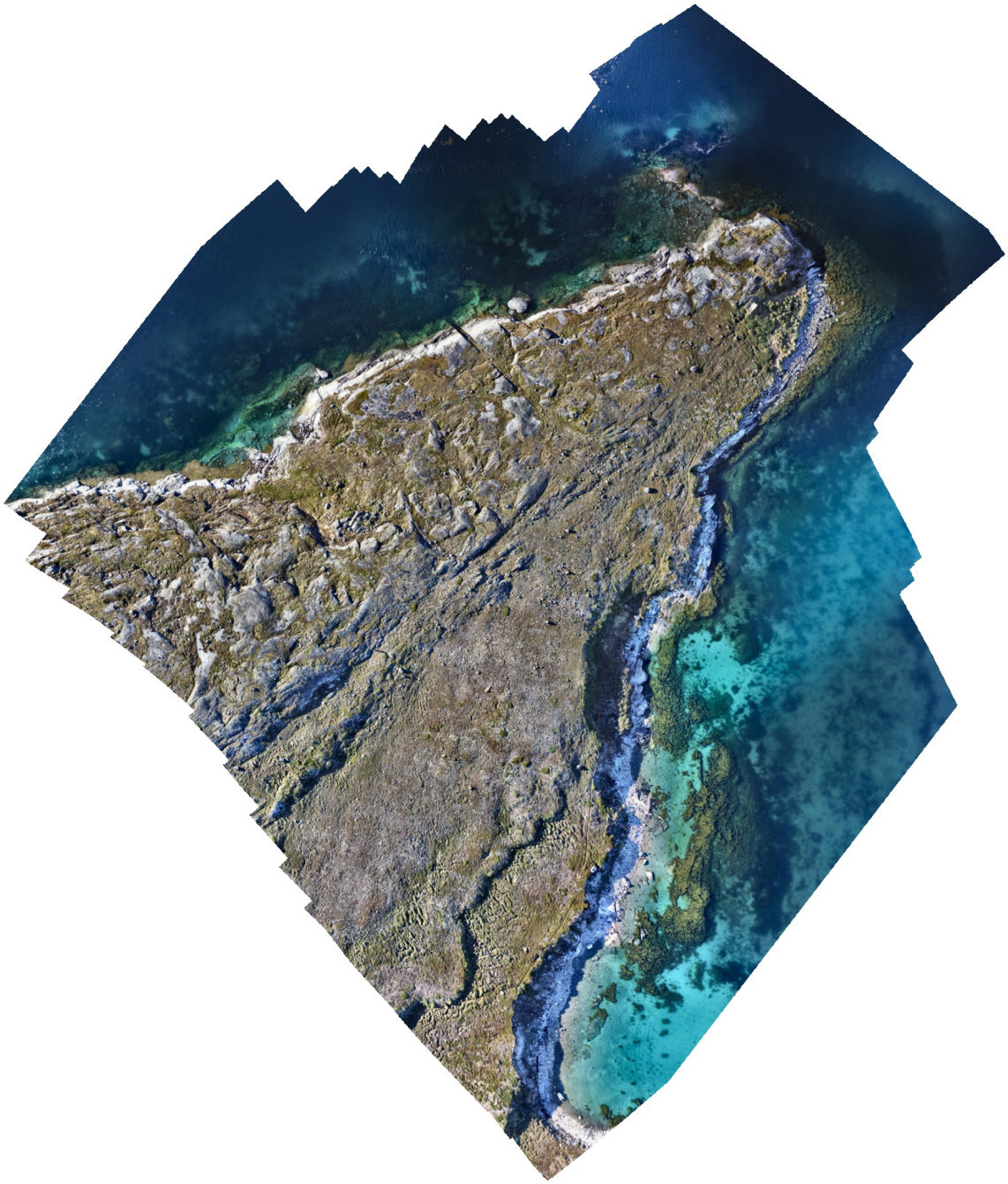
20170711_GFBay

Processing Report

10 September 2022



Survey Data

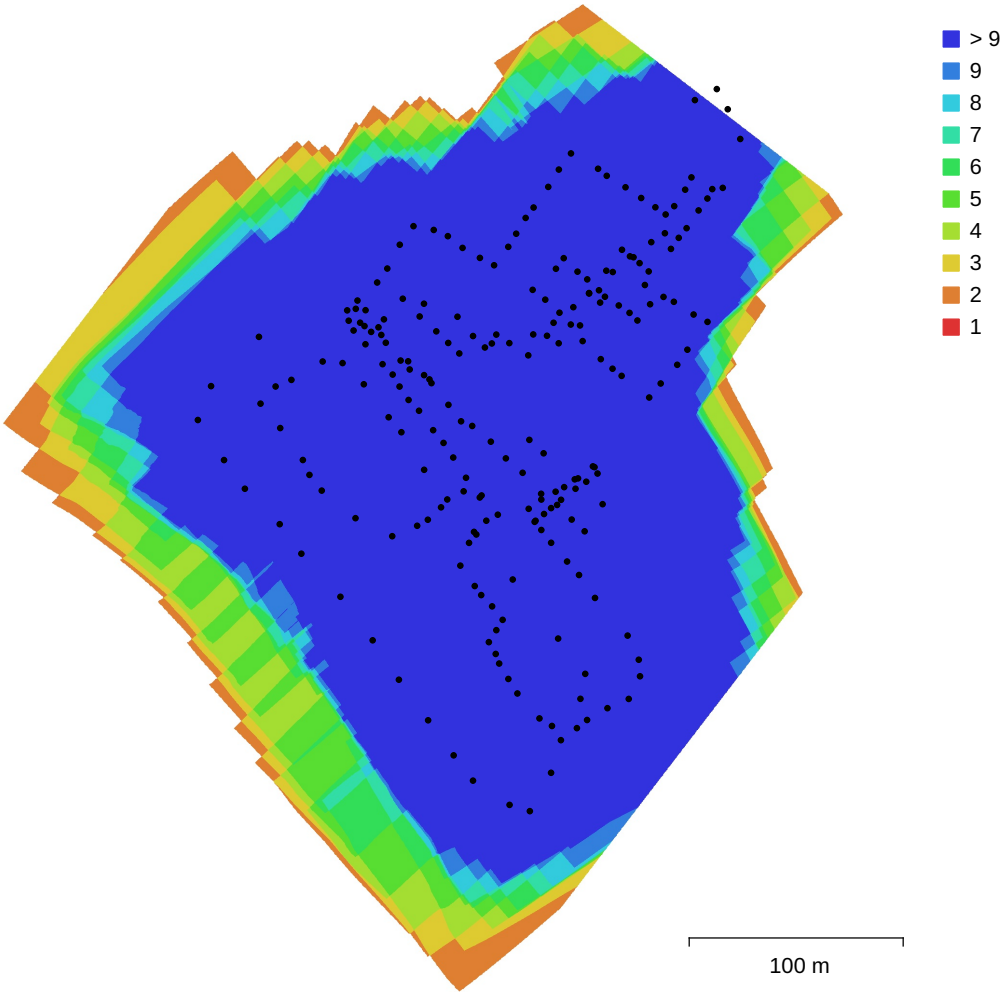


Fig. 1. Camera locations and image overlap.

Number of images:	225	Camera stations:	225
Flying altitude:	76.6 m	Tie points:	381,279
Ground resolution:	2.55 cm/pix	Projections:	1,230,715
Coverage area:	0.102 km²	Reprojection error:	0.317 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC300C (3.61mm)	4000 x 3000	3.61 mm	1.56 x 1.56 µm	No

Table 1. Cameras.

