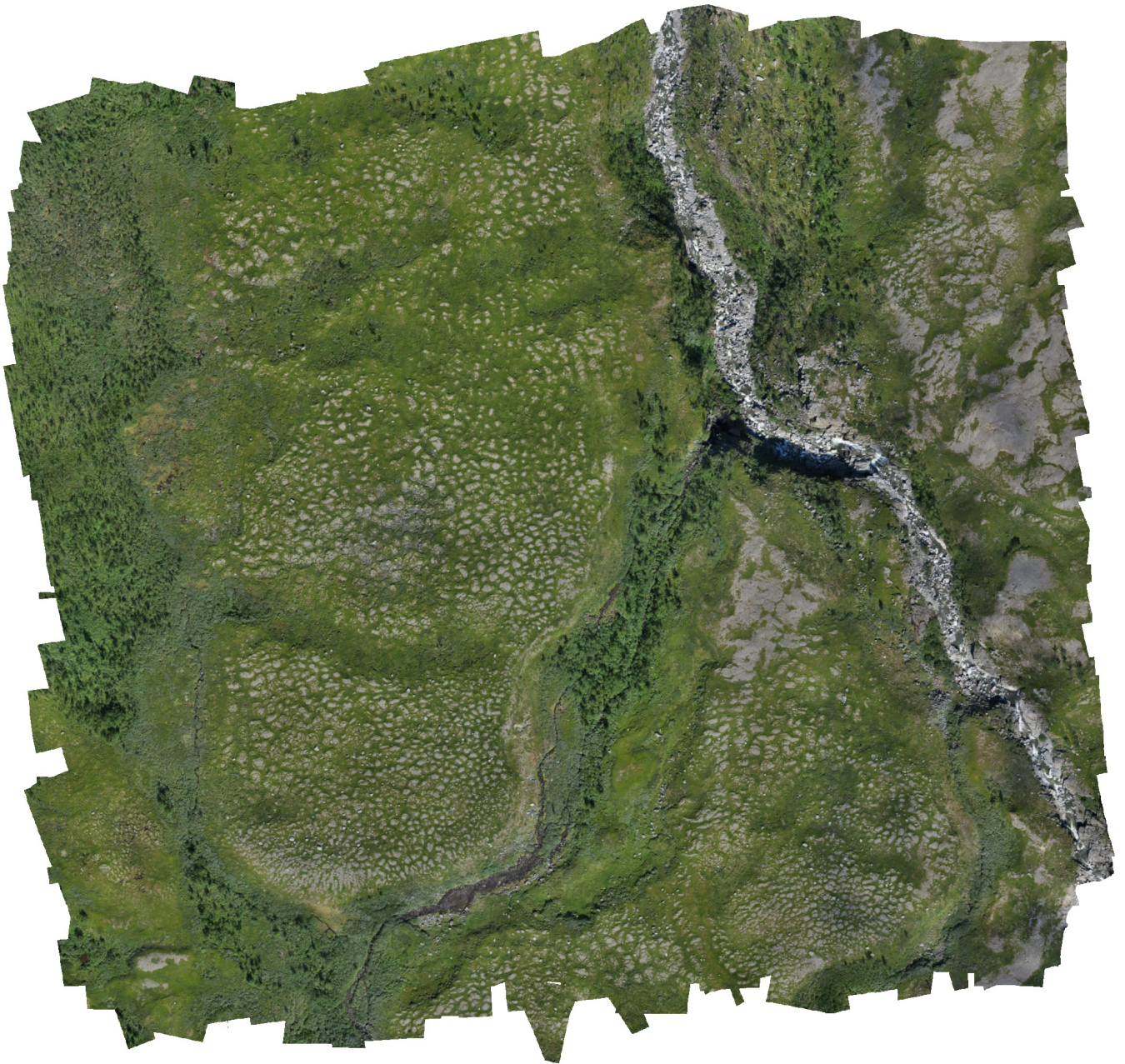


# Agisoft Metashape

Processing Report  
12 March 2021



# Survey Data

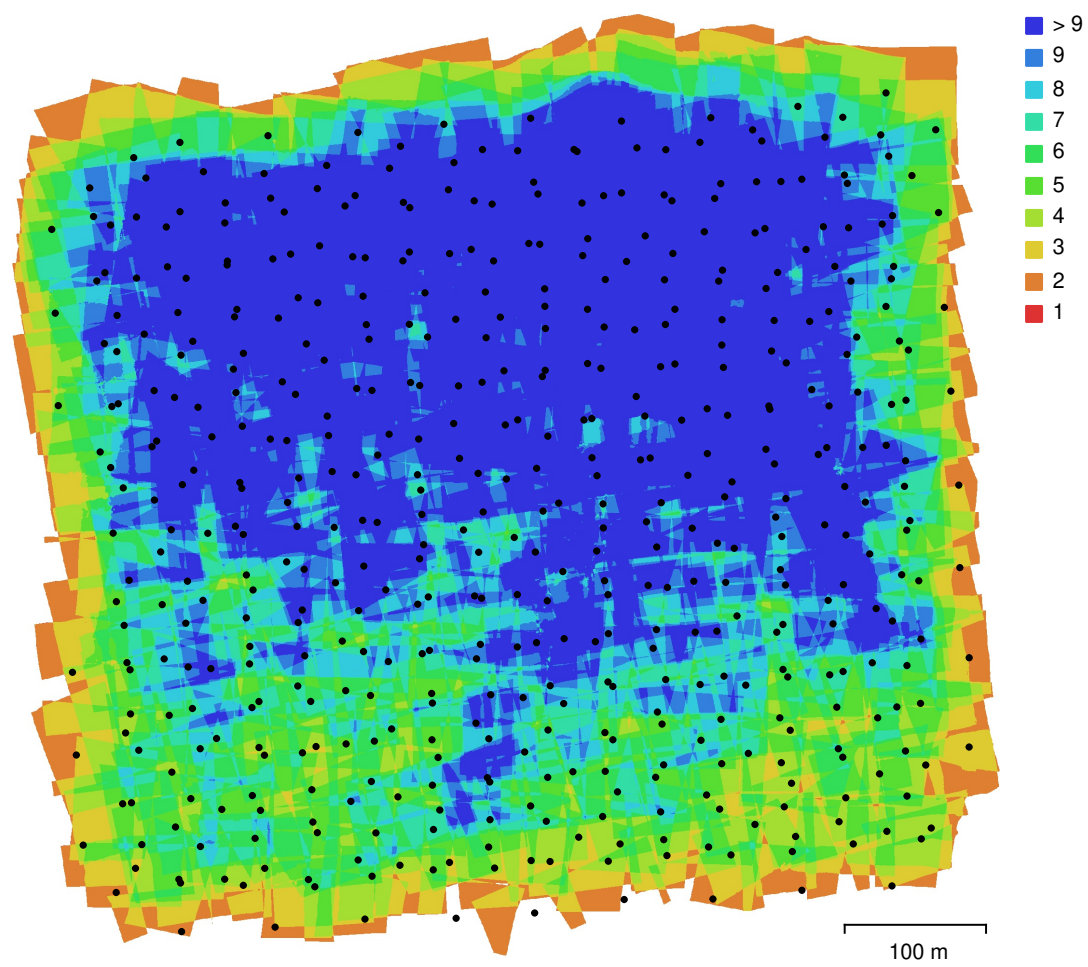


Fig. 1. Camera locations and image overlap.

Number of images:	503	Camera stations:	503
Flying altitude:	80.4 m	Tie points:	603,729
Ground resolution:	1.78 cm/pix	Projections:	1,865,873
Coverage area:	0.396 km <sup>2</sup>	Reprojection error:	0.507 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon PowerShot G9 X (10.2mm)	5472 x 3648	10.2 mm	2.4 x 2.4 μm	No

Table 1. Cameras.



