

forrestal-report

Processing Report
11 April 2024



Survey Data

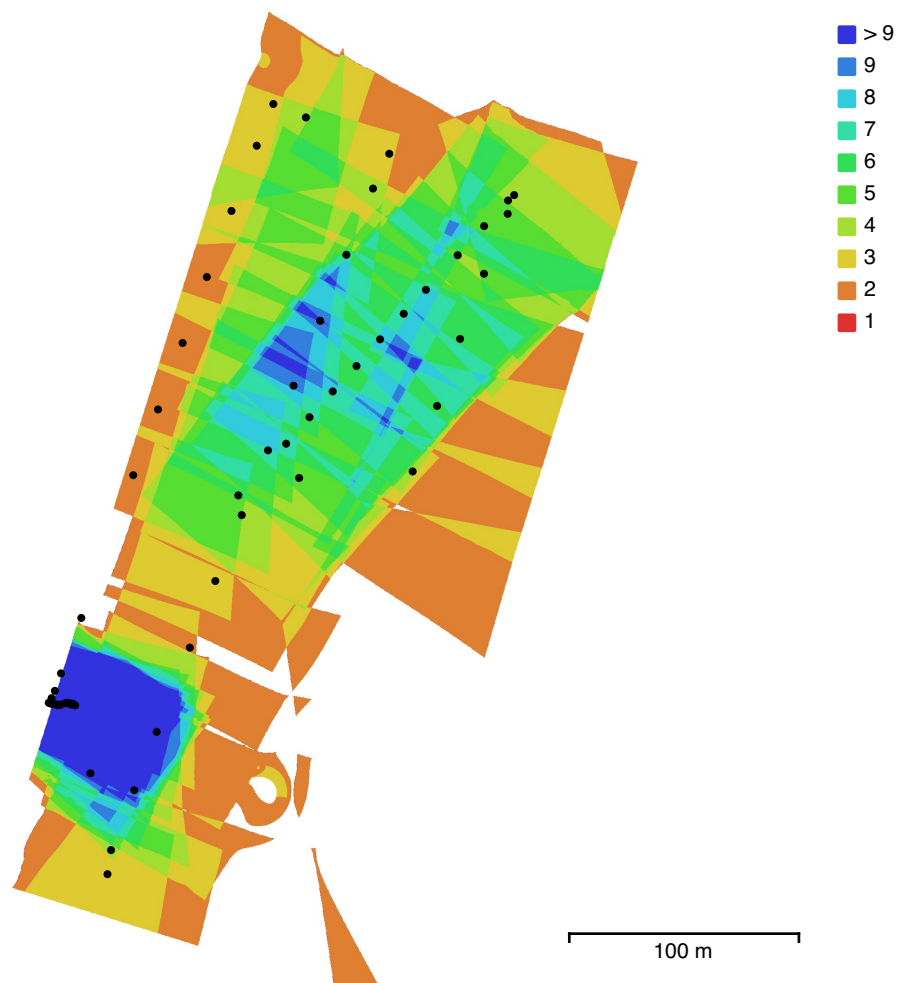


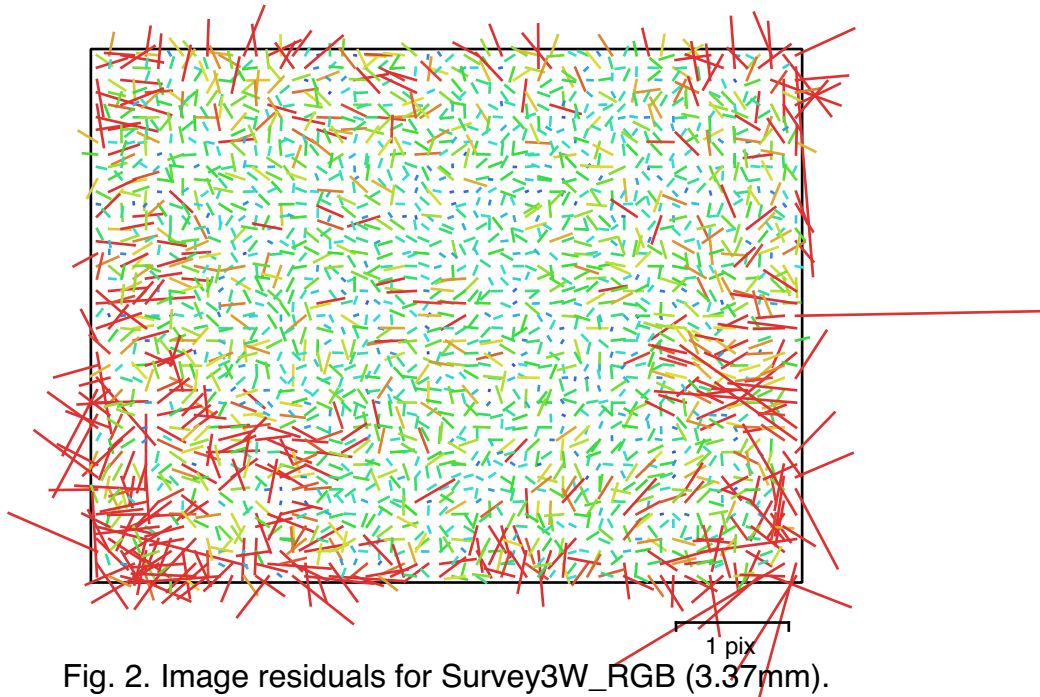
Fig. 1. Camera locations and image overlap.

Number of images:	69	Camera stations:	61
Flying altitude:	49.1 m	Tie points:	65,368
Ground resolution:	2.28 cm/pix	Projections:	179,058
Coverage area:	0.0535 km ²	Reprojection error:	1.18 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Survey3W_RGB (3.37mm)	4000 x 3000	3.37 mm	unknown	No

Table 1. Cameras.

Camera Calibration



Survey3W_RGB (3.37mm)

69 images

Type	Resolution	Focal Length	Pixel Size
Frame	4000 x 3000	3.37 mm	unknown

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	2150.71	1.2	1.00	0.13	0.71	0.38	-0.55	0.39	-0.05	-0.01
Cx	-164.241	0.22		1.00	0.09	0.14	-0.12	0.05	0.43	0.06
Cy	131.697	0.33			1.00	0.26	-0.37	0.28	-0.06	0.34
K1	0.0608781	0.0002				1.00	-0.80	0.68	0.05	0.35
K2	-0.0698791	0.00026					1.00	-0.96	0.01	-0.03
K3	0.0152233	0.00012						1.00	-0.05	0.00
P1	0.000199363	1.6e-05							1.00	0.08
P2	0.00048504	2.2e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

