

# Agisoft Metashape

Processing Report  
26 January 2022



# Survey Data

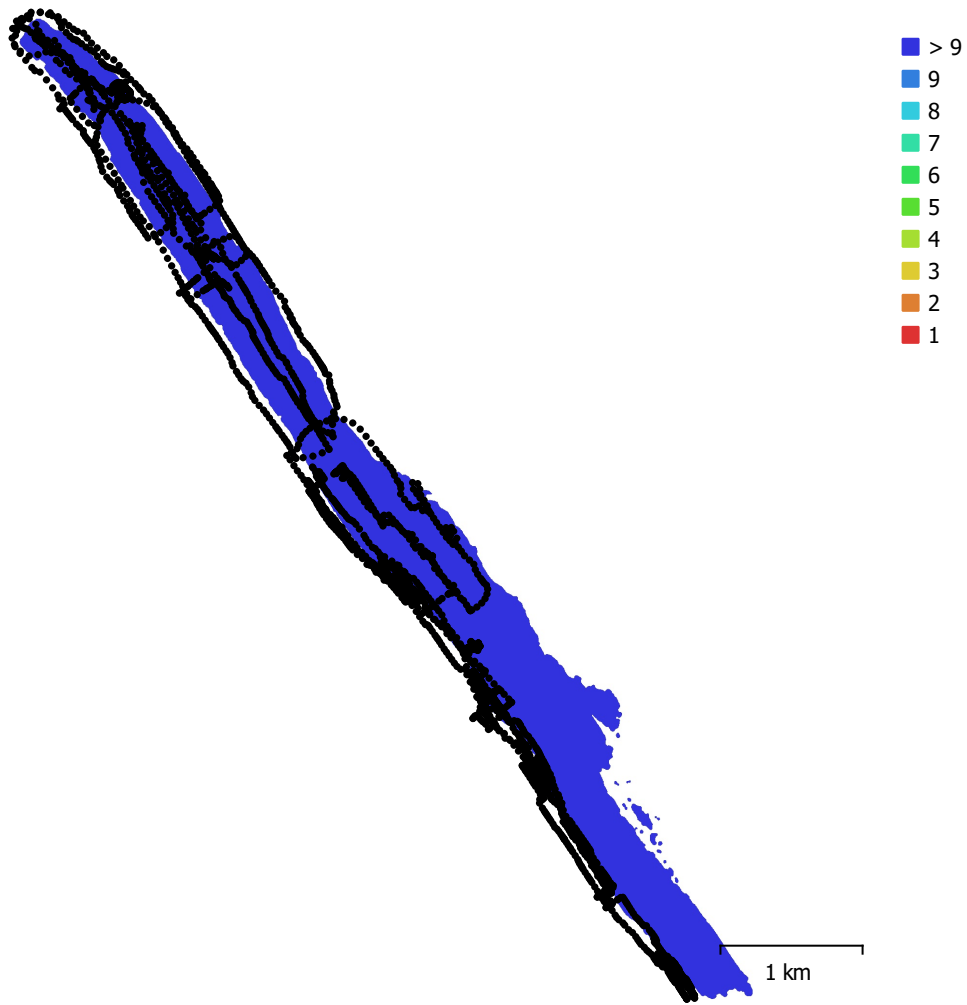


Fig. 1. Camera locations and image overlap.

Number of images:	2,458	Camera stations:	2,458
Flying altitude:	239 m	Tie points:	627,423
Ground resolution:	5.28 cm/pix	Projections:	5,174,704
Coverage area:	3.73 km <sup>2</sup>	Reprojection error:	1.35 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
L1D-20c (10.26mm)	8192 x 4096	10.26 mm	unknown	No

Table 1. Cameras.

