

SL1-1

Processing Report
16 April 2018



Survey Data

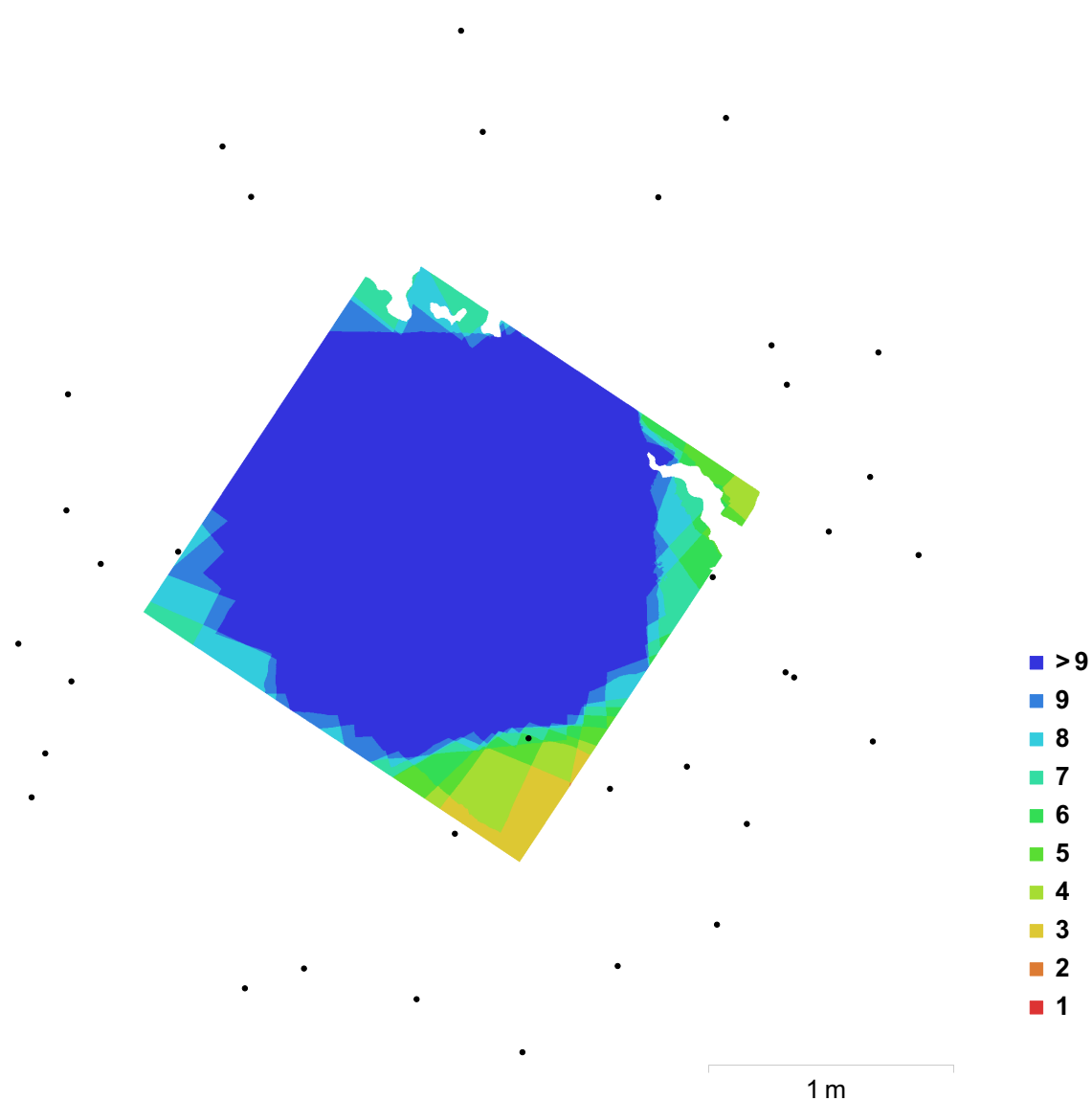


Fig. 1. Camera locations and image overlap.

Number of images:	40	Camera stations:	35
Flying altitude:	1.16 m 0.261	Tie points:	16,624
Ground resolution:	mm/pix 3.24	Projections:	51,082
Coverage area:	sq m	Reprojection error:	0.117 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon EOS 1200D (29 mm)	5184 x 3456	29 mm	4.4 x 4.4 um	No
Canon EOS 1200D (36 mm)	5184 x 3456	36 mm	4.4 x 4.4 um	No
Canon EOS 1200D (47 mm)	5184 x 3456	47 mm	4.4 x 4.4 um	No

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon EOS 1200D (48 mm)	5184 x 3456	48 mm	4.4 x 4.4 um	No
Canon EOS 1200D (46 mm)	5184 x 3456	46 mm	4.4 x 4.4 um	No
Canon EOS 1200D (43 mm)	5184 x 3456	43 mm	4.4 x 4.4 um	No
Canon EOS 1200D (35 mm)	5184 x 3456	35 mm	4.4 x 4.4 um	No

Table 1. Cameras.

