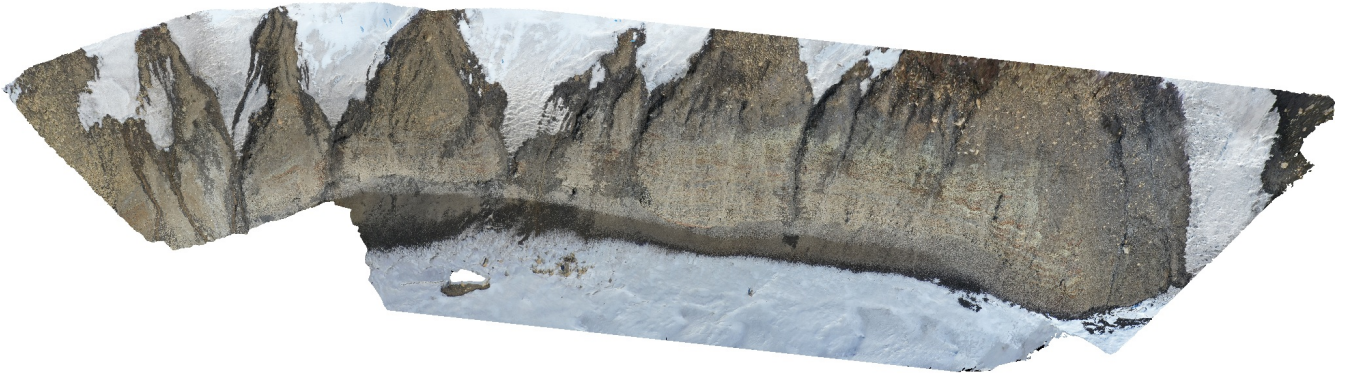


# Helvetiadalen B

Processing Report  
10 March 2021



# Survey Data

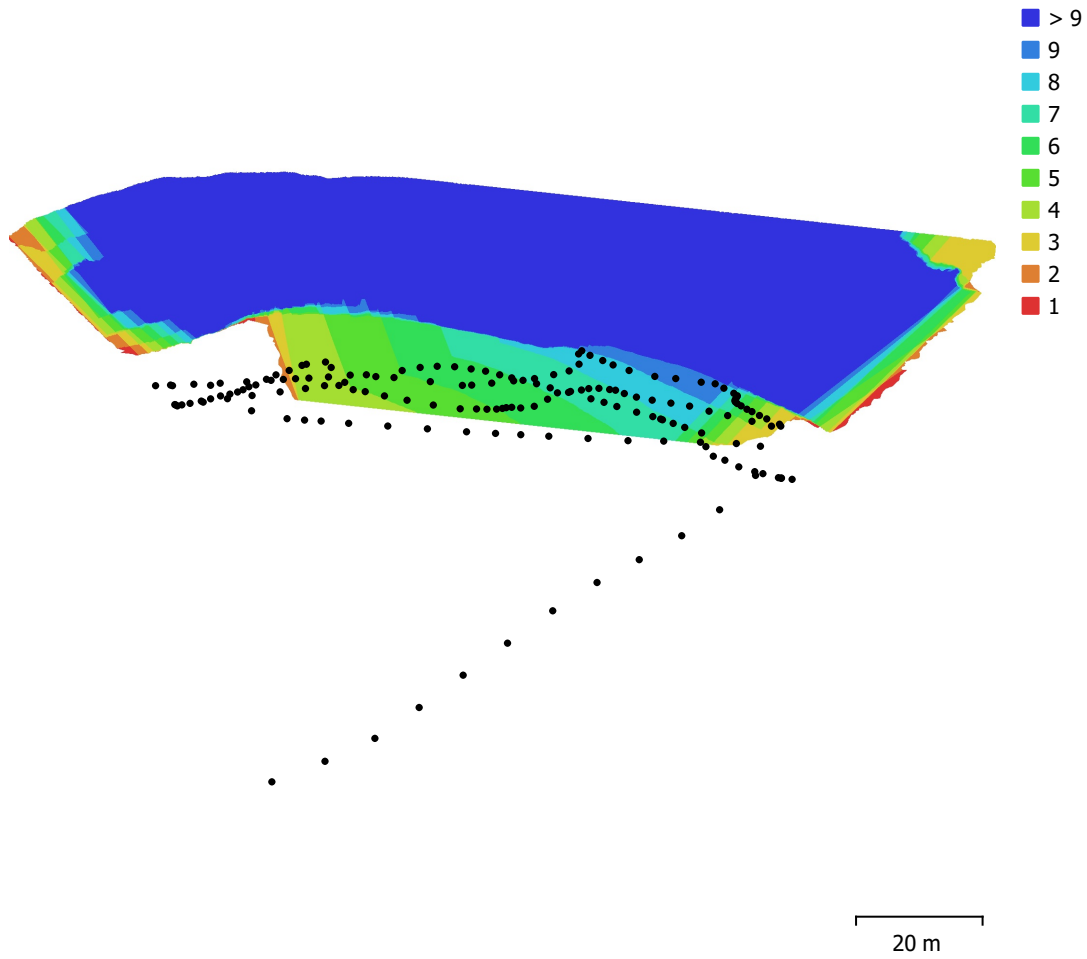


Fig. 1. Camera locations and image overlap.

Number of images:	170	Camera stations:	170
Flying altitude:	19.2 m	Tie points:	110,449
Ground resolution:	4.02 mm/pix	Projections:	581,972
Coverage area:	4.55e+03 m <sup>2</sup>	Reprojection error:	1.07 pix

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

Table 1. Cameras.

# Camera Calibration

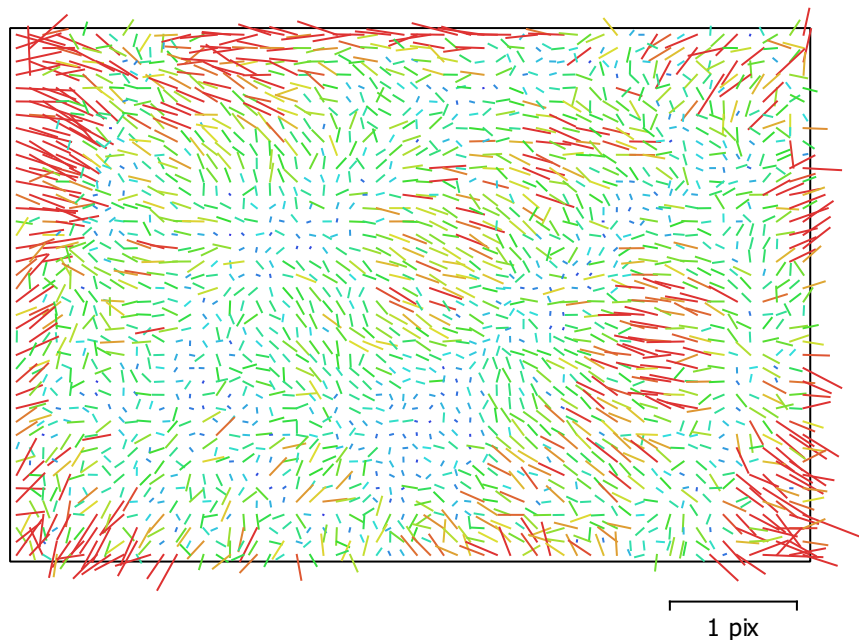


Fig. 2. Image residuals for L1D-20c (10.26mm).

## L1D-20c (10.26mm)

170 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	K1	K2	K3	P1	P2
<b>F</b>	<b>4329.78</b>	0.26	1.00	-0.10	-0.86	0.00	0.09	-0.09	-0.08	-0.24
<b>Cx</b>	<b>4.82483</b>	0.18		1.00	0.11	0.00	-0.00	-0.00	0.82	0.06
<b>Cy</b>	<b>12.8858</b>	0.36			1.00	-0.03	-0.03	0.03	0.05	0.43
<b>K1</b>	<b>0.00461062</b>	6.4e-05				1.00	-0.96	0.90	-0.01	-0.05
<b>K2</b>	<b>0.0296574</b>	0.00027					1.00	-0.98	0.00	-0.00
<b>K3</b>	<b>-0.0304716</b>	0.00035						1.00	-0.01	-0.00
<b>P1</b>	<b>0.000210168</b>	1e-05							1.00	0.04
<b>P2</b>	<b>-0.00340086</b>	5.7e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

