

# Helvetiadalen A

Processing Report  
10 March 2021



# Survey Data

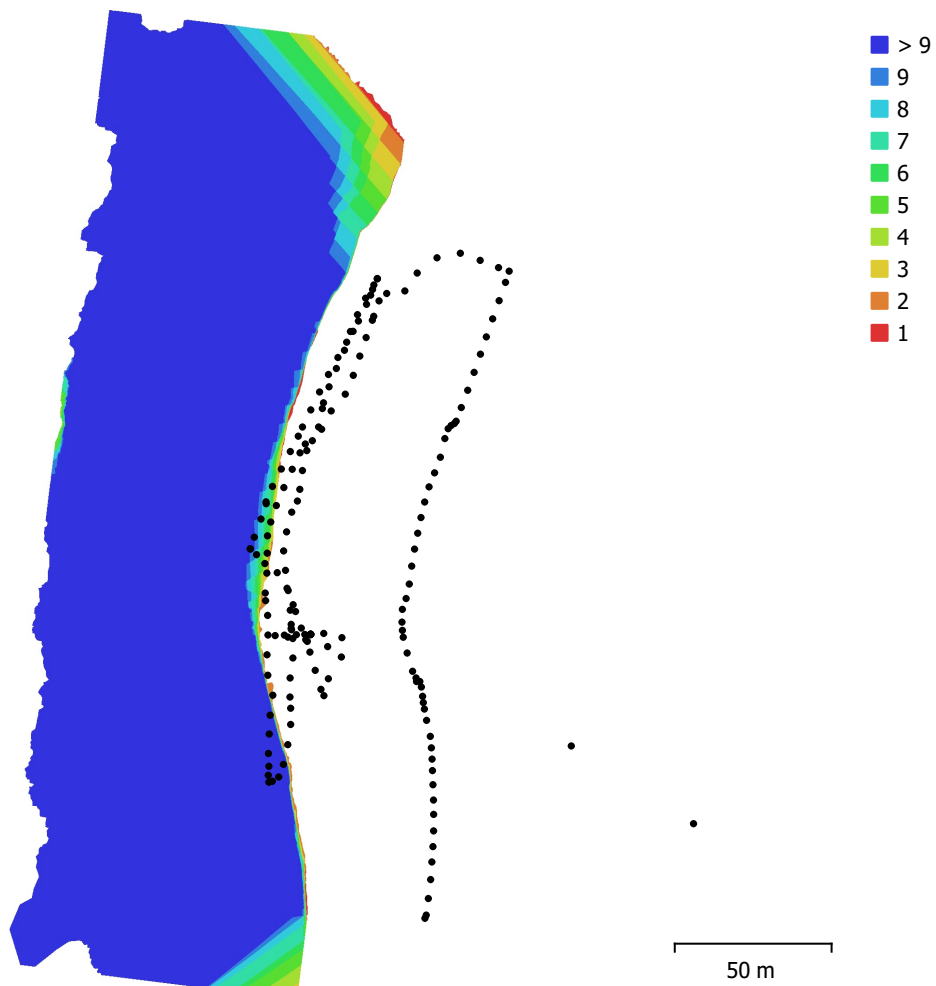


Fig. 1. Camera locations and image overlap.

Number of images:	179	Camera stations:	179
Flying altitude:	54.8 m	Tie points:	216,054
Ground resolution:	1.17 cm/pix	Projections:	1,291,707
Coverage area:	0.0242 km <sup>2</sup>	Reprojection error:	0.592 pix

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

Table 1. Cameras.

# Camera Calibration

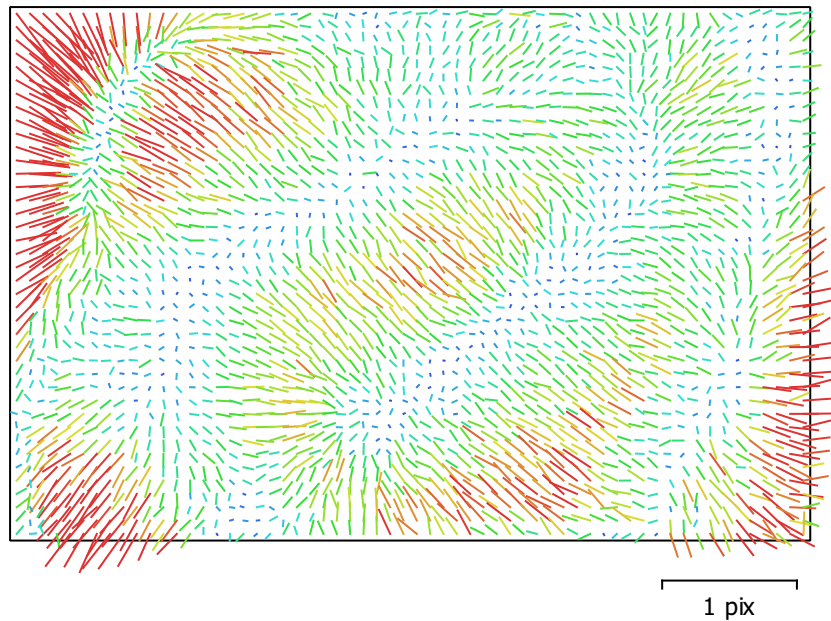


Fig. 2. Image residuals for L1D-20c (10.26mm).

