Agisoft PhotoScan

Processing Report

16 April 2018

Survey Data

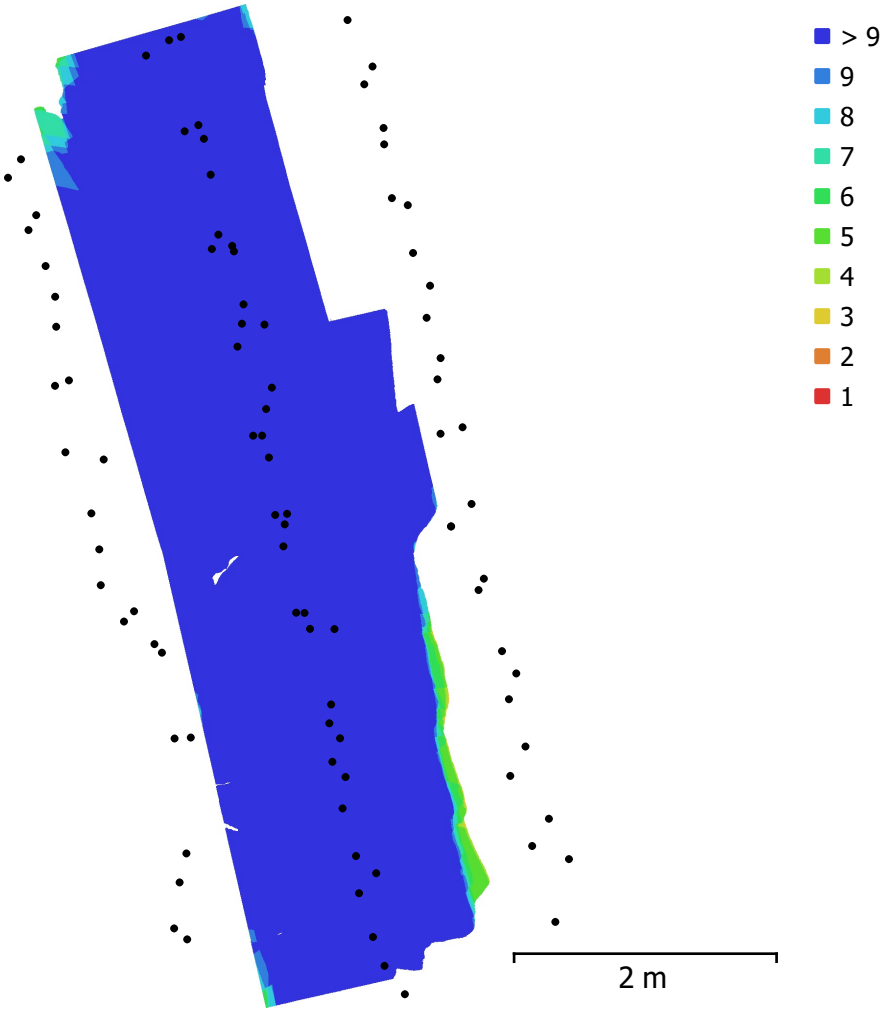

Fig. 1. Camera locations and image overlap.

Number of images:	92	Camera stations:	92
Flying altitude:	2.13 m	Tie points:	323,652
Ground resolution:	0.364 mm/pix	Projections:	871,123
Coverage area:	13.6 m²	Reprojection error:	1.53 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
NIKON D600 (28 mm)	6034 x 4028	28 mm	5.96 x 5.96 µm	No
NIKON D600 (28 mm)	4028 x 6034	28 mm	5.96 x 5.96 µm	No
NIKON D600 (40 mm)	6034 x 4028	40 mm	5.96 x 5.96 µm	No
NIKON D600 (34 mm)	6034 x 4028	34 mm	5.96 x 5.96 µm	No
NIKON D600 (35 mm)	6034 x 4028	35 mm	5.96 x 5.96 µm	No

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
NIKON D600 (38 mm)	6034 x 4028	38 mm	5.96 x 5.96 µm	No
NIKON D600 (44 mm)	6034 x 4028	44 mm	5.96 x 5.96 µm	No
NIKON D600 (28 mm)	6034 x 4028	28 mm	5.96 x 5.96 µm	No
NIKON D600 (28 mm)	4028 x 6034	28 mm	5.96 x 5.96 µm	No
NIKON D600 (40 mm)	6034 x 4028	40 mm	5.96 x 5.96 µm	No
NIKON D600 (31 mm)	6034 x 4028	31 mm	5.96 x 5.96 µm	No
NIKON D600 (34 mm)	6034 x 4028	34 mm	5.96 x 5.96 µm	No
NIKON D600 (38 mm)	6034 x 4028	38 mm	5.96 x 5.96 µm	No
NIKON D600 (35 mm)	6034 x 4028	35 mm	5.96 x 5.96 µm	No

Table 1. Cameras.

