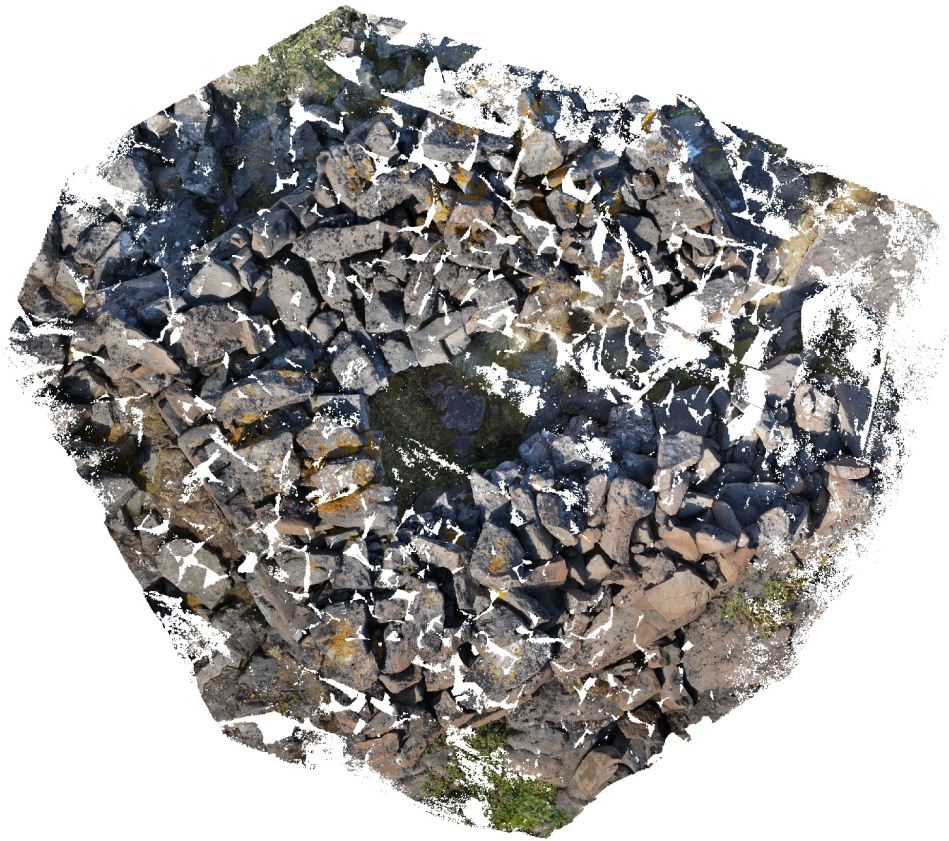


20190810_BearTrap_Ground

Processing Report

25 Oktober 2021



Survey Data

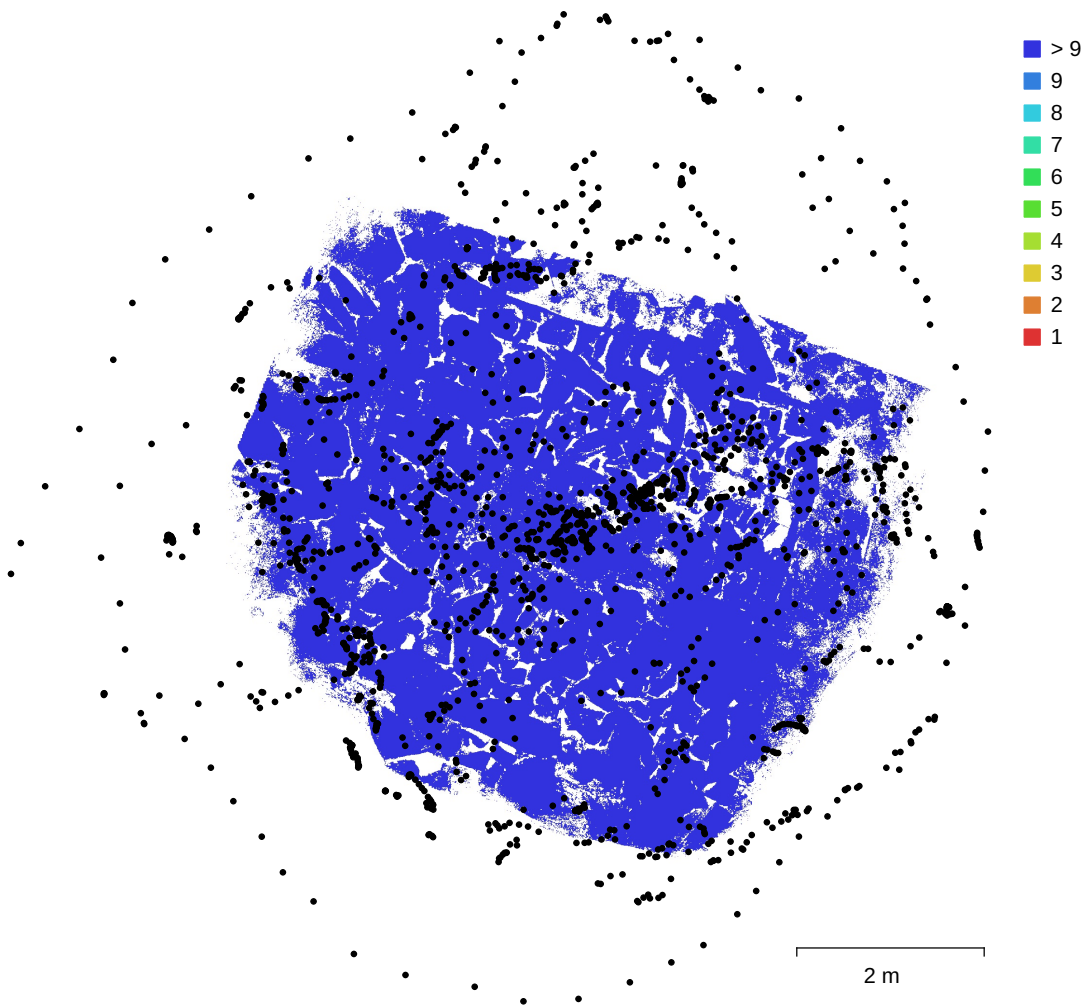


Fig. 1. Camera locations and image overlap.

Number of images:	1,687	Camera stations:	1,686
Flying altitude:	97.8 cm	Tie points:	1,729,769
