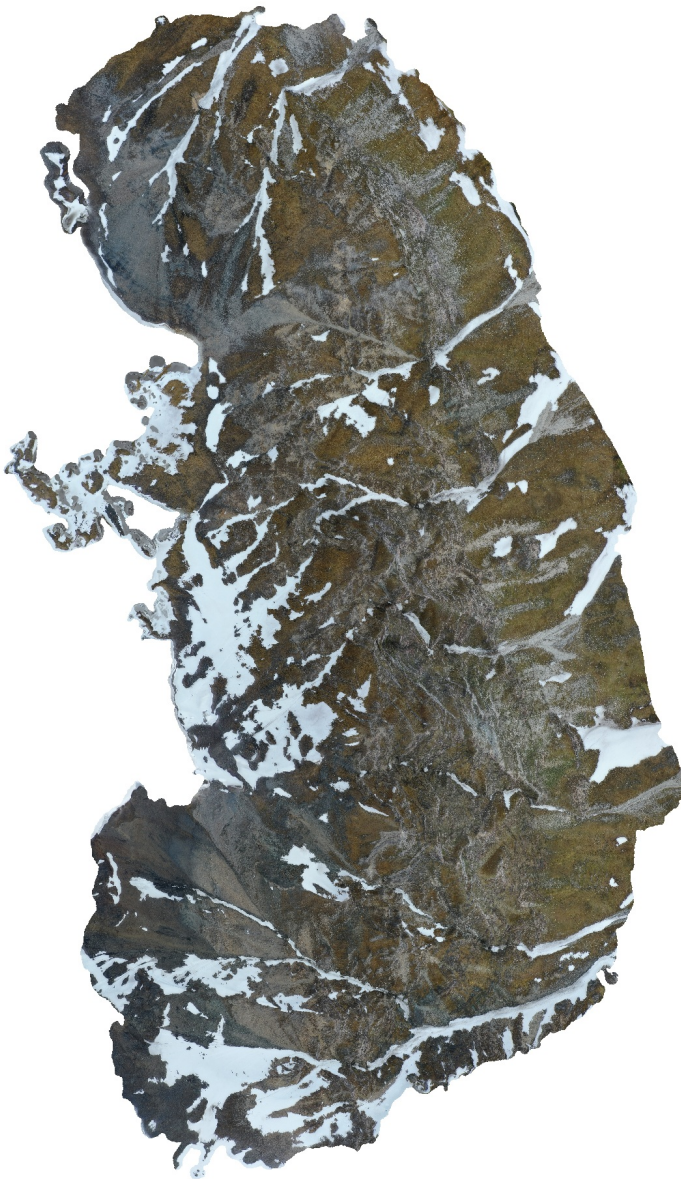


# Observatoriefjellet

Processing Report  
06 December 2021



# Survey Data

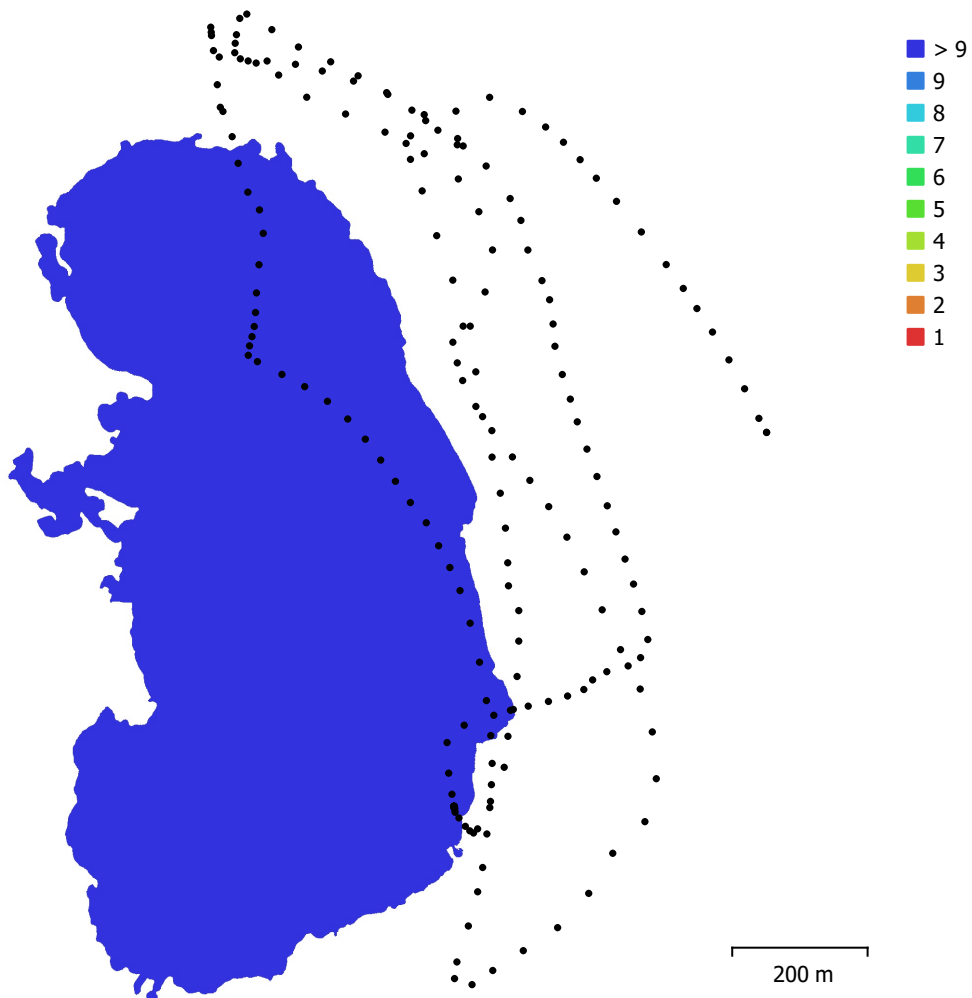


Fig. 1. Camera locations and image overlap.

Number of images:	196	Camera stations:	196
Flying altitude:	388 m	Tie points:	45,158
Ground resolution:	8.36 cm/pix	Projections:	616,888
Coverage area:	0.61 km <sup>2</sup>	Reprojection error:	0.796 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
L1D-20c (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 $\mu\text{m}$	No

Table 1. Cameras.

# Camera Calibration

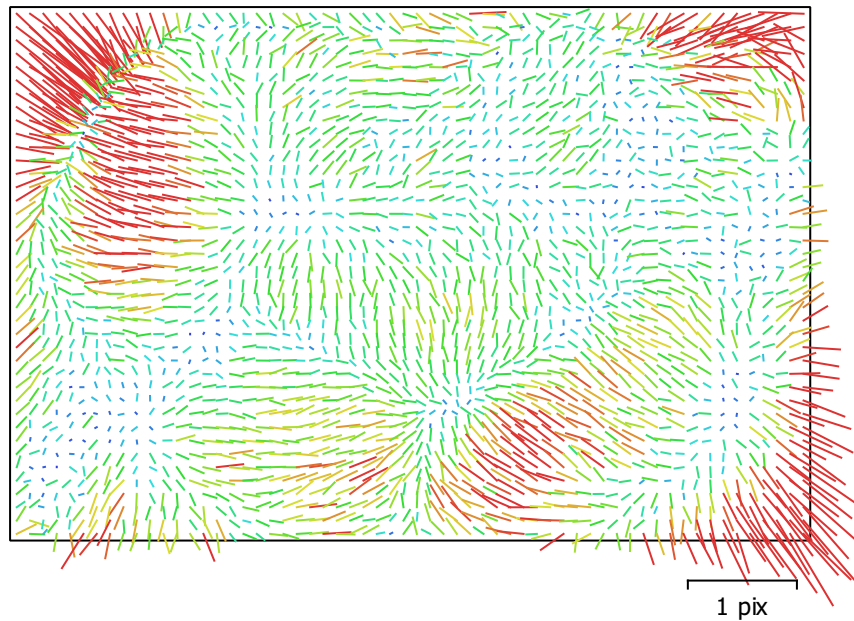


Fig. 2. Image residuals for L1D-20c (10.26mm).

## L1D-20c (10.26mm)

196 images

Type  
Frame

Resolution  
**5472 x 3648**

Focal Length  
**10.26 mm**

Pixel Size  