Camera Calibration

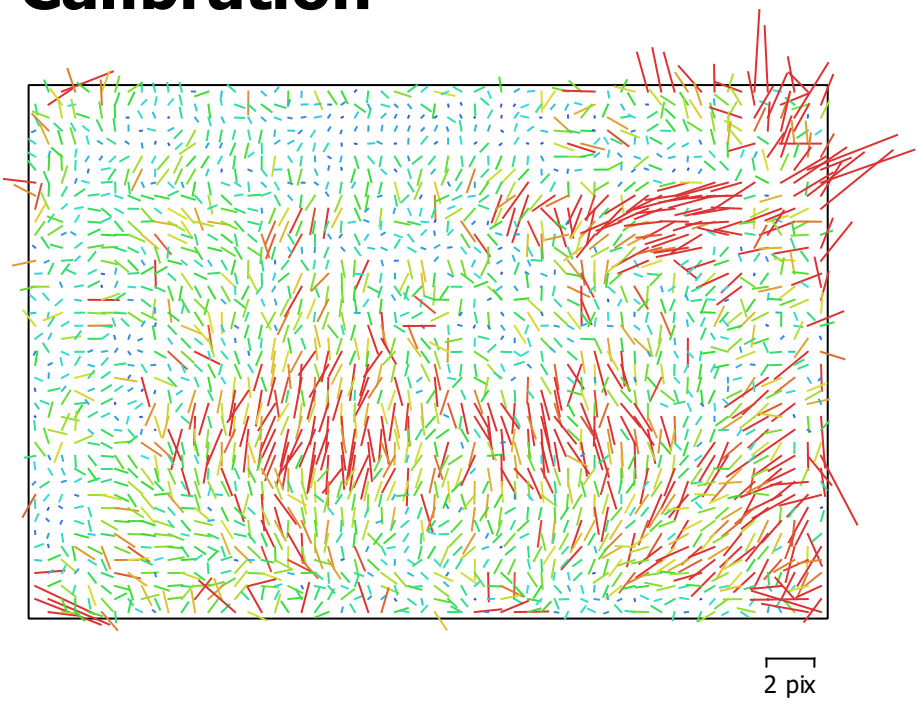

Fig. 2. Image residuals for NIKON D600 (28 mm).

NIKON D600 (28 mm)

6 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**28 mm**	**5.96 x 5.96 µm**

F:	4819.62		
Cx:	19.368	B1:	-12.8493
Cy:	-2.06756	B2:	-5.95269
K1:	-0.131975	P1:	-0.000206978
K2:	0.0976423	P2:	-0.000176549
K3:	-0.0724793	P3:	0
K4:	0	P4:	0

Camera Calibration

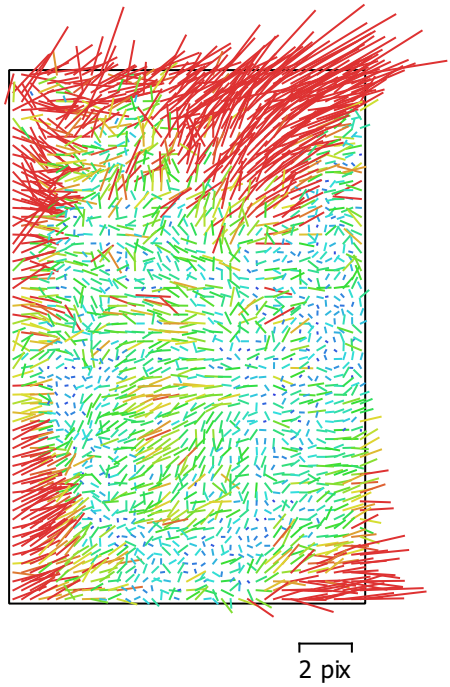

Fig. 3. Image residuals for NIKON D600 (28 mm).

