

I3

Processing Report
10 May 2022



Survey Data

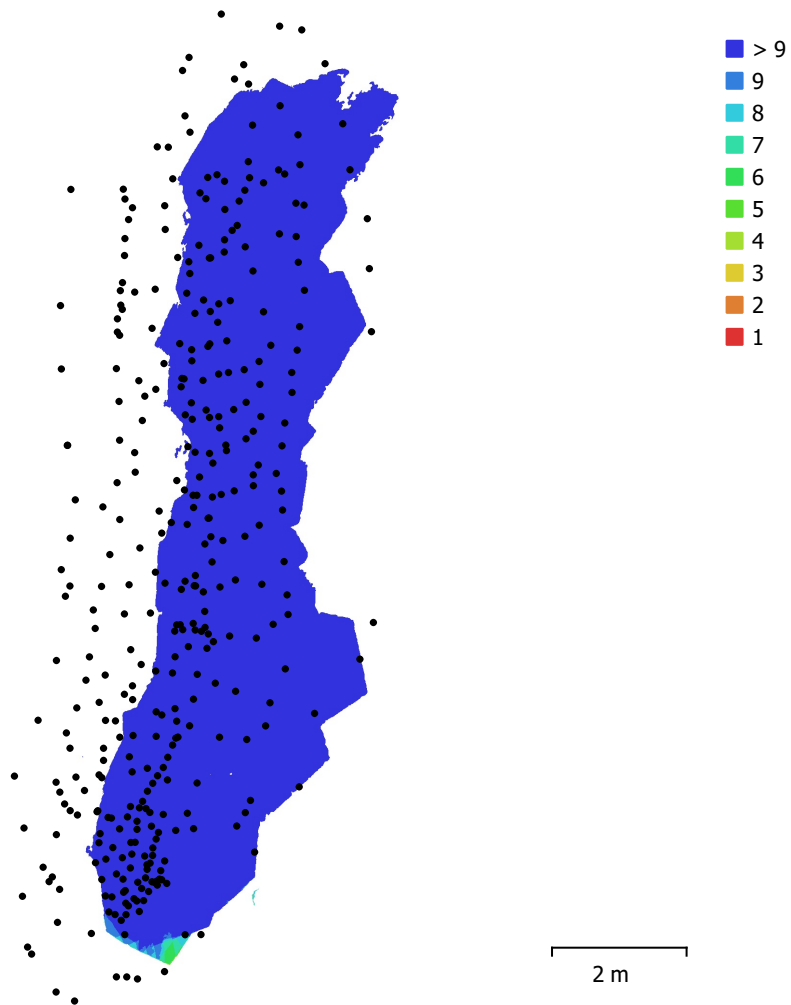


Fig. 1. Camera locations and image overlap.

Number of images:	369	Camera stations:	363
Flying altitude:	1.05 m	Tie points:	136,676
Ground resolution:	0.296 mm/pix	Projections:	277,500
Coverage area:	31.3 m ²	Reprojection error:	0.238 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibration
iPhone SE, iPhone SE back camera 4.15mm f/2.2 (4.15mm)	4032 x 3024	4.15 mm	1.23 x 1.23 μm	No

Table 1. Cameras.

Camera Calibration

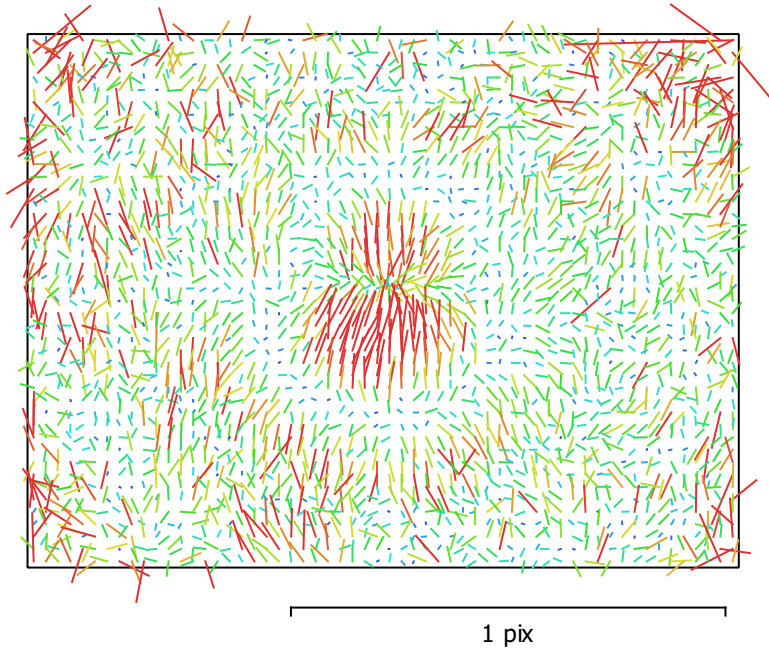


Fig. 2. Image residuals for iPhone SE, iPhone SE back camera 4.15mm f/2.2 (4.15mm).

