

# Esperantodalen

**Filtered by:**

**Reprojection error: 0.3;**

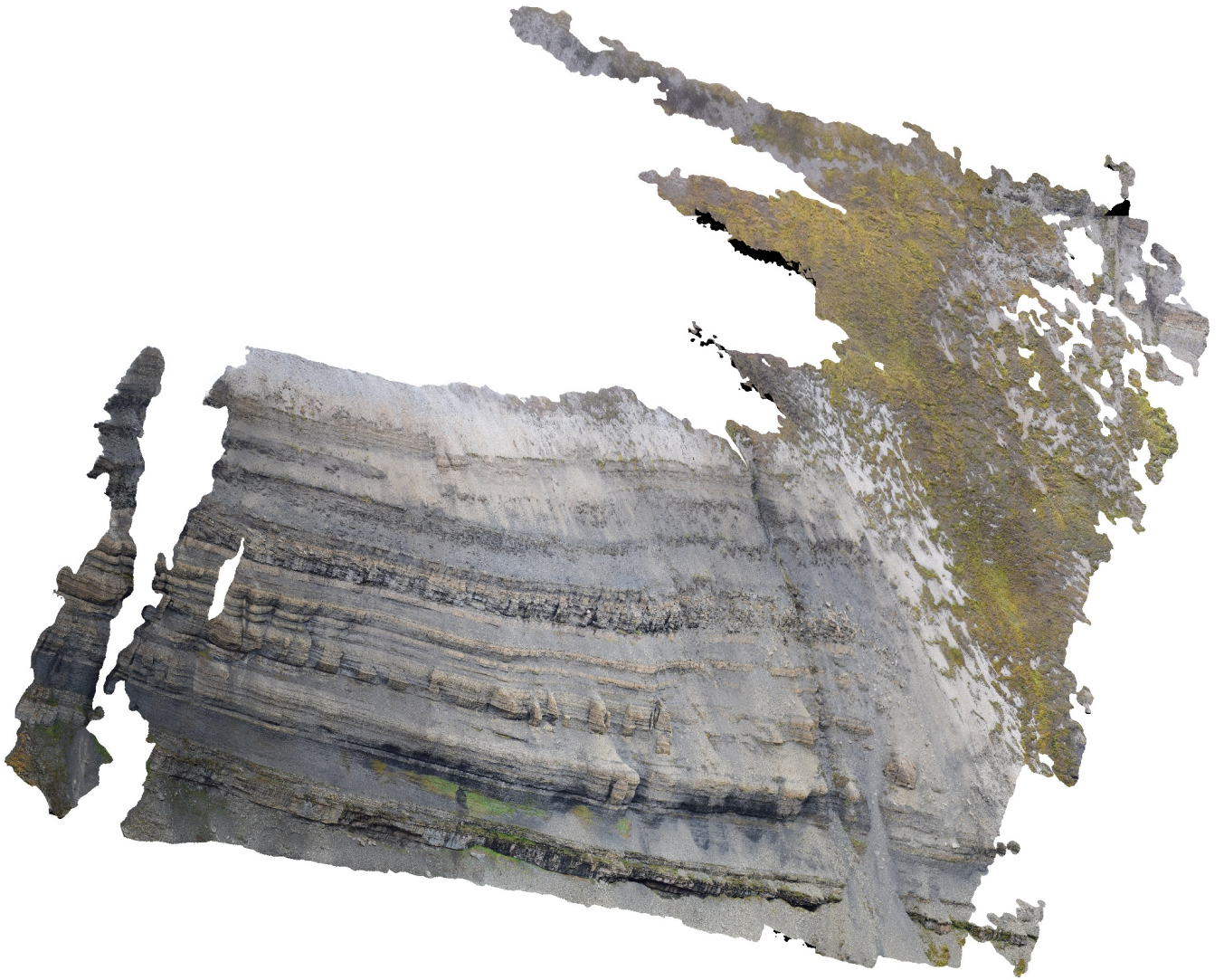
**Reconstruction error: 10;**

**Projection accuracy: 3;**

**Dense cloud confidence: 3-255;**

**Connected component size: 5%**

**16 February 2022**



# Survey Data

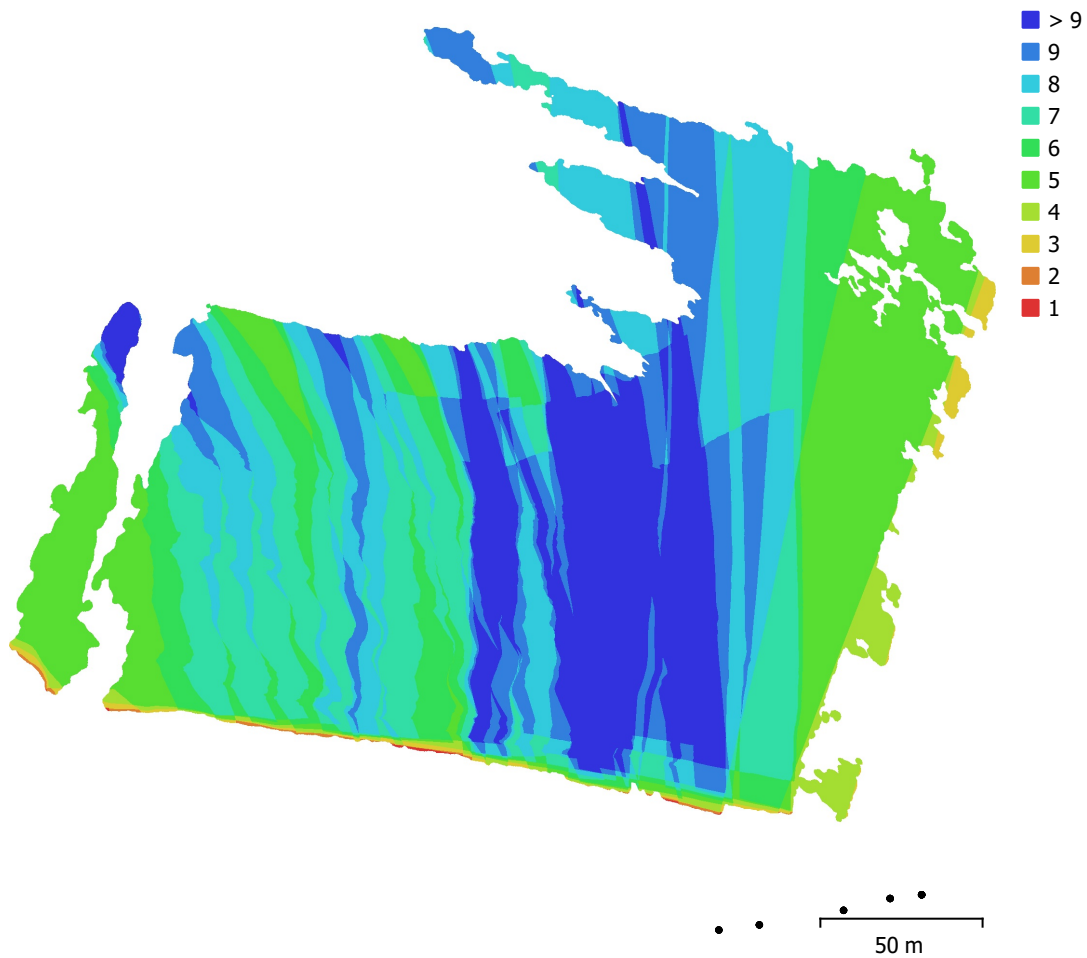


Fig. 1. Camera locations and image overlap.

Number of images:	36	Camera stations:	36
Flying altitude:	203 m	Tie points:	52,639
Ground resolution:	1.75 cm/pix	Projections:	218,324
Coverage area:	0.0382 km <sup>2</sup>	Reprojection error:	0.201 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
NIKON D5300 (50mm)	6000 x 4000	50 mm	4 x 4 $\mu$ m	No

Table 1. Cameras.