NIKON D600 (28 mm)

12 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4028 x 6034**	**28 mm**	**5.96 x 5.96 µm**

F:	4830.04		
Cx:	-8.43793	B1:	9.29236
Cy:	-24.8134	B2:	4.16067
K1:	-0.123519	P1:	0.00114578
K2:	0.0549467	P2:	-0.000208738
K3:	-0.0240042	P3:	0
K4:	0	P4:	0

Camera Calibration

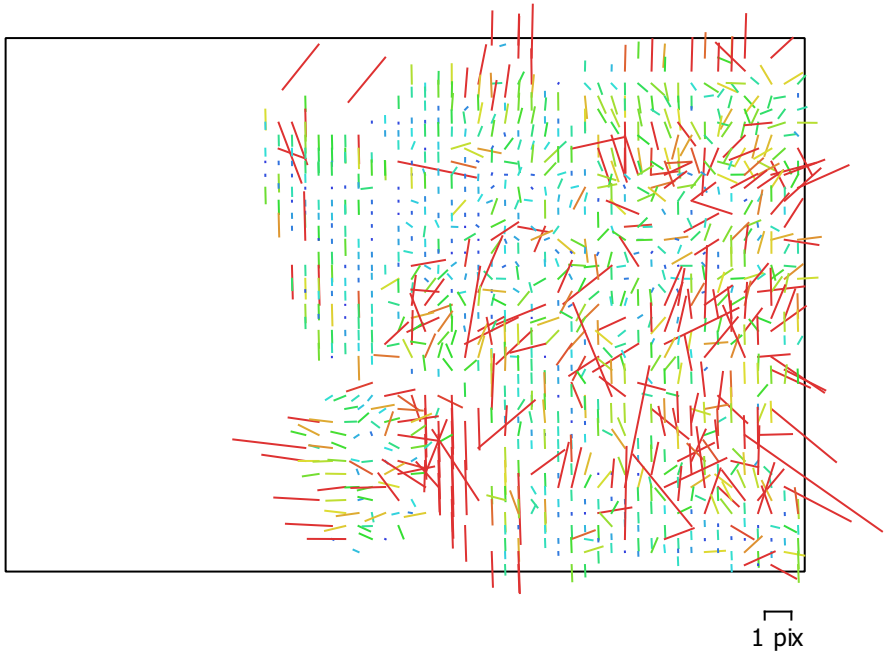

Fig. 4. Image residuals for NIKON D600 (40 mm).

NIKON D600 (40 mm)

1 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**40 mm**	**5.96 x 5.96 µm**

F:	6590.78		
Cx:	47.764	B1:	36.1081
Cy:	6.27793	B2:	-24.223
K1:	-0.0637178	P1:	0.00136466
K2:	-0.0774575	P2:	0.00201895
K3:	0.254839	P3:	0
K4:	0	P4:	0

Camera Calibration

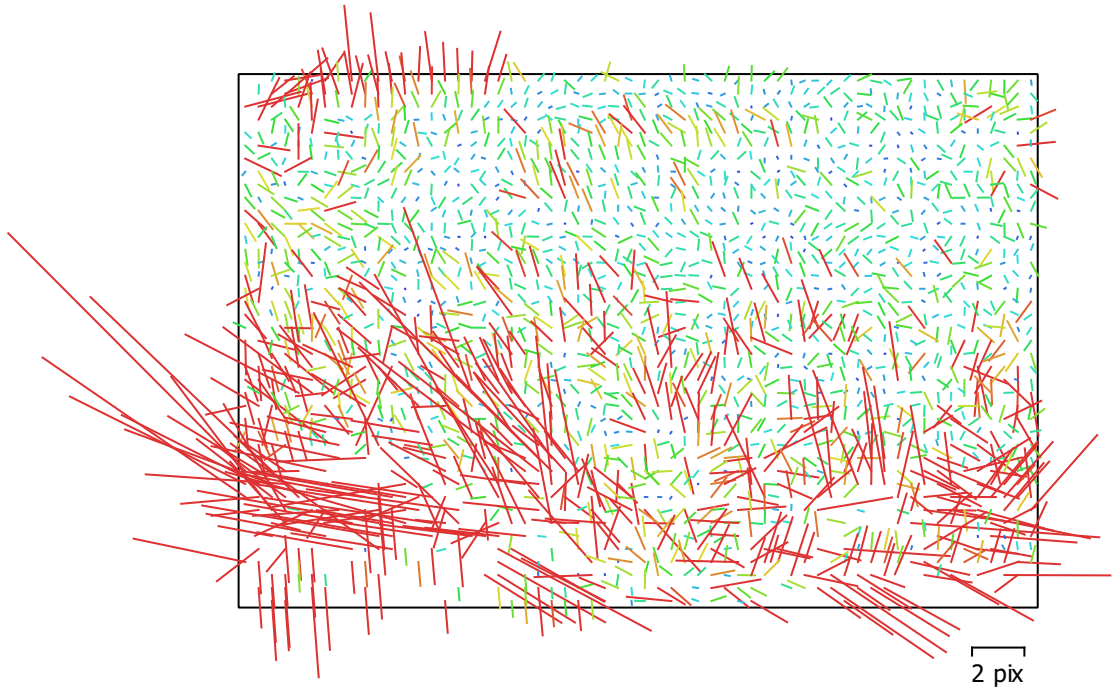

Fig. 5. Image residuals for NIKON D600 (34 mm).

