

20190810_BearTrap_RockPile02

Processing Report

30 Oktober 2021



Survey Data

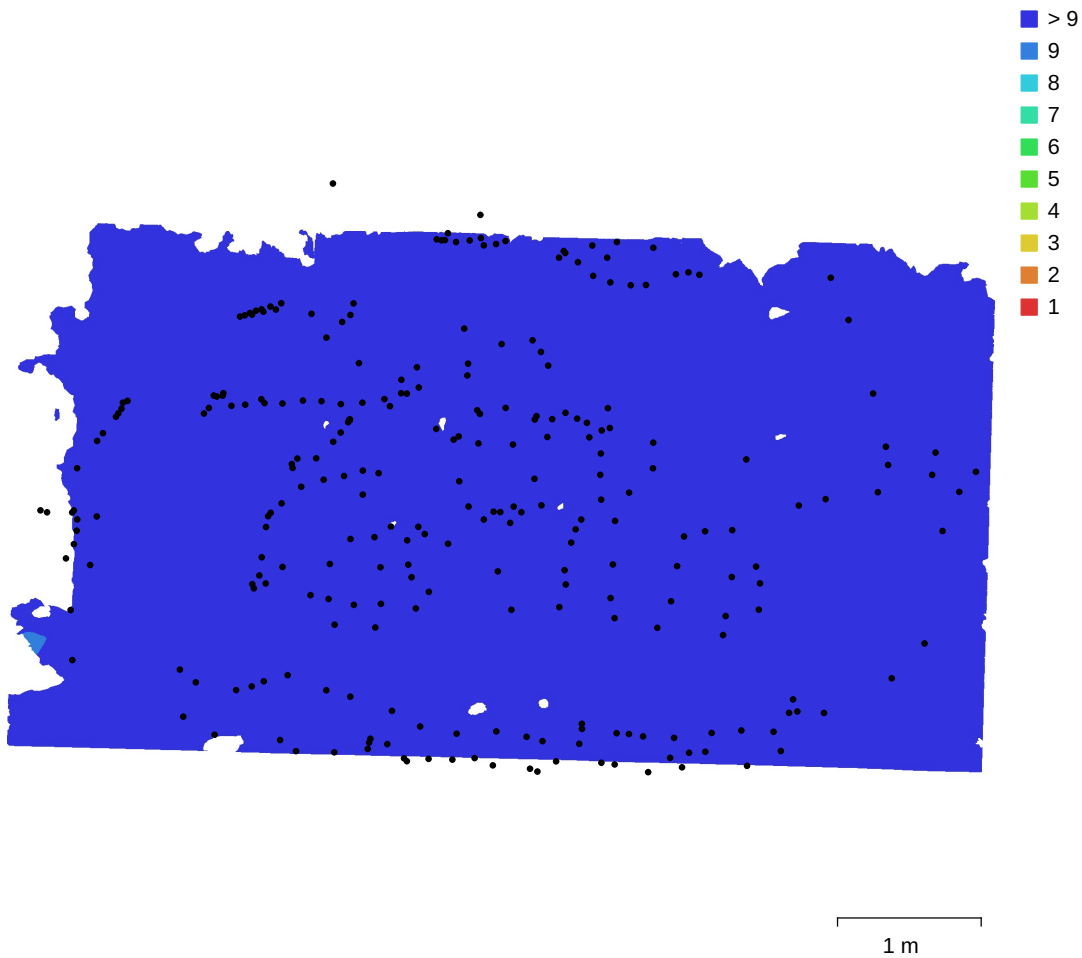


Fig. 1. Camera locations and image overlap.

Number of images:	267	Camera stations:	267
Flying altitude:	1.19 m	Tie points:	610,993
Ground resolution:	0.29 mm/pix	Projections:	1,427,667
Coverage area:	23.1 m ²	Reprojection error:	0.38 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
ILCE-5100, E PZ 16-50mm F3.5-5.6 OSS (16mm)	6000 x 4000	16 mm	4 x 4 μm	No

Table 1. Cameras.