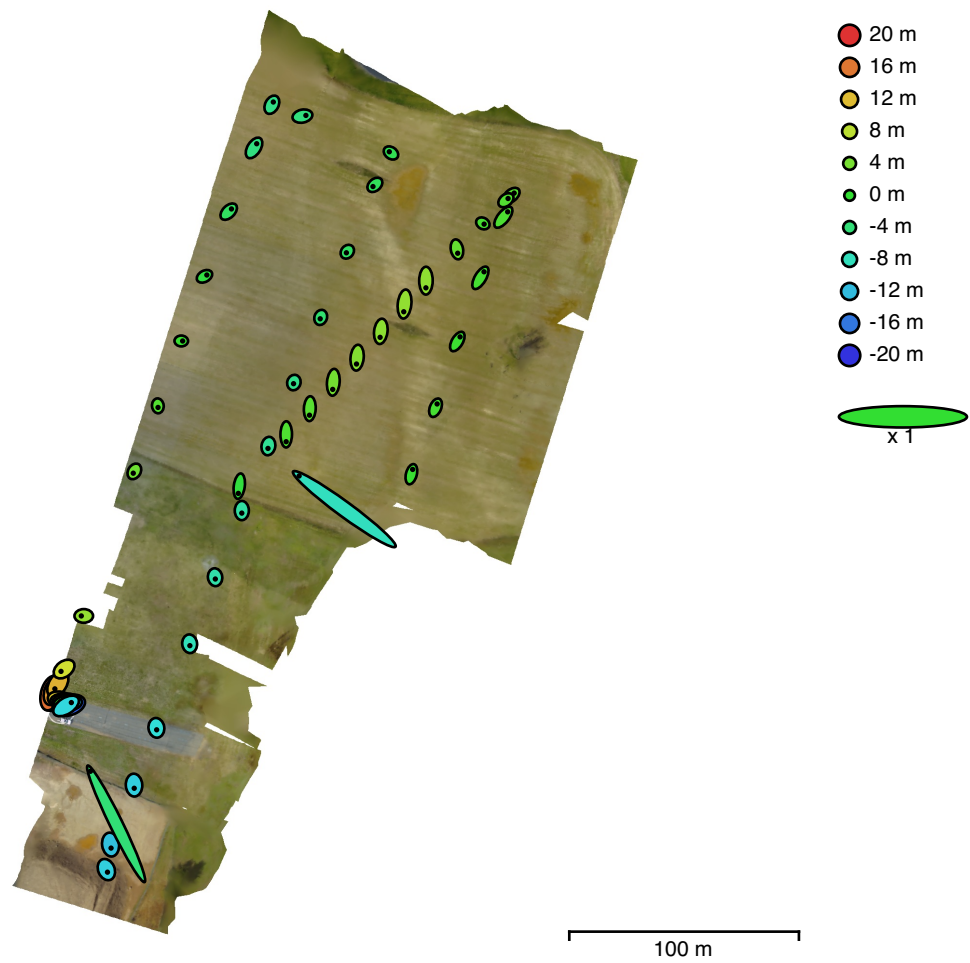


Fig. 3. Camera locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
6.25037	7.68913	7.18816	9.90908	12.2417