**2.41 x 2.41  $\mu\text{m}$**

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	P1	P2
<b>F</b>	<b>4376.79</b>	0.081	1.00	-0.01	0.48	-0.87	-0.07	-0.09	0.10	-0.08	-0.03	0.10
<b>Cx</b>	<b>-6.8063</b>	0.073		1.00	0.09	-0.07	0.23	-0.00	-0.00	0.00	0.87	0.16
<b>Cy</b>	<b>-47.4533</b>	0.096			1.00	-0.75	0.01	-0.03	0.01	-0.01	0.06	0.67
<b>B1</b>	<b>0.856125</b>	0.095				1.00	-0.03	-0.02	0.01	-0.01	-0.01	-0.24
<b>B2</b>	<b>-2.29812</b>	0.054					1.00	-0.00	0.02	-0.02	-0.15	-0.02
<b>K1</b>	<b>0.00988804</b>	3.8e-05						1.00	-0.96	0.91	0.01	-0.09
<b>K2</b>	<b>0.0424088</b>	0.00016							1.00	-0.98	-0.02	0.05
<b>K3</b>	<b>-0.044527</b>	0.00021								1.00	0.01	-0.05
<b>P1</b>	<b>-0.000349549</b>	5.4e-06									1.00	0.15
<b>P2</b>	<b>-0.00307494</b>	3.4e-06										1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