# Camera Calibration

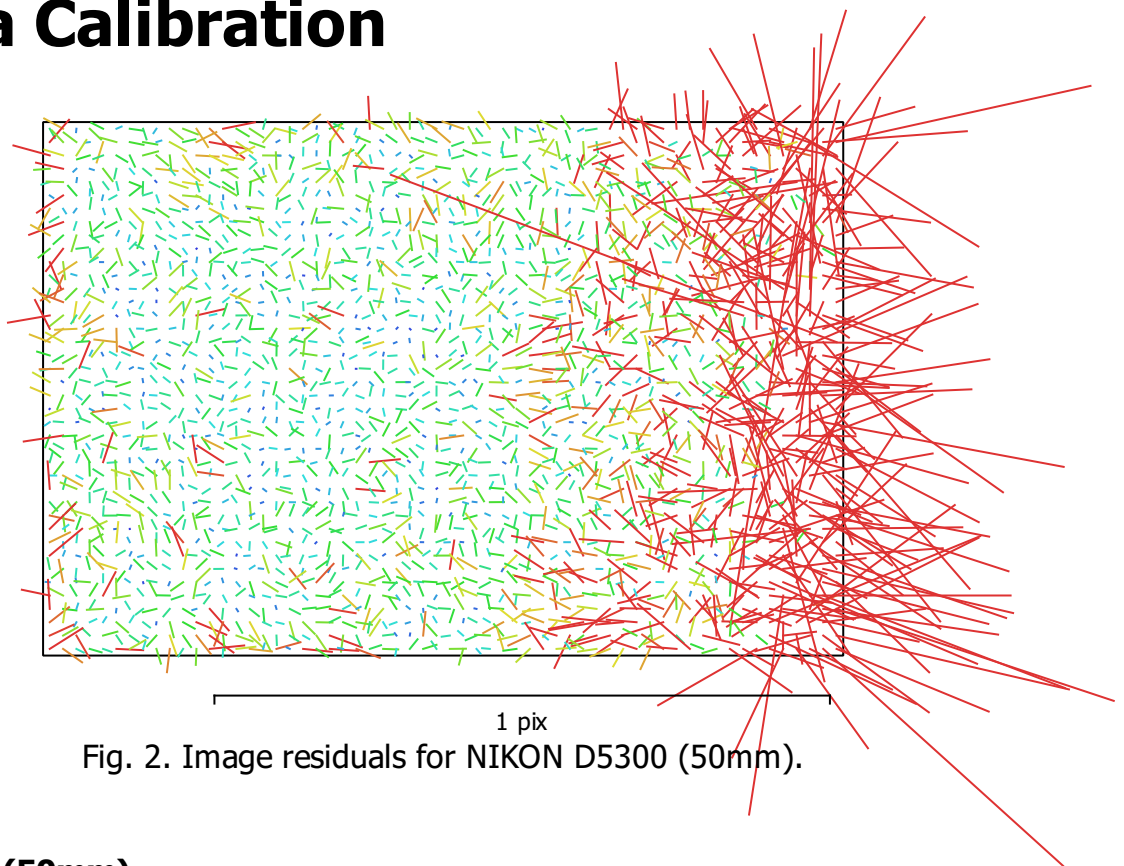


Fig. 2. Image residuals for NIKON D5300 (50mm).

## NIKON D5300 (50mm)

36 images

Type  
Frame

Resolution  
**6000 x 4000**

Focal Length  
**50 mm**

Pixel Size  
**4 x 4 μm**

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
<b>F</b>	<b>12690.1</b>	0.63	1.00	0.52	0.26	0.05	-0.02	0.04	0.46	0.26
<b>Cx</b>	<b>-39.8755</b>	1.4		1.00	0.11	0.07	-0.06	0.07	0.91	0.12
<b>Cy</b>	<b>-15.4048</b>	1.3			1.00	0.02	-0.00	0.01	0.14	0.98
<b>K1</b>	<b>-0.0112569</b>	0.00029				1.00	-0.96	0.91	0.10	0.01
<b>K2</b>	<b>0.286093</b>	0.0084					1.00	-0.98	-0.06	0.00
<b>K3</b>	<b>-1.34568</b>	0.074						1.00	0.06	0.01
<b>P1</b>	<b>-0.00111538</b>	2.8e-05							1.00	0.13
<b>P2</b>	<b>-0.000437185</b>	3.1e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