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

Ground Control Points

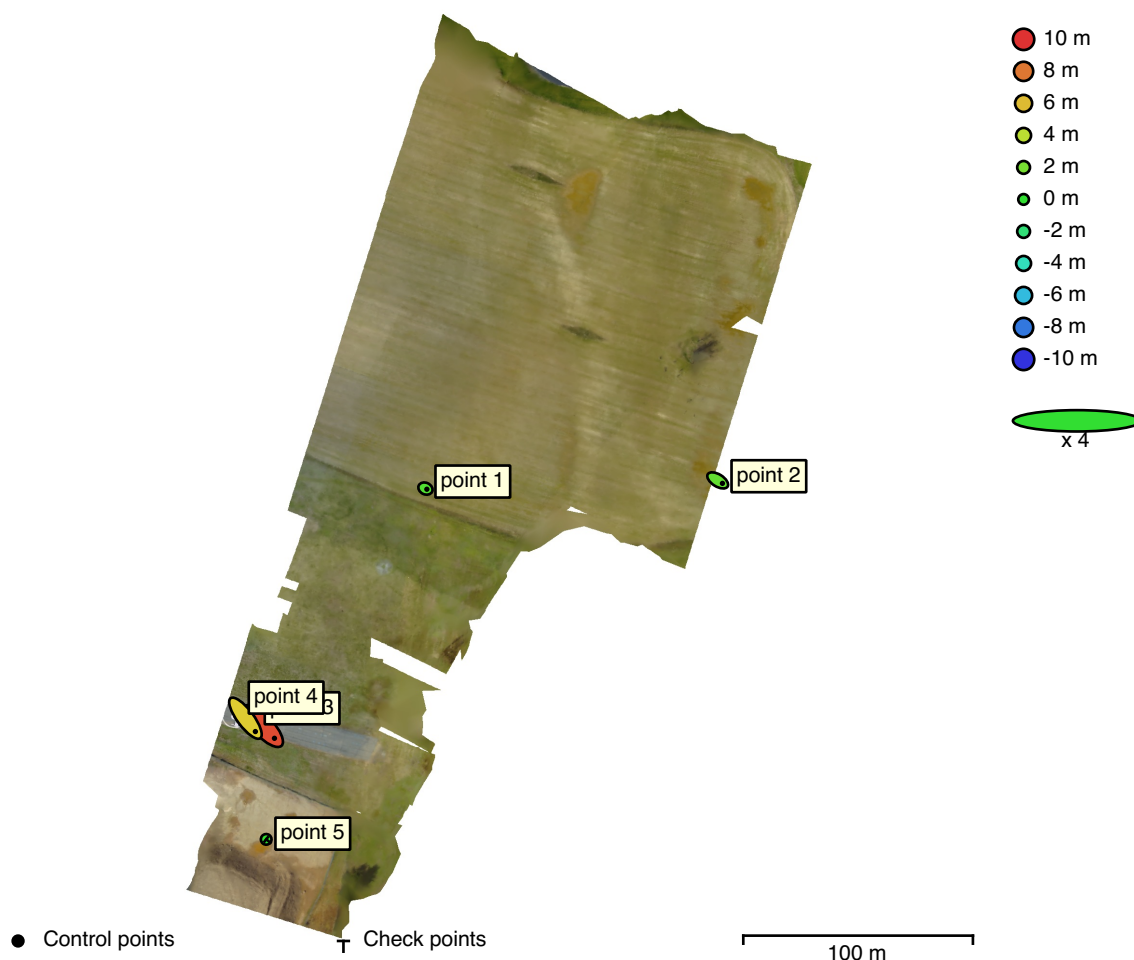


Fig. 4. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (m)	Y error (m)	Z error (m)	XY error (m)	Total (m)
4	1.74444	1.99986	5.45024	2.65377	6.06198

Table 4. Control points RMSE.
X - Longitude, Y - Latitude, Z - Altitude.

Count	X error (m)	Y error (m)	Z error (m)	XY error (m)	Total (m)
1	5.76976e-07	4.49283e-07	3.26076e-07	7.31271e-07	8.00676e-07

Table 5. Check points RMSE.
X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 1	0.309003	-0.145667	0.895314	0.958274	62.464 (8)
point 2	1.03231	-0.646817	1.41765	1.86917	190.883 (4)
point 3	2.51914	-2.66896	9.25572	9.95679	157.844 (21)
point 4	2.15986	-2.90427	5.50824	6.59094	150.827 (22)
Total	1.74444	1.99986	5.45024	6.06198	147.749

Table 6. Control points.
X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 5	-5.76976e-07	4.49283e-07	-3.26076e-07	8.00676e-07	0.000 (3)
Total	5.76976e-07	4.49283e-07	3.26076e-07	8.00676e-07	0.000