Ground resolution:	0.233 mm/pix	Projections:	4,165,934
Coverage area:	29.1 m ²	Reprojection error:	0.418 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
ILCE-5100 (16mm)	6000 x 4000	16 mm	4 x 4 μm	No

Table 1. Cameras.

Camera Calibration

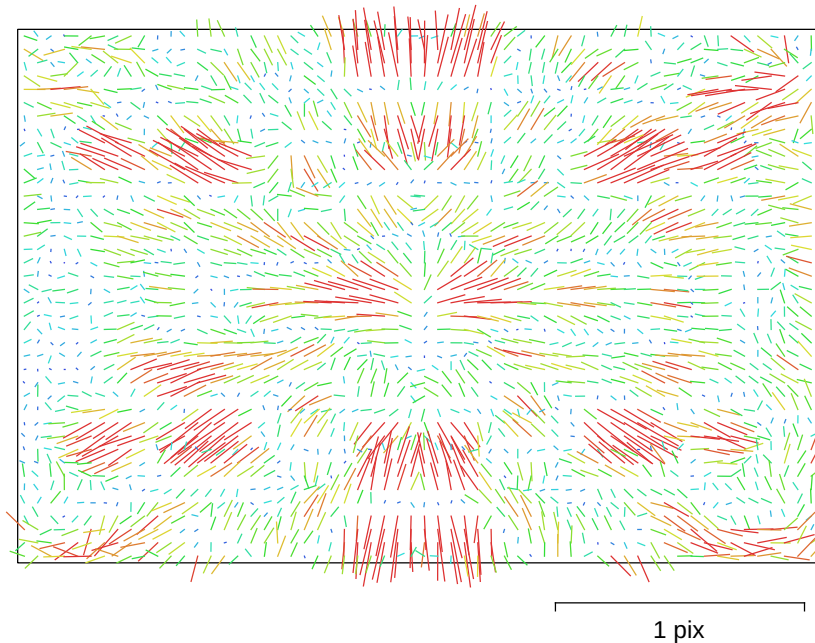


Fig. 2. Image residuals for ILCE-5100 (16mm).