NIKON D600 (34 mm)

6 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**34 mm**	**5.96 x 5.96 µm**

F:	5344.52		
Cx:	73.6298	B1:	-29.367
Cy:	26.4999	B2:	14.1851
K1:	-0.117688	P1:	0.00297673
K2:	0.0867501	P2:	0.000750557
K3:	-0.0671126	P3:	0
K4:	0	P4:	0

Camera Calibration

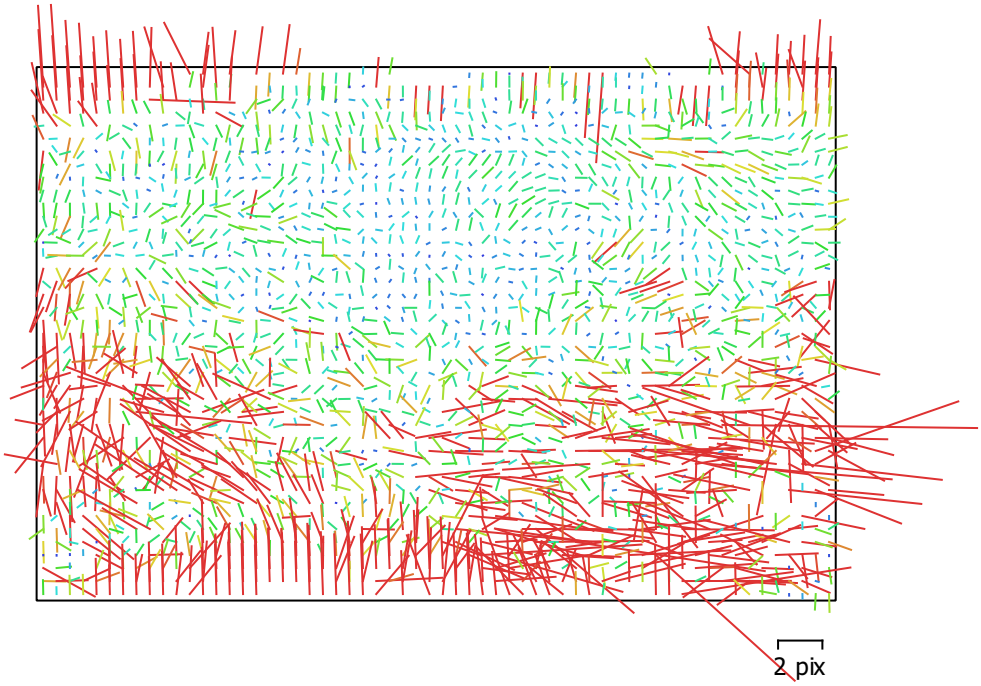

Fig. 6. Image residuals for NIKON D600 (35 mm).

NIKON D600 (35 mm)

6 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**35 mm**	**5.96 x 5.96 µm**

F:	5904.4		
Cx:	-20.7695	B1:	2.55086
Cy:	19.1622	B2:	-25.0771
K1:	-0.104748	P1:	-0.000611471
K2:	0.10087	P2:	0.000336129
K3:	-0.0755695	P3:	0
K4:	0	P4:	0

