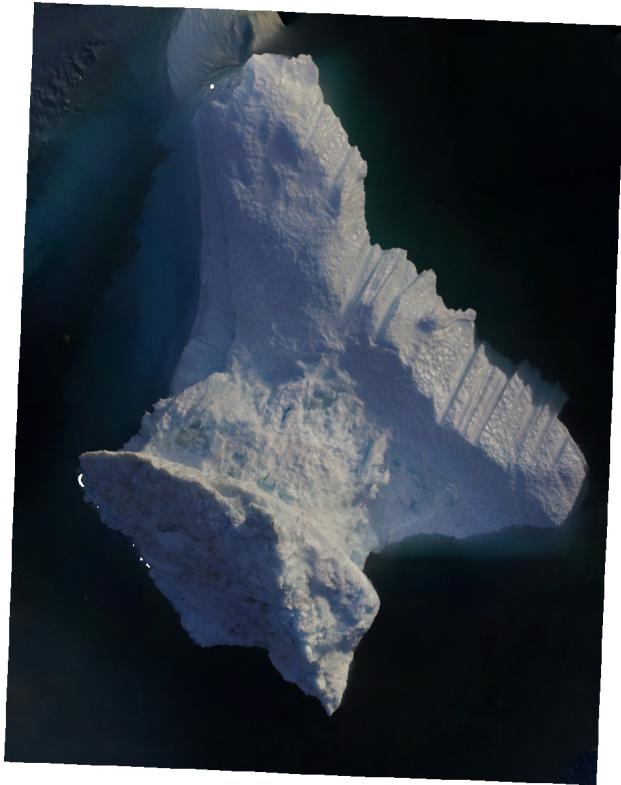


# 20170726\_Qeqertarsuaq

Processing Report  
03 September 2020



# Survey Data

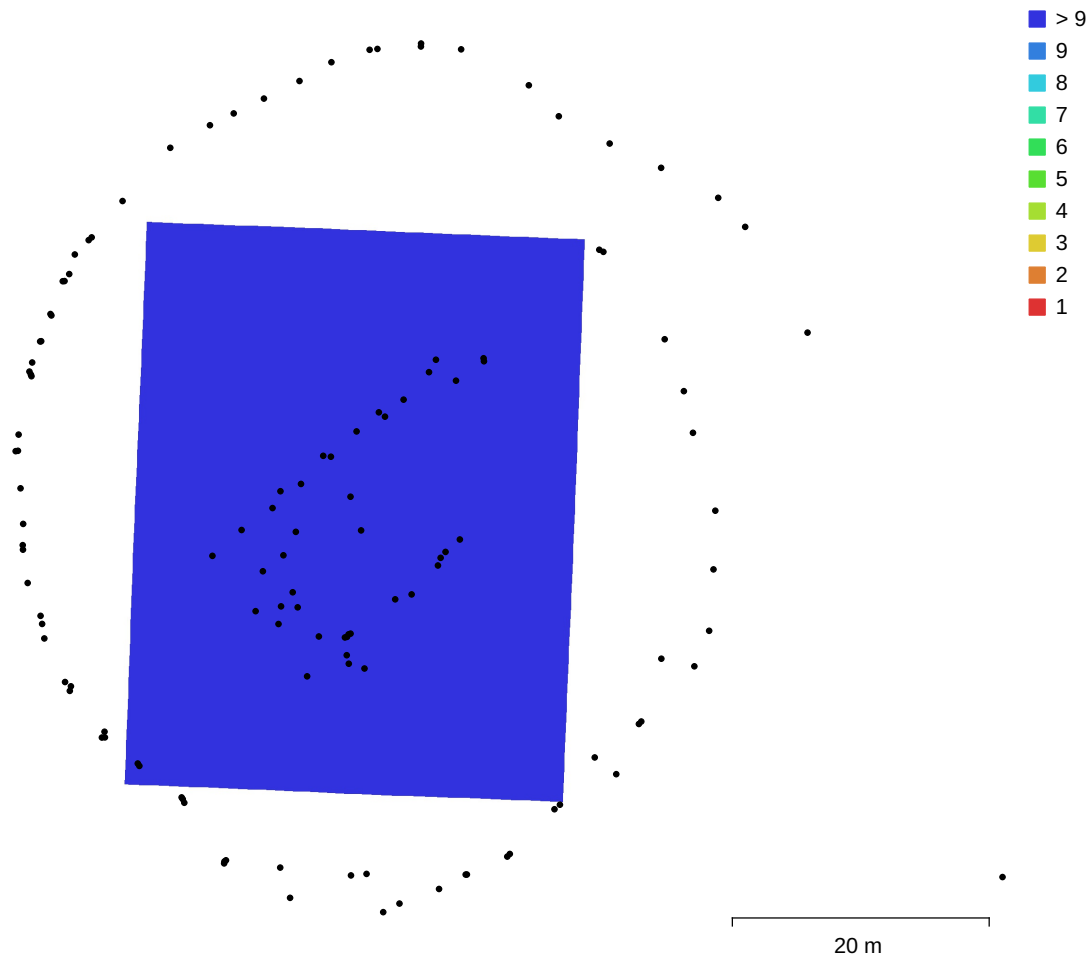


Fig. 1. Camera locations and image overlap.

Number of images:	227	Camera stations:	127
Flying altitude:	24.1 m	Tie points:	69,224
Ground resolution:	7.67 mm/pix	Projections:	282,782
