

# Storvola

Processing Report  
07 December 2021



# Survey Data

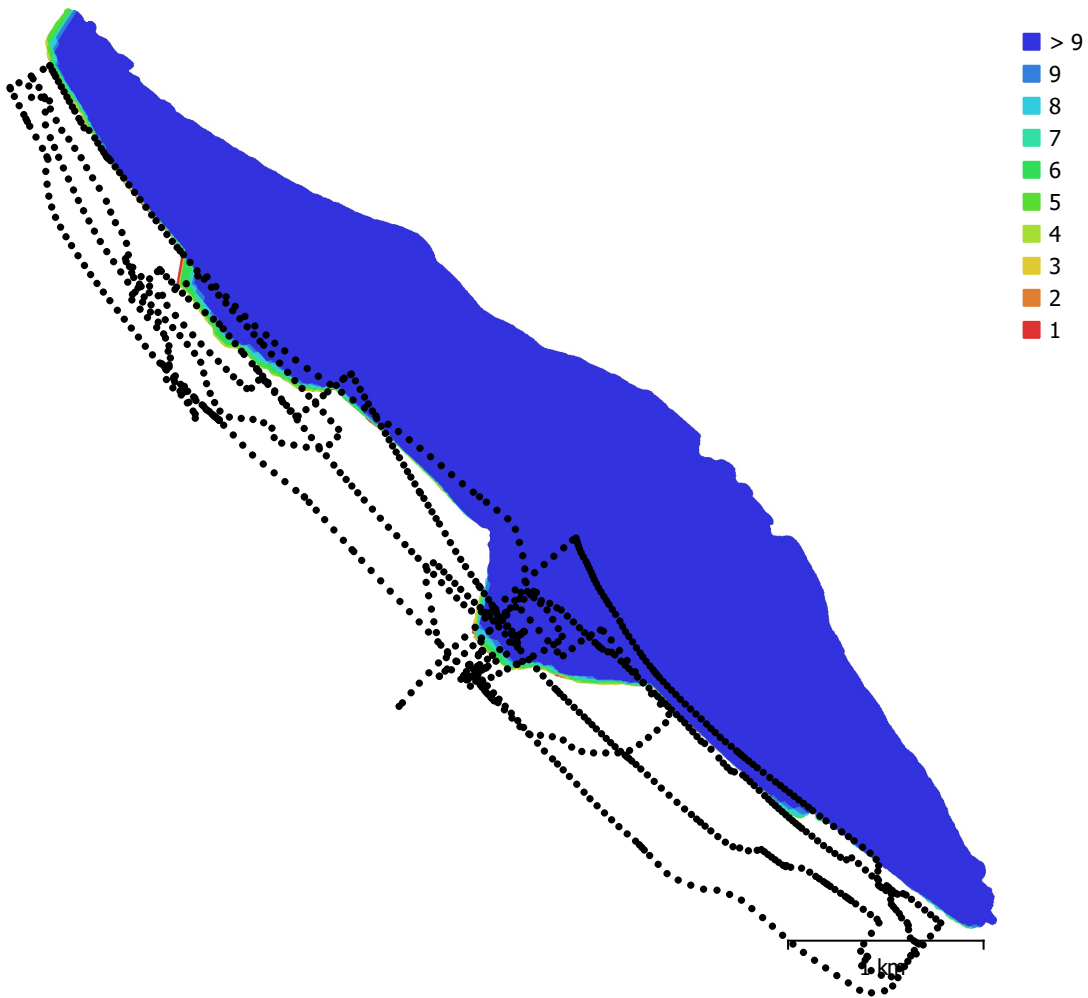


Fig. 1. Camera locations and image overlap.