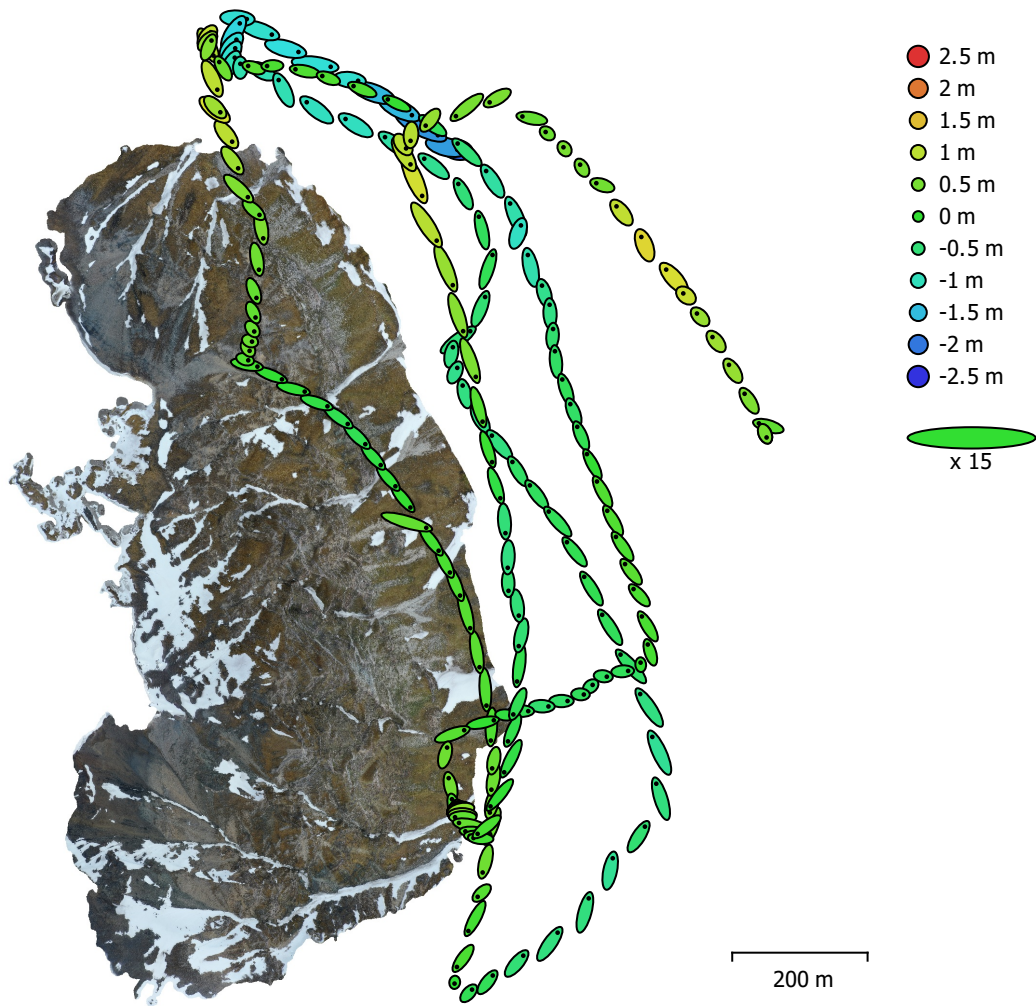


Fig. 3. Camera locations and error estimates.

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)
1.27708	1.61617	0.649633	2.05984	2.15985