Camera Calibration

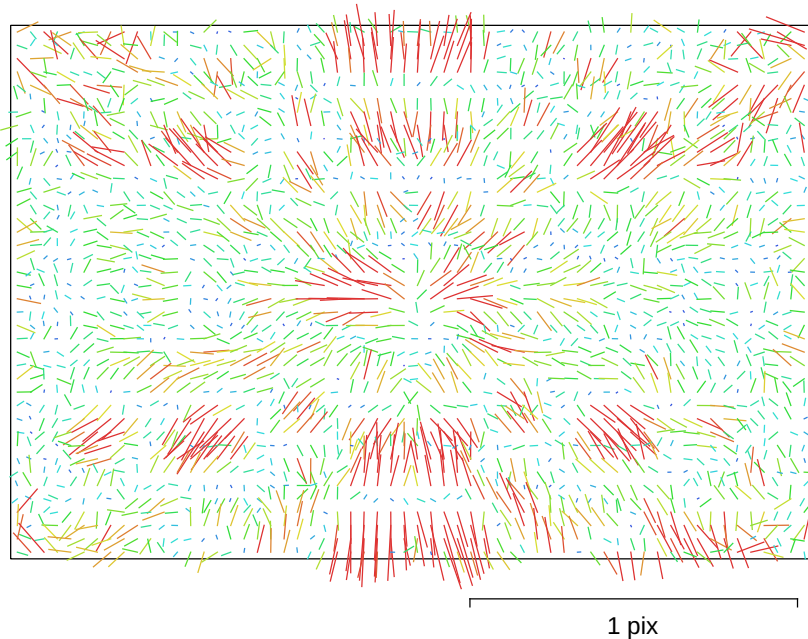


Fig. 2. Image residuals for ILCE-5100, E PZ 16-50mm F3.5-5.6 OSS (16mm).

ILCE-5100, E PZ 16-50mm F3.5-5.6 OSS (16mm)

267 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	P1	P2
F	4027.69	0.046	1.00	-0.00	-0.53	-0.27	-0.03	-0.07	0.15	-0.13	0.01	-0.36
Cx	-16.5651	0.036		1.00	-0.03	0.02	-0.11	0.00	0.00	-0.01	0.86	-0.04
Cy	-88.7098	0.038			1.00	-0.00	0.02	-0.08	0.00	-0.00	-0.03	0.66
B1	-1.89713	0.018				1.00	0.00	-0.01	-0.03	0.03	0.03	0.23
B2	0.155166	0.016					1.00	-0.01	0.00	-0.01	-0.21	0.01
K1	-0.047848	2.4e-05						1.00	-0.95	0.88	0.01	-0.13
K2	0.0485607	7.2e-05							1.00	-0.98	-0.00	0.03
K3	-0.017401	6.6e-05								1.00	-0.00	-0.02
P1	-0.000243022	2.8e-06									1.00	-0.03
P2	-0.00681861	2.3e-06										1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