Number of images:	1,007	Camera stations:	1,007
Flying altitude:	601 m	Tie points:	174,368
Ground resolution:	14.4 cm/pix	Projections:	1,530,554
Coverage area:	5.31 km <sup>2</sup>	Reprojection error:	0.904 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

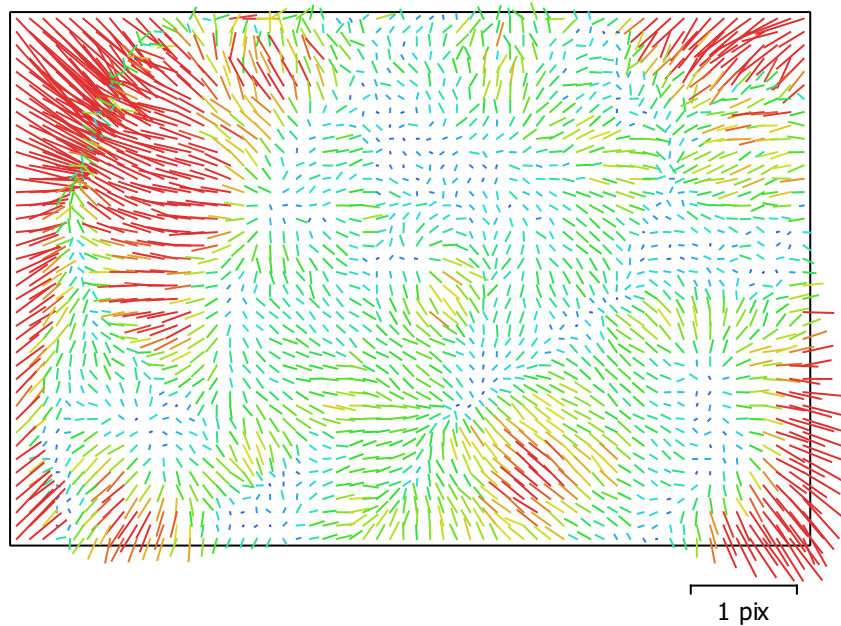


Fig. 2. Image residuals for L1D-20c (10.26mm).

## L1D-20c (10.26mm)

1007 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	K4	P1	P2
<b>F</b>	<b>4382.58</b>	0.088	1.00	0.02	0.21	-0.74	-0.10	-0.05	0.07	-0.07	0.06	-0.02	0.12
<b>Cx</b>	<b>-0.386519</b>	0.079		1.00	-0.07	-0.03	0.44	0.01	-0.00	0.01	-0.01	0.84	-0.05
<b>Cy</b>	<b>-56.1308</b>	0.12			1.00	-0.65	-0.17	-0.01	-0.01	0.01	-0.01	-0.03	0.50
<b>B1</b>	<b>-8.29082</b>	0.1				1.00	0.09	-0.03	0.02	-0.02	0.02	0.01	-0.28
<b>B2</b>	<b>-8.34258</b>	0.075					1.00	0.00	-0.00	0.00	0.00	0.32	-0.04
<b>K1</b>	<b>0.0113423</b>	5.3e-05						1.00	-0.97	0.92	-0.87	0.01	-0.05
<b>K2</b>	<b>0.0229571</b>	0.00038							1.00	-0.99	0.96	-0.01	0.01
<b>K3</b>	<b>0.0229739</b>	0.0011								1.00	-0.99	0.01	0.00
<b>K4</b>	<b>-0.0721717</b>	0.001									1.00	-0.01	-0.01
<b>P1</b>	<b>0.000472689</b>	4.6e-06										1.00	-0.07
<b>P2</b>	<b>-0.00315967</b>	2.7e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