Camera Calibration

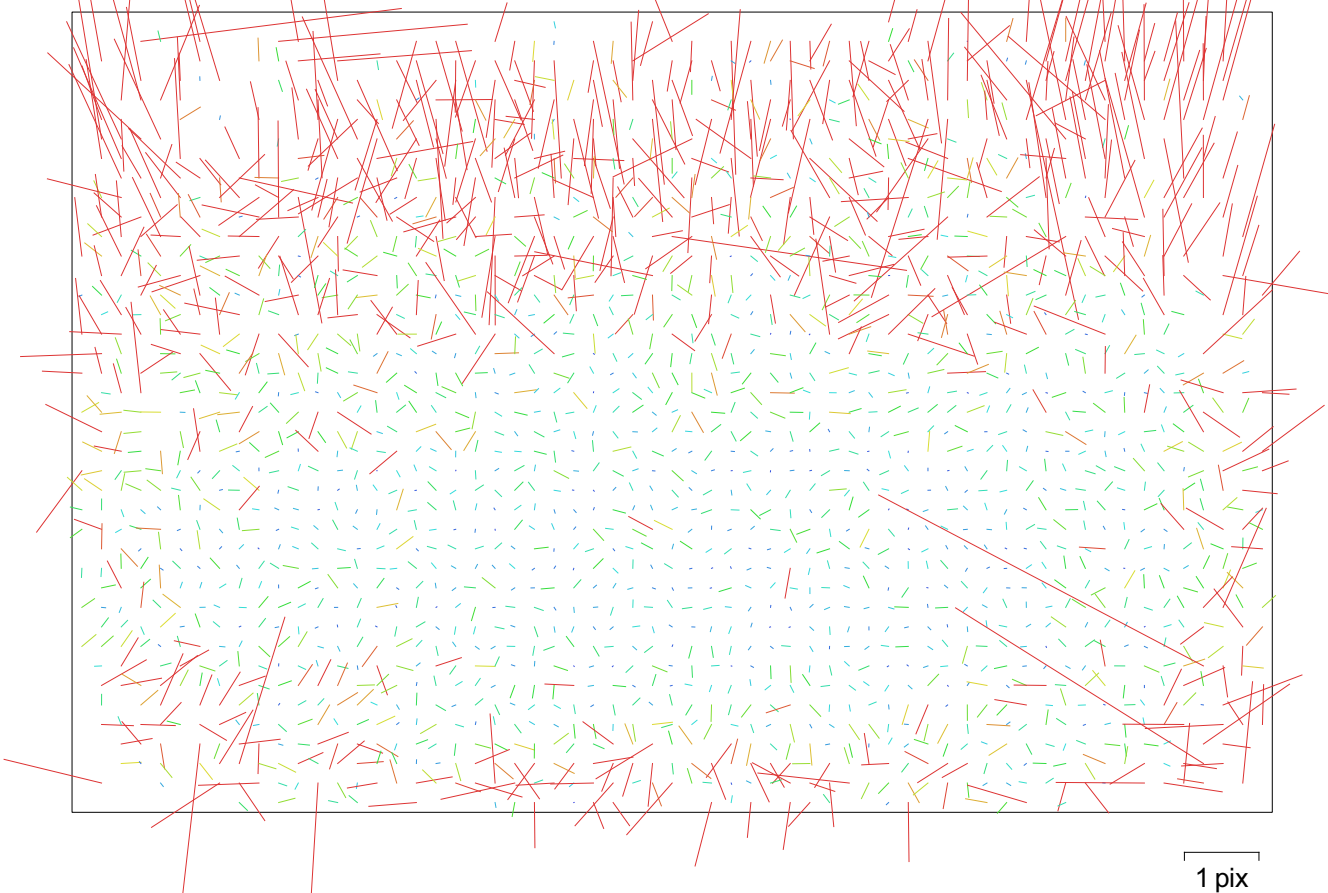


Fig. 2. Image residuals for Canon EOS 1200D (29 mm).

Canon EOS 1200D (29 mm)

Resolution	Focal Length	Pixel Size	Precalibrated
5184 x 3456	29 mm	4.4 x 4.4 μ m	No
Type:	Frame	K1:	-0.0798317
Fx:	6850.17	K2:	0.201876
Fy:	6850.17	K3:	-0.122664
Cx:	2673.24	K4:	0
Cy:	1722.9	P1:	0
Skew:	0	P2:	0