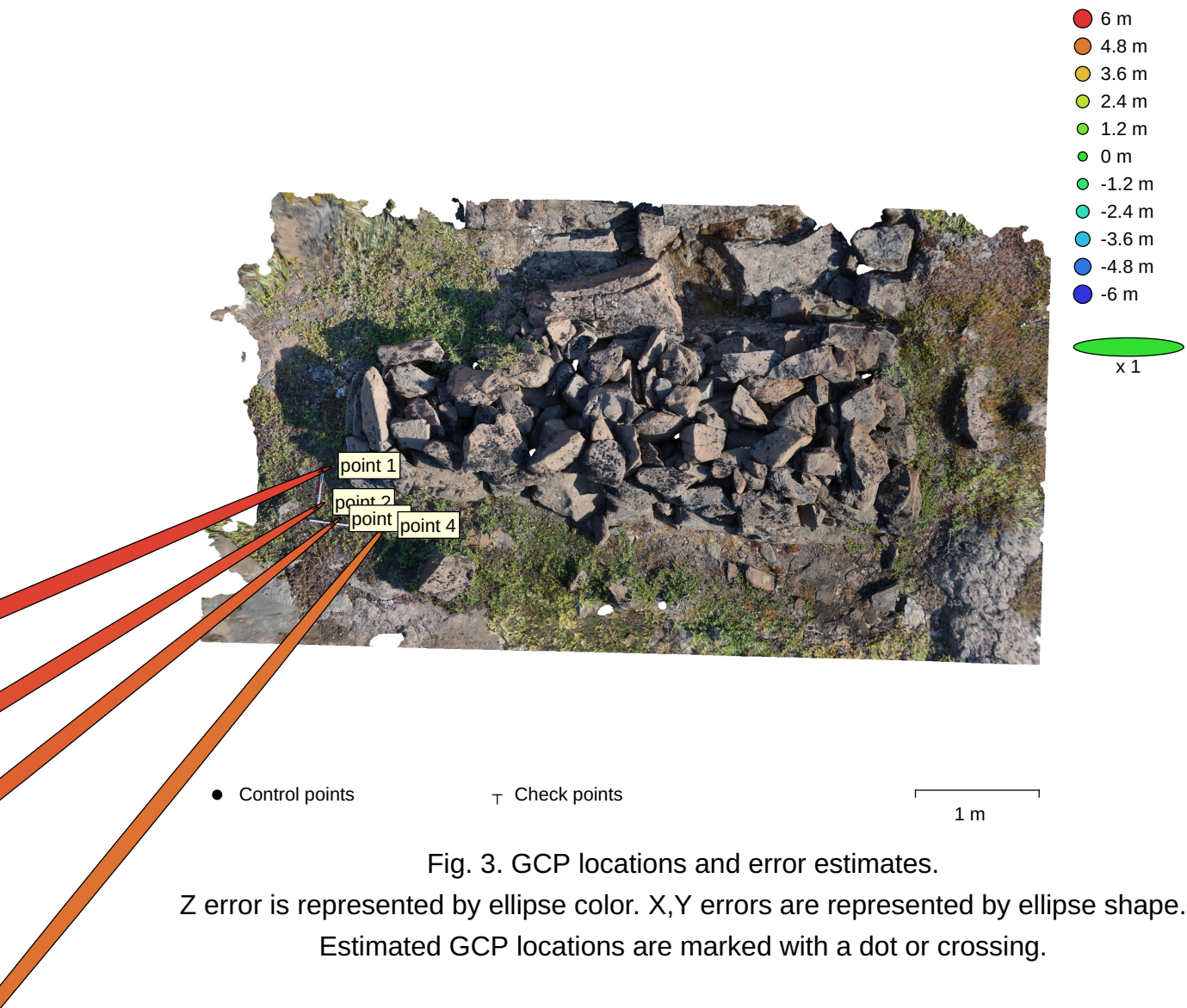


Fig. 3. GCP locations and error estimates.

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)
4	5.87812	4.28259	5.34	7.27275	9.02267

Table 3. Check points RMSE.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 1	6.30863	2.70586	5.76764	8.96583	5.044 (30)
point 2	6.67113	4.08809	5.49101	9.55864	3.602 (23)
point 3	6.02179	4.79866	5.17567	9.27775	3.847 (24)
point 4	4.20055	5.12845	4.88447	8.2343	1.492 (29)
Total	5.87812	4.28259	5.34	9.02267	3.738

Table 4. Check points.

Scale Bars

Label	Distance (m)	Error (m)
point 1_point 2	0.299056	-0.000943582
point 3_point 4	0.400704	0.000704228
Total		0.000832552

Table 5. Control scale bars.