# Camera Calibration

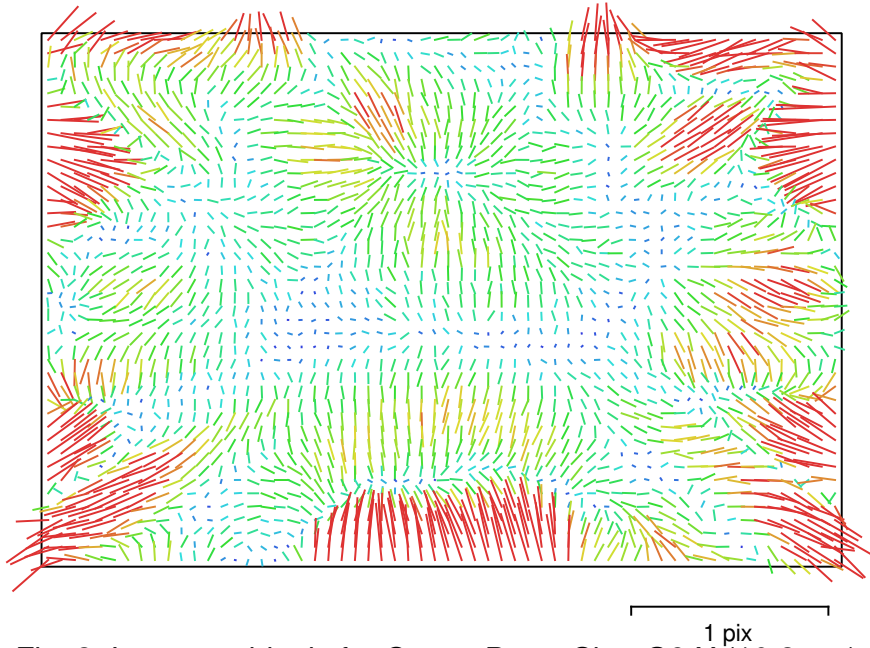


Fig. 2. Image residuals for Canon PowerShot G9 X (10.2mm).

## Canon PowerShot G9 X (10.2mm)

503 images

Type  
Frame

Resolution  
5472 x 3648

Focal Length  
10.2 mm

Pixel Size  
2.4 x 2.4  $\mu\text{m}$

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	4307.77	0.078	1.00	-0.03	-0.80	0.11	0.08	-0.08	-0.01	-0.44
Cx	-2.19526	0.016		1.00	0.02	-0.01	0.00	-0.00	0.80	0.02
Cy	-13.9626	0.022			1.00	-0.16	-0.03	0.04	-0.00	0.65
K1	-0.00481439	2.2e-05				1.00	-0.92	0.87	-0.02	-0.26
K2	0.00676544	8.7e-05					1.00	-0.98	0.01	0.02
K3	-0.00873846	0.00011						1.00	-0.01	-0.02
P1	-0.000348562	1.2e-06							1.00	0.02
P2	-0.00125688	1.2e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

