

# Agisoft Metashape

Processing Report  
23 February 2021



# Survey Data

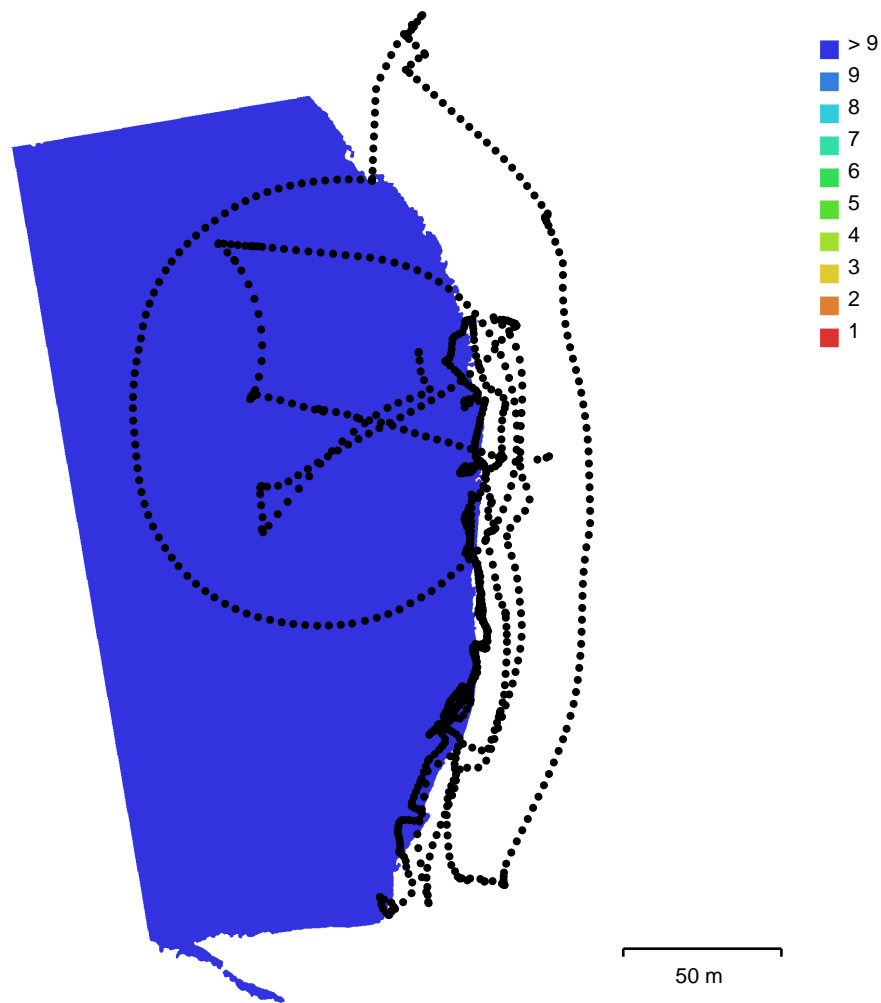


Fig. 1. Camera locations and image overlap.

Number of images:	921	Camera stations:	921
Flying altitude:	33 m	Tie points:	335,192
Ground resolution:	7.54 mm/pix	Projections:	2,617,192
Coverage area:	0.0299 km <sup>2</sup>	Reprojection error:	0.807 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
L1D-20c (10.26mm)	5472 x 3648	10.26 mm	2.41 x 2.41 um	No

Table 1. Cameras.

