Agisoft Metashape

Processing Report
24 June 2024

Survey Data

	> 9
	9
	8
	7
	6
	5
	4
	3
	2
	1

20 cm
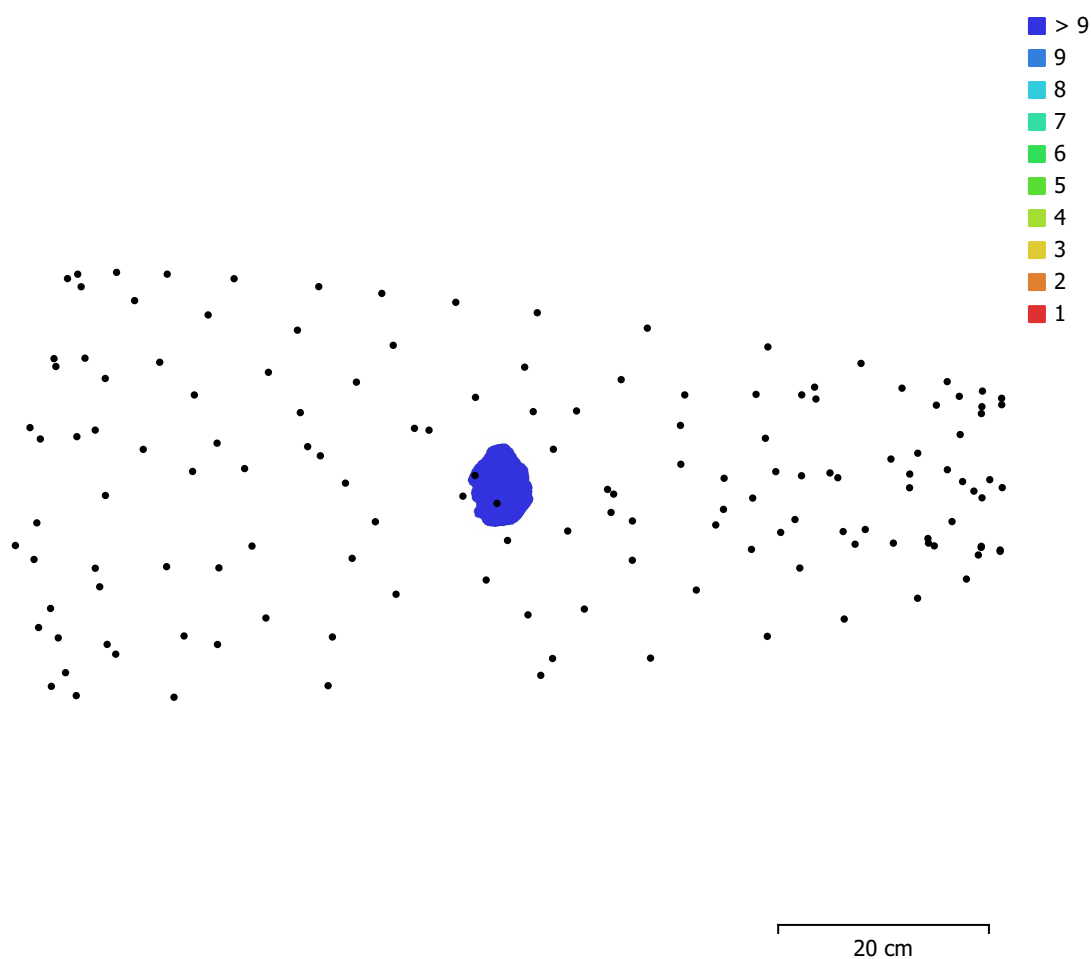
Fig. 1. Camera locations and image overlap.

Number of images:	145	Camera stations:	145
Flying altitude:	44.6 cm	Tie points:	178,614
Ground resolution:	0.0418 mm/pix	Projections:	912,216
Coverage area:	35.5 cm²	Reprojection error:	0.697 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
DMC-G7 (39mm)	4592 x 2584	39 mm	3.77 x 3.77 µm	No
DMC-G7 (39mm)	4592 x 2584	39 mm	3.77 x 3.77 µm	No

Table 1. Cameras.