Digital Elevation Model

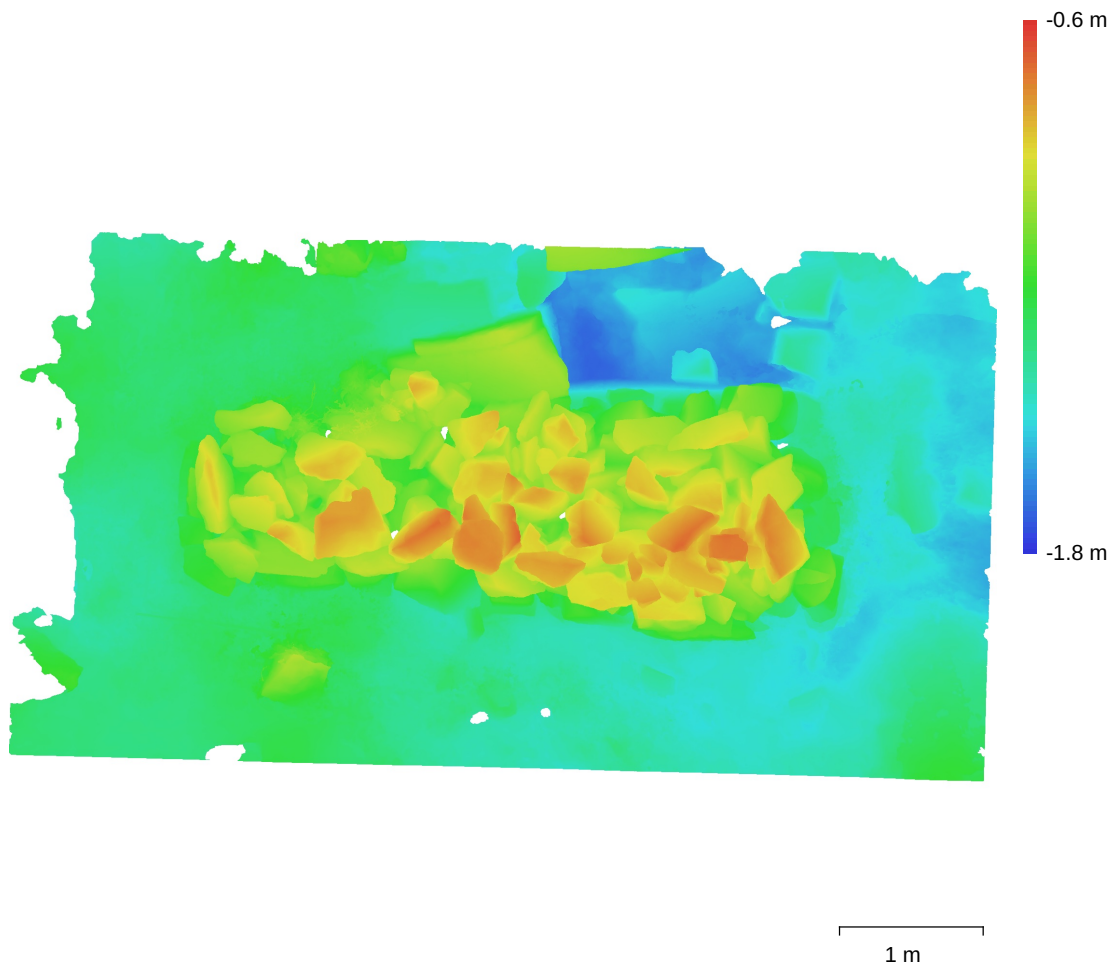


Fig. 4. Reconstructed digital elevation model.

Resolution: 0.499 mm/pix
Point density: 4.02 points/mm²

Processing Parameters

General

Cameras	267
Aligned cameras	267
Markers	4
Scale bars	2
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	610,993 of 3,297,730
RMS reprojection error	0.127417 (0.38025 pix)
Max reprojection error	0.253739 (2.0364 pix)
Mean key point size	2.86281 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	4.56114

Alignment parameters

Accuracy	High
Generic preselection	No
Reference preselection	No
Key point limit	0
Tie point limit	60,000
Filter points by mask	Yes
Mask tie points	Yes
Exclude stationary tie points	No
Guided image matching	No
Adaptive camera model fitting	No
Matching time	15 hours 8 minutes
Matching memory usage	4.74 GB
Alignment time	20 minutes 26 seconds
Alignment memory usage	2.11 GB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	Yes
Optimization time	29 seconds
Software version	1.7.1.11797
File size	252.97 MB

Depth Maps

Count	267
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Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild
Processing time	3 hours 37 minutes
Memory usage	11.14 GB
Software version	1.7.1.11797
File size	7.17 GB

Dense Point Cloud

Points	658,349,769
Point colors	3 bands, uint8

Depth maps generation parameters

Quality	Ultra High
Filtering mode	Mild

Processing time	3 hours 37 minutes
Memory usage	11.14 GB
Dense cloud generation parameters	
Processing time	3 hours 17 minutes
Memory usage	55.14 GB
Software version	1.7.1.11797
File size	9.42 GB
Model	
Faces	68,733,166
Vertices	34,374,050
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096, 4 bands, uint8
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Processing time	3 hours 37 minutes
Memory usage	11.14 GB
Reconstruction parameters	
Surface type	Arbitrary
Source data	Depth maps
Interpolation	Enabled
Strict volumetric masks	No
Processing time	2 hours 57 minutes
Memory usage	14.37 GB
Texturing parameters	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	7 minutes 21 seconds
UV mapping memory usage	9.31 GB
Blending time	37 minutes 29 seconds
Blending memory usage	13.13 GB
Software version	1.7.1.11797
File size	2.86 GB
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