# Camera Calibration

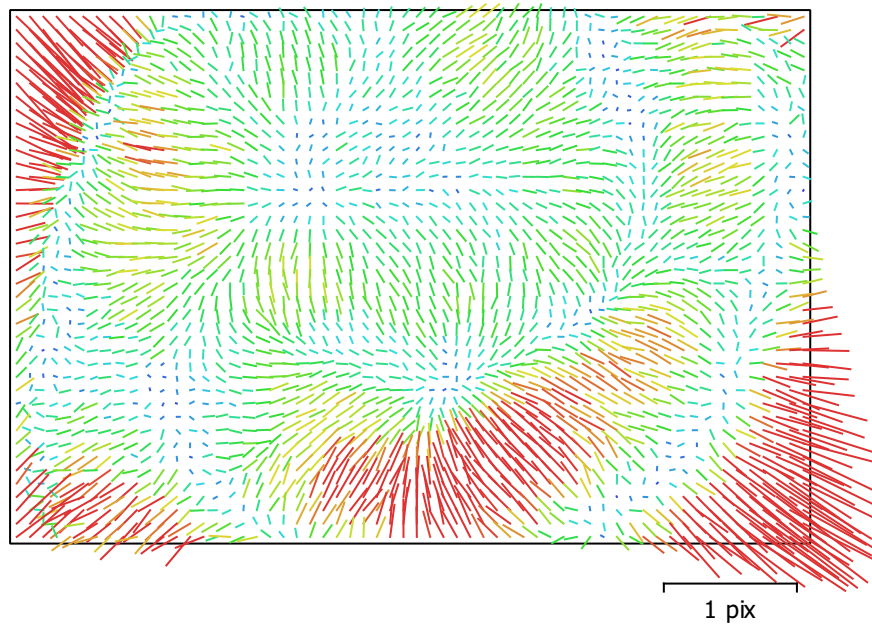


Fig. 2. Image residuals for L1D-20c (10.26mm).

## L1D-20c (10.26mm)

2457 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>4377.54</b>	0.035	1.00	-0.10	-0.52	-0.07	-0.12	-0.17	0.18	-0.16	0.15	-0.03	-0.14
<b>Cx</b>	<b>-1.91404</b>	0.031		1.00	0.06	0.02	0.57	0.00	-0.00	0.00	-0.00	0.85	-0.02
<b>Cy</b>	<b>-43.0273</b>	0.042			1.00	-0.60	0.18	-0.02	-0.01	0.01	-0.01	0.01	0.56
<b>B1</b>	<b>-3.30049</b>	0.013				1.00	-0.07	-0.01	0.00	-0.00	0.00	0.01	-0.10
<b>B2</b>	<b>-4.95874</b>	0.01					1.00	0.00	-0.00	0.00	-0.00	0.20	0.03
<b>K1</b>	<b>0.0110051</b>	3.8e-05						1.00	-0.97	0.92	-0.87	0.00	-0.04
<b>K2</b>	<b>0.0213147</b>	0.00028							1.00	-0.99	0.96	-0.00	-0.01
<b>K3</b>	<b>0.0282531</b>	0.00081								1.00	-0.99	0.00	0.01
<b>K4</b>	<b>-0.0794588</b>	0.0008									1.00	-0.00	-0.02
<b>P1</b>	<b>0.000157979</b>	2e-06										1.00	-0.02
<b>P2</b>	<b>-0.00308632</b>	1.8e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Calibration

