

Skyline Drive_EMCDemo

Processing Report
19 April 2021



Survey Data

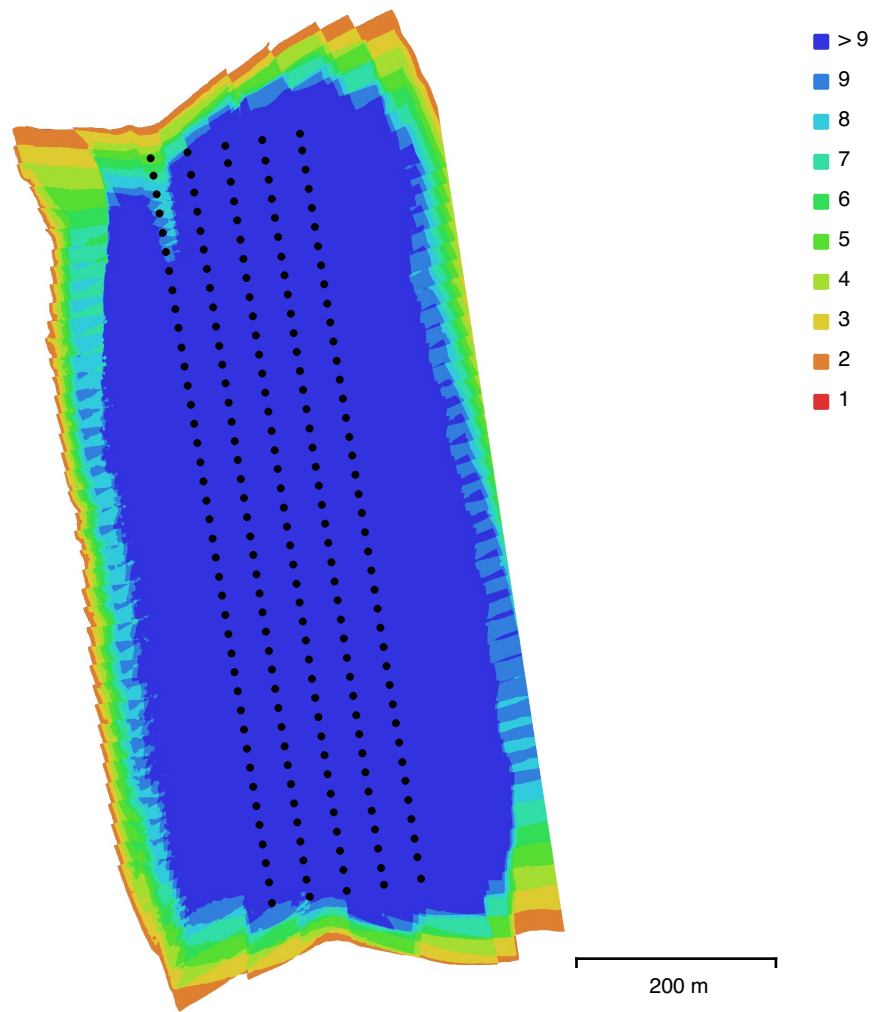


Fig. 1. Camera locations and image overlap.

Number of images:	200	Camera stations:	200
Flying altitude:	140 m	Tie points:	112,183
Ground resolution:	3.59 cm/pix	Projections:	817,451
Coverage area:	0.378 km ²	Reprojection error:	0.476 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
FC6310 (8.8mm)	5472 x 3648	8.8 mm	2.41 x 2.41 μ m	No

Table 1. Cameras.

Camera Calibration

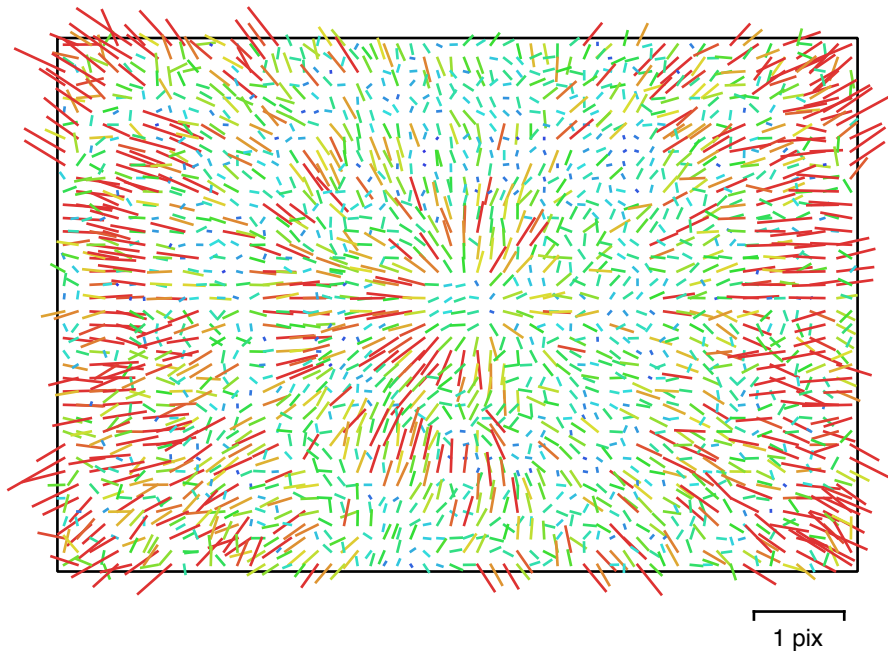


Fig. 2. Image residuals for FC6310 (8.8mm).