## L1D-20c (10.26mm)

179 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>4344.02</b>	0.094	1.00	-0.08	-0.23	-0.65	0.13	-0.08	0.06	-0.06	-0.02	-0.13
<b>Cx</b>	<b>11.1629</b>	0.065		1.00	-0.01	0.10	0.07	0.02	-0.02	0.02	0.82	-0.07
<b>Cy</b>	<b>-40.0686</b>	0.14			1.00	-0.49	0.05	-0.02	-0.02	0.03	0.02	0.45
<b>B1</b>	<b>19.8992</b>	0.11				1.00	-0.09	0.05	0.02	-0.02	0.02	-0.08
<b>B2</b>	<b>-6.58649</b>	0.081					1.00	-0.02	0.00	-0.00	-0.29	0.02
<b>K1</b>	<b>0.00554821</b>	2.4e-05						1.00	-0.95	0.90	0.02	-0.08
<b>K2</b>	<b>0.0433035</b>	0.0001							1.00	-0.98	-0.01	0.01
<b>K3</b>	<b>-0.0476953</b>	0.00013								1.00	0.01	-0.01
<b>P1</b>	<b>0.000499572</b>	4.7e-06									1.00	-0.04
<b>P2</b>	<b>-0.00361013</b>	2.7e-06										1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

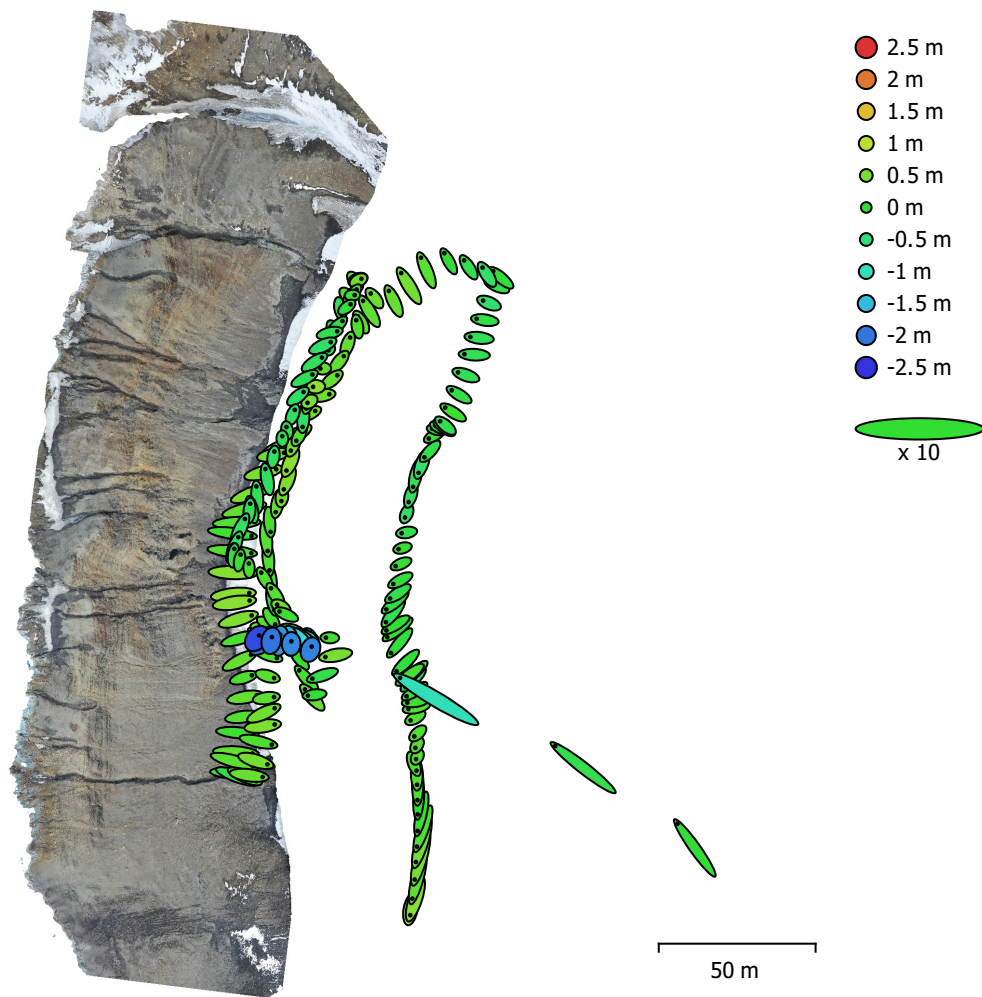


Fig. 3. Camera locations and error estimates.

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>
53.7515	46.065	51.7934	70.7899	87.7142

Table 3. Average camera location error.