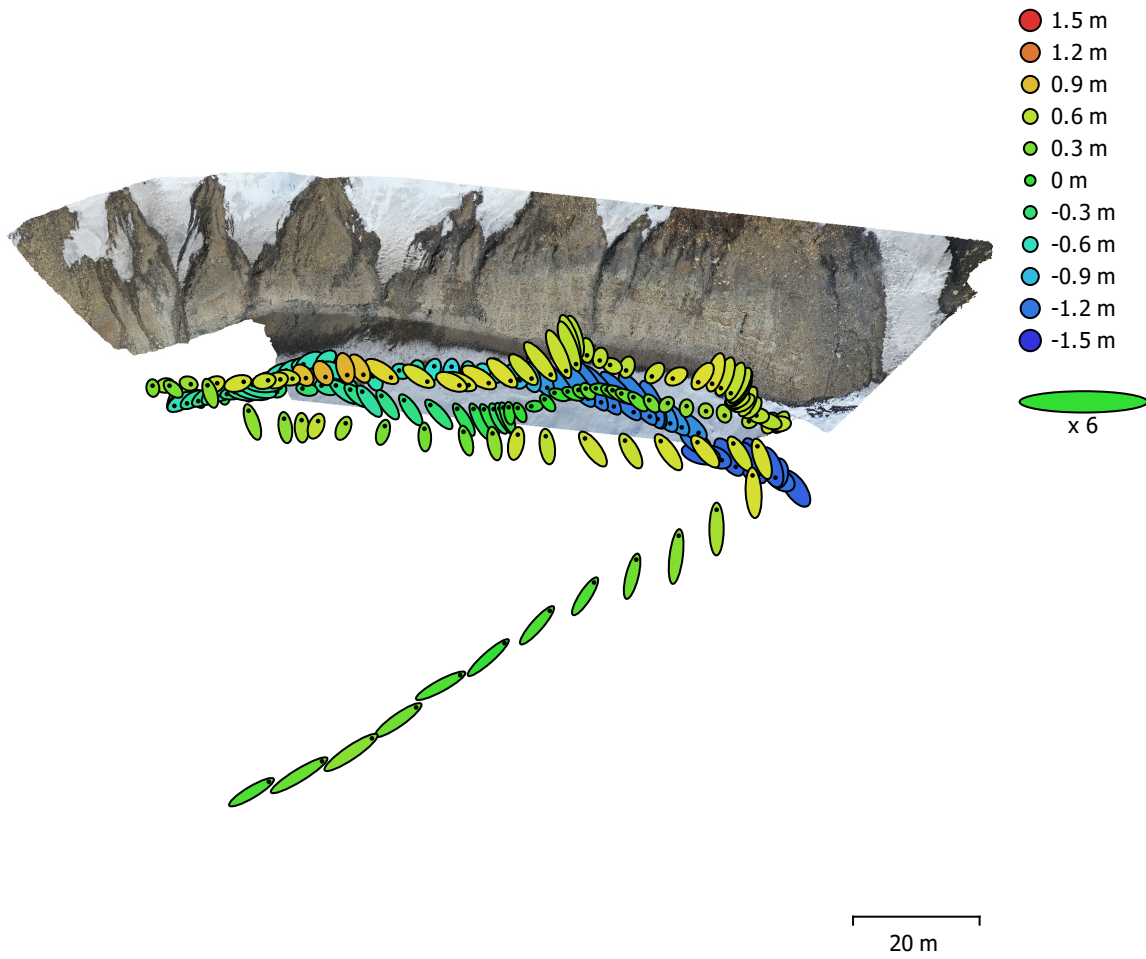


Fig. 3. Camera locations and error estimates.

Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.

Estimated camera locations are marked with a black dot.

<b>X error (cm)</b>	<b>Y error (cm)</b>	<b>Z error (cm)</b>	<b>XY error (cm)</b>	<b>Total error (cm)</b>
35.3009	43.2317	64.9989	55.8134	85.6737

Table 3. Average camera location error.

X - Longitude, Y - Latitude, Z - Altitude.