iPhone SE, iPhone SE back camera 4.15mm f/2.2 (4.15mm)

369 images

Type	Resolution	Focal Length	Pixel Size
Frame	4032 x 3024	4.15 mm	1.23 x 1.23 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	3389.32	0.16	1.00	-0.01	-0.27	0.05	0.01	-0.07	-0.03	-0.06
Cx	-6.56921	0.098		1.00	-0.00	0.02	-0.04	0.04	0.73	0.04
Cy	18.0133	0.098			1.00	-0.08	0.06	-0.04	0.03	0.58
K1	0.120042	0.00011				1.00	-0.94	0.87	-0.01	-0.08
K2	-0.19507	0.00056					1.00	-0.98	-0.01	0.02
K3	0.0128025	0.00081						1.00	0.02	-0.01
P1	0.000237356	9.8e-06							1.00	0.07
P2	1.49821e-05	9.5e-06								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

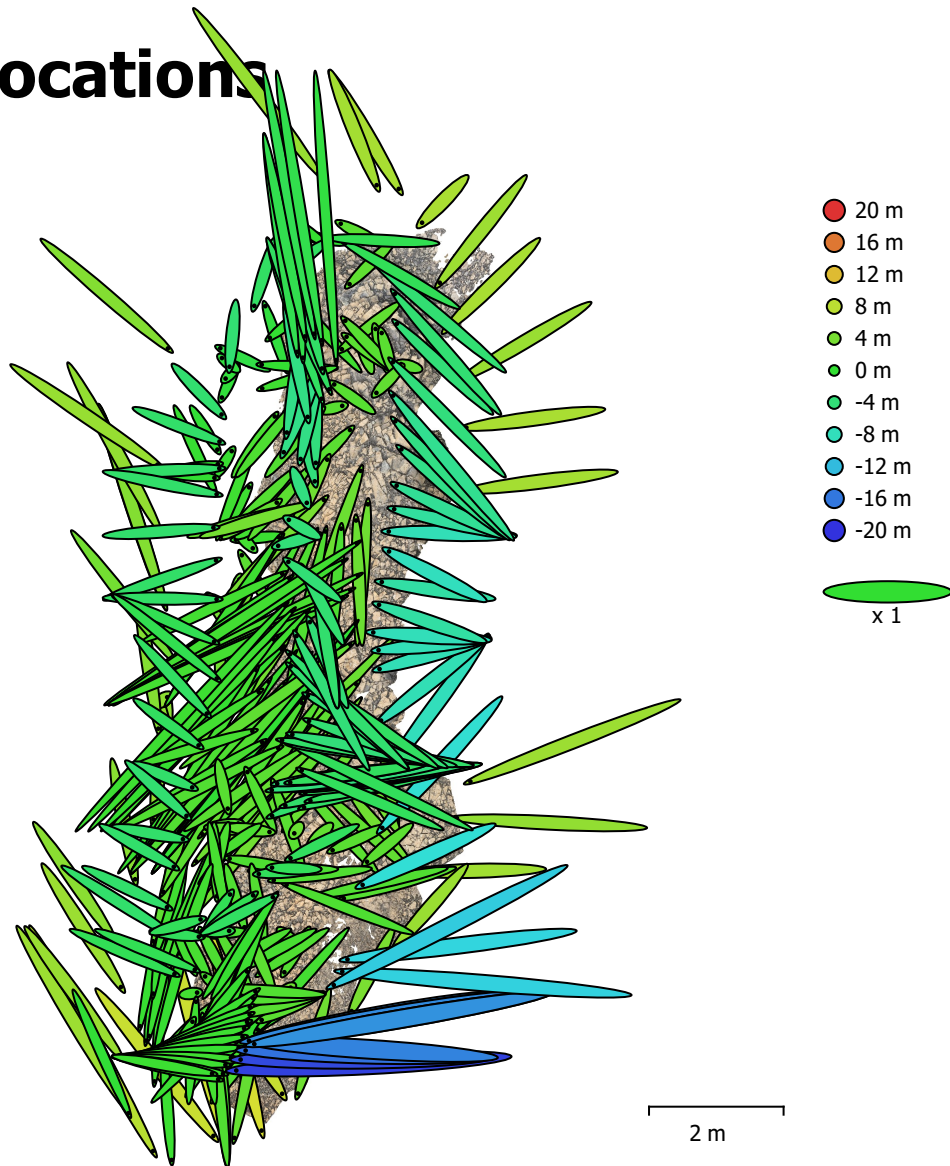


Fig. 3. Camera locations and error estimates.