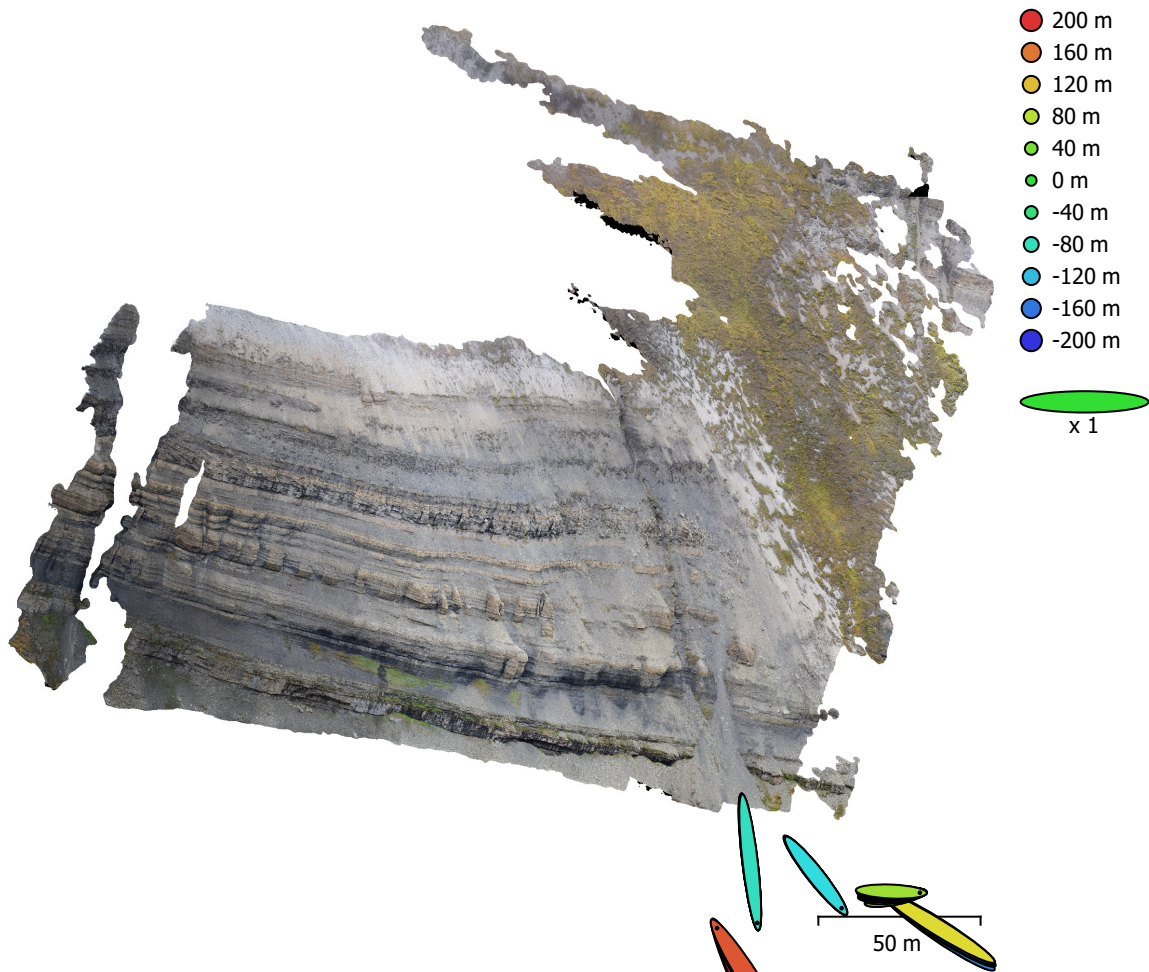


Fig. 3. Camera locations and error estimates.  
 Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.  
 Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
19.4281	24.3212	110.83	31.1283	115.119