Camera Calibration

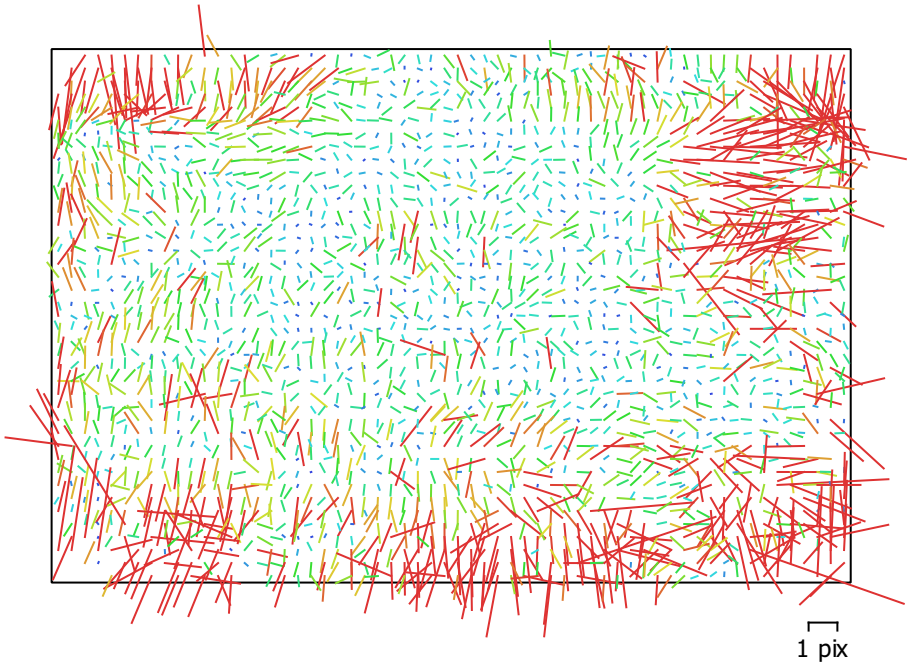

Fig. 7. Image residuals for NIKON D600 (38 mm).

NIKON D600 (38 mm)

5 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**38 mm**	**5.96 x 5.96 µm**

F:	6049.82		
Cx:	-31.6296	B1:	4.98121
Cy:	7.97679	B2:	-13.2049
K1:	-0.0674312	P1:	-0.00178087
K2:	0.000207606	P2:	-0.00131056
K3:	-0.106664	P3:	0
K4:	0	P4:	0

Camera Calibration

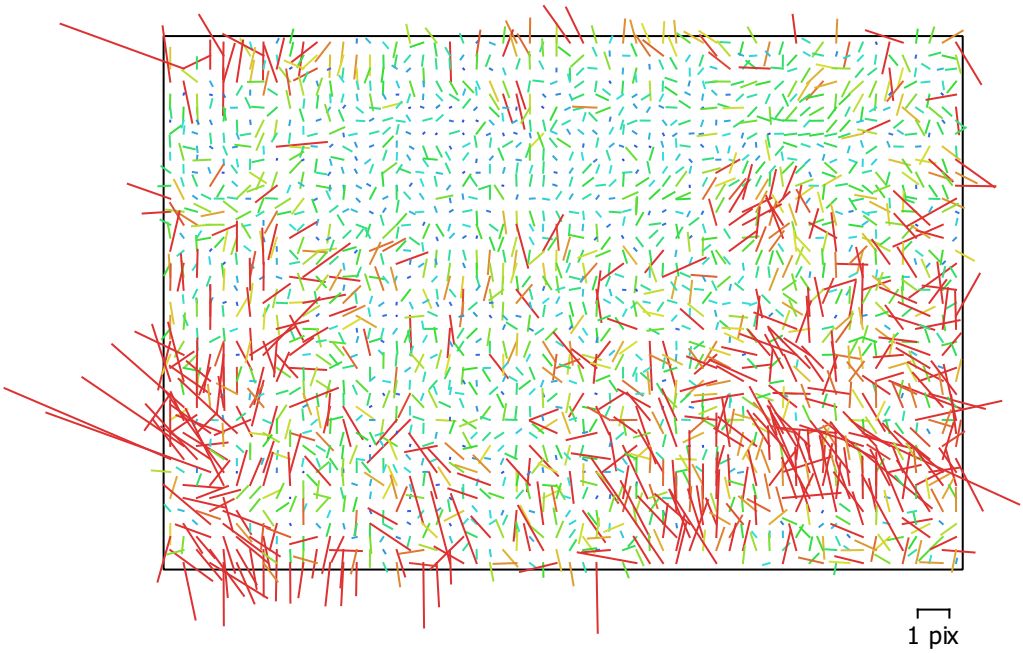

Fig. 8. Image residuals for NIKON D600 (44 mm).

NIKON D600 (44 mm)

3 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**44 mm**	**5.96 x 5.96 µm**

F:	6918.42		
Cx:	36.0927	B1:	16.7609
Cy:	22.0483	B2:	-8.67756
K1:	-0.0725901	P1:	0.00092811
K2:	0.032169	P2:	0.000698297
K3:	0.00871564	P3:	0
K4:	0	P4:	0