Camera Calibration
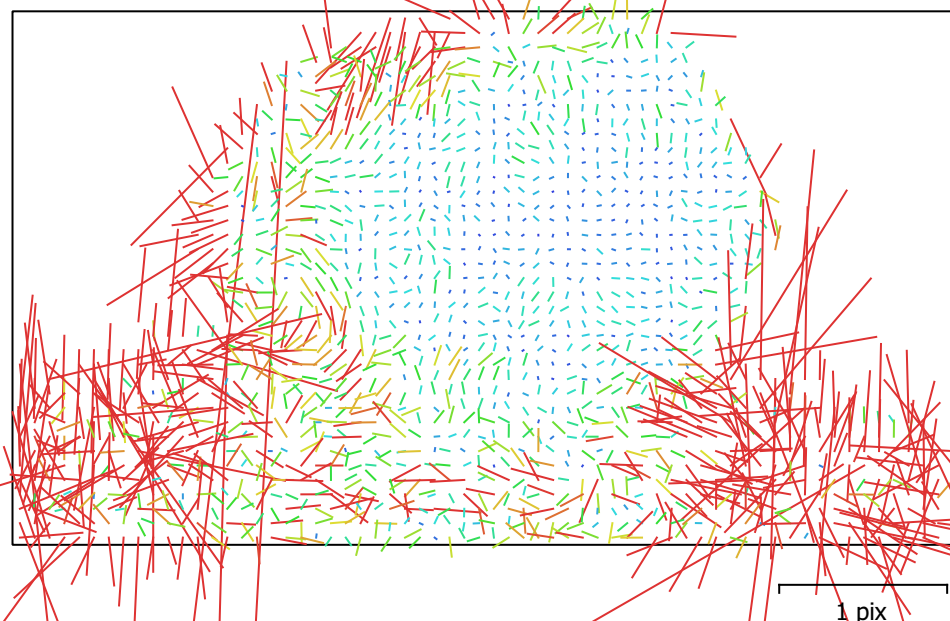
Fig. 2. Image residuals for DMC-G7 (39mm).

DMC-G7 (39mm)

77 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4592 x 2584**	**39 mm**	**3.77 x 3.77 µm**

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	**10729.9**	1.9	1.00	0.14	-0.11	-0.27	0.17	-0.09	0.11	0.06
Cx	**206.691**	3.1		1.00	-0.02	0.24	-0.38	0.42	0.95	0.12
Cy	**-225.18**	4.5			1.00	-0.13	0.30	-0.38	0.03	0.79
K1	**-0.0967484**	0.0017				1.00	-0.88	0.77	0.22	0.00
K2	**6.16696**	0.08					1.00	-0.97	-0.34	0.11
K3	**-56.7249**	0.88						1.00	0.40	-0.19
P1	**0.00985374**	0.00011							1.00	0.13
P2	**-0.00992742**	0.00011								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Calibration
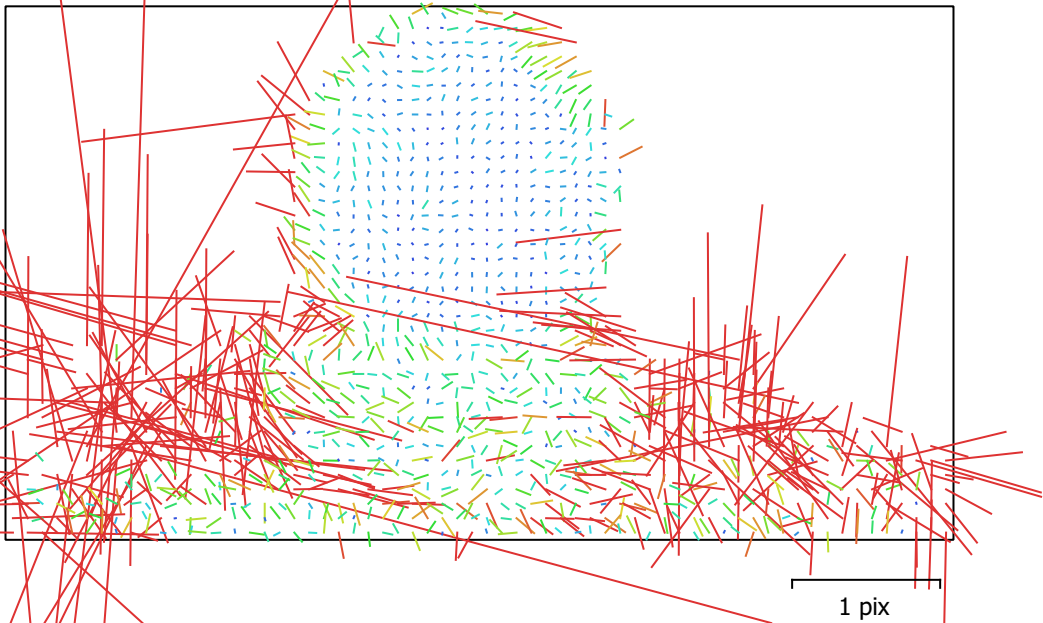
Fig. 3. Image residuals for DMC-G7 (39mm).