FC6310 (8.8mm)

200 images

Type
Frame

Resolution
5472 x 3648

Focal Length
8.8 mm

Pixel Size
2.41 x 2.41 μm

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	K3	K4	P1	P2
F	3645.9	0.41	1.00	0.46	-0.70	-0.24	0.20	0.09	-0.14	0.21	-0.26	-0.16	-0.21
Cx	-7.96324	0.014		1.00	-0.37	-0.11	-0.32	0.06	-0.08	0.11	-0.13	0.62	-0.13
Cy	18.7576	0.013			1.00	0.41	-0.08	-0.08	0.11	-0.16	0.19	0.07	0.68
B1	0.452693	0.011				1.00	0.04	-0.05	0.03	-0.05	0.06	0.02	0.17
B2	0.818217	0.013					1.00	-0.01	-0.02	0.03	-0.04	-0.14	-0.00
K1	0.0121079	3.7e-05						1.00	-0.94	0.90	-0.85	-0.01	-0.06
K2	-0.0599501	0.00017							1.00	-0.99	0.96	0.03	0.04
K3	0.105554	0.00032								1.00	-0.99	-0.04	-0.05
K4	-0.0619158	0.00021									1.00	0.04	0.06
P1	-0.000696385	1.2e-06										1.00	0.00
P2	0.000282893	9.7e-07											1.00

Table 2. Calibration coefficients and correlation matrix.

Camera Locations

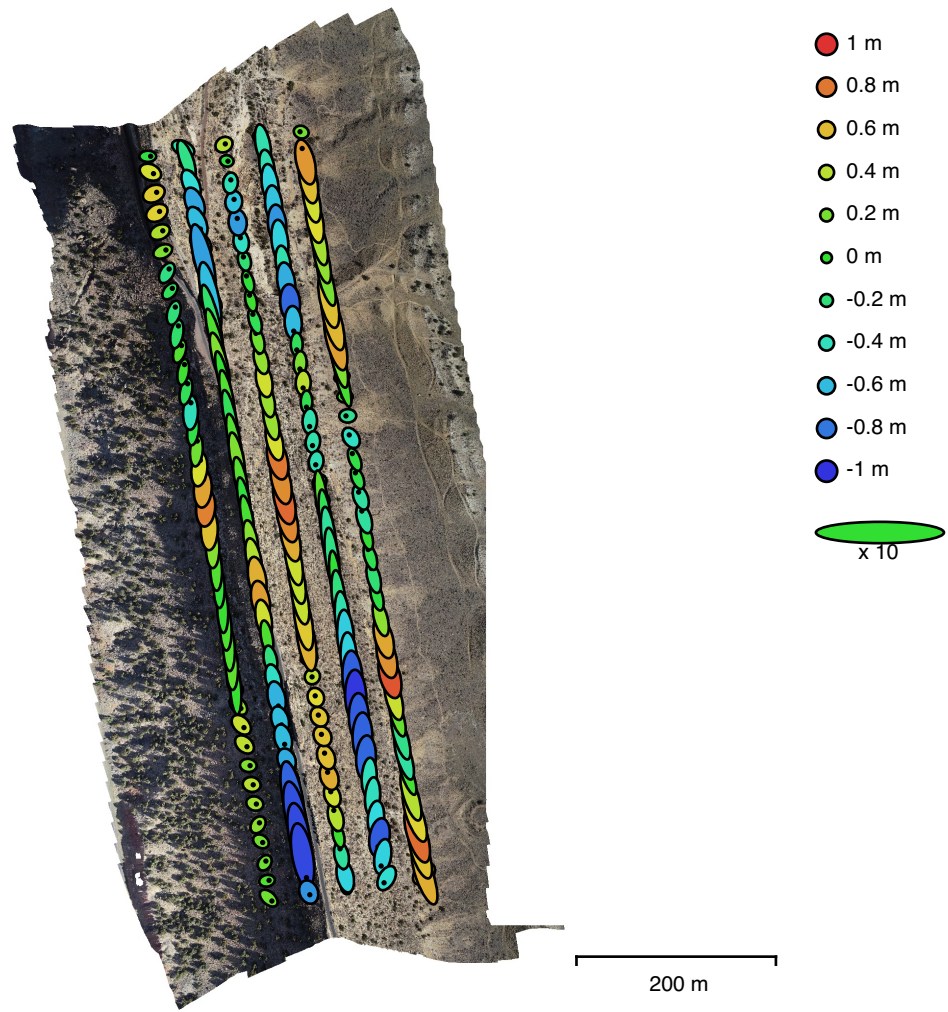


Fig. 3. Camera locations and error estimates.
 Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
 Estimated camera locations are marked with a black dot.