Camera Calibration

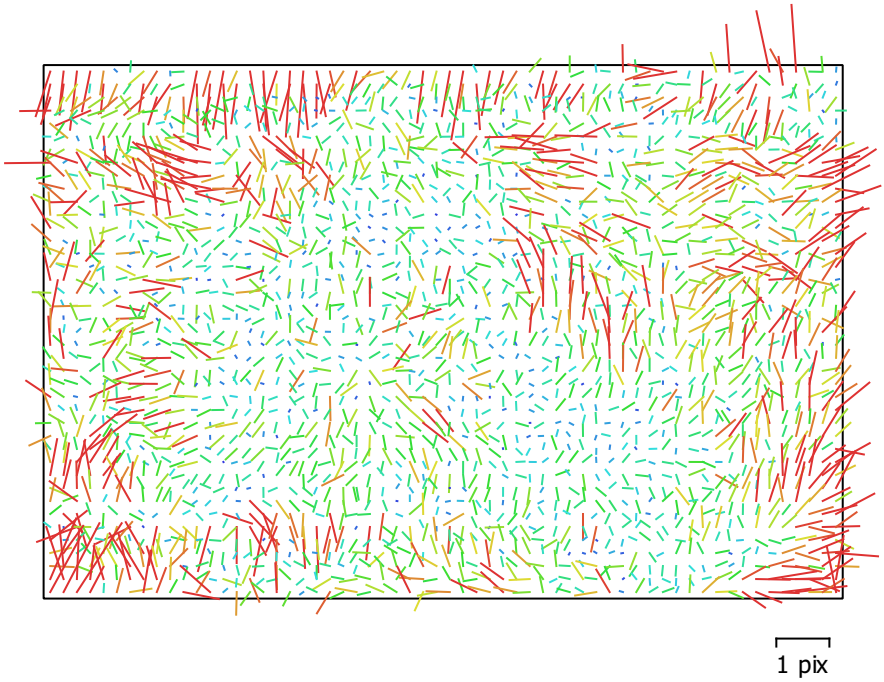

Fig. 9. Image residuals for NIKON D600 (28 mm).

NIKON D600 (28 mm)

13 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**28 mm**	**5.96 x 5.96 µm**

F:	4875.74		
Cx:	0.570483	B1:	-2.89859
Cy:	-0.931826	B2:	5.75602
K1:	-0.124934	P1:	-7.58667e-06
K2:	0.0737532	P2:	-0.000479711
K3:	-0.0513518	P3:	0
K4:	0	P4:	0

Camera Calibration

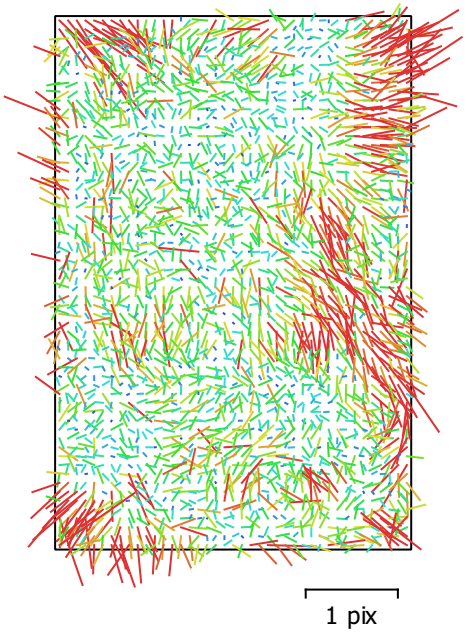

Fig. 10. Image residuals for NIKON D600 (28 mm).

NIKON D600 (28 mm)

18 images

Type	Resolution	Focal Length	Pixel Size
Frame	**4028 x 6034**	**28 mm**	**5.96 x 5.96 µm**

F:	4832.84		
Cx:	1.6951	B1:	5.14201
Cy:	-5.96119	B2:	-7.56086
K1:	-0.124804	P1:	1.75801e-05
K2:	0.0818508	P2:	-5.09569e-05
K3:	-0.0618288	P3:	0
K4:	0	P4:	0