DMC-G7 (39mm)

68 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4592 x 2584**	**39 mm**	**3.77 x 3.77 µm**

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	**10660.2**	2.1	1.00	0.17	-0.36	-0.38	0.07	0.03	-0.18	0.06
Cx	**432.607**	3.7		1.00	-0.12	0.03	-0.47	0.64	0.59	0.40
Cy	**-71.0055**	3.7			1.00	-0.06	0.16	-0.22	-0.07	0.17
K1	**-0.250048**	0.0032				1.00	-0.73	0.54	0.53	0.29
K2	**10.8507**	0.13					1.00	-0.94	-0.42	-0.44
K3	**-109.306**	1.5						1.00	0.45	0.41
P1	**0.0138709**	0.00014							1.00	0.36
P2	**-0.0105223**	0.00011								1.00

Table 3. Calibration coefficients and correlation matrix.

Ground Control Points

	8 m
	6.4 m
	4.8 m
	3.2 m
	1.6 m
	0 m
	-1.6 m
	-3.2 m
	-4.8 m
	-6.4 m
	-8 m

x 1

point 2

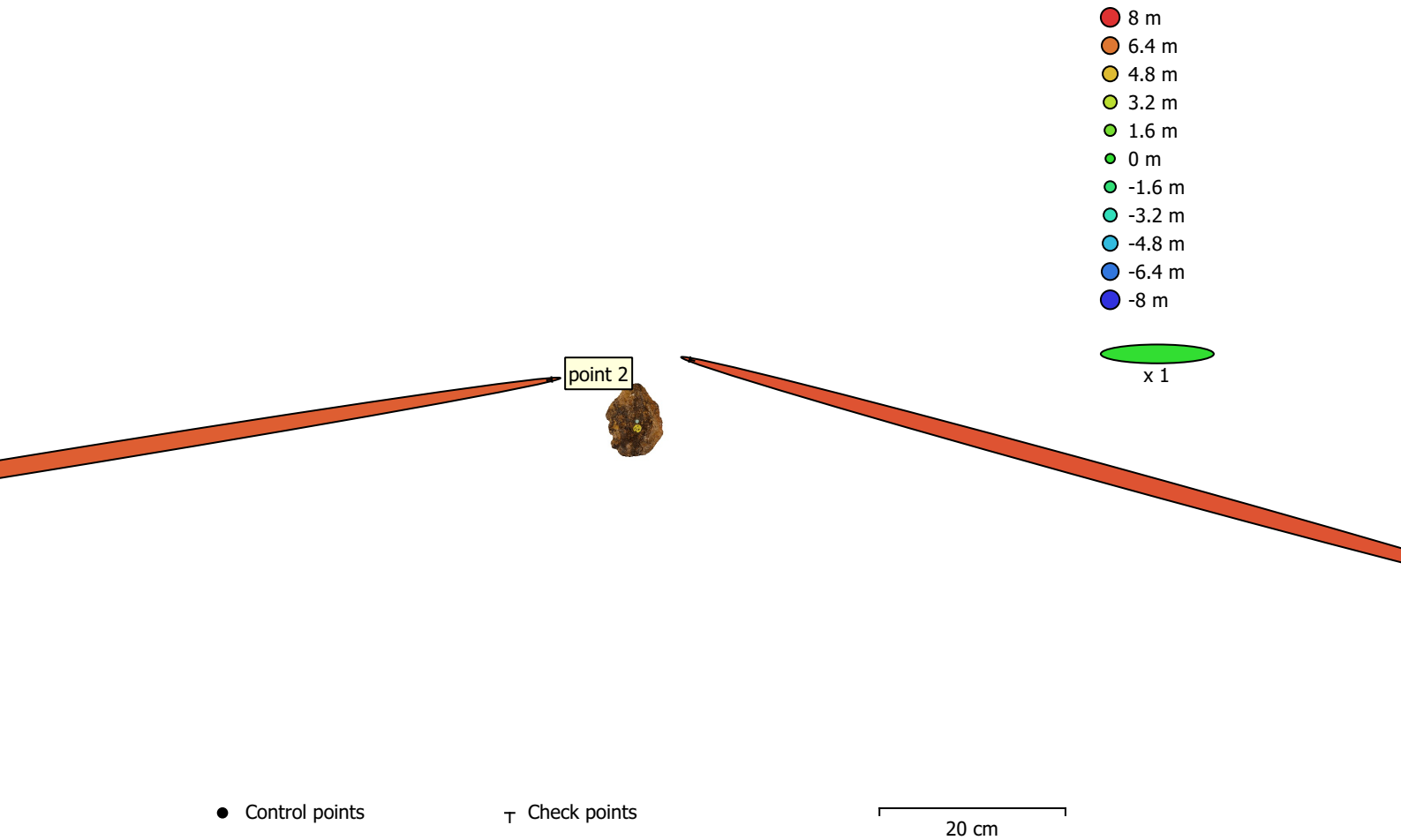● Control points   ⊤ Check points |———— 20 cm ————|

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 (m)	Y error (m)	Z error (m)	XY error (m)	Total (m)
2	1.01889	0.219846	7.1191	1.04234	7.195

Table 4. Check points RMSE.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 1	-0.920396	0.253331	7.24998	7.31256	0.001 (36)
point 2	1.10866	0.180243	6.98577	7.07549	0.000 (44)
Total	**1.01889**	**0.219846**	**7.1191**	**7.195**	**0.001**

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
point 1_point 2	0.15	-3.05311e-16
Total		**3.05311e-16**

Table 6. Control scale bars.