Camera Calibration

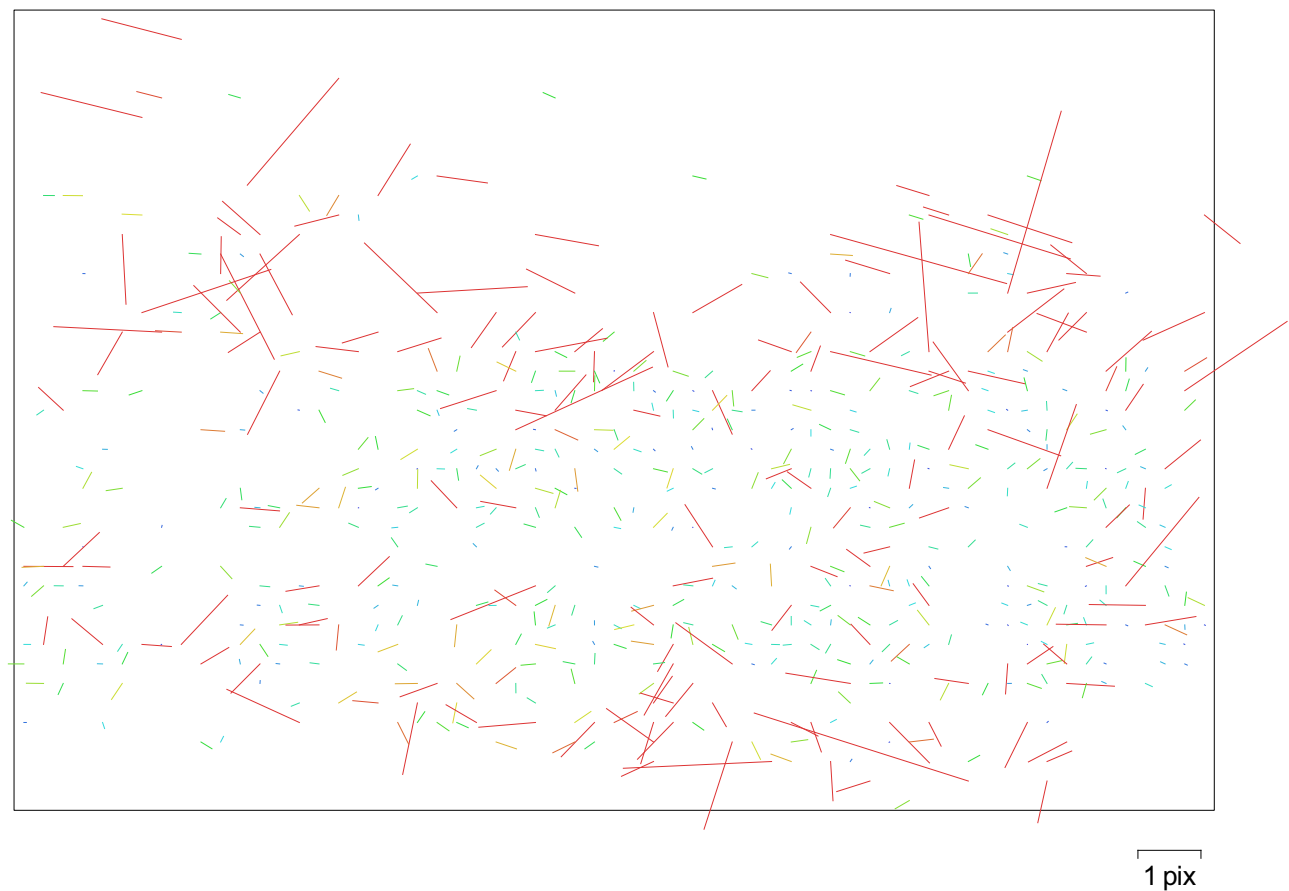


Fig. 3. Image residuals for Canon EOS 1200D (36 mm).

Canon EOS 1200D (36 mm)

Resolution	Focal Length	Pixel Size	Precalibrated
5184 x 3456	36 mm	4.4 x 4.4 um	No
Type:	Frame	K1:	-0.0209622
Fx:	8594.82	K2:	0.11515
Fy:	8594.82	K3:	0.4822
Cx:	2701.57	K4:	0
Cy:	1678.7	P1:	0
Skew:	0	P2:	0