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)
1.53199	1.44478	4.22784	2.1058	4.72324

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

Digital Elevation Model

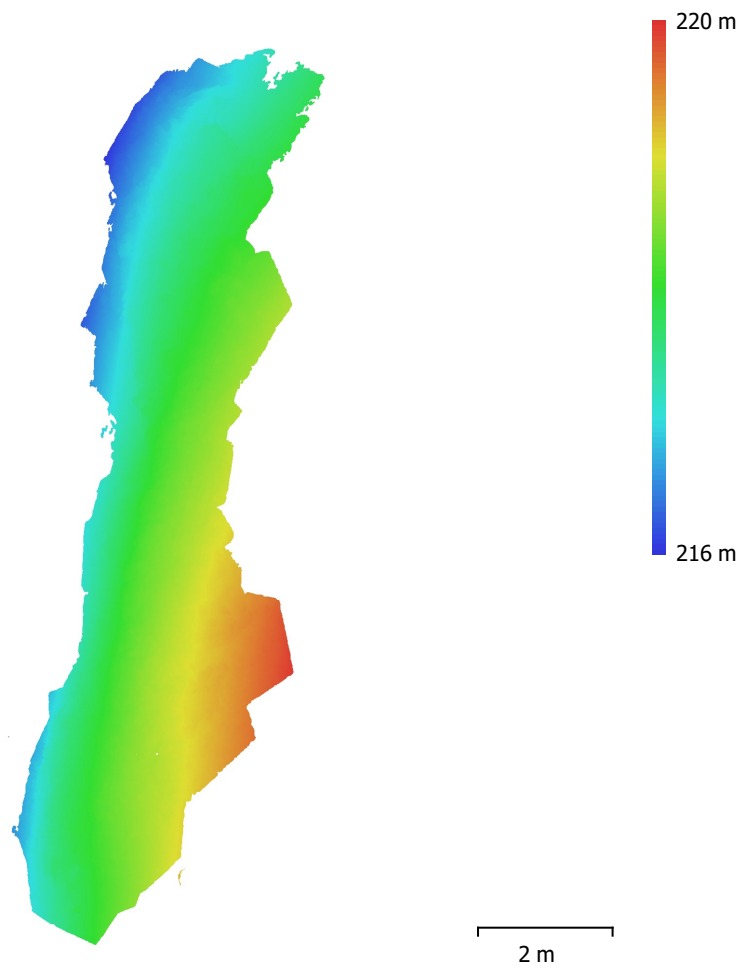


Fig. 4. Reconstructed digital elevation model.

Resolution: 0.62 mm/pix
Point density: 2.6 points/mm²

Processing Parameters

General

Cameras	369
Aligned cameras	363
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	136,676 of 1,243,582
RMS reprojection error	0.157062 (0.237685 pix)
Max reprojection error	7.82996 (19.8026 pix)
Mean key point size	1.45084 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.52166

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	No
Key point limit	60,000
Tie point limit	0
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	49 seconds
Matching memory usage	1.64 GB
Alignment time	1 minutes 10 seconds
Alignment memory usage	320.52 MB

Optimization parameters

Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	No
Optimization time	16 seconds
Software version	1.7.2.12040
File size	54.58 MB

Depth Maps

Count	333
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	8 minutes 57 seconds
Memory usage	1.56 GB
Software version	1.7.2.12040
File size	1.27 GB

Dense Point Cloud

Points	112,692,430
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	8 minutes 57 seconds
Memory usage	1.56 GB
Dense cloud generation parameters	

Processing time	1 hours 7 minutes
Memory usage	7.22 GB
Software version	1.7.2.12040
File size	3.03 GB
Model	
Faces	22,538,486
Vertices	11,291,404
Vertex colors	3 bands, uint8
Texture	4,096 x 4,096 x 10, 4 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	8 minutes 57 seconds
Memory usage	1.56 GB
Reconstruction parameters	
Surface type	Arbitrary
Source data	Dense cloud
Interpolation	Enabled
Strict volumetric masks	No
Processing time	56 minutes 54 seconds
Memory usage	64.44 GB
Texturing parameters	
Mapping mode	Generic
Blending mode	Mosaic
Texture size	4,096
Enable hole filling	Yes
Enable ghosting filter	Yes
UV mapping time	7 minutes 7 seconds
UV mapping memory usage	5.04 GB
Blending time	6 minutes 15 seconds
Blending memory usage	9.62 GB
Software version	1.7.2.12040
File size	1.21 GB
Tiled Model	
Texture	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	8 minutes 57 seconds
Memory usage	1.56 GB
Reconstruction parameters	
Source data	Dense cloud
Tile size	256
Face count	High
Enable ghosting filter	No
Processing time	3 hours 57 minutes
Memory usage	11.44 GB
Software version	1.7.2.12040
File size	2.66 GB
System	
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