# Camera Calibration

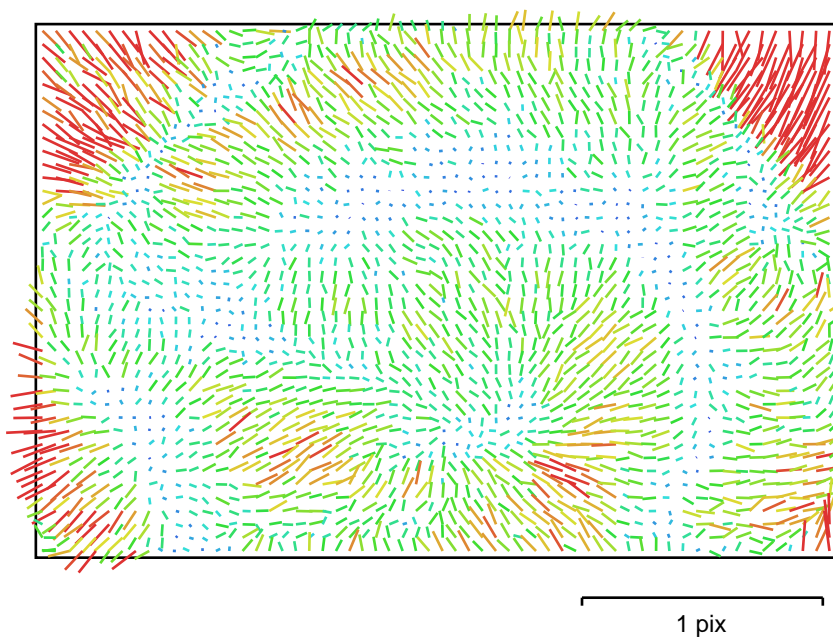


Fig. 2. Image residuals for L1D-20c (10.26mm).

## L1D-20c (10.26mm)

921 images

Type	Resolution	Focal Length	Pixel Size
<b>Frame</b>	<b>5472 x 3648</b>	<b>10.26 mm</b>	<b>2.41 x 2.41 um</b>

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
<b>F</b>	<b>4335.02</b>	0.051	1.00	-0.01	0.20	-0.86	0.04	-0.11	0.11	-0.10	0.09	-0.05	-0.12
<b>Cx</b>	<b>20.6624</b>	0.042		1.00	-0.07	0.04	0.56	-0.01	0.00	-0.01	0.01	0.79	0.00
<b>Cy</b>	<b>-49.066</b>	0.051			1.00	-0.59	-0.11	0.00	-0.01	0.01	-0.01	-0.01	0.42
<b>B1</b>	<b>0.128807</b>	0.048				1.00	0.01	-0.01	0.01	-0.01	0.01	0.05	-0.01
<b>B2</b>	<b>8.13237</b>	0.044					1.00	-0.00	-0.00	-0.00	0.00	-0.01	0.02
<b>K1</b>	<b>0.00437294</b>	3.5e-05						1.00	-0.97	0.92	-0.87	0.00	-0.03
<b>K2</b>	<b>-0.0146132</b>	0.00024							1.00	-0.99	0.95	0.00	-0.00
<b>K3</b>	<b>0.056061</b>	0.00066								1.00	-0.99	-0.00	0.01
<b>K4</b>	<b>-0.0681525</b>	0.00061									1.00	0.00	-0.01
<b>P1</b>	<b>0.00122383</b>	2.6e-06										1.00	0.00
<b>P2</b>	<b>-0.00270383</b>	1.4e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