Camera Calibration

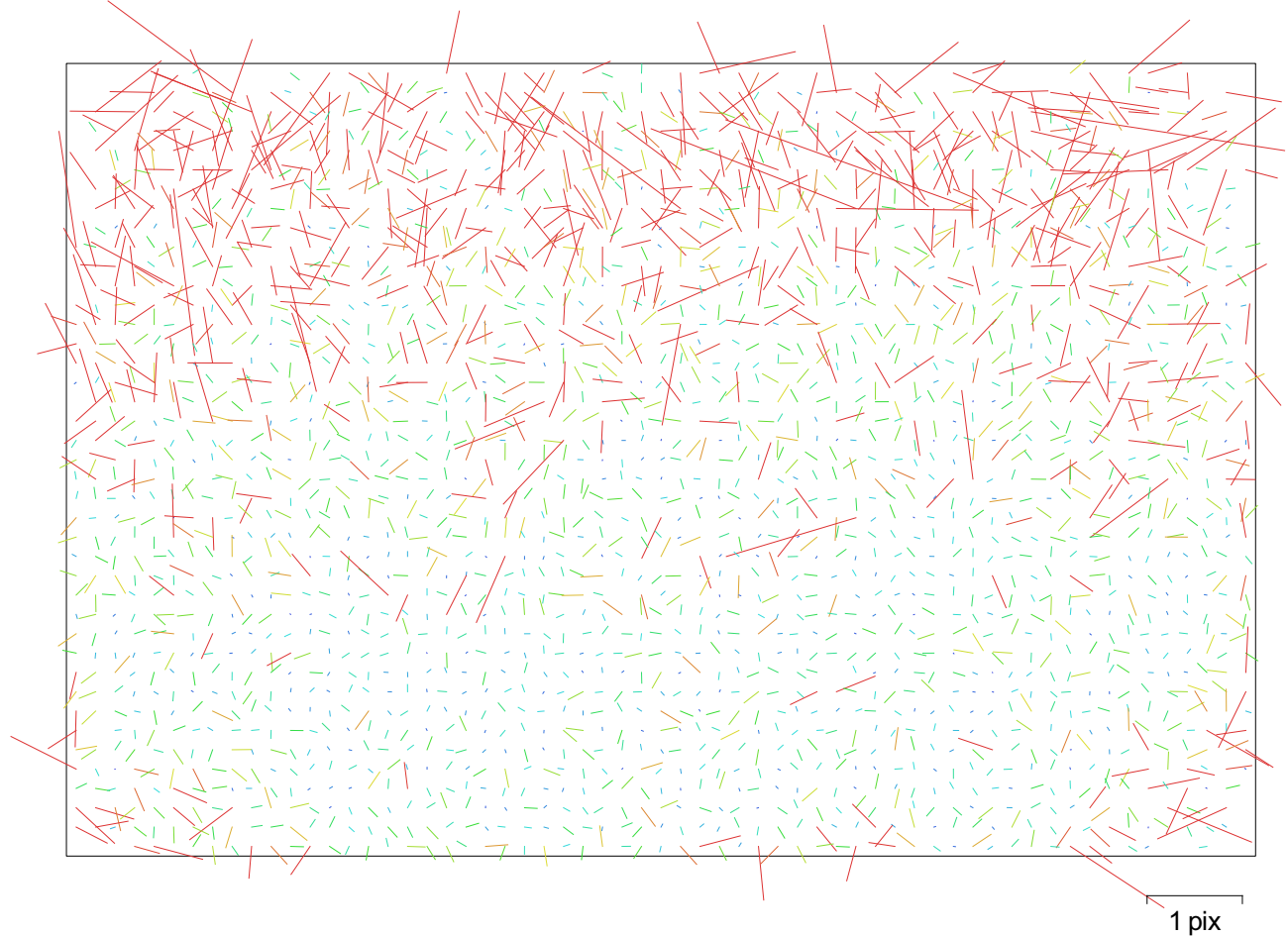


Fig. 4. Image residuals for Canon EOS 1200D (47 mm).

Canon EOS 1200D (47 mm)

Resolution	Focal Length	Pixel Size	Precalibrated
5184 x 3456	47 mm	4.4 x 4.4 um	No
Type:	Frame	K1:	0.0400782
Fx:	10903.2	K2:	0.189981
Fy:	10903.2	K3:	0.49508
Cx:	2673	K4:	0
Cy:	1690.92	P1:	0
Skew:	0	P2:	0

Camera Calibration

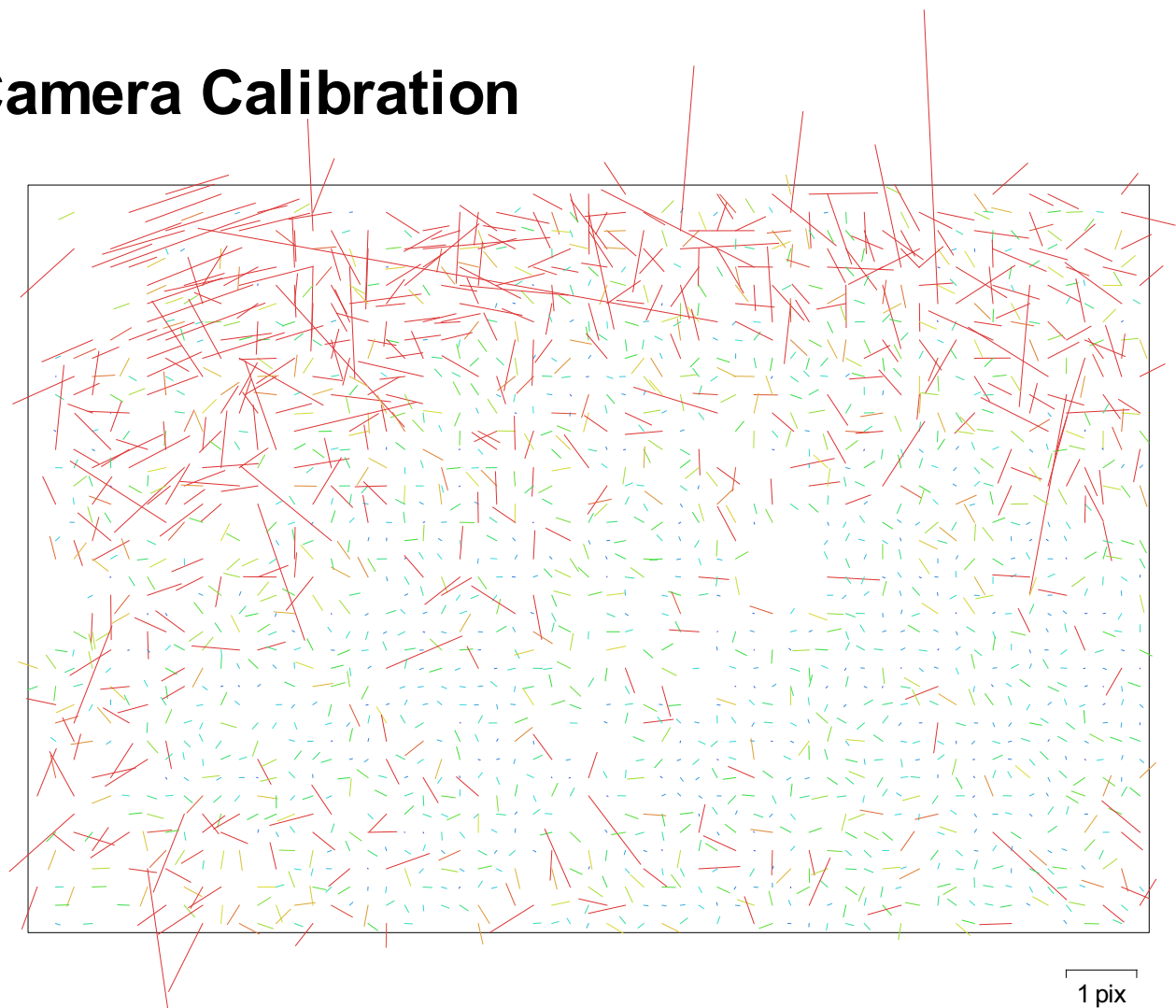


Fig. 5. Image residuals for Canon EOS 1200D (48 mm).