ILCE-5100 (16mm)

1687 images

Type	Resolution	Focal Length	Pixel Size
Frame	6000 x 4000	16 mm	4 x 4 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	4031.09	0.023	1.00	0.02	-0.29	-0.30	0.00	-0.25	0.27	-0.24	0.22	0.01	-0.27
Cx	-17.1616	0.032		1.00	0.02	-0.05	-0.00	-0.01	0.01	-0.01	0.01	0.89	0.01
Cy	-90.9431	0.031			1.00	-0.10	0.04	-0.03	0.01	-0.00	0.00	0.01	0.76
B1	-0.921155	0.012				1.00	0.01	-0.00	-0.01	0.01	-0.01	-0.02	0.17
B2	-0.0757143	0.011					1.00	0.00	-0.00	0.00	-0.00	-0.16	0.04
K1	-0.0490556	3e-05						1.00	-0.96	0.91	-0.85	-0.00	-0.03
K2	0.0492553	0.00015							1.00	-0.98	0.95	0.00	-0.00
K3	-0.0176753	0.0003								1.00	-0.99	-0.00	0.01
K4	0.00127412	0.00021									1.00	0.00	-0.01
P1	-0.000512752	2.2e-06										1.00	0.00
P2	-0.00632402	1.8e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

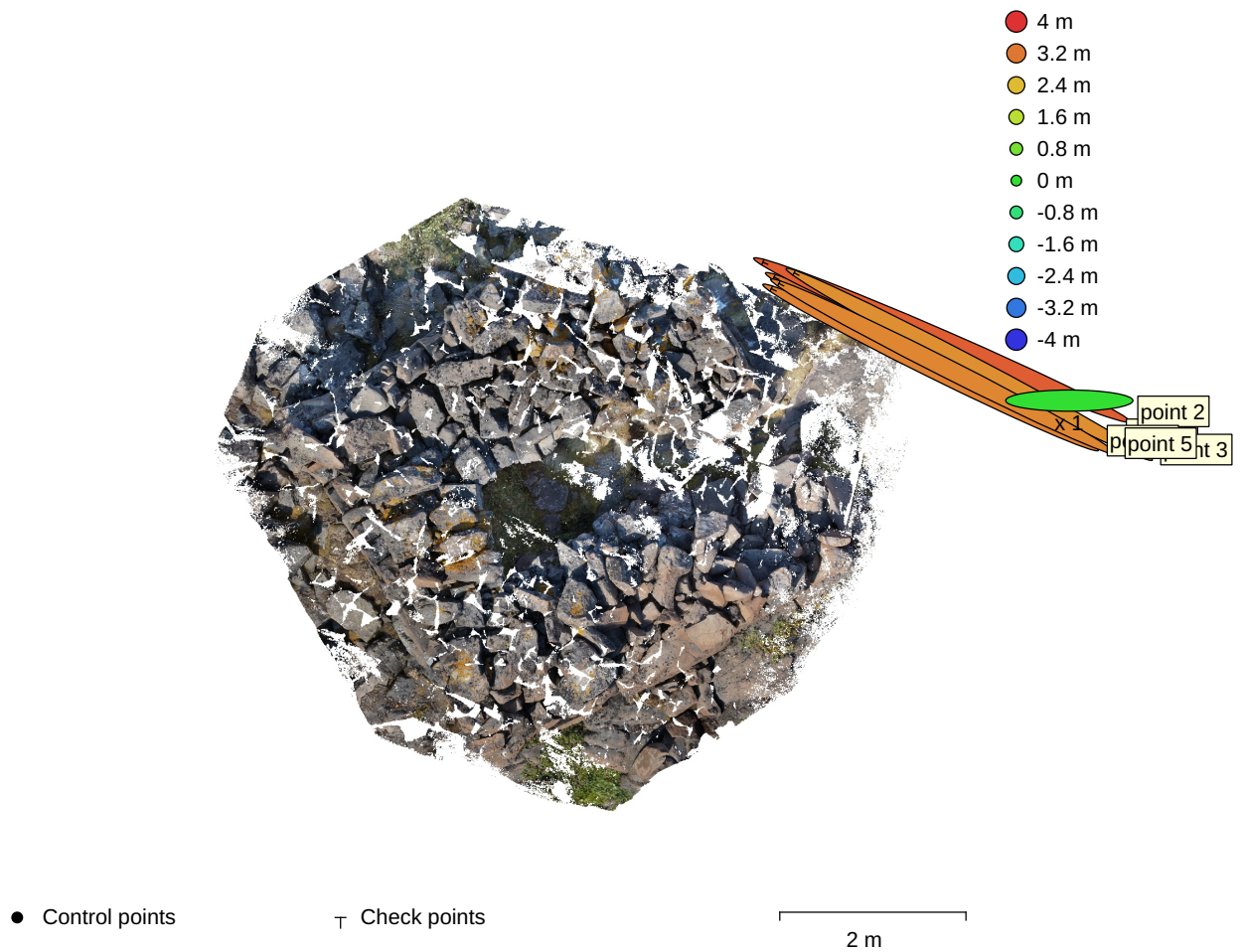


Fig. 3. GCP locations and error estimates.

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)
5	3.63575	1.77637	3.15631	4.0465	5.13191

Table 3. Check points RMSE.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 1	-3.6002	1.74992	3.2191	5.13675	0.370 (259)
point 2	-3.84693	1.67162	3.5076	5.46776	0.155 (430)
point 3	-3.76023	1.96664	2.9129	5.14703	0.486 (210)
point 4	-3.4233	1.69212	3.08113	4.90669	0.268 (512)
point 5	-3.53195	1.78608	3.02776	4.98318	0.415 (326)
Total	3.63575	1.77637	3.15631	5.13191	0.329

Table 4. Check points.

Scale Bars

Label	Distance (m)	Error (m)
point 1_point 2	0.20039	0.000390356
point 3_point 4	0.300429	0.00042896
point 4_point 5	0.0999171	-8.29103e-05
Total		0.000338259

Table 5. Control scale bars.

