Amphitheatre Todalen

Processing Report
28 February 2021

Survey Data

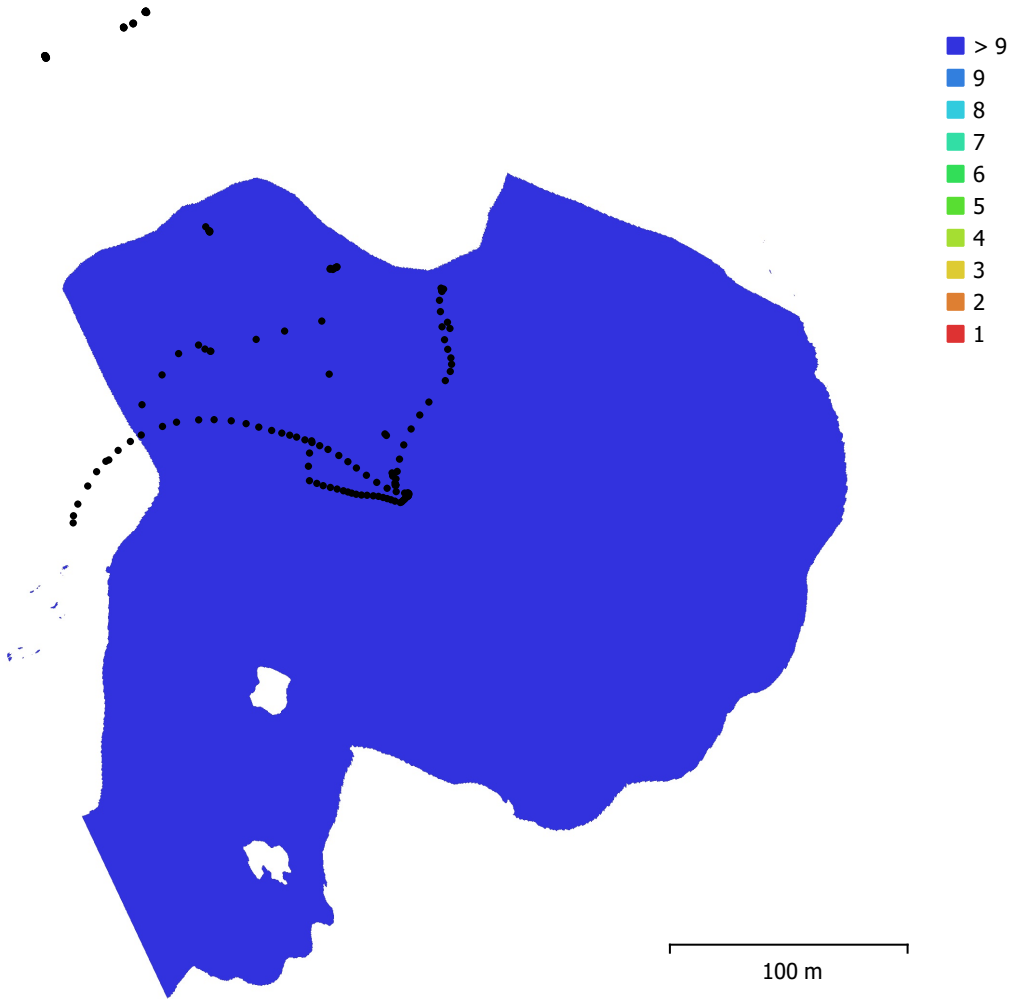

Fig. 1. Camera locations and image overlap.

Number of images:	155	Camera stations:	155
Flying altitude:	67.3 m	Tie points:	84,195
Ground resolution:	2.67 cm/pix	Projections:	544,859
Coverage area:	0.0744 km²	Reprojection error:	0.66 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC300X (3.61mm)	4000 x 3000	3.61 mm	1.56 x 1.56 µm	No

Table 1. Cameras.

