

PBSF_09052020

Processing Report

14 June 2021



Survey Data

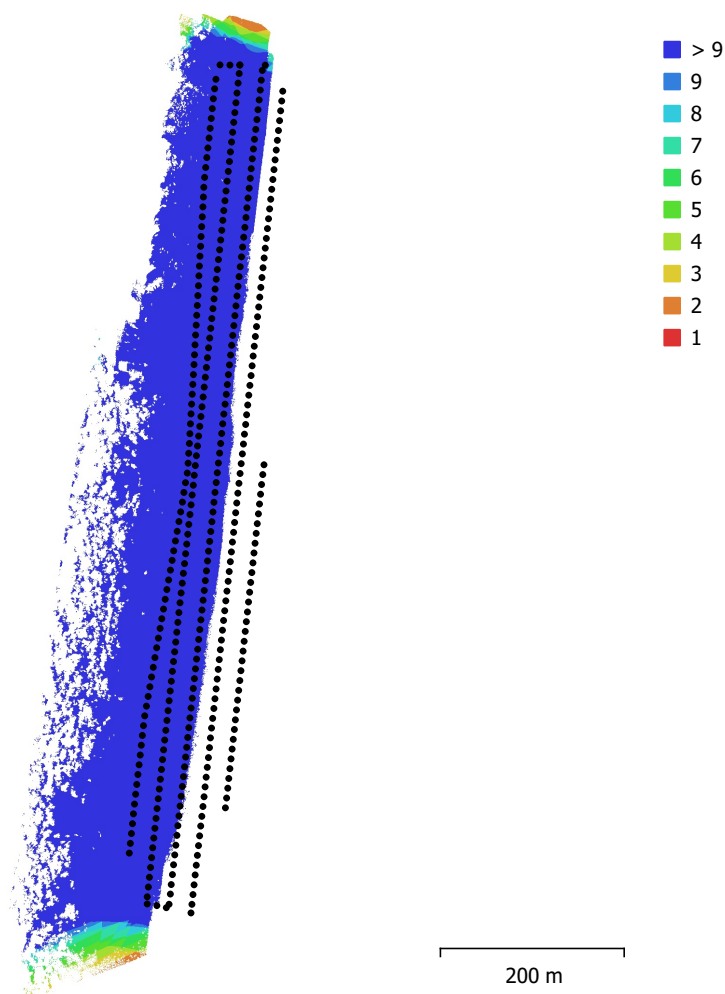


Fig. 1. Camera locations and image overlap.

Number of images:	380	Camera stations:	380
Flying altitude:	82.3 m	Tie points:	756,011
Ground resolution:	2 cm/pix	Projections:	2,721,130
Coverage area:	0.12 km ²	Reprojection error:	0.651 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310R (8.8mm)	5472 x 3648	8.8 mm	2.41 x 2.41 μm	Yes

Table 1. Cameras.

Camera Calibration

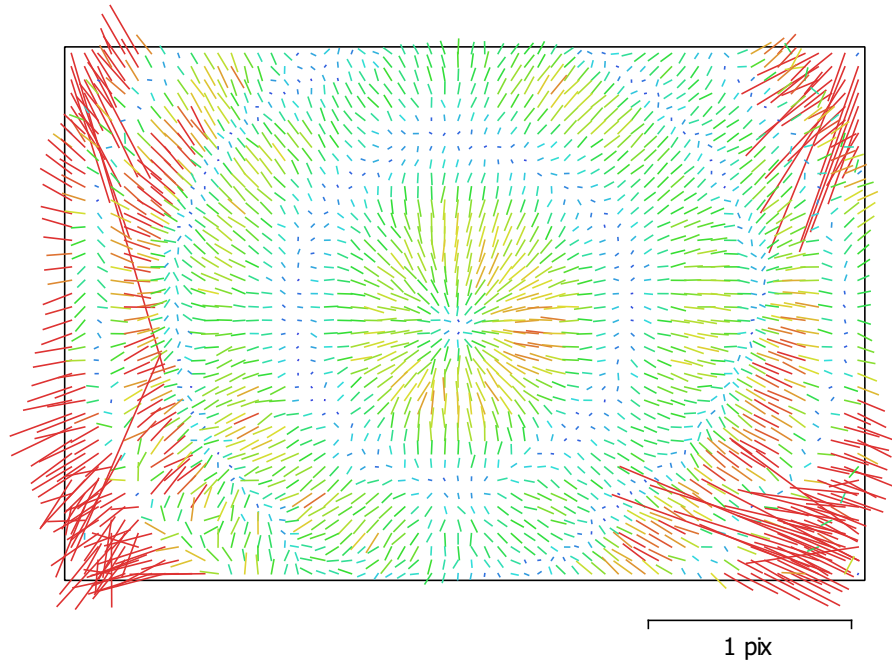


Fig. 2. Image residuals for FC6310R (8.8mm).