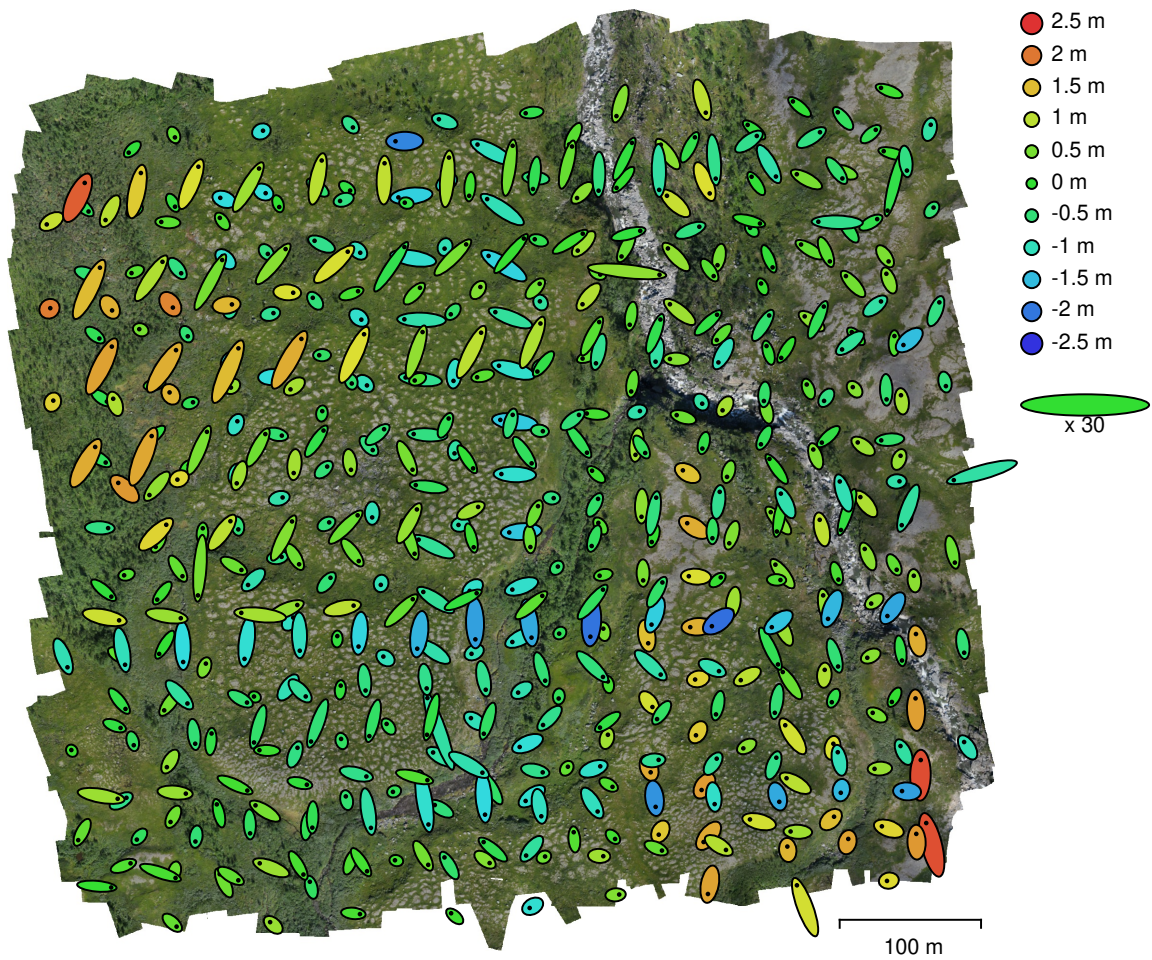


Fig. 3. Camera locations and error estimates.  
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.  
Estimated camera locations are marked with a black dot.

X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total error (cm)
30.557	40.6169	81.6844	50.8278	96.2071

Table 3. Average camera location error.  
X - Easting, Y - Northing, Z - Altitude.