Camera Calibration

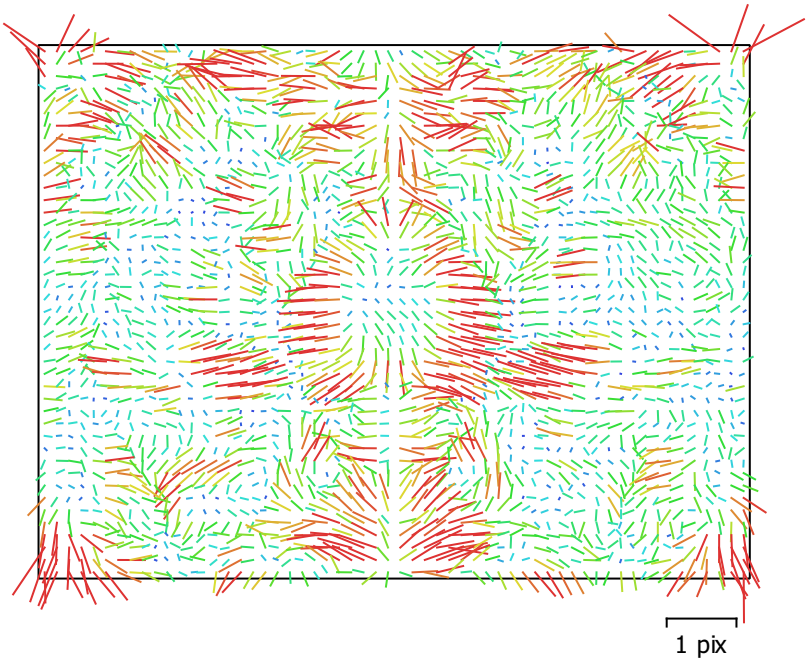

Fig. 2. Image residuals for FC300X (3.61mm).

FC300X (3.61mm)

155 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4000 x 3000**	**3.61 mm**	**1.56 x 1.56 µm**

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	**2312.76**	0.033	1.00	0.02	-0.56	-0.05	0.20	-0.17	0.01	-0.32
Cx	**7.40131**	0.058		1.00	0.00	-0.01	0.03	-0.04	0.98	0.13
Cy	**5.59644**	0.074			1.00	-0.14	0.04	-0.04	0.02	0.73
K1	**-0.0086152**	3.2e-05				1.00	-0.95	0.89	-0.02	-0.12
K2	**0.00296304**	6.6e-05					1.00	-0.98	0.03	0.02
K3	**0.00874654**	4.3e-05						1.00	-0.04	-0.03
P1	**0.000633322**	8.3e-06							1.00	0.13
P2	**-0.000159557**	5.6e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