# Camera Locations

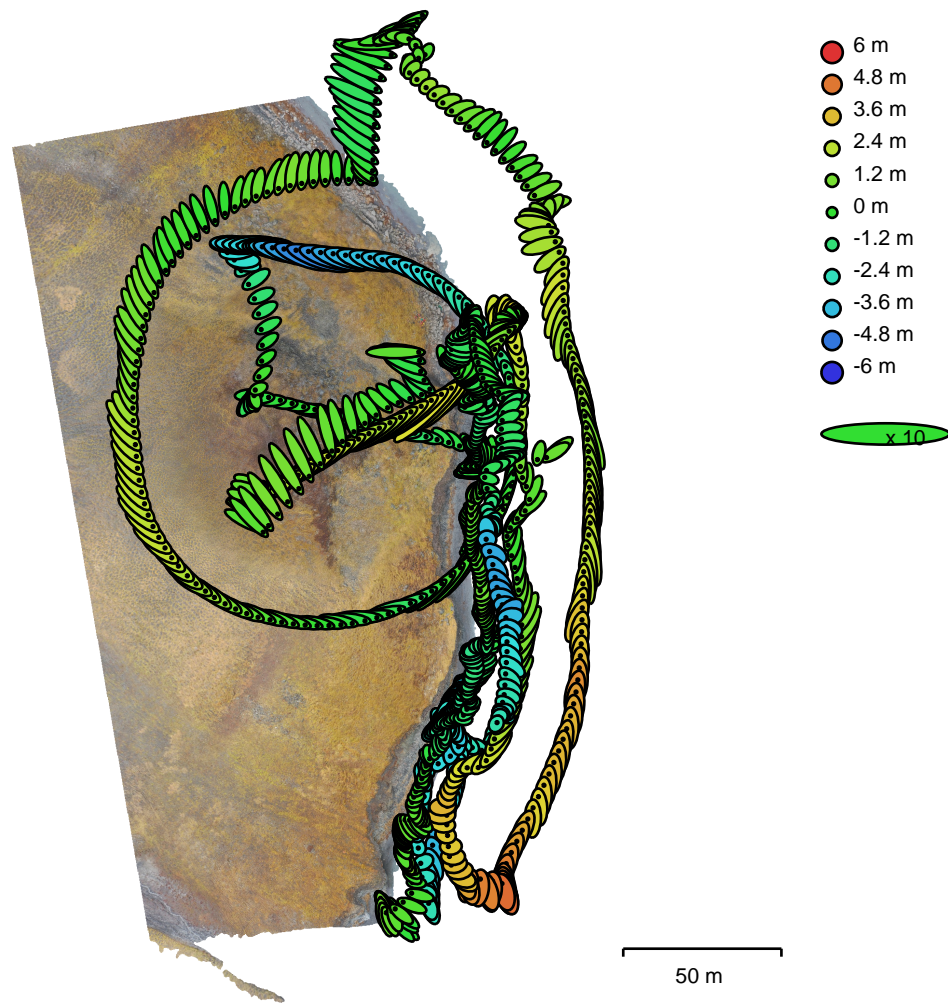


Fig. 3. Camera locations and error estimates.

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)
0.510276	0.517016	1.85259	0.726421	1.98992