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

# Digital Elevation Model

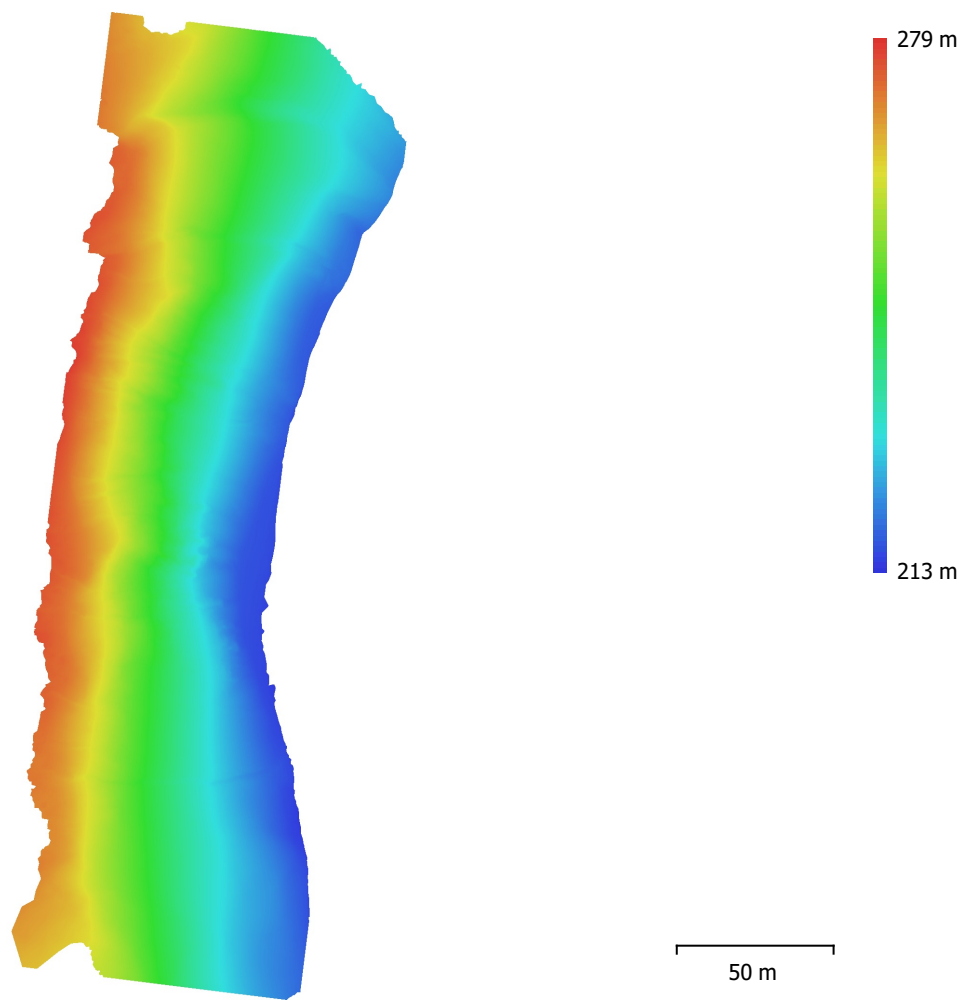


Fig. 4. Reconstructed digital elevation model.

Resolution: 19.9 cm/pix  
Point density: 25.3 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	179
Aligned cameras	179
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	216,054 of 257,067
RMS reprojection error	0.355114 (0.592046 pix)
Max reprojection error	1.34405 (30.3704 pix)
Mean key point size	1.62451 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	7.60489

## Alignment parameters

Accuracy	Highest
Generic preselection	No
Reference preselection	No
Key point limit	40,000
Tie point limit	10,000
Guided image matching	No
Adaptive camera model fitting	Yes
Matching time	1 hours 37 minutes
Matching memory usage	723.68 MB
Alignment time	4 minutes 56 seconds
Alignment memory usage	131.30 MB

## Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	Yes
Optimization time	13 seconds
Software version	1.6.3.10732
File size	35.53 MB

## Depth Maps

Count	179
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	1 hours 42 minutes
Memory usage	6.68 GB
Software version	1.6.3.10732
File size	946.13 MB

## Dense Point Cloud

Points	73,162,300
Point colors	3 bands, uint8

## Depth maps generation parameters

Quality	High
Filtering mode	Mild
Processing time	1 hours 42 minutes
Memory usage	6.68 GB

## Dense cloud generation parameters

Processing time	1 hours 15 minutes
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Memory usage	9.11 GB
Software version	1.6.3.10732
File size	931.93 MB
<b>Model</b>	
Faces	999,999
Vertices	500,931
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	1 hours 42 minutes
Memory usage	6.68 GB
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Depth maps
Interpolation	Enabled
Strict volumetric masks	No
Processing time	1 hours 51 minutes
Memory usage	11.15 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	6 minutes 32 seconds
Blending time	23 minutes 0 seconds
Software version	1.6.3.10732
File size	606.45 MB
<b>Tiled Model</b>	
Texture	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	1 hours 42 minutes
Memory usage	6.68 GB
<b>Reconstruction parameters</b>	
Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	1 hours 13 minutes
Memory usage	3.07 GB
Software version	1.7.1.11797
File size	357.16 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