Canon EOS 1200D (48 mm)

Resolution	Focal Length	Pixel Size	Precalibrated
5184 x 3456	48 mm	4.4 x 4.4 μ m	No
Type:	Frame	K1:	0.04611
Fx:	11117.8	K2:	0.228176
Fy:	11117.8	K3:	0.266135
Cx:	2680.43	K4:	0
Cy:	1669.65	P1:	0
Skew:	0	P2:	0

Camera Calibration

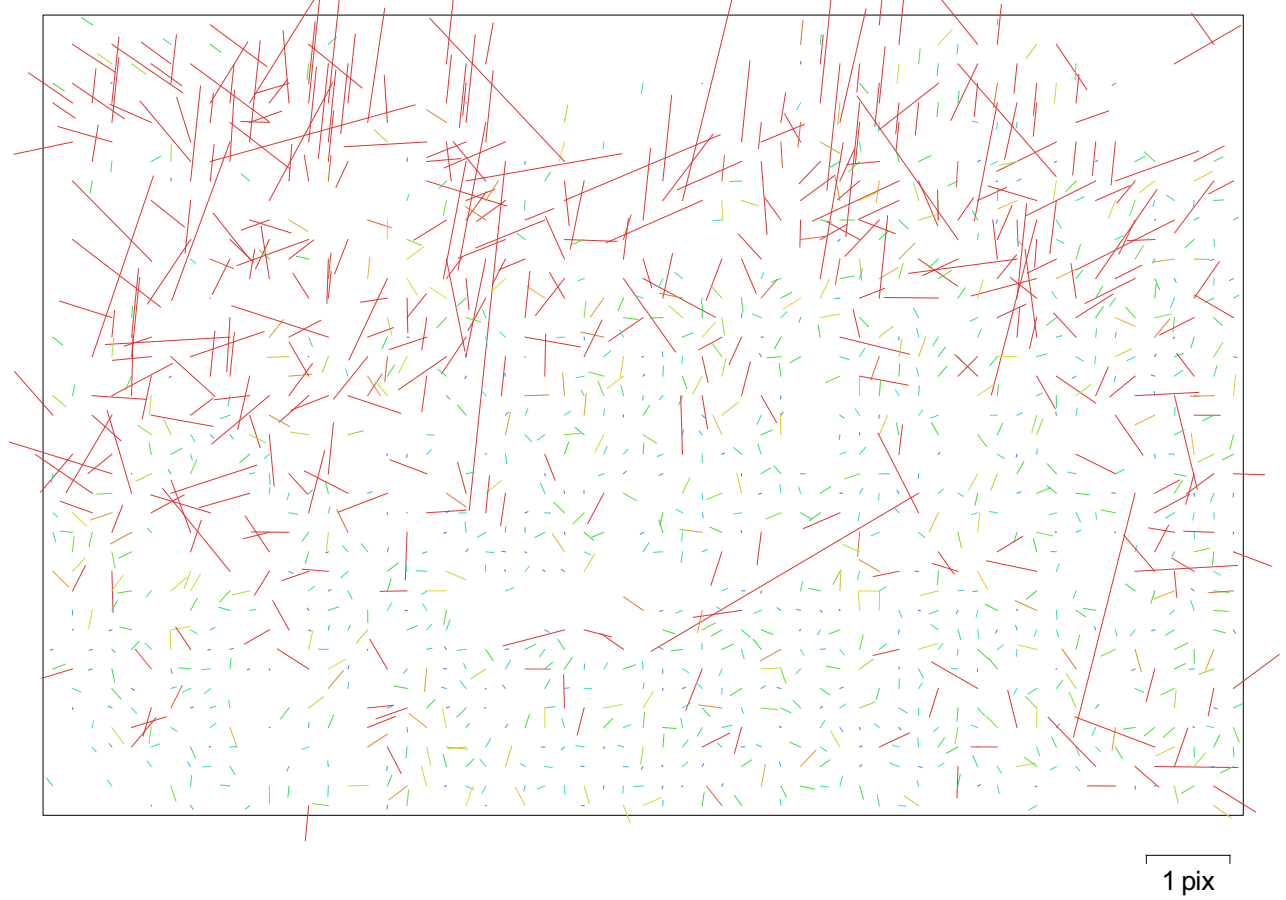


Fig. 6. Image residuals for Canon EOS 1200D (46 mm).

Canon EOS 1200D (46 mm)

Resolution	Focal Length	Pixel Size	Precalibrated
5184 x 3456	46 mm	4.4 x 4.4 μ m	No
Type:	Frame	K1:	0.0405048
Fx:	10615.8	K2:	-0.0114115
Fy:	10615.8	K3:	2.52558
Cx:	2678.15	K4:	0
Cy:	1703.24	P1:	0
Skew:	0	P2:	0