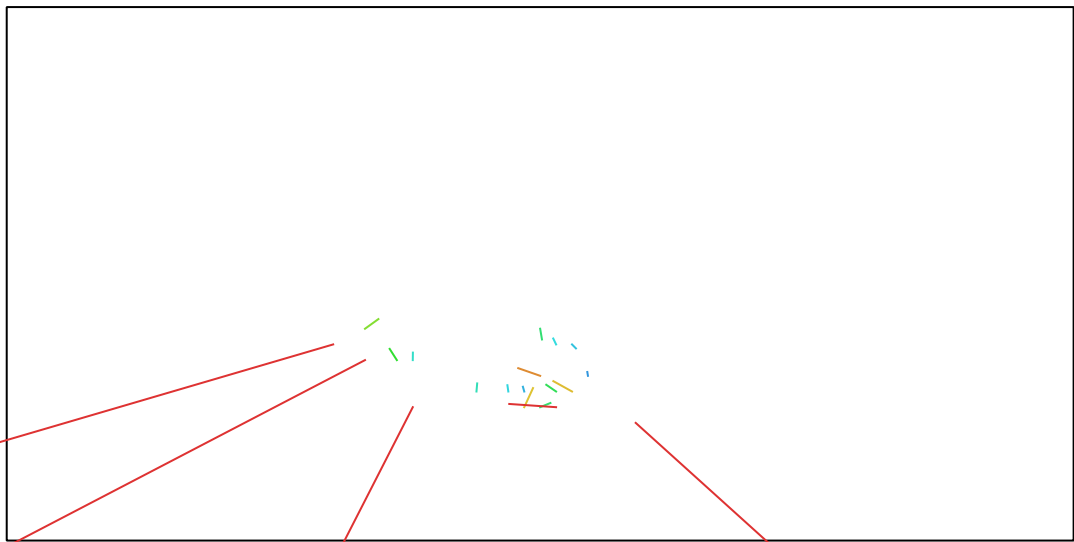


Fig. 3. Image residuals for L1D-20c (10.26mm).

14 pix

## L1D-20c (10.26mm)

1 images

Type  
Frame

Resolution  
**8192 x 4096**

Focal Length  
**10.26 mm**

Pixel Size  
**unknown**

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
<b>F</b>	<b>1140.99</b>	37	1.00	-0.18	0.38	-0.15	0.27	-0.56	0.60	-0.47	0.39	0.14	0.13
<b>Cx</b>	<b>-329.564</b>	44		1.00	0.20	0.20	-0.51	-0.20	0.29	-0.37	0.41	0.32	0.14
<b>Cy</b>	<b>-345.462</b>	41			1.00	0.50	-0.01	-0.69	0.47	-0.29	0.26	0.06	0.70
<b>B1</b>	<b>160.695</b>	30				1.00	0.44	-0.69	0.49	-0.42	0.46	-0.52	0.93
<b>B2</b>	<b>149.938</b>	35					1.00	-0.50	0.49	-0.47	0.46	-0.79	0.46
<b>K1</b>	<b>-0.215086</b>	0.029						1.00	-0.92	0.81	-0.79	0.36	-0.84
<b>K2</b>	<b>0.0344575</b>	0.0082							1.00	-0.97	0.95	-0.35	0.59
<b>K3</b>	<b>-0.00313733</b>	0.0013								1.00	-1.00	0.39	-0.46
<b>K4</b>	<b>0.000117523</b>	7.7e-05									1.00	-0.42	0.47
<b>P1</b>	<b>-0.00150005</b>	0.0012										1.00	-0.44
<b>P2</b>	<b>0.0162075</b>	0.0082											1.00

Table 3. Calibration coefficients and correlation matrix.