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

# Digital Elevation Model

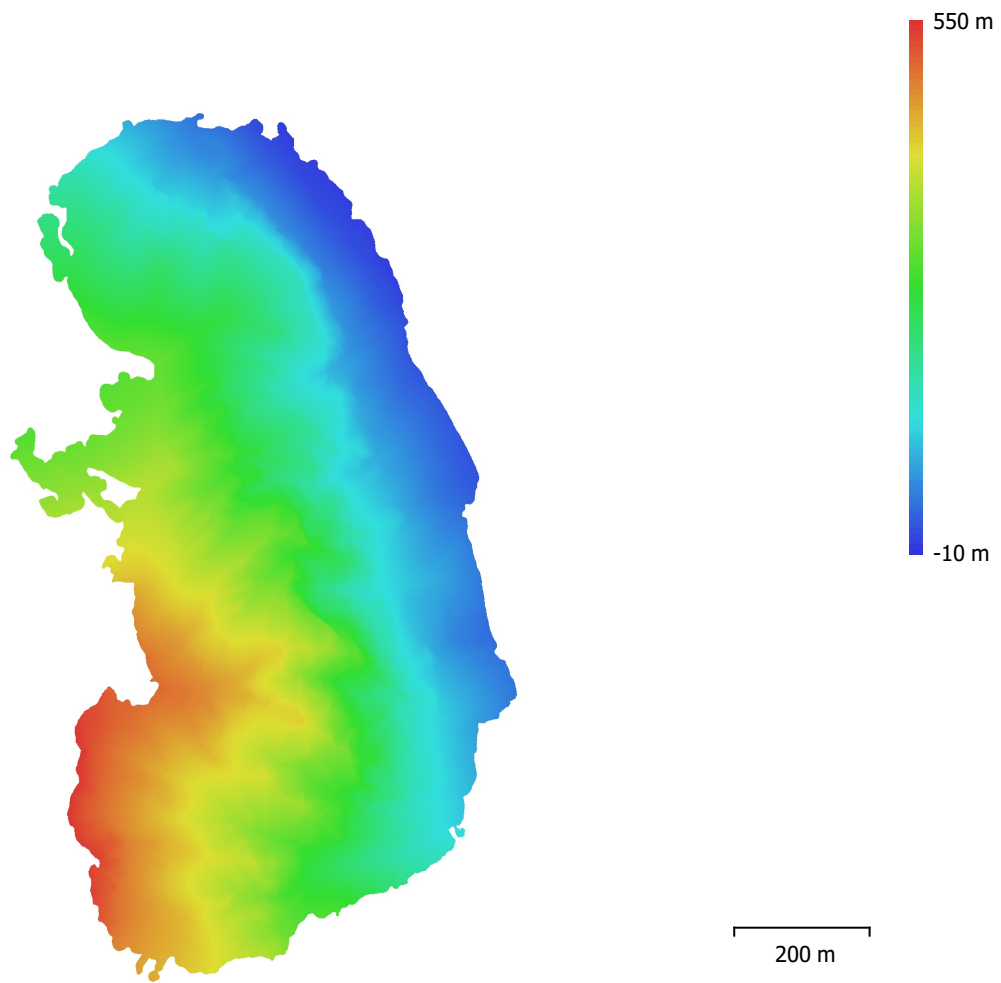


Fig. 4. Reconstructed digital elevation model.

Resolution: 16.7 cm/pix  
Point density: 35.8 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	196
Aligned cameras	196
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	45,158 of 66,085
RMS reprojection error	0.458533 (0.796174 pix)
Max reprojection error	1.88181 (47.1338 pix)
Mean key point size	1.58845 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	16.3856

## Alignment parameters

Accuracy	Highest
Generic preselection	No
Reference preselection	No
Key point limit	40,000
Tie point limit	4,000
Exclude stationary tie points	No
Guided image matching	No
Adaptive camera model fitting	Yes
Matching time	15 seconds
Matching memory usage	875.82 MB
Alignment time	42 seconds
Alignment memory usage	89.93 MB

## Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	9 seconds
Software version	1.7.2.12040
File size	17.77 MB

## Depth Maps

Count	196
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## Depth maps generation parameters

Quality	High
Filtering mode	Mild
Processing time	0 seconds
Memory usage	5.62 GB
Software version	1.7.2.12040
File size	1.37 GB

## Dense Point Cloud

Points	36,496,675
Point colors	3 bands, uint8

## Depth maps generation parameters

Quality	High
Filtering mode	Mild
Processing time	0 seconds
Memory usage	5.62 GB

## Dense cloud generation parameters

Processing time	24 seconds
Memory usage	13.41 GB
Software version	1.7.2.12040
File size	687.60 MB
<b>Model</b>	
Faces	2,389,550
Vertices	1,199,655
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096 x 10, 4 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	0 seconds
Memory usage	5.62 GB
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	20 minutes 56 seconds
Memory usage	18.24 GB
<b>Texturing parameters</b>	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	5 minutes 27 seconds
UV mapping memory usage	3.73 GB
Blending time	3 minutes 41 seconds
Blending memory usage	5.28 GB
Software version	1.7.2.12040
File size	353.94 MB
<b>Tiled Model</b>	
Texture	3 bands, uint8
<b>Reconstruction parameters</b>	
Source data	Mesh
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	7 seconds
Memory usage	3.11 GB
Software version	1.7.2.12040
File size	204.61 MB
<b>System</b>	
Software name	Agisoft Metashape Professional
Software version	1.7.2 build 12040
OS	Windows 64 bit
RAM	127.78 GB
CPU	Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
GPU(s)	GeForce RTX 2080