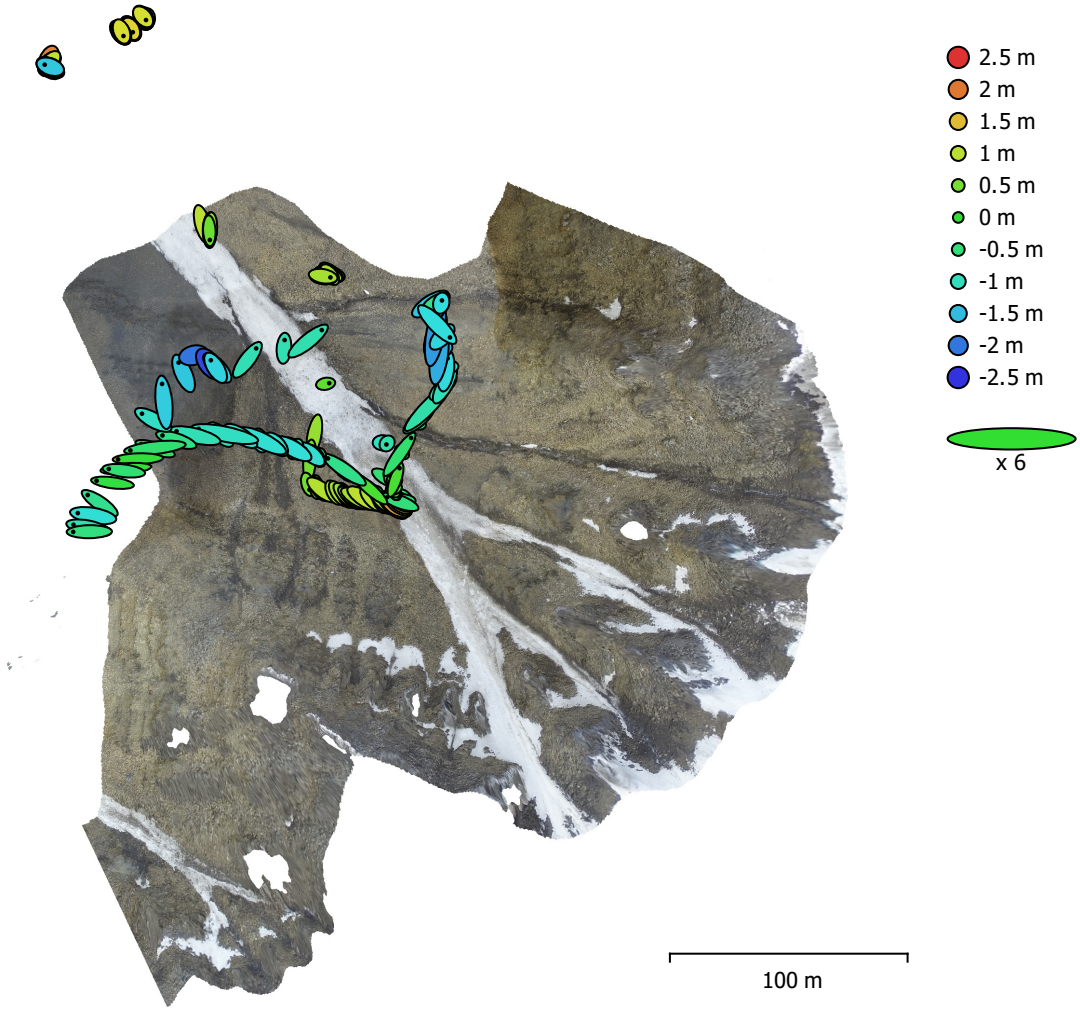

Fig. 3. Camera locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
1.0626	0.935266	1.01766	1.41557	1.74341

Table 3. Average camera location error.
X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