Camera Calibration

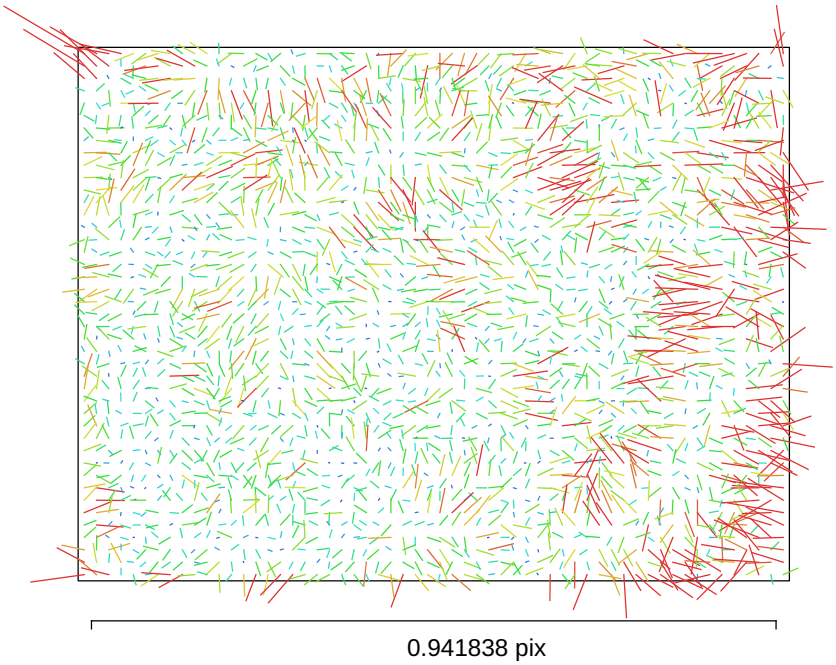


Fig. 2. Image residuals for FC300C (3.61mm).

FC300C (3.61mm)

225 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4000 x 3000**	**3.61 mm**	**1.56 x 1.56 µm**

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	**2710.44**	0.34	1.00	0.19	-0.09	-0.04	-0.33	-0.72	0.52	-0.29	0.27	-0.21	0.04
Cx	**18.0565**	0.033		1.00	-0.08	-0.20	0.12	-0.13	0.08	-0.05	0.05	-0.18	0.06
Cy	**13.858**	0.036			1.00	-0.17	-0.13	0.12	-0.06	0.03	-0.03	0.04	-0.13
B1	**0.913283**	0.021				1.00	0.05	-0.00	-0.01	0.01	-0.02	0.34	0.30
B2	**-3.89088**	0.021					1.00	0.21	-0.17	0.09	-0.09	-0.01	0.28
K1	**-0.146665**	5e-05						1.00	-0.92	0.79	-0.74	0.17	-0.10
K2	**0.163627**	0.00016							1.00	-0.96	0.93	-0.09	0.02
K3	**-0.0885606**	0.00024								1.00	-0.99	0.05	-0.01
K4	**0.0345812**	0.00014									1.00	-0.05	-0.00
P1	**-0.000239029**	5e-06										1.00	0.10
P2	**0.00026513**	4.8e-06											1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