# Camera Locations

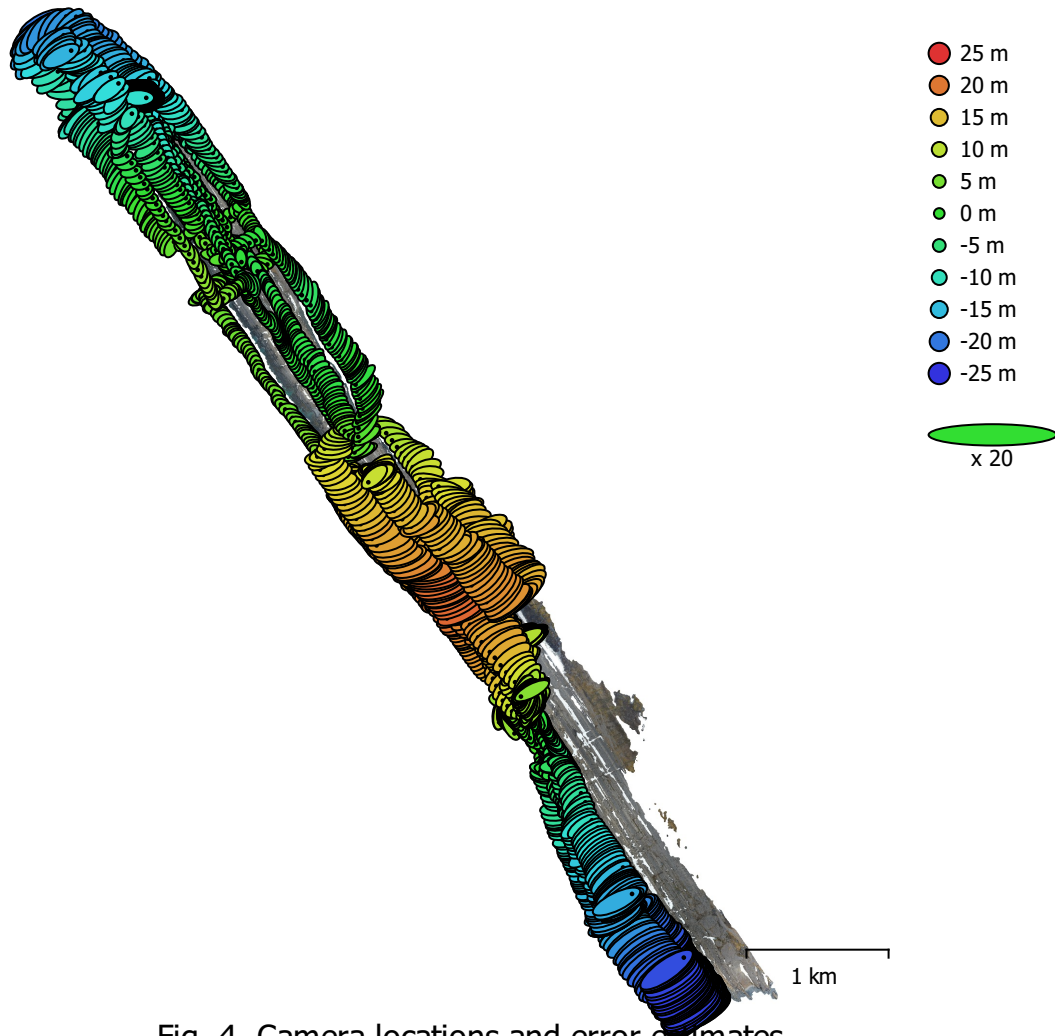


Fig. 4. Camera locations and error estimates.

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)
7.27663	4.54242	12.8247	8.57805	15.429

Table 4. Average camera location error.  
X - Longitude, Y - Latitude, Z - Altitude.