FC6310R (8.8mm)

380 images, precalibrated

Type
Frame

Resolution
5472 x 3648

Focal Length
8.8 mm

Pixel Size
2.41 x 2.41 μm

	Value	Error	F	Cx	Cy	K1	K2	K3	P1	P2
F	3689.73	0.012	1.00	-0.25	-0.37	-0.42	0.26	-0.21	0.16	0.39
Cx	-41.6736	0.014		1.00	0.15	-0.02	0.04	-0.05	-0.08	-0.26
Cy	-8.33884	0.013			1.00	0.11	-0.04	0.03	-0.33	-0.63
K1	-0.283804	6.1e-06				1.00	-0.95	0.88	-0.08	-0.11
K2	0.125026	1.3e-05					1.00	-0.98	0.02	0.05
K3	-0.0348391	8.6e-06						1.00	-0.03	-0.03
P1	-0.000280456	3.7e-07							1.00	0.30
P2	0.000397646	5.5e-07								1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

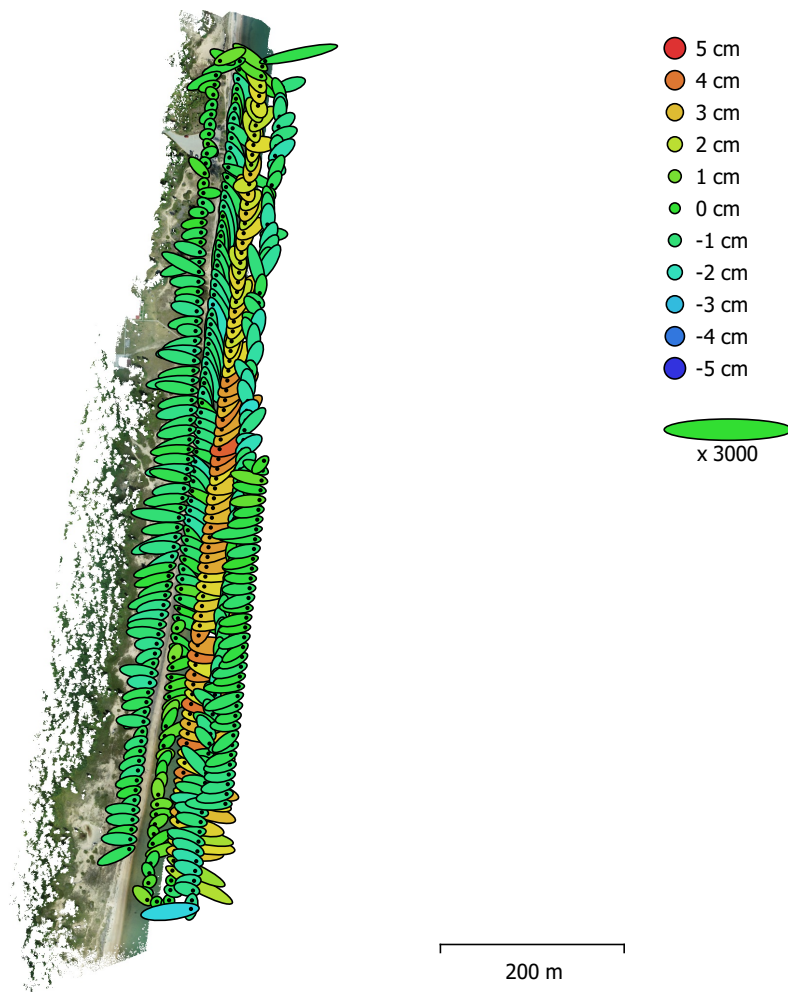


Fig. 3. Camera locations and error estimates.

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 (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total error (cm)
0.754433	0.51717	1.5692	0.914677	1.81632

Table 3. Average camera location error.

X - Easting, Y - Northing, 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 (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
2	6.01993	34.2443	9.93446	34.7694	36.1608

Table 4. Control points RMSE.

X - Easting, Y - Northing, Z - Altitude.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
5	2.759	26.2083	9.90837	28.1542	31.026 (3)
6	-8.05401	40.7243	9.96048	42.6913	50.905 (2)
Total	6.01993	34.2443	9.93446	36.1608	40.175

Table 5. Control points.
X - Easting, Y - Northing, Z - Altitude.