# Digital Elevation Model

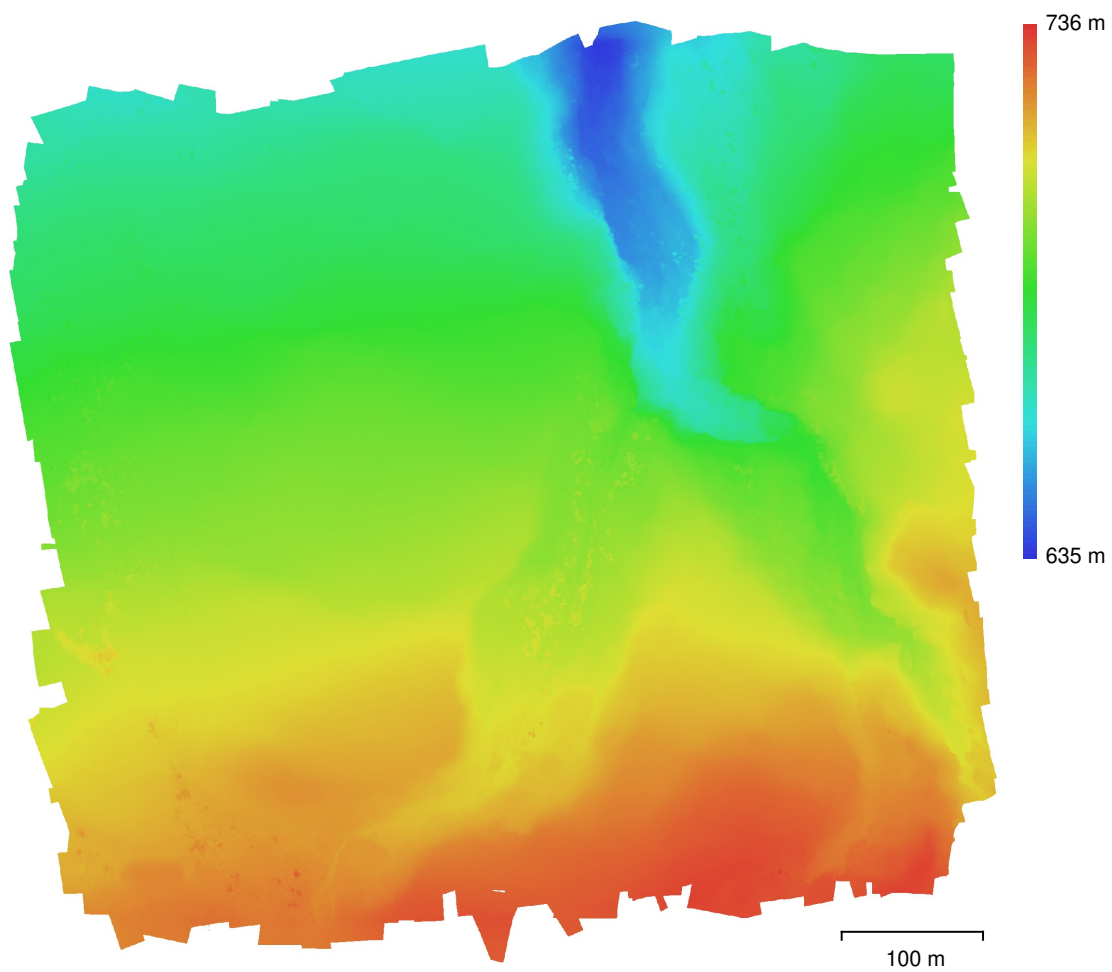


Fig. 4. Reconstructed digital elevation model.

Resolution: 3.56 cm/pix  
Point density: 790 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	503
Aligned cameras	503
Coordinate system	SWEREF99 TM (EPSG::3006)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	603,729 of 626,578
RMS reprojection error	0.129412 (0.50709 pix)
Max reprojection error	0.38859 (17.7374 pix)
Mean key point size	3.72807 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.17185

### 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	2 minutes 48 seconds
Matching memory usage	2.05 GB
Alignment time	1 minutes 49 seconds
Alignment memory usage	659.46 MB
Software version	1.6.2.10247

## Depth Maps

Count	502
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	55 minutes 13 seconds
Software version	1.6.2.10247

## Dense Point Cloud

Points	375,422,636
Point colors	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Processing time	55 minutes 13 seconds

### Dense cloud generation parameters

Processing time	48 minutes 20 seconds
Software version	1.6.2.10247

## DEM

Size	27,714 x 26,299
Coordinate system	SWEREF99 TM (EPSG::3006)

### Reconstruction parameters

Source data	Dense cloud
Interpolation	Enabled
Processing time	11 minutes 20 seconds
Software version	1.6.2.10247

**Orthomosaic**

Size	39,233 x 37,409
Coordinate system	SWEREF99 TM (EPSG::3006)
Colors	3 bands, uint8

**Reconstruction parameters**

Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Processing time	25 minutes 38 seconds
Software version	1.6.2.10247

**System**

Software name	Agisoft Metashape Professional
Software version	1.6.2 build 10247
OS	Linux 64 bit
RAM	62.65 GB
CPU	Intel(R) Xeon(R) CPU E5-2650 v3 @ 2.30GHz
GPU(s)	Tesla K80
	Tesla K80
	Tesla K80
	Tesla K80