Camera Calibration

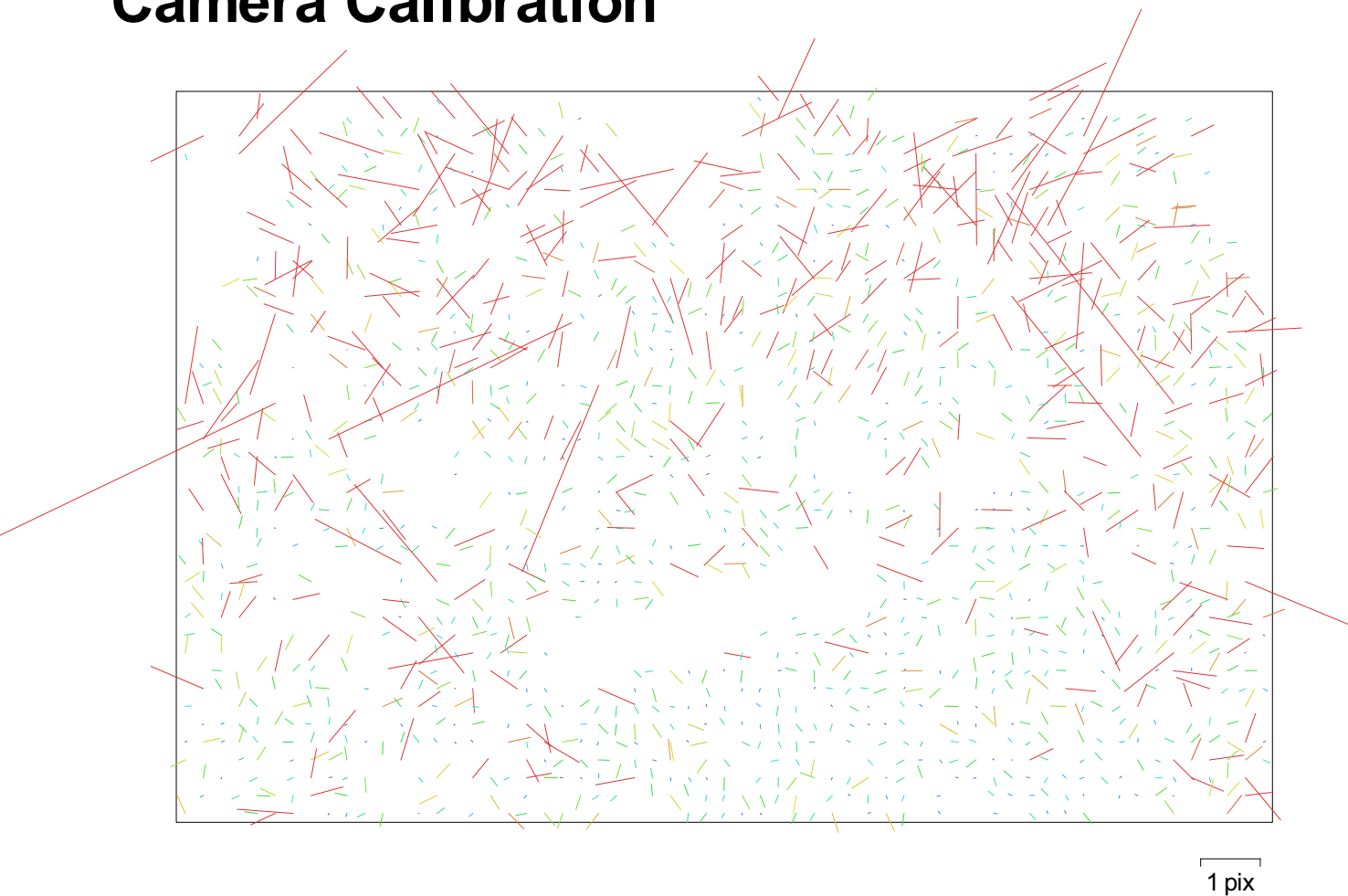


Fig. 7. Image residuals for Canon EOS 1200D (43 mm).

Canon EOS 1200D (43 mm)

Resolution	Focal Length	Pixel Size	Precalibrated
5184 x 3456	43 mm	4.4 x 4.4 μ m	No
Type:	Frame	K1:	0.0388626
Fx:	10117.4	K2:	-0.17645
Fy:	10117.4	K3:	2.64499
Cx:	2678.49	K4:	0
Cy:	1644.59	P1:	0
Skew:	0	P2:	0