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

# Digital Elevation Model

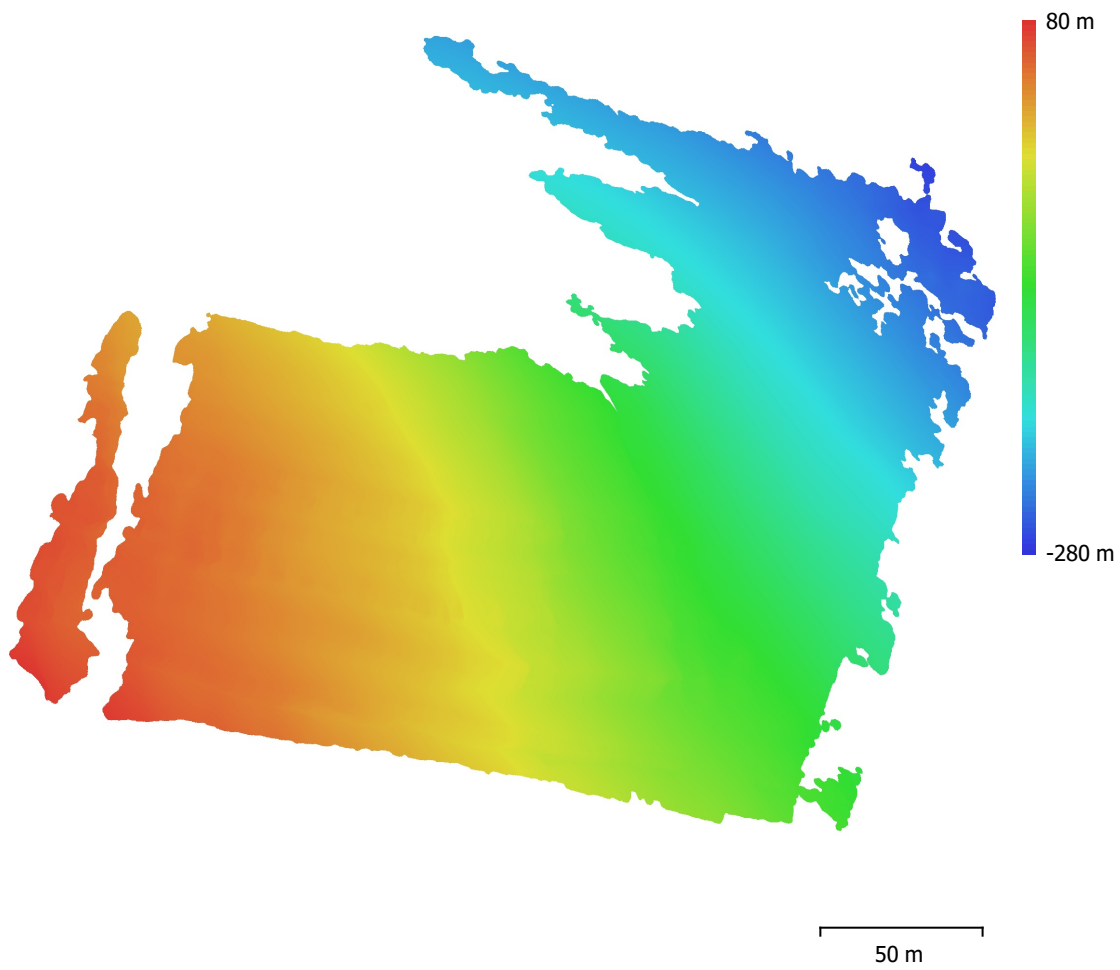


Fig. 4. Reconstructed digital elevation model.

Resolution: 3.51 cm/pix  
Point density: 813 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	36
Aligned cameras	36
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	52,639 of 231,734
RMS reprojection error	0.121168 (0.201268 pix)
Max reprojection error	0.331131 (1.2373 pix)
Mean key point size	1.6535 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.15995

## Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	No
Key point limit	60,000
Tie point limit	0
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	1 minutes 50 seconds
Matching memory usage	416.84 MB
Alignment time	42 seconds
Alignment memory usage	246.31 MB

## Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	1 seconds
Software version	1.7.2.12040
File size	13.05 MB

## Depth Maps

Count	36
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	1 minutes 48 seconds
Memory usage	2.11 GB
Software version	1.7.2.12040
File size	239.62 MB

## Dense Point Cloud

Points	42,588,167
Point colors	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	1 minutes 48 seconds
Memory usage	2.11 GB
<b>Dense cloud generation parameters</b>	

Processing time	6 minutes 13 seconds
Memory usage	6.41 GB
Software version	1.7.2.12040
File size	979.52 MB
<b>Model</b>	
Faces	8,346,642
Vertices	4,185,932
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	1 minutes 48 seconds
Memory usage	2.11 GB
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	17 minutes 29 seconds
Memory usage	23.16 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	3 minutes 37 seconds
UV mapping memory usage	4.14 GB
Blending time	1 minutes 13 seconds
Blending memory usage	6.83 GB
Software version	1.7.2.12040
File size	568.47 MB
<b>Tiled Model</b>	
Texture	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	1 minutes 48 seconds
Memory usage	2.11 GB
<b>Reconstruction parameters</b>	
Source data	Dense cloud
Tile size	256
Face count	High
Enable ghosting filter	No
Processing time	49 minutes 15 seconds
Memory usage	4.17 GB
Software version	1.7.2.12040
File size	866.12 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) i9-10900 CPU @ 2.80GHz
GPU(s)	GeForce RTX 2080 SUPER