Digital Elevation Model

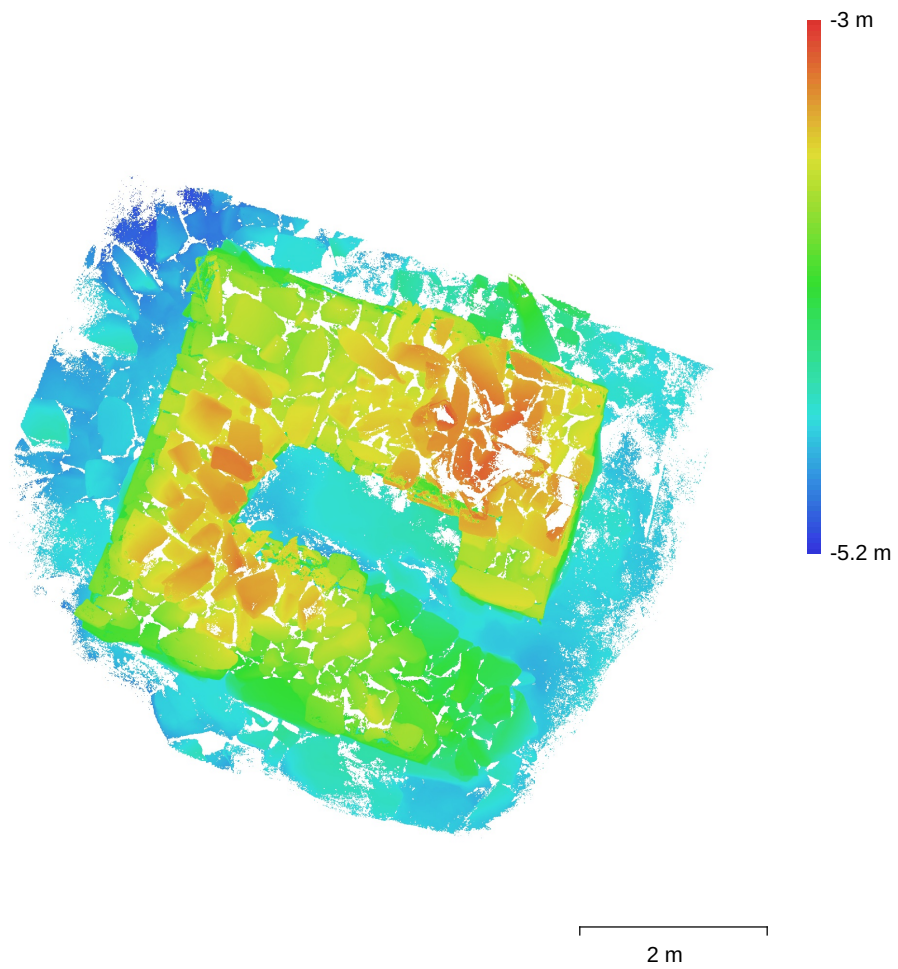


Fig. 4. Reconstructed digital elevation model.

Resolution: 0.465 mm/pix
Point density: 4.62 points/mm²

Processing Parameters

General

Cameras	1687
Aligned cameras	1686
Markers	5
Scale bars	3

Shapes

Polygons	2
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	1,729,769 of 8,987,891
RMS reprojection error	0.149665 (0.417832 pix)
Max reprojection error	1.98634 (8.18154 pix)
Mean key point size	2.70718 pix
Point colors	3 bands, uint8
Key points	7.99 GB
Average tie point multiplicity	3.65042

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	No
Key point limit	60,000
Tie point limit	0
Filter points by mask	Yes
Mask tie points	No
Exclude stationary tie points	No
Guided image matching	No
Adaptive camera model fitting	No
Matching time	2 hours 32 minutes
Matching memory usage	1.69 GB
Alignment time	1 hours 31 minutes
Alignment memory usage	4.18 GB

Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k4, p1, p2
Adaptive camera model fitting	No
Optimization time	22 seconds
Software version	1.7.1.11797
File size	691.36 MB

Depth Maps

Count	1680
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Depth maps generation parameters

Quality	High
Filtering mode	Aggressive
Processing time	5 hours 32 minutes
Memory usage	8.86 GB
Software version	1.7.1.11797
File size	9.38 GB

Dense Point Cloud

Points	294,302,165
Point colors	3 bands, uint8

Depth maps generation parameters

Quality	High
Filtering mode	Aggressive
Processing time	5 hours 32 minutes
Memory usage	8.86 GB
Dense cloud generation parameters	
Processing time	5 hours 27 minutes
Memory usage	32.44 GB
Software version	1.7.1.11797
File size	12.76 GB
Model	
Faces	75,771,986
Vertices	37,890,645
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096, 4 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Aggressive
Processing time	5 hours 32 minutes
Memory usage	8.86 GB
Reconstruction parameters	
Surface type	Arbitrary
Source data	Depth maps
Interpolation	Enabled
Strict volumetric masks	No
Processing time	5 hours 38 minutes
Memory usage	15.12 GB
Texturing parameters	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	No
Enable ghosting filter	Yes
UV mapping time	5 minutes 5 seconds
UV mapping memory usage	9.26 GB
Blending time	3 hours 22 minutes
Blending memory usage	17.46 GB
Software version	1.7.1.11797
File size	3.14 GB
DEM	
Size	27,270 x 26,826
Coordinate system	Local Coordinates (m)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Disabled
Processing time	1 minutes 3 seconds
Memory usage	300.39 MB
Software version	1.7.1.11797
File size	458.19 MB
System	
Software name	Agisoft Metashape Professional
Software version	1.7.1 build 11797
OS	Linux 64 bit
RAM	125.62 GB
CPU	Intel(R) Core(TM) i7-9800X CPU @ 3.80GHz
GPU(s)	Quadro P1000