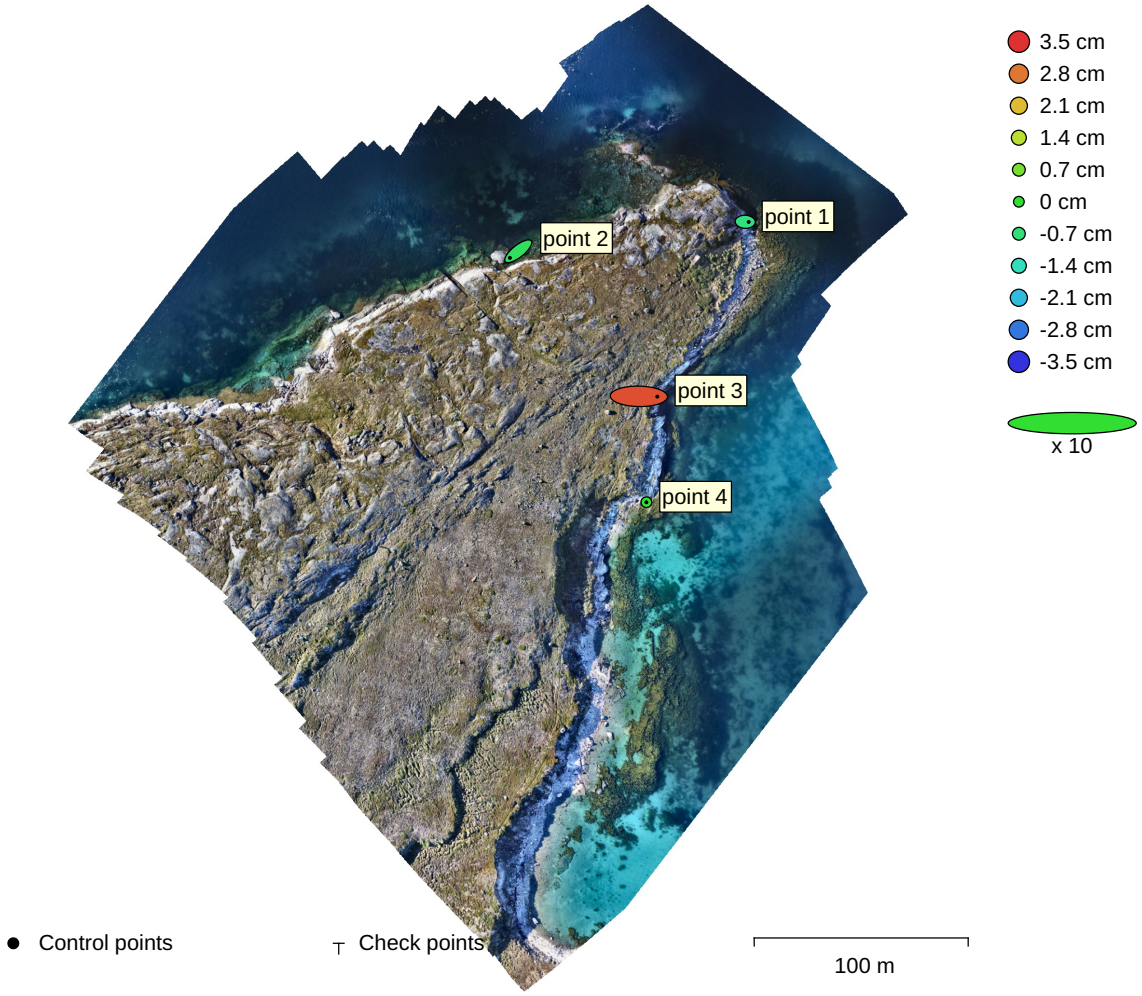


Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (m)	Y error (m)	Z error (m)	XY error (m)	Total (m)
4	0.958356	0.309615	0.0166957	1.00713	1.00727

Table 3. Control points RMSE.
X - Longitude, Y - Latitude, Z - Altitude.

Label	X error (m)	Y error (m)	Z error (m)	Total (m)	Image (pix)
point 1	0.32512	-0.0159636	-0.00818116	0.325614	0.302 (32)
point 2	-0.779181	-0.61845	-0.00445196	0.994798	0.476 (39)
point 3	1.72074	-0.0266527	0.0320661	1.72125	0.355 (36)
point 4	-0.000506669	0.000264417	-7.77311e-06	0.000571568	1.058 (53)
Total	**0.958356**	**0.309615**	**0.0166957**	**1.00727**	**0.687**

Table 4. Control points.

X - Longitude, Y - Latitude, Z - Altitude.

