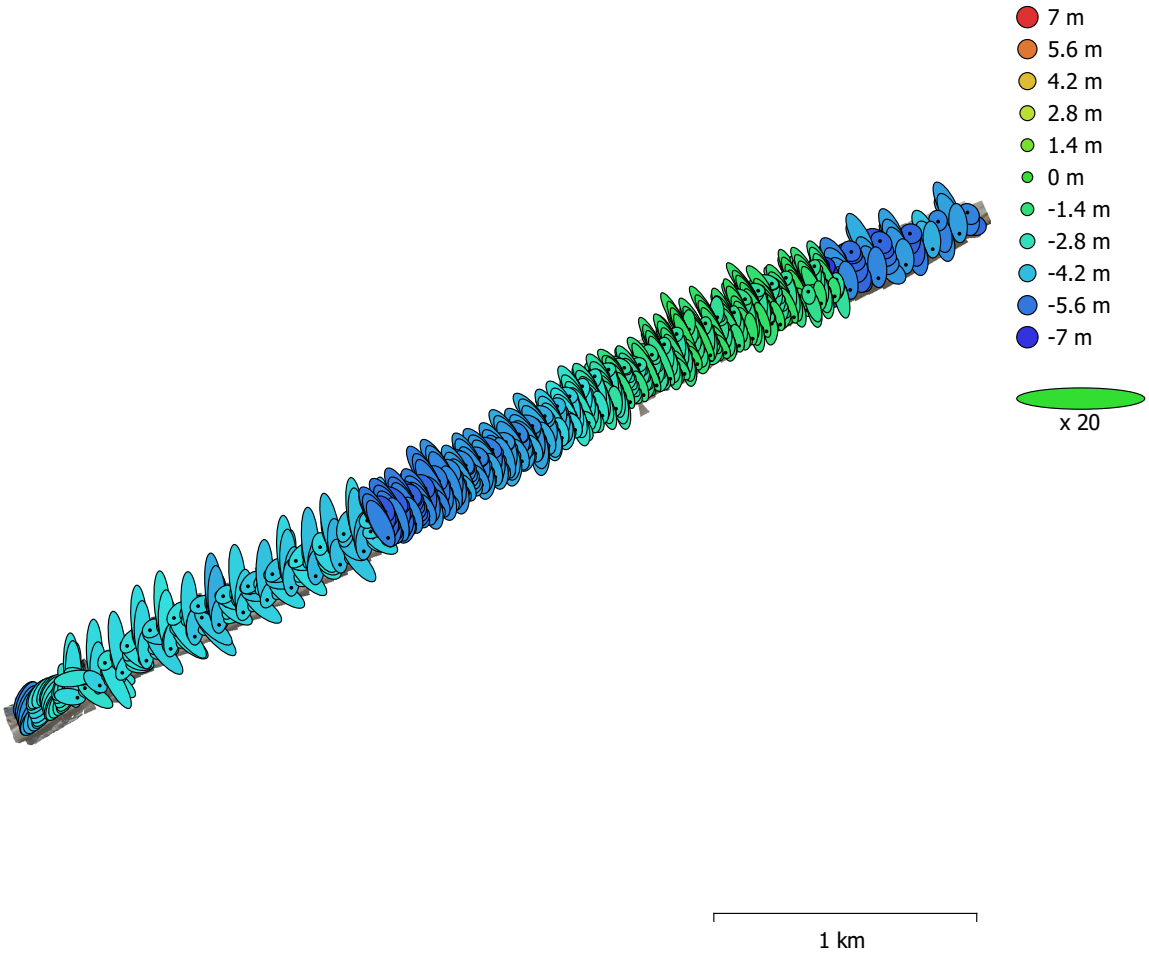

Fig. 4. Camera locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
1.75521	3.30611	3.60049	3.74314	5.19371

Table 4. Average camera location error.
X - Easting, Y - Northing, Z - Altitude.