Camera Calibration

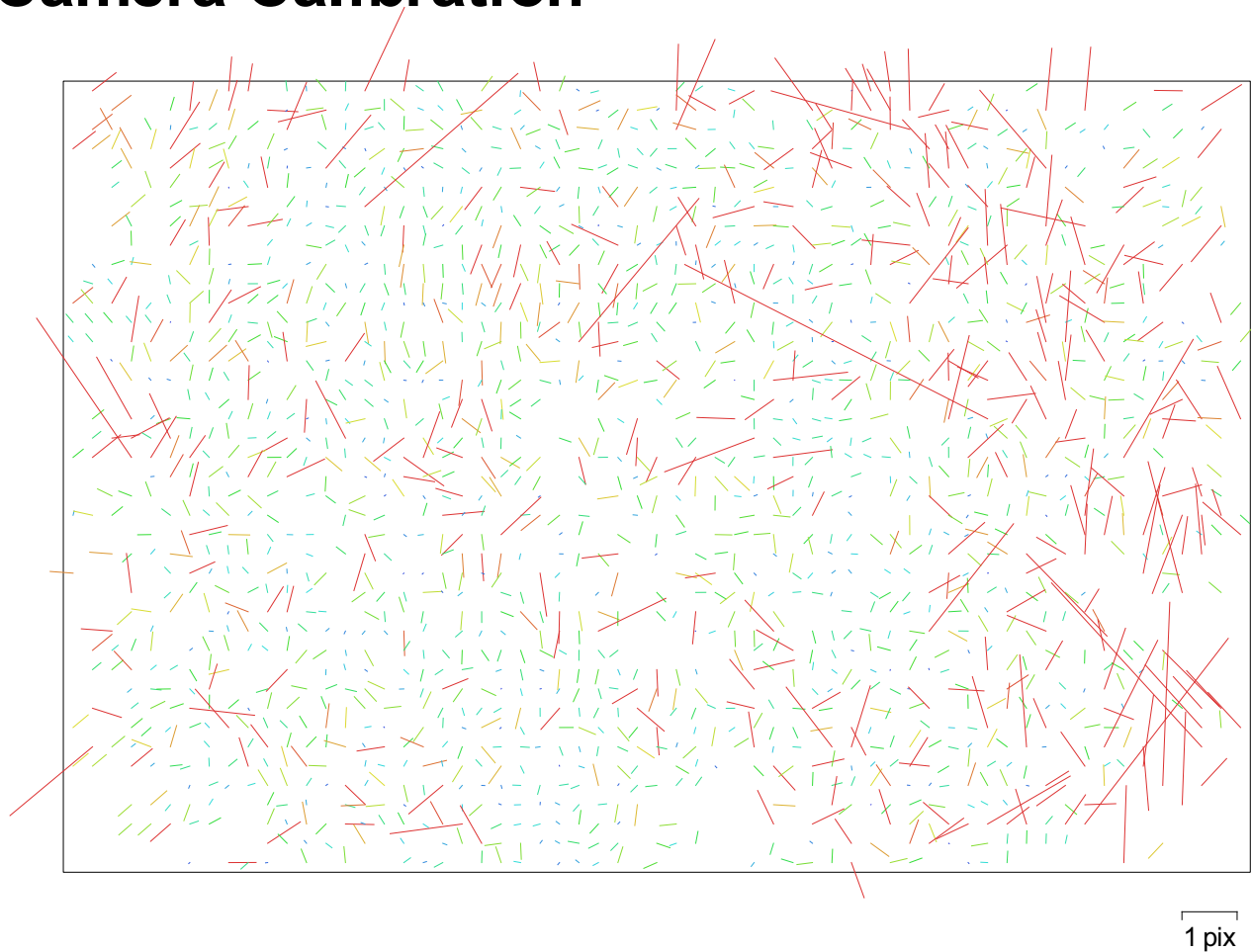


Fig. 8. Image residuals for Canon EOS 1200D (35 mm).

Canon EOS 1200D (35 mm)

Resolution	Focal Length	Pixel Size	Precalibrated
5184 x 3456	35 mm	4.4 x 4.4 um	No
Type:	Frame	K1:	-0.0356166
Fx:	8230.67	K2:	0.266144
Fy:	8230.67	K3:	-0.667277
Cx:	2680.02	K4:	0
Cy:	1673.43	P1:	0
Skew:	0	P2:	0

Ground Control Points

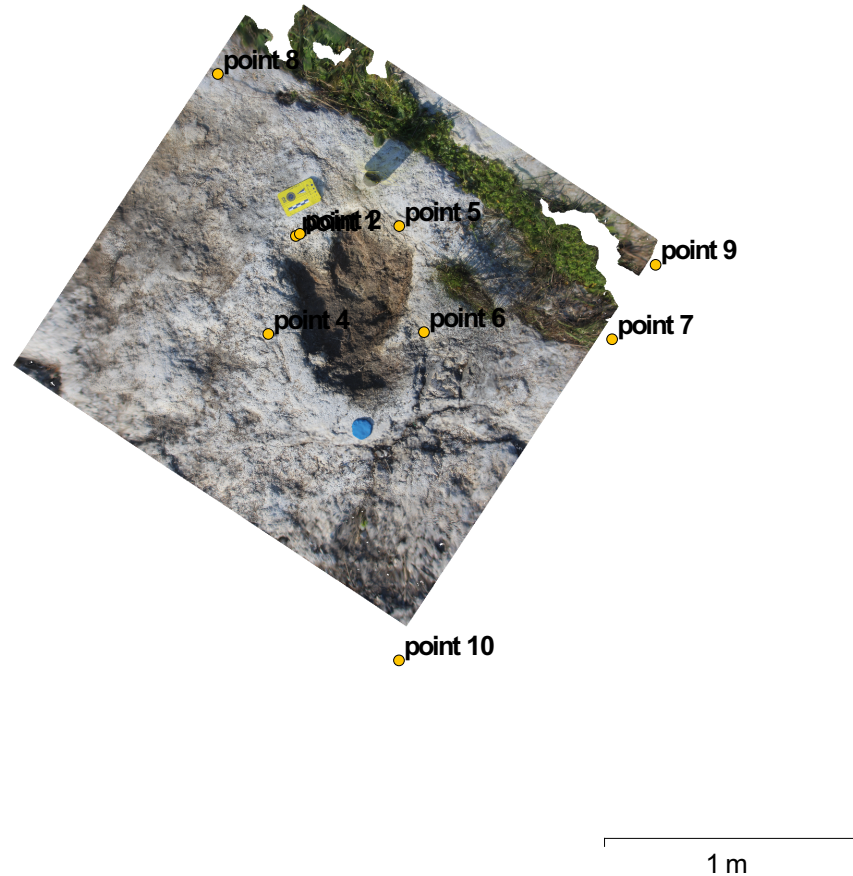


Fig. 9. GCP locations.