Digital Elevation Model

50.6 cm

48.4 cm

20 cm
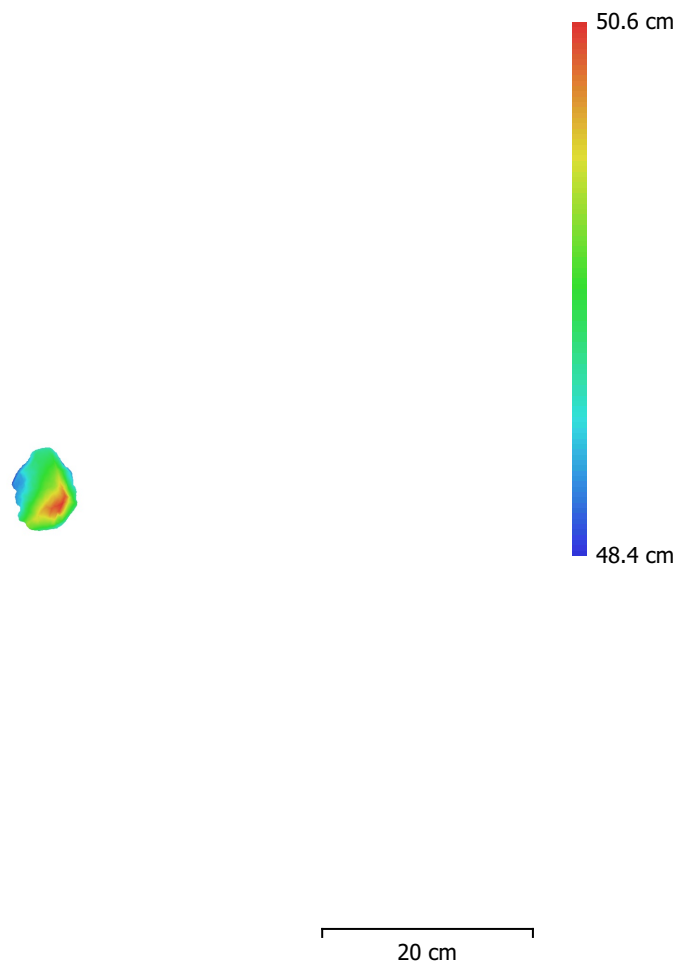
Fig. 5. Reconstructed digital elevation model.

Resolution: 0.151 mm/pix
Point density: 43.9 points/mm²

Processing Parameters

General

Cameras	145
Aligned cameras	145
Markers	2
Scale bars	1
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	178,614 of 244,795
RMS reprojection error	0.208012 (0.696932 pix)
Max reprojection error	0.768152 (23.322 pix)
Mean key point size	2.91134 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	5.6568
File size	25.94 MB

Depth Maps

Count	145

  Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	9 minutes 22 seconds
Memory usage	8.96 GB

Date created	2024:05:24 15:20:47
Software version	1.8.4.14671
File size	204.42 MB

Model

Faces	362,100
Vertices	181,052
Vertex colors	3 bands, uint8
Texture	16,000 x 16,000 x 2, 4 bands, uint8

  Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Max neighbors	16
Processing time	9 minutes 22 seconds
Memory usage	8.96 GB

  Reconstruction parameters

Surface type	Arbitrary
Source data	Depth maps
Interpolation	Enabled
Strict volumetric masks	No
Processing time	1 minutes 58 seconds
Memory usage	8.11 GB

  Texturing parameters

Mapping mode	Generic
Blending mode	Mosaic
Texture size	16,000
Enable hole filling	Yes

Enable ghosting filter	Yes
UV mapping time	21 seconds
UV mapping memory usage	825.41 MB
Blending time	1 minutes 25 seconds
Blending memory usage	13.79 GB
Blending GPU memory usage	11.91 GB
Date created	2024:05:24 15:22:45
Software version	1.8.4.14671
File size	270.56 MB

System

Software name	Agisoft Metashape Professional
Software version	1.8.4 build 14671
OS	Windows 64 bit
RAM	127.71 GB
CPU	Intel(R) Core(TM) i9-10940X CPU @ 3.30GHz
GPU(s)	Quadro RTX 5000