# Digital Elevation Model

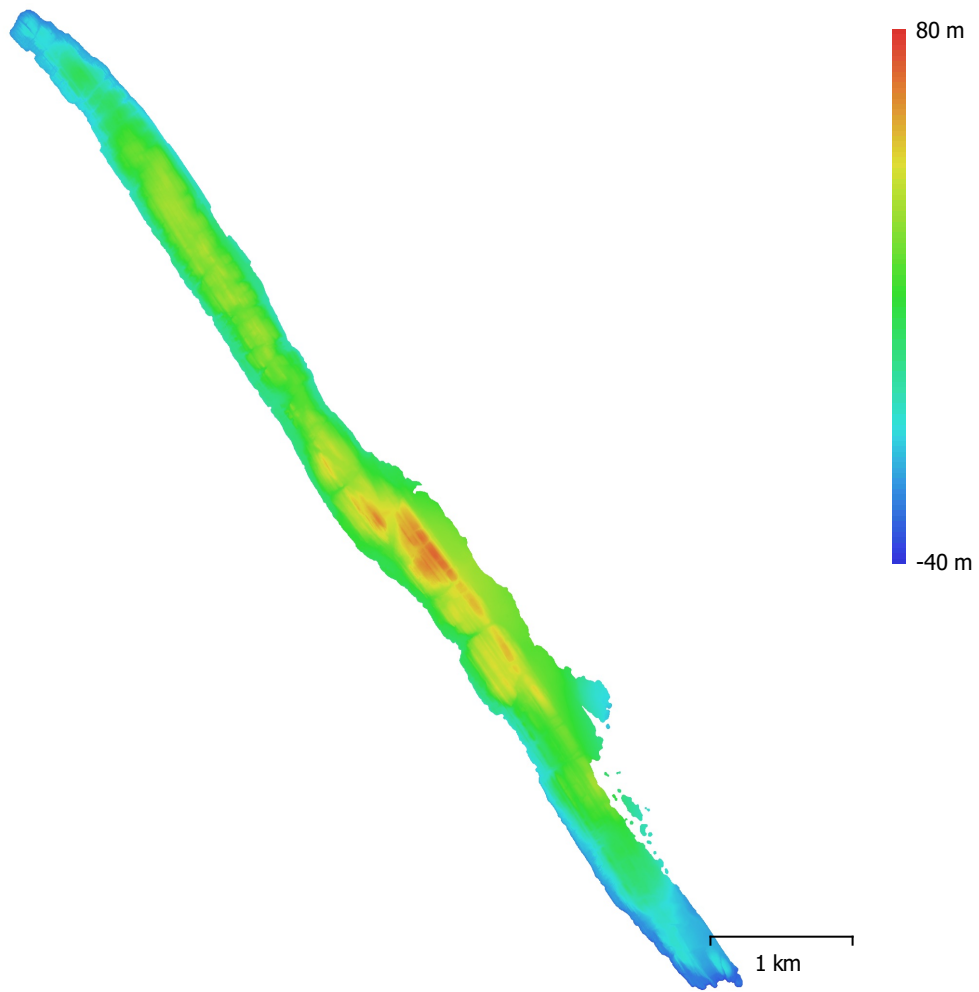


Fig. 5. Reconstructed digital elevation model.

Resolution: 36.7 cm/pix  
Point density: 7.43 points/m<sup>2</sup>

# Processing Parameters

## General

Cameras	2458
Aligned cameras	2458
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	627,423 of 1,001,668
RMS reprojection error	0.597963 (1.34815 pix)
Max reprojection error	216.008 (270.434 pix)
Mean key point size	1.93217 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	13.1519

## 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	2 days 14 hours
Matching memory usage	8.53 GB
Alignment time	59 minutes 55 seconds
Alignment memory usage	1.97 GB

## Optimization parameters

Parameters	f, b1, b2, cx, cy, k1-k4, p1, p2
Adaptive camera model fitting	No
Optimization time	2 minutes 18 seconds
Software version	1.7.2.12040
File size	218.56 MB

## Depth Maps

Count	2444
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## Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	2 hours 10 minutes
Memory usage	2.44 GB
Software version	1.7.2.12040
File size	4.33 GB

## Dense Point Cloud

Points	74,578,029
Point colors	3 bands, uint8

## Depth maps generation parameters

Quality	Medium
Filtering mode	Mild
Processing time	2 hours 10 minutes
Memory usage	2.44 GB

## Dense cloud generation parameters

Processing time	4 hours 31 minutes
Memory usage	7.82 GB
Software version	1.7.2.12040
File size	1.41 GB
<b>Model</b>	
Faces	4,971,867
Vertices	2,493,556
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096 x 15, 4 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	Medium
Filtering mode	Mild
Processing time	2 hours 10 minutes
Memory usage	2.44 GB
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	11 minutes 34 seconds
Memory usage	14.79 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	7 minutes 8 seconds
UV mapping memory usage	6.05 GB
Blending time	2 hours 14 minutes
Blending memory usage	22.23 GB
Software version	1.7.2.12040
File size	537.90 MB
<b>Tiled Model</b>	
Texture	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	Medium
Filtering mode	Mild
Processing time	2 hours 10 minutes
Memory usage	2.44 GB
<b>Reconstruction parameters</b>	
Source data	Dense cloud
Tile size	256
Face count	Medium
Enable ghosting filter	No
Processing time	5 hours 0 minutes
Memory usage	3.79 GB
Software version	1.7.2.12040
File size	1.86 GB
<b>System</b>	
Software name	Agisoft Metashape Professional
Software version	1.7.2 build 12070
OS	Windows 64 bit
RAM	63.71 GB
CPU	Intel(R) Core(TM) i7-9850H CPU @ 2.60GHz
GPU(s)	Quadro T2000