Coverage area:	1.5e+03 m <sup>2</sup>	Reprojection error:	0.912 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC300C (3.61mm)	4000 x 3000	3.61 mm	1.56 x 1.56 $\mu$ m	No

Table 1. Cameras.

# Camera Calibration

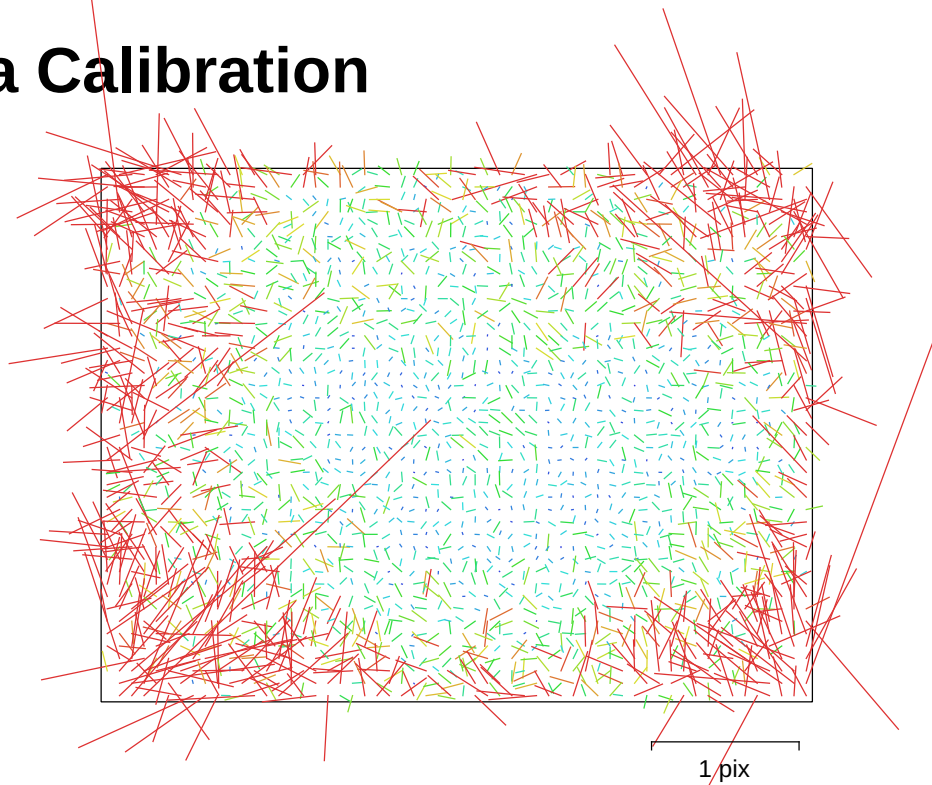


Fig. 2. Image residuals for FC300C (3.61mm).