X error (m)	Y error (m)	Z error (m)	XY error (m)	Total error (m)
0.577773	2.49642	0.465441	2.56241	2.60434

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

Digital Elevation Model

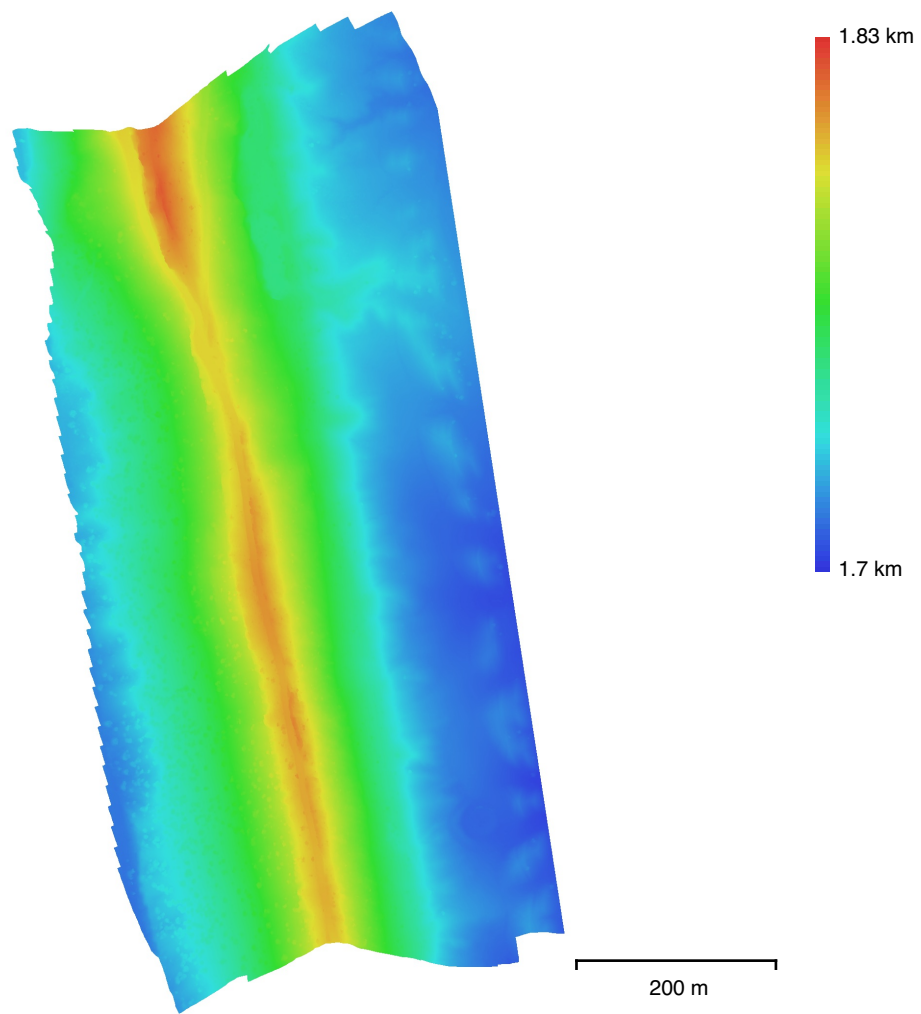


Fig. 4. Reconstructed digital elevation model.

Resolution: 7.18 cm/pix
Point density: 194 points/m²

Processing Parameters

General

Cameras	200
Aligned cameras	200
Coordinate system	WGS 84 (EPSG::4326)
Rotation angles	Yaw, Pitch, Roll

Point Cloud

Points	112,183 of 119,284
RMS reprojection error	0.194662 (0.475757 pix)
Max reprojection error	0.584261 (10.3382 pix)
Mean key point size	2.46614 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	7.70925

Alignment parameters

Accuracy	High
Generic preselection	Yes
Reference preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	18 minutes 58 seconds
Alignment time	1 minutes 44 seconds

Depth Maps

Count	200
Reconstruction parameters	
Quality	High
Filtering mode	Aggressive
Processing time	10 hours 45 minutes

Dense Point Cloud

Points	101,556,028
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	High
Depth filtering	Aggressive
Depth maps generation time	10 hours 45 minutes
Dense cloud generation time	3 hours 39 minutes

Model

Faces	6,675,403
Vertices	3,342,732
Vertex colors	3 bands, uint8
Reconstruction parameters	
Surface type	Height field
Source data	Dense
Interpolation	Enabled
Quality	High
Depth filtering	Aggressive
Face count	6,770,362
Processing time	4 minutes 48 seconds

DEM

Size	8,871 x 17,407
Coordinate system	WGS 84 (EPSG::4326)
Reconstruction parameters	
Source data	Dense cloud
Interpolation	Enabled
Processing time	1 minutes 40 seconds

Orthomosaic

Size	15,430 x 28,000
Coordinate system	WGS 84 (EPSG::4326)
Colors	3 bands, uint8

Reconstruction parameters

Blending mode	Mosaic
Surface	Mesh
Enable hole filling	Yes
Processing time	1 hours 52 minutes

Software

Version	1.4.2 build 6205
Platform	Mac OS 64