Table 7. Check points.
X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

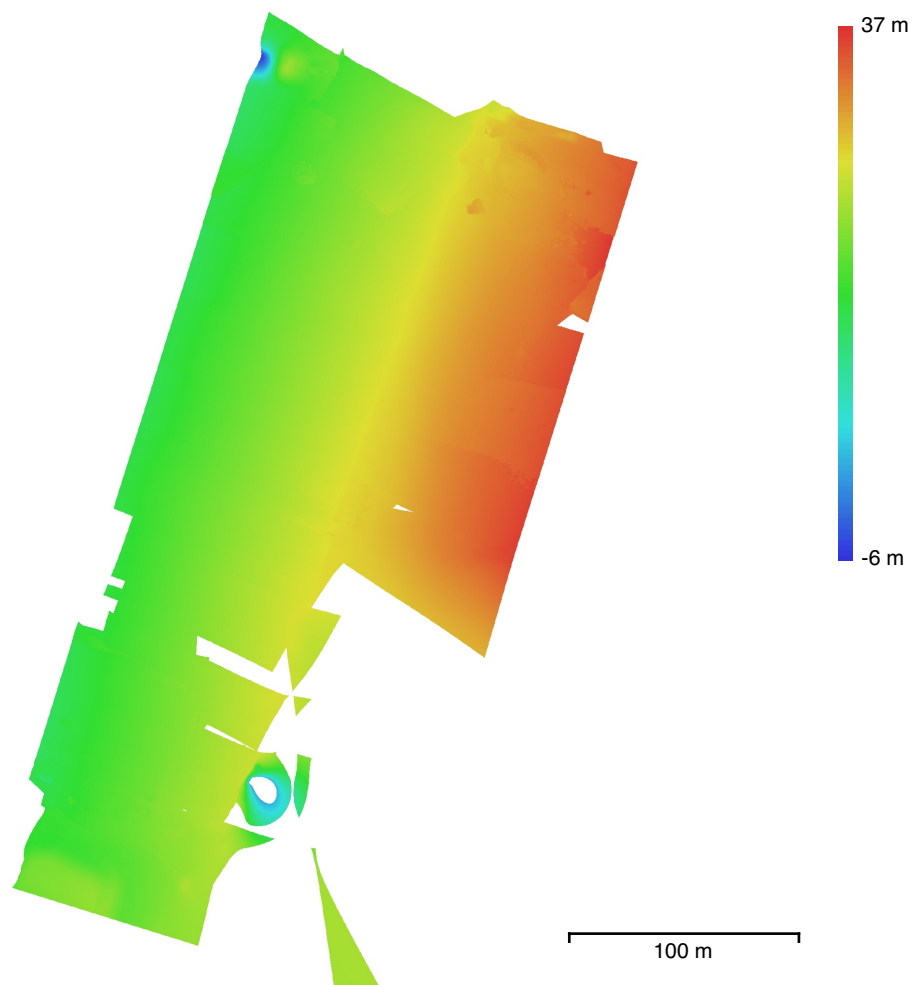


Fig. 5. Reconstructed digital elevation model.

Resolution: 9.13 cm/pix
Point density: 120 points/m²

Processing Parameters

General

Cameras	69
Aligned cameras	61
Markers	5
Shapes	
LineString	1
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Tie Points

Points	65,368 of 83,800
RMS reprojection error	0.853584 (1.17614 pix)
Max reprojection error	2.61096 (53.7491 pix)
Mean key point size	1.4061 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.74124

Alignment parameters

Accuracy	Highest
Generic preselection	Yes
Reference preselection	No
Key point limit	40,000
Key point limit per Mpx	1,000
Tie point limit	4,000
Filter points by mask	No
Mask tie points	No
Exclude stationary tie points	Yes
Guided image matching	No
Adaptive camera model fitting	No
Matching time	4 minutes 46 seconds
Matching memory usage	1.61 GB
Alignment time	2 minutes 30 seconds
Alignment memory usage	129.81 MB
Date created	2024:04:10 21:57:24
Software version	2.1.1.17821
File size	5.25 MB

Depth Maps

Count	63
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	16
Processing time	47 minutes 40 seconds
File size	71.73 MB

Model

Faces	529,450
Vertices	264,920
Vertex colors	3 bands, uint8
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	16

Processing time	47 minutes 40 seconds
Reconstruction parameters	
Surface type	Arbitrary
Source data	Depth maps
Interpolation	Enabled
Strict volumetric masks	No
Processing time	3 minutes 6 seconds
Memory usage	1.53 GB
Date created	2024:04:10 22:51:58
Software version	2.1.1.17821
File size	11.36 MB
DEM	
Size	3,270 x 4,698
Coordinate system	WGS 84 (EPSG::4326)
Depth maps generation parameters	
Quality	Medium
Filtering mode	Mild
Max neighbors	16
Processing time	47 minutes 40 seconds
Reconstruction parameters	
Source data	Depth maps
Interpolation	Enabled
Processing time	23 minutes 50 seconds
Memory usage	2.08 GB
Date created	2024:04:11 20:57:54
Software version	2.1.1.17821
File size	33.72 MB
System	
Software name	Agisoft Metashape Professional
Software version	2.1.1 build 17821
OS	Mac OS 64 bit
RAM	16.00 GB
CPU	Intel(R) Core(TM) i7-8569U CPU @ 2.80GHz
GPU(s)	None