Camera Calibration

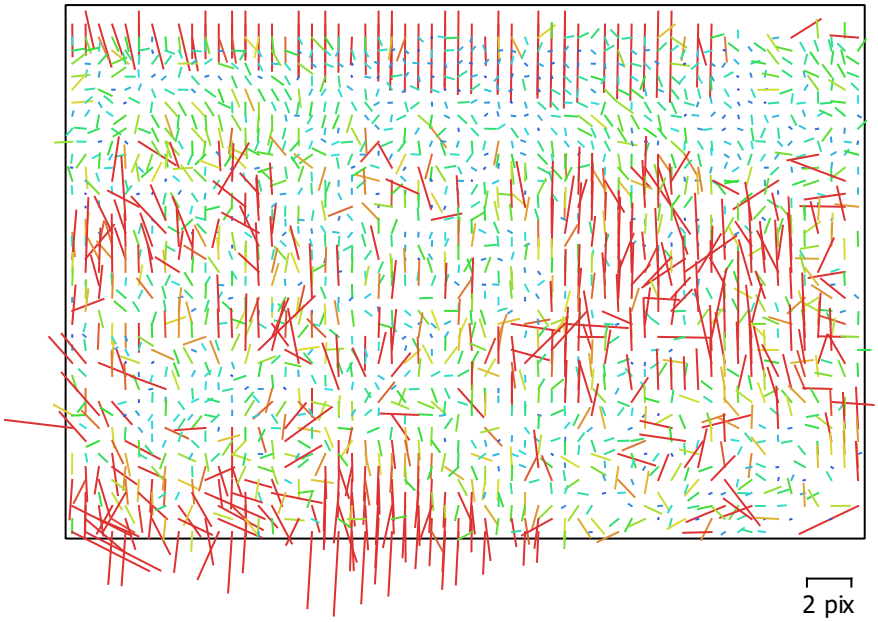

Fig. 11. Image residuals for NIKON D600 (40 mm).

NIKON D600 (40 mm)

4 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**40 mm**	**5.96 x 5.96 µm**

F:	6558.21		
Cx:	-6.0846	B1:	-7.40399
Cy:	-80.763	B2:	-3.98753
K1:	-0.0961472	P1:	-0.00021594
K2:	0.148379	P2:	-0.000408292
K3:	-0.26772	P3:	0
K4:	0	P4:	0

Camera Calibration

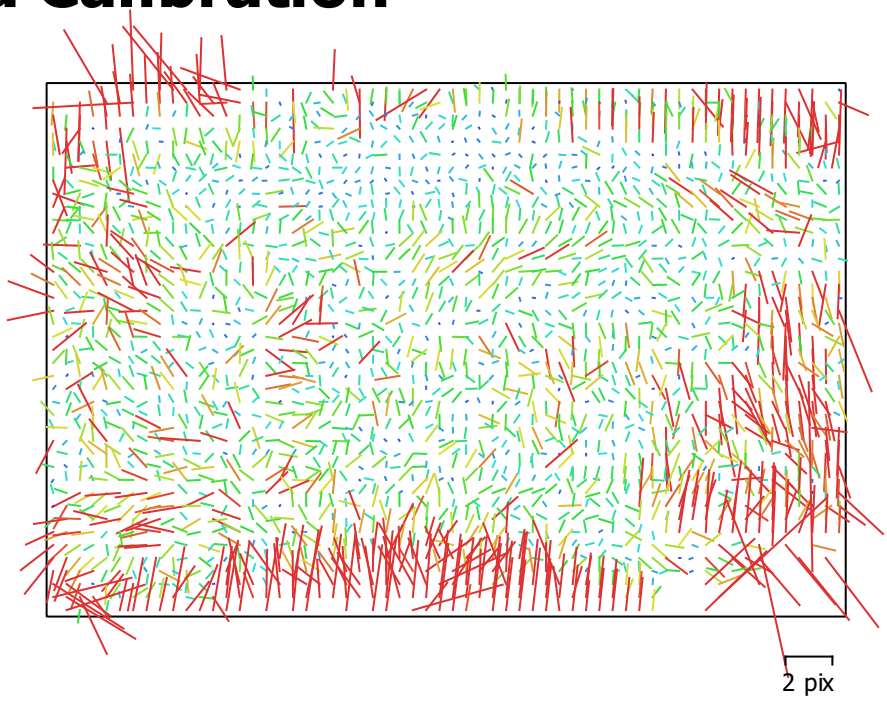

Fig. 12. Image residuals for NIKON D600 (31 mm).

NIKON D600 (31 mm)

6 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**31 mm**	**5.96 x 5.96 µm**

F:	5116.17		
Cx:	-51.3572	B1:	8.3499
Cy:	-31.8823	B2:	-1.71915
K1:	-0.107336	P1:	-0.0014406
K2:	0.0386542	P2:	0.000779837
K3:	-0.0124005	P3:	0
K4:	0	P4:	0