## FC300C (3.61mm)

127 images

Type	Resolution	Focal Length	Pixel Size
Frame	<b>4000 x 3000</b>	<b>3.61 mm</b>	<b>1.56 x 1.56 <math>\mu\text{m}</math></b>

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2	P3	P4
<b>F</b>	<b>2707.51</b>	0.23	1.00	0.06	-0.46	-0.28	0.01	-0.13	0.14	-0.09	0.07	0.07	0.07	-0.07	0.07
<b>Cx</b>	<b>21.8984</b>	0.13		1.00	-0.07	-0.19	-0.00	-0.00	-0.01	0.01	-0.02	0.34	0.33	-0.33	0.33
<b>Cy</b>	<b>17.6076</b>	0.11			1.00	0.06	-0.08	-0.03	0.02	-0.03	0.03	0.31	0.31	-0.31	0.31
<b>B1</b>	<b>-0.313526</b>	0.052				1.00	0.04	0.01	-0.01	0.01	-0.01	-0.09	-0.09	0.09	-0.08
<b>B2</b>	<b>-0.0755973</b>	0.05					1.00	-0.02	0.01	-0.00	-0.00	-0.07	-0.07	0.07	-0.06
<b>K1</b>	<b>-0.142889</b>	0.0002						1.00	-0.94	0.88	-0.81	-0.12	-0.12	0.12	-0.12
<b>K2</b>	<b>0.144381</b>	0.001							1.00	-0.98	0.94	0.10	0.10	-0.10	0.10
<b>K3</b>	<b>-0.0524933</b>	0.002								1.00	-0.99	-0.08	-0.08	0.08	-0.09
<b>K4</b>	<b>0.0114203</b>	0.0013									1.00	0.08	0.08	-0.08	0.08
<b>P1</b>	<b>3.09391e-07</b>	1e-05										1.00	1.00	-1.00	1.00
<b>P2</b>	<b>4.64712e-07</b>	1.5e-05											1.00	-1.00	1.00
<b>P3</b>	<b>362.807</b>	1.2e+04												1.00	-1.00
<b>P4</b>	<b>-205.06</b>	6.8e+03													1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