Ground Control Points

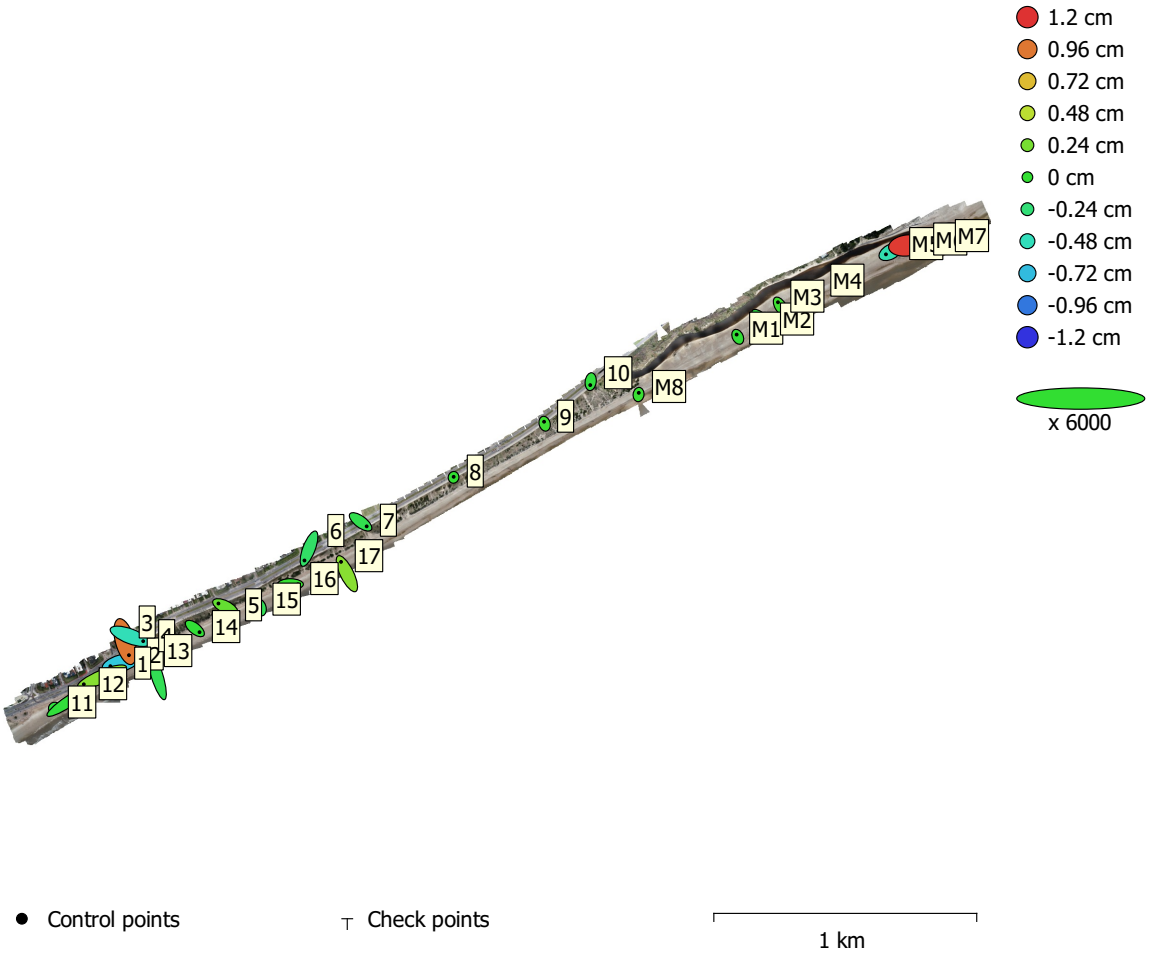

Fig. 5. GCP locations and error estimates.

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)
25	0.913147	0.865434	0.40105	1.2581	1.32048

Table 5. Control points RMSE.

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

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
2	-1.29681	-0.366837	-0.670968	1.50549	0.190 (9)
3	0.481573	-1.72125	0.959293	2.02851	0.154 (13)
4	1.64372	-0.617165	-0.462937	1.81577	0.189 (8)
5	-0.860485	0.426417	0.175274	0.976211	0.286 (6)
6	-0.578695	-1.49498	-0.180435	1.6132	0.195 (6)
7	0.773483	-0.571185	-0.0960026	0.966305	0.140 (9)
8	0.0134142	0.0691455	0.00019193	0.0704349	0.128 (5)
9	-0.071432	0.249794	0.0395416	0.262799	0.151 (6)
10	-0.056441	-0.433696	-0.0446666	0.439628	0.221 (6)
11	0.0626986	0.025869	-0.046851	0.0824338	0.205 (15)
12	2.17215	1.43267	-0.0301144	2.60225	0.151 (9)
13	-0.750247	2.40354	-0.118592	2.5207	0.127 (6)
14	0.592577	-0.463827	-0.0144646	0.752657	0.249 (6)
15	-0.114996	0.338483	-0.123958	0.378365	0.222 (4)
16	0.927433	-0.0185114	0.0162969	0.927761	0.110 (5)
17	-0.742345	1.50038	0.300238	1.70069	0.195 (8)
1	-2.30349	-0.951784	0.301587	2.51056	0.137 (9)
M1	-0.137446	0.280438	-0.0139357	0.31262	0.163 (8)
M2	0.660305	-0.644683	-0.0679377	0.925329	0.183 (8)
M3	-0.309056	0.513953	0.0440206	0.601333	0.268 (7)
M4	-0.0859881	-0.0656176	0.0740084	0.131061	0.152 (8)
M5	-0.571499	-0.309371	-0.434302	0.781627	0.103 (9)
M6	1.01018	0.120518	1.16858	1.54937	0.139 (10)
M7	-0.525487	0.106286	-0.761062	0.93094	0.307 (9)
M8	0.0275199	0.215424	0.0218662	0.218272	0.197 (5)
Total	**0.913147**	**0.865434**	**0.40105**	**1.32048**	**0.188**

Table 6. Control points.