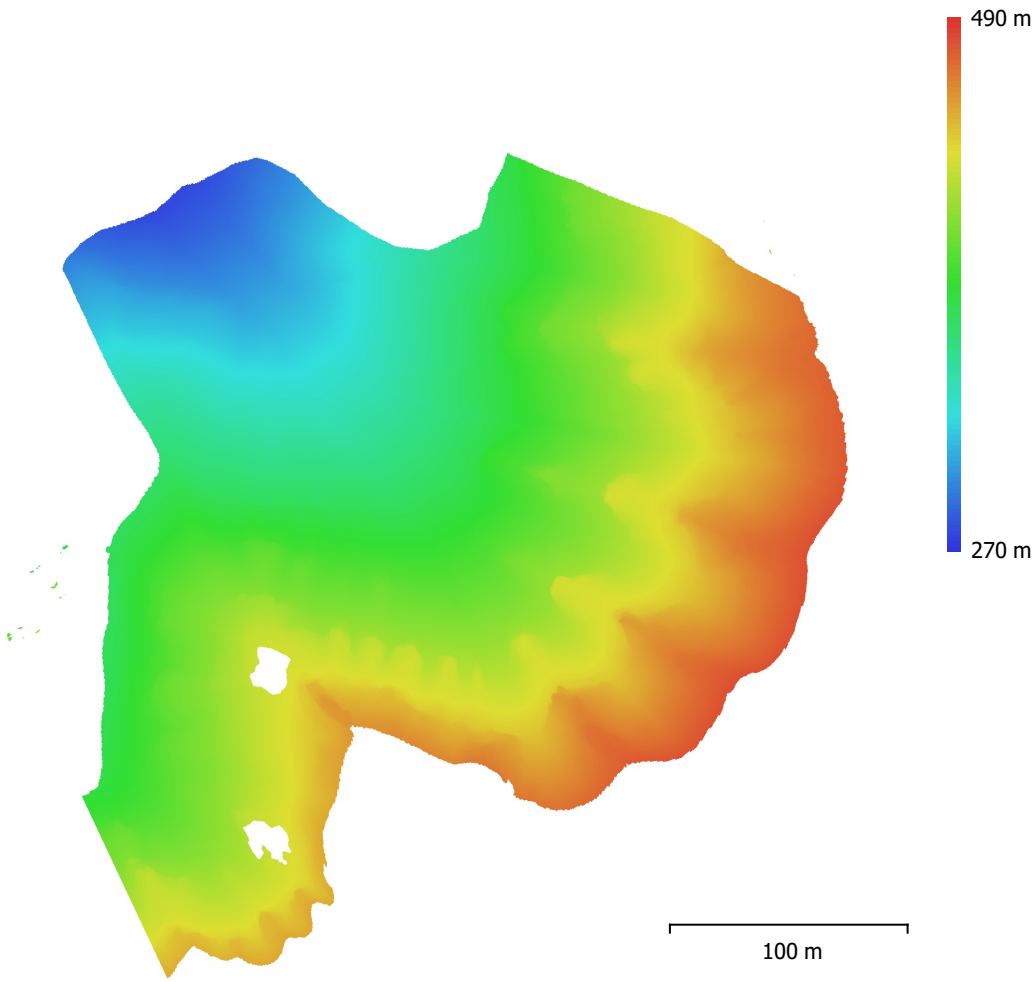

Fig. 4. Reconstructed digital elevation model.

Resolution:	5.33 cm/pix
Point density:	352 points/m²

Processing Parameters

General	
Cameras	155
Aligned cameras	155
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	84,195 of 97,613
RMS reprojection error	0.216598 (0.659607 pix)
Max reprojection error	0.651319 (18.2231 pix)
Mean key point size	3.02972 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	6.82568
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	40,000
Tie point limit	4,000
Guided image matching	No
Adaptive camera model fitting	No
Matching time	17 minutes 18 seconds
Matching memory usage	342.76 MB
Alignment time	2 minutes 8 seconds
Alignment memory usage	78.36 MB
Software version	1.6.1.10009
File size	12.39 MB
Depth Maps	
Count	155
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	30 minutes 59 seconds
Memory usage	2.30 GB
Software version	1.6.1.10009
File size	501.08 MB
Dense Point Cloud	
Points	64,743,147
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	30 minutes 59 seconds
Memory usage	2.30 GB
Dense cloud generation parameters	
Processing time	1 hours 34 minutes
Memory usage	7.58 GB
Software version	1.6.1.10009
File size	825.11 MB
Model	

Faces	1,999,999
Vertices	1,005,604
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096 x 10, 4 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	30 minutes 59 seconds
Memory usage	2.30 GB
Reconstruction parameters	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	2 hours 31 minutes
Memory usage	33.75 GB
Texturing parameters	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	5 minutes 25 seconds
Blending time	9 minutes 25 seconds
Software version	1.6.1.10009
File size	279.58 MB
Tiled Model	
Texture	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	30 minutes 59 seconds
Memory usage	2.30 GB
Reconstruction parameters	
Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	38 minutes 19 seconds
Memory usage	4.13 GB
Software version	1.7.1.11797
File size	328.19 MB
System	
Software name	Agisoft Metashape Professional
Software version	1.7.1 build 11797
OS	Windows 64 bit
RAM	127.78 GB
CPU	Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
GPU(s)	GeForce RTX 2080