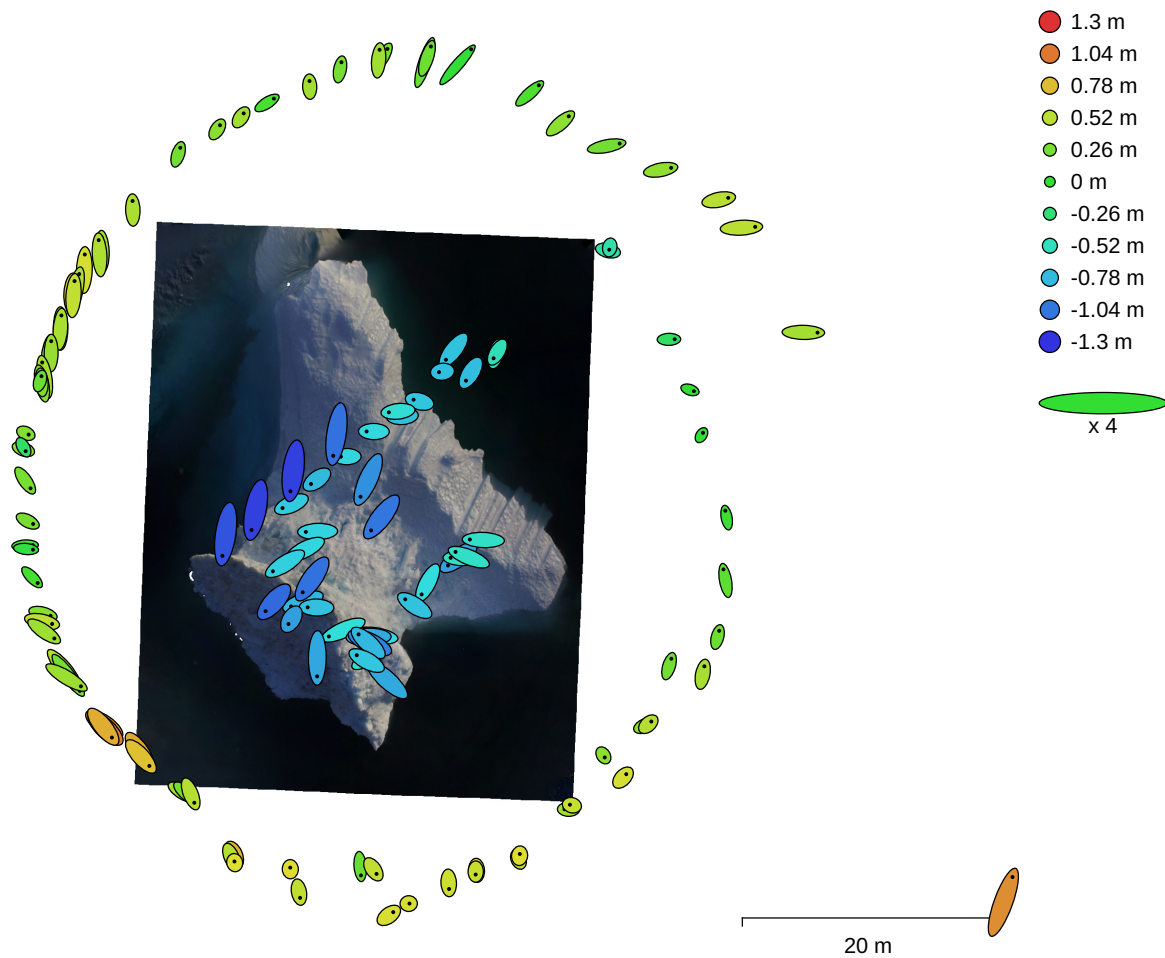


Fig. 3. Camera locations and error estimates.

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)
27.9108	34.9803	60.2746	44.7508	75.0711