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

Digital Elevation Model

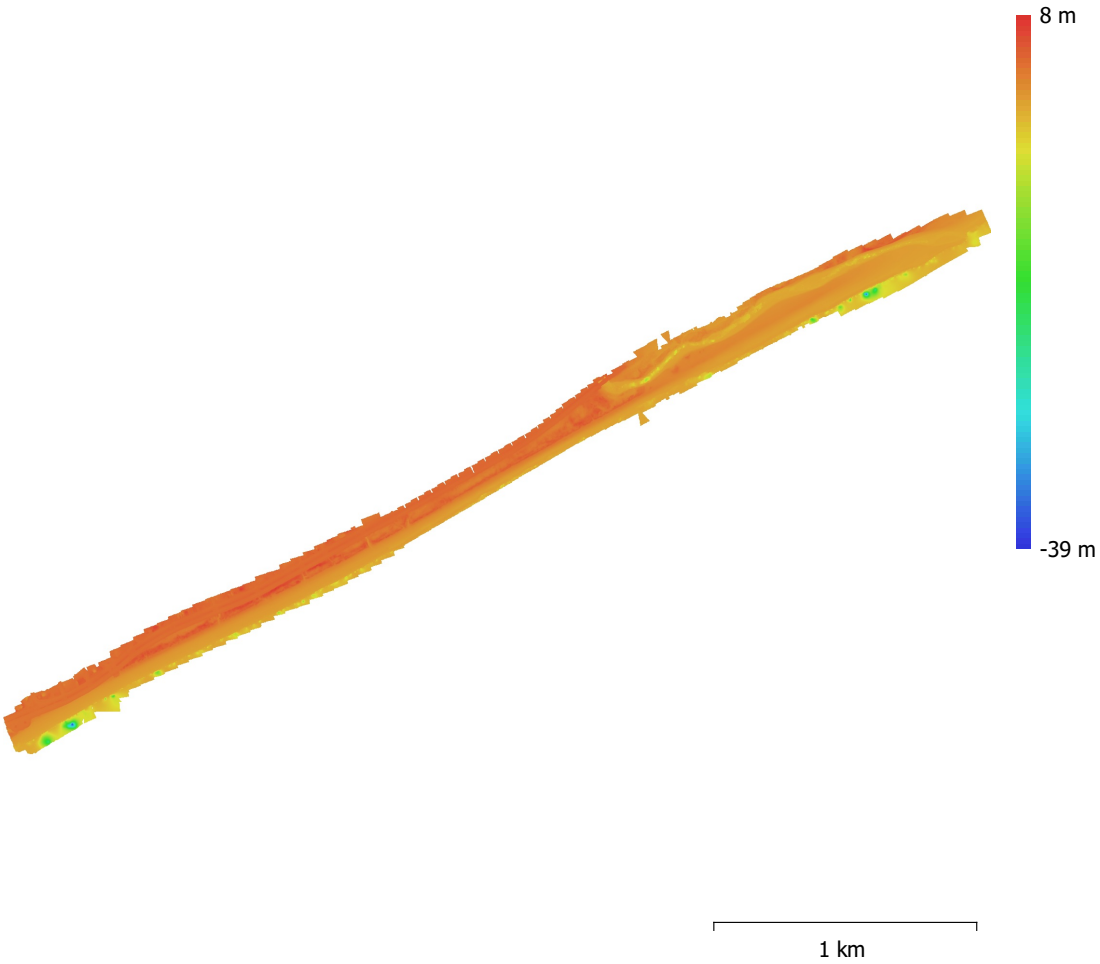

Fig. 6. Reconstructed digital elevation model.

Resolution:	3.2 cm/pix
Point density:	979 points/m²

Processing Parameters

General	
Cameras	848
Aligned cameras	848
Markers	28
Shapes	
Point	1
LineString	689
Polygon	176810
Coordinate system	WGS 84 / UTM zone 21S EGM08
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	868,814 of 940,671
RMS reprojection error	0.164279 (0.766881 pix)
Max reprojection error	1.1544 (29.0281 pix)
Mean key point size	4.47601 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.70783
Alignment parameters	
Accuracy	High
Generic preselection	No
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	37 minutes 30 seconds
Alignment time	11 minutes 8 seconds
Optimization parameters	
Parameters	f, b1, b2, cx, cy, k1-k4, p1-p4
Adaptive camera model fitting	No
Optimization time	21 seconds
File size	75.91 MB
Dense Point Cloud	
Points	711,891,510
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Aggressive
Processing time	1 hours 12 minutes
Dense cloud generation parameters	
Processing time	1 hours 37 minutes
File size	9.11 GB
DEM	
Size	129,712 x 81,520
Coordinate system	WGS 84 / UTM zone 21S EGM08
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled
Processing time	37 minutes 52 seconds
File size	3.65 GB

Orthomosaic

Size	234,931 x 129,723
Coordinate system	WGS 84 / UTM zone 21S EGM08
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	37 minutes 50 seconds
File size	11.99 GB

System

Software name	Agisoft Metashape Professional
Software version	1.7.2 build 12070
OS	Windows 64 bit
RAM	63.93 GB
CPU	Intel(R) Core(TM) i7-9700F CPU @ 3.00GHz
GPU(s)	Radeon(TM) RX 460 Graphics (Baffin)