Label	X error (m)	Y error (m)	Z error (m)	Error (m)	Projections	Error (pix)
point 4	-0.292704	0.195534	7.14459e-09	0.352007	35	7.84053e-05
point 5	0.195534	-0.400229	-5.0615e-09	0.44544	35	9.32202e-05
point 6	0.0971705	0.204696	2.59885e-08	0.226589	35	8.235e-05
Total	0.210833	0.28303	1.58331e-08	0.352925		8.489e-05

Table 2. Control points.

Label	X error (m)	Y error (m)	Z error (m)	Error (m)	Projections	Error (pix)
point 1					35	8.75075e-05
point 2					35	8.28217e-05

Label	X error (m)	Y error (m)	Z error (m)	Error (m)	Projections	Error (pix)
point 7					4	0.000109074
point 8					9	7.46011e-05
point 9					4	3.47816e-05
point 10					3	2.18204e-05
Total						

Table 3. Check points.

Digital Elevation Model

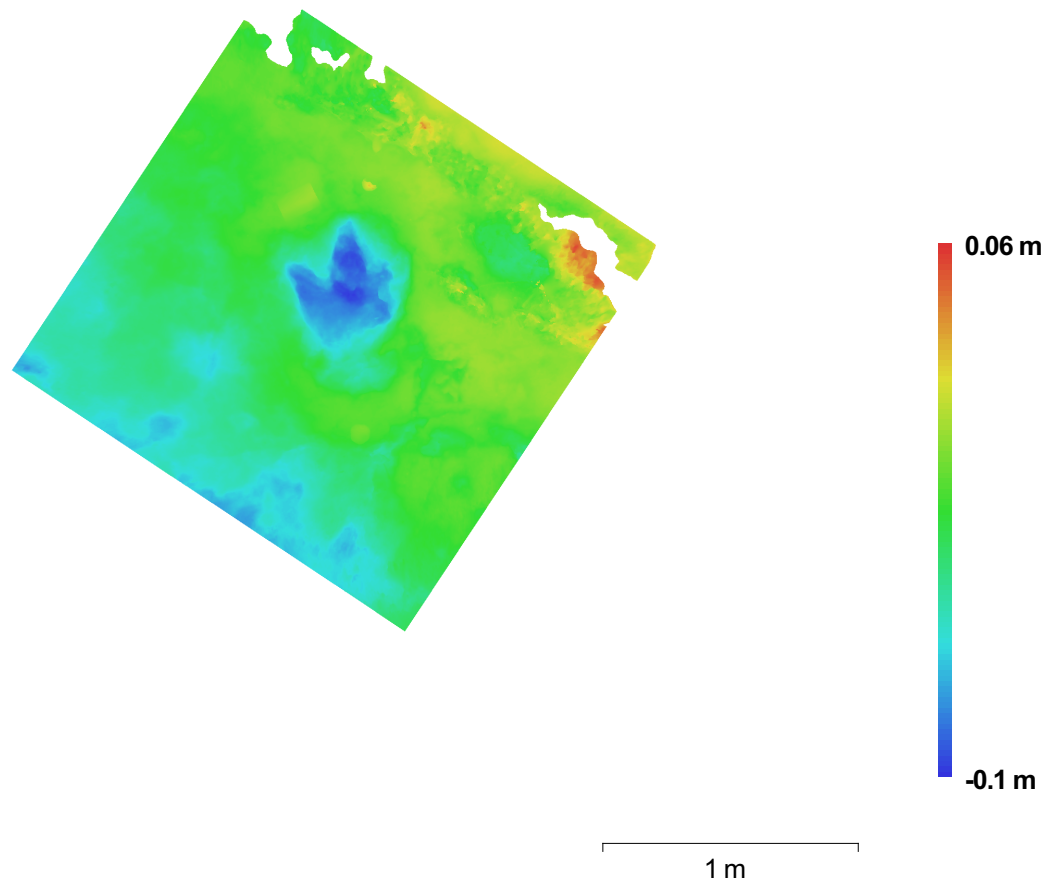


Fig. 10. Reconstructed digital elevation model.

Resolution:	0.521 mm/pix
Point density:	3.67811e+06 points per sq m

Processing Parameters

General

Cameras	40
Aligned cameras	35
Markers	9
Scale bars	3

Point Cloud

Points	16,624 of 17,878
RMS reprojection error	0.117379 (0.755603 pix)
Max reprojection error	0.596028 (4.52427 pix)
Mean key point size	4.90761 pix
Effective overlap	3.37711

Alignment parameters

Accuracy	High
Pair preselection	Generic
Key point limit	8,000
Tie point limit	80,000
Constrain features by mask	No
Matching time	30 minutes 0 seconds
Alignment time	3 seconds

Dense Point Cloud

Points	17,059,000
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Reconstruction parameters

Quality	High
Depth filtering	Aggressive
Processing time	30 minutes 29 seconds

Model

Faces	2,385,933
Vertices	1,196,239
Texture	4,096 x 4,096, uint8

Reconstruction parameters

Surface type	Arbitrary
Source data	Dense
Interpolation	Enabled
Quality	High
Depth filtering	Aggressive
Face count	2,385,934
Processing time	59 minutes 28 seconds

Texturing parameters

Mapping mode	Orthophoto
Blending mode	Mosaic
Texture size	4,096 x 4,096
UV mapping time	5 seconds
Blending time	7 minutes 45 seconds

DEM

Size	4,873 x 4,846
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Orthomosaic

Size	9,666 x 9,327
Channels	3, uint8
Blending mode	Mosaic