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

# Digital Elevation Model

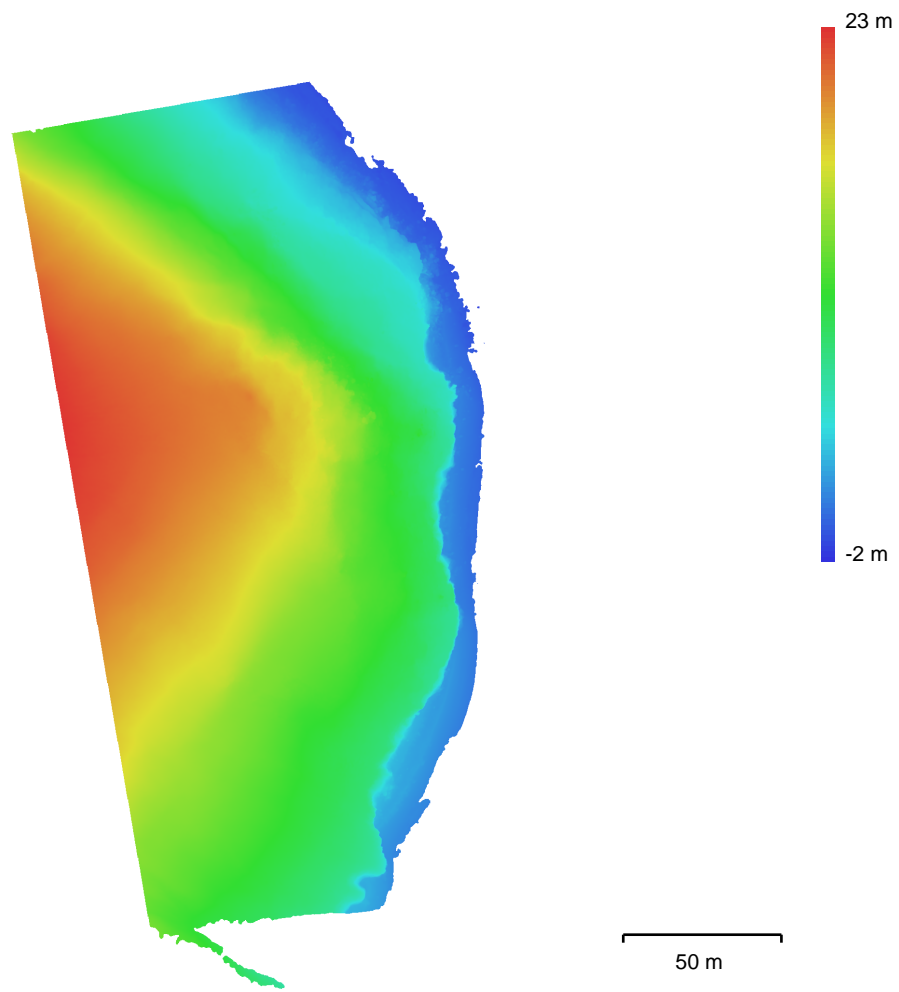


Fig. 4. Reconstructed digital elevation model.

Resolution: 10 mm/pix  
Point density: 1 points/cm<sup>2</sup>

# Processing Parameters

## General

Cameras	921
Aligned cameras	921
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

## Point Cloud

Points	335,192 of 471,191
RMS reprojection error	0.340633 (0.807464 pix)
Max reprojection error	1.62207 (44.1921 pix)
Mean key point size	1.91702 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	9.27325

## Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	Source
Key point limit	40,000
Tie point limit	4,000
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	Yes
Matching time	10 minutes 3 seconds
Matching memory usage	1.11 GB
Alignment time	12 minutes 15 seconds
Alignment memory usage	1.04 GB

## Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	Yes
Optimization time	18 seconds
Software version	1.7.1.11797
File size	75.81 MB

## Depth Maps

Count	921
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Max neighbors	100
Processing time	1 hours 17 minutes
Memory usage	10.74 GB
Software version	1.7.1.11797
File size	6.77 GB

## Dense Point Cloud

Points	132,080,268
Point colors	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Max neighbors	100
Processing time	1 hours 17 minutes
Memory usage	10.74 GB

<b>Dense cloud generation parameters</b>	
Processing time	7 hours 58 minutes
Memory usage	18.91 GB
Software version	1.7.1.11797
File size	2.62 GB
<b>Model</b>	
Faces	26,416,053
Vertices	13,216,882
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096 x 30, 4 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Max neighbors	100
Processing time	1 hours 17 minutes
Memory usage	10.74 GB
<b>Reconstruction parameters</b>	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	56 minutes 46 seconds
Memory usage	73.93 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	32 minutes 59 seconds
UV mapping memory usage	11.80 GB
Blending time	1 hours 26 minutes
Blending memory usage	40.33 GB
Software version	1.7.1.11797
File size	1.60 GB
<b>Tiled Model</b>	
Texture	3 bands, uint8
<b>Depth maps generation parameters</b>	
Quality	High
Filtering mode	Mild
Max neighbors	100
Processing time	1 hours 17 minutes
Memory usage	10.74 GB
<b>Reconstruction parameters</b>	
Source data	Dense cloud
Tile size	128
Face count	Low
Enable ghosting filter	No
Processing time	1 hours 46 minutes
Memory usage	63.64 GB
Software version	1.7.1.11797
File size	4.33 MB
<b>DEM</b>	
Size	21,070 x 31,678
Coordinate system	WGS 84 (EPSG::4326)
<b>Reconstruction parameters</b>	

Source data	Mesh
Interpolation	Disabled
Processing time	4 minutes 52 seconds
Memory usage	3.20 GB
Software version	1.7.1.11797
File size	1.36 GB
<b>System</b>	
Software name	Agisoft Metashape Professional
Software version	1.7.1 build 11797
OS	Windows 64 bit
RAM	127.78 GB
CPU	Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz
GPU(s)	GeForce RTX 2080