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

# Digital Elevation Model

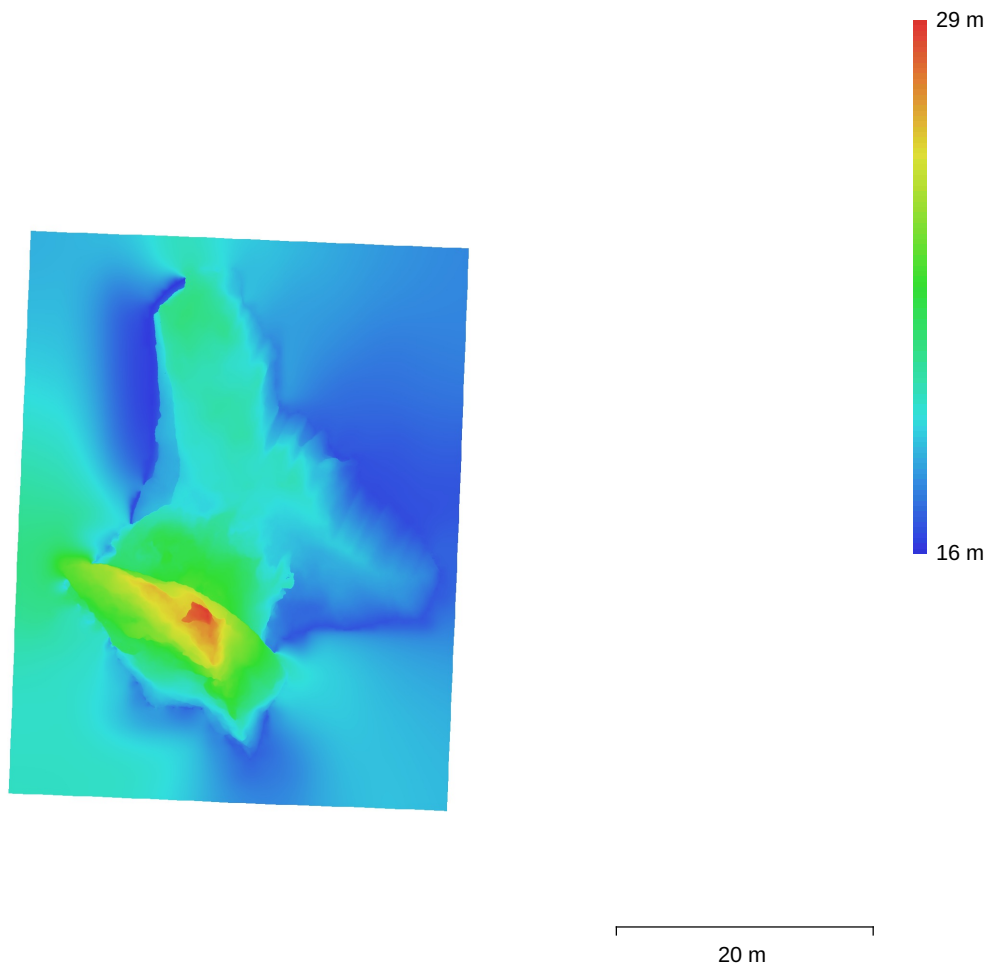


Fig. 4. Reconstructed digital elevation model.

Resolution: 1.53 cm/pix  
Point density: 0.425 points/cm<sup>2</sup>

# Processing Parameters

## General

Cameras	127
Aligned cameras	127
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	69,224 of 245,632
RMS reprojection error	0.197015 (0.912347 pix)
Max reprojection error	0.499918 (6.21152 pix)
Mean key point size	4.64585 pix
Point colors	3 bands, uint8
Key points	491.40 MB
Average tie point multiplicity	3.87816

## Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Yes
Key point limit	60,000
Tie point limit	0
Adaptive camera model fitting	No
Matching time	4 minutes 43 seconds
Alignment time	2 minutes 40 seconds

## Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k4, p1-p4
Adaptive camera model fitting	No
Optimization time	11 seconds
File size	20.48 MB

## Dense Point Cloud

Points	6,160,692
Point colors	3 bands, uint8

## Depth maps generation parameters

Quality	High
Filtering mode	Aggressive
Processing time	21 minutes 28 seconds

## Dense cloud generation parameters

Processing time	22 minutes 46 seconds
File size	91.90 MB

## Model

Faces	1,232,137
Vertices	617,146
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096, 4 bands, uint8

## Depth maps generation parameters

Quality	High
Filtering mode	Aggressive
Processing time	21 minutes 28 seconds

## Reconstruction parameters

Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No

Processing time	2 minutes 15 seconds
Memory usage	2.73 GB
<b>Texturing parameters</b>	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	No
Enable ghosting filter	No
UV mapping time	1 minutes 51 seconds
UV mapping memory usage	3.45 GB
Blending time	1 minutes 7 seconds
Blending memory usage	1.70 GB
Software version	1.6.4.10928
File size	69.55 MB
<b>DEM</b>	
Size	2,370 x 2,974
Coordinate system	WGS 84 (EPSG::4326)
<b>Reconstruction parameters</b>	
Source data	Dense cloud
Interpolation	Enabled
Processing time	2 seconds
Memory usage	169.39 MB
Software version	1.6.4.10928
File size	28.30 MB
<b>Orthomosaic</b>	
Size	4,674 x 5,888
Coordinate system	WGS 84 (EPSG::4326)
Colors	3 bands, uint8
<b>Reconstruction parameters</b>	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	No
Processing time	1 minutes 29 seconds
Memory usage	2.42 GB
Software version	1.6.4.10928
File size	814.80 MB
<b>System</b>	
Software name	Agisoft Metashape Professional
Software version	1.6.4 build 10928
OS	Linux 64 bit
RAM	62.62 GB
CPU	Intel(R) Core(TM) i7-9800X CPU @ 3.80GHz
GPU(s)	Quadro P1000