Digital Elevation Model

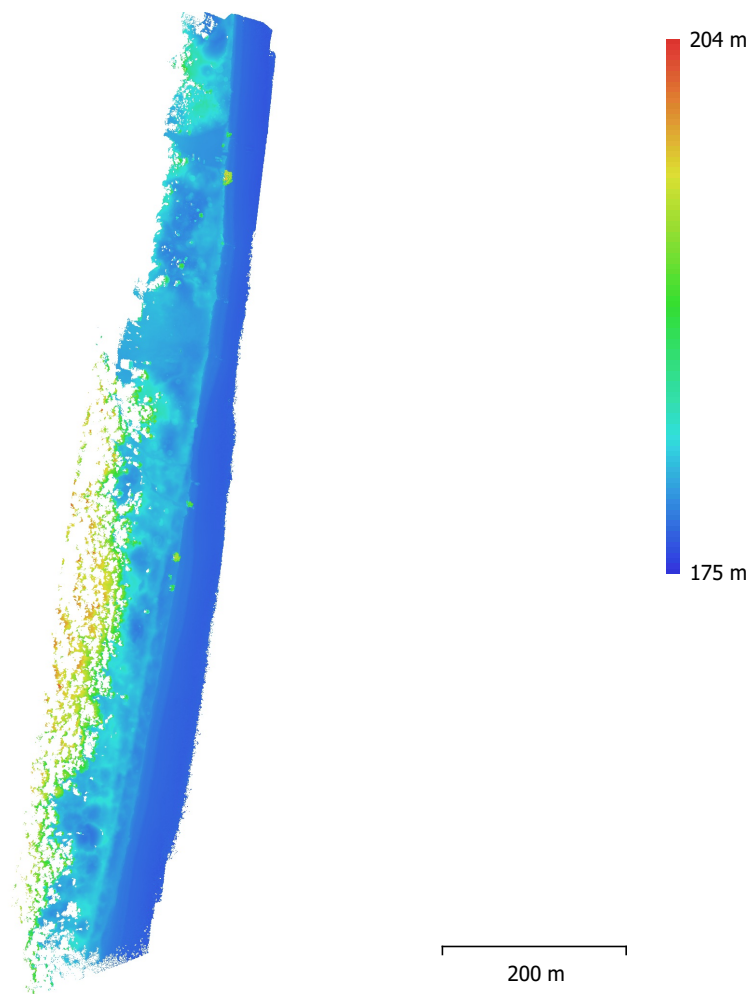


Fig. 5. Reconstructed digital elevation model.

Resolution: 4 cm/pix
Point density: 626 points/m²

Processing Parameters

General

Cameras	380
Aligned cameras	380
Markers	2
Coordinate system	WGS 84 / UTM zone 16N (EPSG::32616)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	756,011 of 813,224
RMS reprojection error	0.123389 (0.650857 pix)
Max reprojection error	0.373972 (39.5313 pix)
Mean key point size	3.70121 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	4.12907

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	No
Key point limit	40,000
Tie point limit	10,000
Guided image matching	No
Adaptive camera model fitting	No
Matching time	46 minutes 53 seconds
Matching memory usage	8.00 KB
Alignment time	5 minutes 39 seconds
Alignment memory usage	278.02 MB
Software version	1.6.2.10247

Depth Maps

Count	378
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	7 hours 36 minutes
Software version	1.6.2.10247

Dense Point Cloud

Points	117,943,644
Point colors	3 bands, uint8
Depth maps generation parameters	
Quality	High
Filtering mode	Mild
Processing time	7 hours 36 minutes
Dense cloud generation parameters	
Processing time	3 hours 45 minutes
Software version	1.6.2.10247

Model

Faces	14,642,522
Vertices	8,719,891
Vertex colors	3 bands, uint8
Depth maps generation parameters	
Quality	High

Filtering mode	Mild
Processing time	7 hours 36 minutes
Reconstruction parameters	
Surface type	Height field
Source data	Dense cloud
Interpolation	Disabled
Strict volumetric masks	No
Processing time	6 minutes 40 seconds
Software version	1.6.2.10247
Orthomosaic	
Size	14,624 x 53,752
Coordinate system	WGS 84 / UTM zone 16N (EPSG::32616)
Colors	3 bands, uint8
Reconstruction parameters	
Blending mode	Mosaic
Surface	Mesh
Enable hole filling	Yes
Processing time	28 minutes 36 seconds
Software version	1.6.2.10247
System	
Software name	Agisoft Metashape Professional
Software version	1.6.2 build 10247
OS	Windows 64 bit
RAM	63.87 GB
CPU	Intel(R) Core(TM) i7-7700 CPU @ 3.60GHz
GPU(s)	AMD RadeonT R7 450 (Capeverde)