Digital Elevation Model

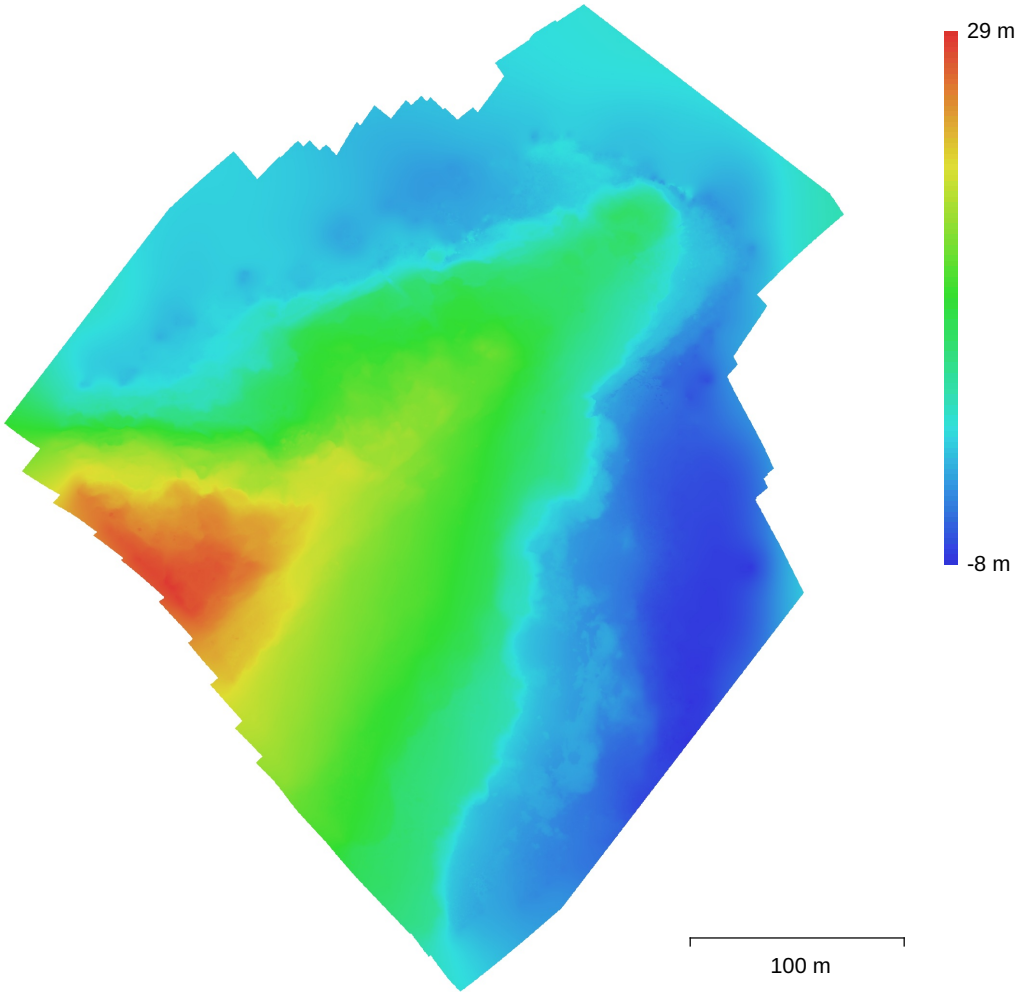


Fig. 4. Reconstructed digital elevation model.

Resolution:	2.55 cm/pix
Point density:	0.154 points/cm²

Processing Parameters

General	
Cameras	225
Aligned cameras	225
Markers	4
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	381,279 of 1,121,806
RMS reprojection error	0.116162 (0.316697 pix)
Max reprojection error	0.263815 (2.28537 pix)
Mean key point size	2.66294 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	5.71559
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Reference preselection	Source
Key point limit	60,000
Tie point limit	0
Exclude stationary tie points	No
Guided image matching	No
Adaptive camera model fitting	No
Matching time	3 minutes 37 seconds
Matching memory usage	699.14 MB
Alignment time	8 minutes 48 seconds
Alignment memory usage	757.64 MB
Optimization parameters	
Parameters	f, cx, cy, k1-k3, p1, p2
Adaptive camera model fitting	Yes
Optimization time	5 seconds
Software version	1.7.1.11797
File size	109.80 MB
Depth Maps	
Count	225
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Processing time	1 hours 48 minutes
Memory usage	6.53 GB
Software version	1.7.1.11797
File size	3.24 GB
Dense Point Cloud	
Points	89,428,268
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	Ultra High
Filtering mode	Mild
Processing time	1 hours 48 minutes
Memory usage	6.53 GB
Dense cloud generation parameters	

Processing time	1 hours 55 minutes
Memory usage	24.12 GB
Software version	1.7.1.11797
File size	1.31 GB
DEM	
Size	20,731 x 21,268
Coordinate system	WGS 84 (EPSG::4326)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled
Processing time	1 minutes 12 seconds
Memory usage	285.96 MB
Software version	1.7.1.11797
File size	777.15 MB
Orthomosaic	
Size	15,389 x 18,092
Coordinate system	WGS 84 (EPSG::4326)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	DEM
Enable hole filling	Yes
Enable ghosting filter	No
Processing time	5 minutes 19 seconds
Memory usage	8.21 GB
Software version	1.7.1.11797
File size	4.74 GB
System	
Software name	Agisoft Metashape Professional
Software version	1.7.1 build 11797
OS	Linux 64 bit
RAM	125.62 GB
CPU	Intel(R) Core(TM) i7-9800X CPU @ 3.80GHz
GPU(s)	Quadro P1000