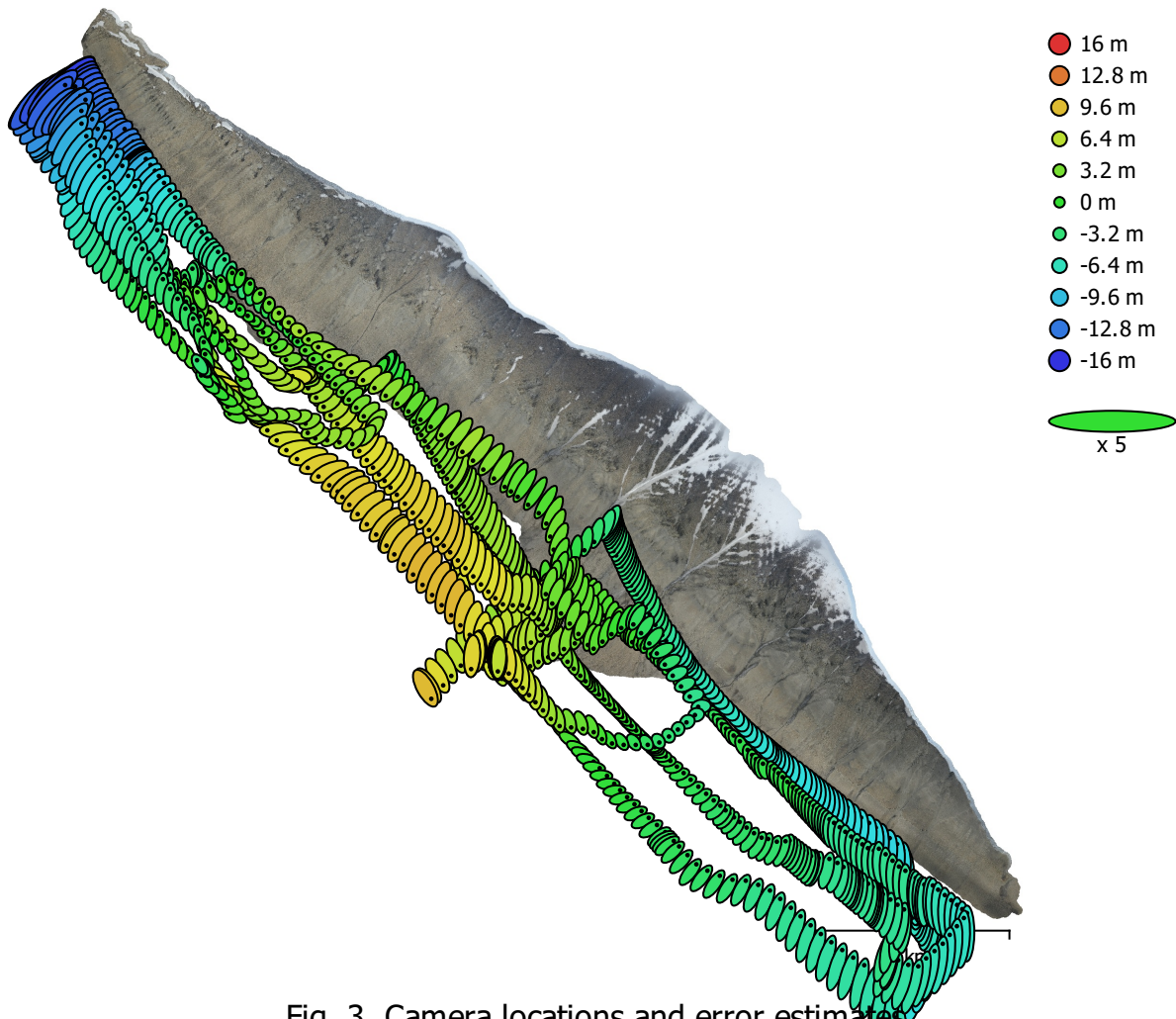


Fig. 3. Camera locations and error estimates.

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

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
10.1499	20.7562	5.68092	23.1049	23.7931