# Digital Elevation Model

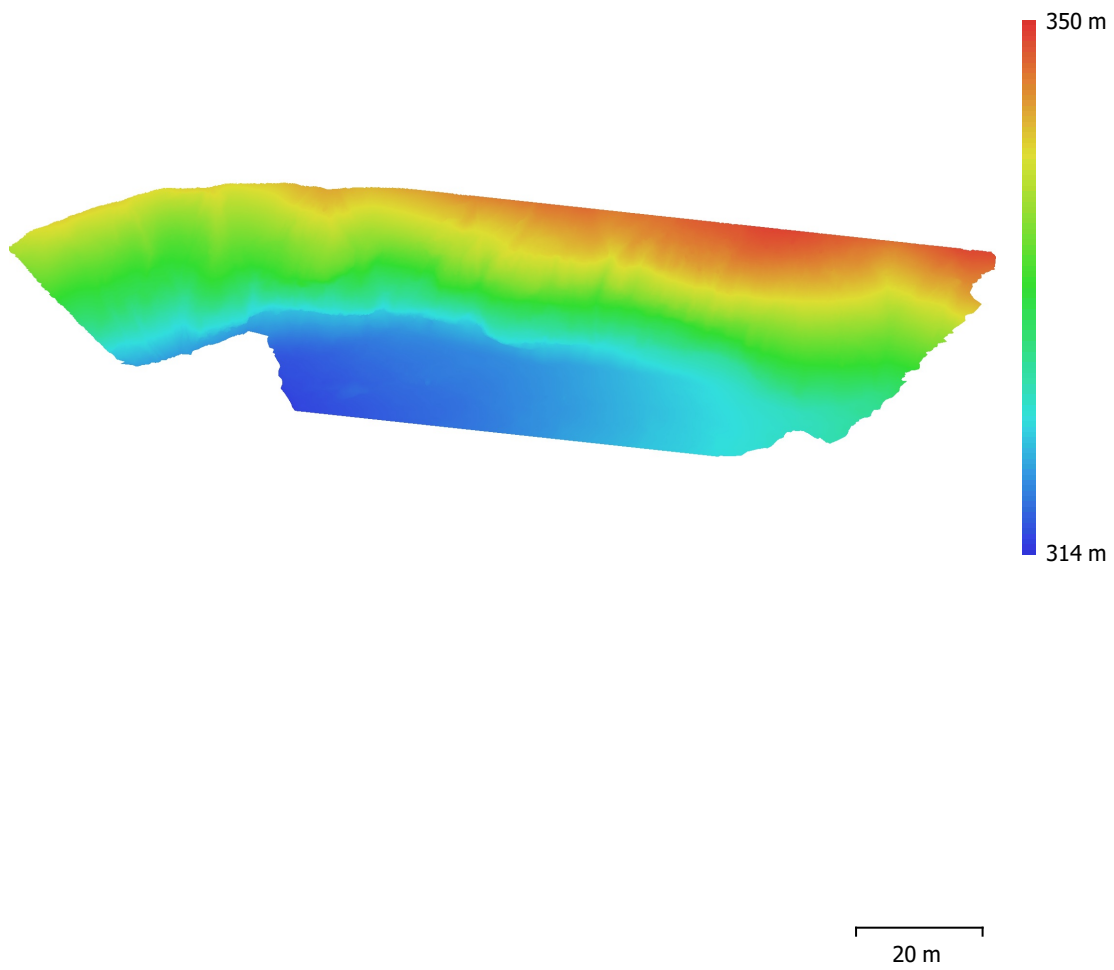


Fig. 4. Reconstructed digital elevation model.

Resolution: 8.84 cm/pix  
Point density: 128 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	170
Aligned cameras	170
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	110,449 of 131,809
RMS reprojection error	0.590466 (1.06814 pix)
Max reprojection error	2.42656 (32.24 pix)
Mean key point size	1.76482 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	5.86054

## Alignment parameters

Accuracy	Highest
Generic preselection	No
Reference preselection	No
Key point limit	40,000
Tie point limit	4,000
Guided image matching	No
Adaptive camera model fitting	No
Matching time	1 hours 34 minutes
Matching memory usage	667.70 MB
Alignment time	1 minutes 20 seconds
Alignment memory usage	86.30 MB

## Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	3 seconds
Software version	1.6.3.10732
File size	14.71 MB

## Depth Maps

Count	170
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	51 minutes 51 seconds
Memory usage	3.88 GB
Software version	1.6.3.10732
File size	1013.27 MB

## Dense Point Cloud

Points	122,535,933
Point colors	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	51 minutes 51 seconds
Memory usage	3.88 GB
<b>Dense cloud generation parameters</b>	
Processing time	1 hours 29 minutes

Memory usage	8.54 GB
Software version	1.6.3.10732
File size	1.68 GB
<b>Model</b>	
Faces	999,999
Vertices	502,028
Vertex colors	3 bands, uint8
Texture	16,384 x 16,384 x 2, 4 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	51 minutes 51 seconds
Memory usage	3.88 GB
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Depth maps
Interpolation	Enabled
Strict volumetric masks	No
Processing time	3 hours 9 minutes
Memory usage	8.05 GB
<b>Texturing parameters</b>	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	16,384
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	10 minutes 19 seconds
Blending time	23 minutes 51 seconds
Software version	1.6.3.10732
File size	639.04 MB
<b>Tiled Model</b>	
Texture	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	51 minutes 51 seconds
Memory usage	3.88 GB
<b>Reconstruction parameters</b>	
Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	1 hours 44 minutes
Memory usage	3.68 GB
Software version	1.7.1.11797
File size	607.64 MB
<b>System</b>	
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