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

# Digital Elevation Model

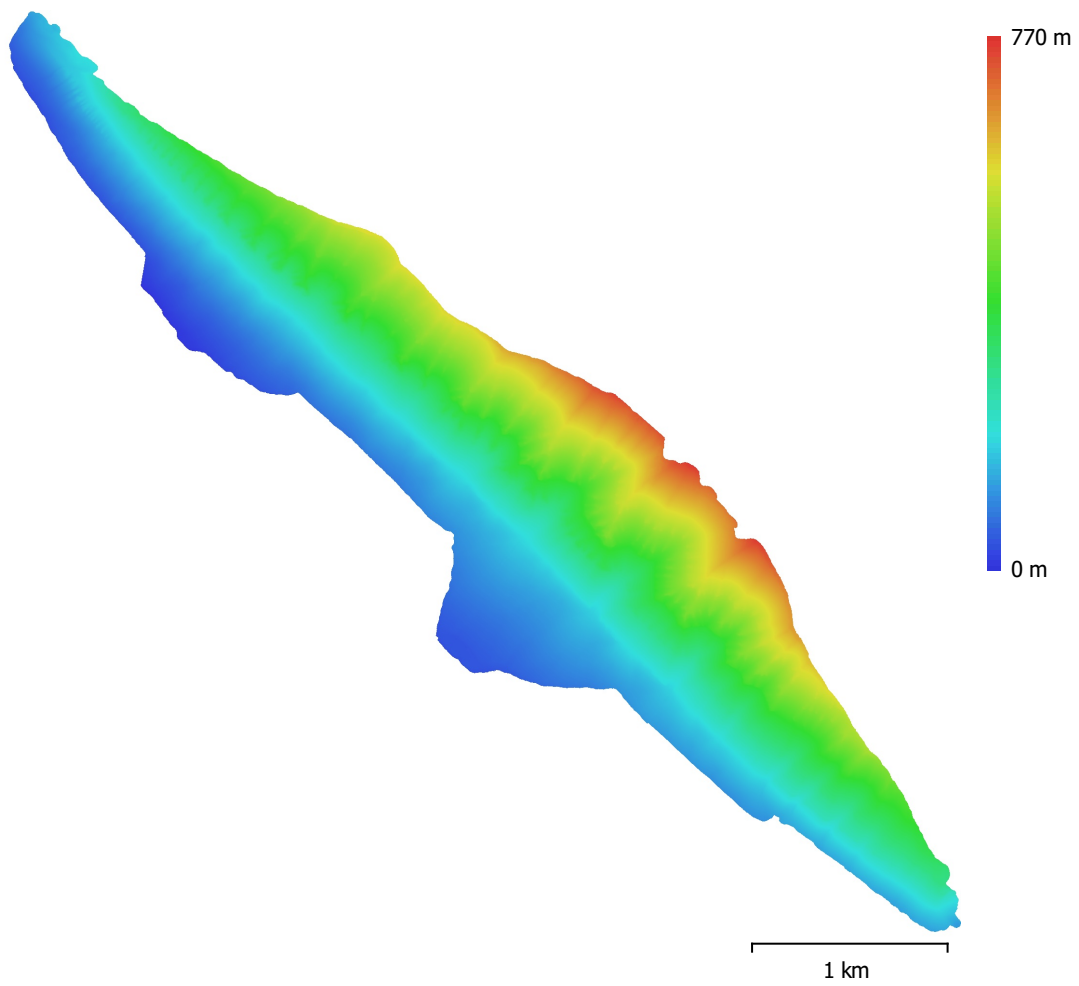


Fig. 4. Reconstructed digital elevation model.

Resolution: 57.6 cm/pix  
Point density: 3.02 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	1007
Aligned cameras	1007
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	174,368 of 298,195
RMS reprojection error	0.473972 (0.904206 pix)
Max reprojection error	3.27015 (81.8065 pix)
Mean key point size	1.62199 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	21.3116

## Alignment parameters

Accuracy	Highest
Generic preselection	No
Reference preselection	No
Key point limit	40,000
Tie point limit	4,000
Exclude stationary tie points	No
Guided image matching	No
Adaptive camera model fitting	Yes
Matching time	1 minutes 18 seconds
Matching memory usage	3.60 GB
Alignment time	4 minutes 16 seconds
Alignment memory usage	1.02 GB

## Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k4, p1, p2
Adaptive camera model fitting	No
Optimization time	33 seconds
Software version	1.7.2.12040
File size	101.95 MB

## Depth Maps

Count	970
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## Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	0 seconds
Memory usage	1.75 GB
Software version	1.7.2.12040
File size	1.82 GB

## Dense Point Cloud

Points	25,628,637
Point colors	3 bands, uint8

## Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	0 seconds
Memory usage	1.75 GB

## Dense cloud generation parameters

Processing time	1 minutes 30 seconds
Memory usage	10.32 GB
Software version	1.7.2.12040
File size	488.47 MB
<b>Model</b>	
Faces	1,573,648
Vertices	790,562
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096 x 10, 4 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	Medium
Filtering mode	Mild
Processing time	0 seconds
Memory usage	1.75 GB
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	8 minutes 57 seconds
Memory usage	12.60 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	2 minutes 54 seconds
UV mapping memory usage	3.70 GB
Blending time	16 minutes 2 seconds
Blending memory usage	5.10 GB
Software version	1.7.2.12040
File size	297.73 MB
<b>Tiled Model</b>	
Texture	3 bands, uint8
<b>Reconstruction parameters</b>	
Source data	Mesh
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	13 seconds
Memory usage	2.70 GB
Software version	1.7.2.12040
File size	317.44 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) i9-9900K CPU @ 3.60GHz
GPU(s)	GeForce RTX 2080