Camera Calibration

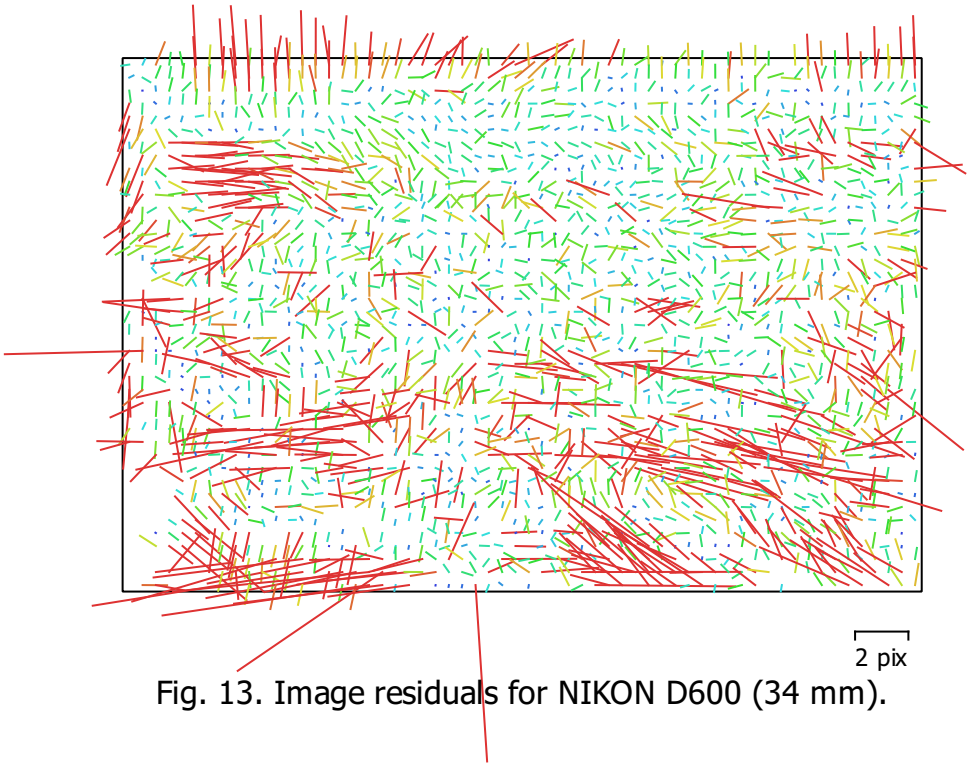

Fig. 13. Image residuals for NIKON D600 (34 mm).

NIKON D600 (34 mm)

2 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**34 mm**	**5.96 x 5.96 µm**

F:	5617.92		
Cx:	36.0636	B1:	4.68625
Cy:	4.94665	B2:	-0.589745
K1:	-0.11743	P1:	0.000709365
K2:	0.12805	P2:	-0.000415629
K3:	-0.130041	P3:	0
K4:	0	P4:	0

Camera Calibration

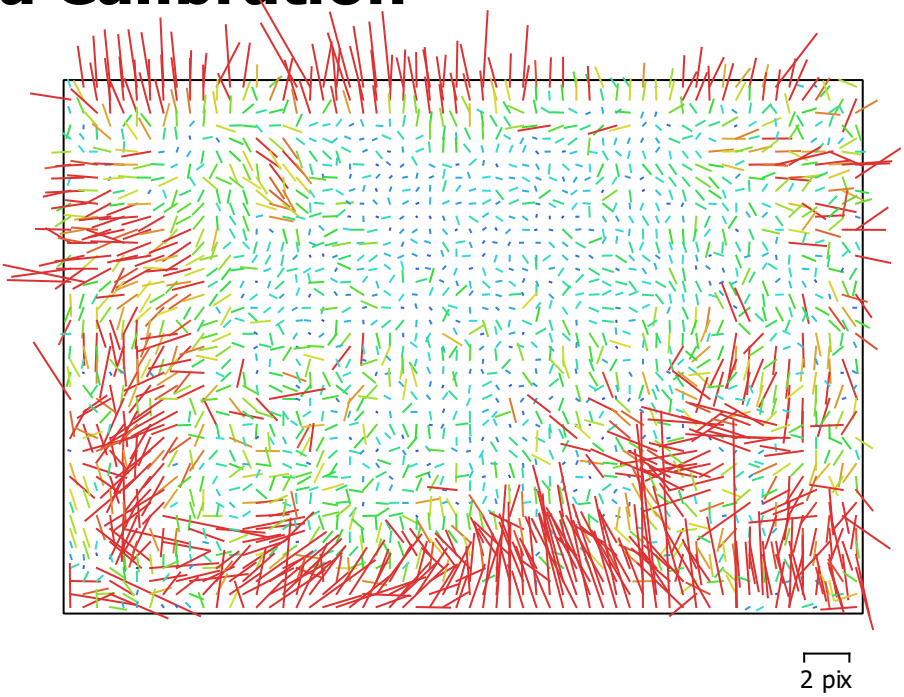

Fig. 14. Image residuals for NIKON D600 (38 mm).

NIKON D600 (38 mm)

6 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**38 mm**	**5.96 x 5.96 µm**

F:	6282.83		
Cx:	62.5112	B1:	23.9093
Cy:	-75.071	B2:	15.7935
K1:	-0.098591	P1:	0.000915747
K2:	0.223877	P2:	0.0017451
K3:	-0.452599	P3:	0
K4:	0	P4:	0

Camera Calibration

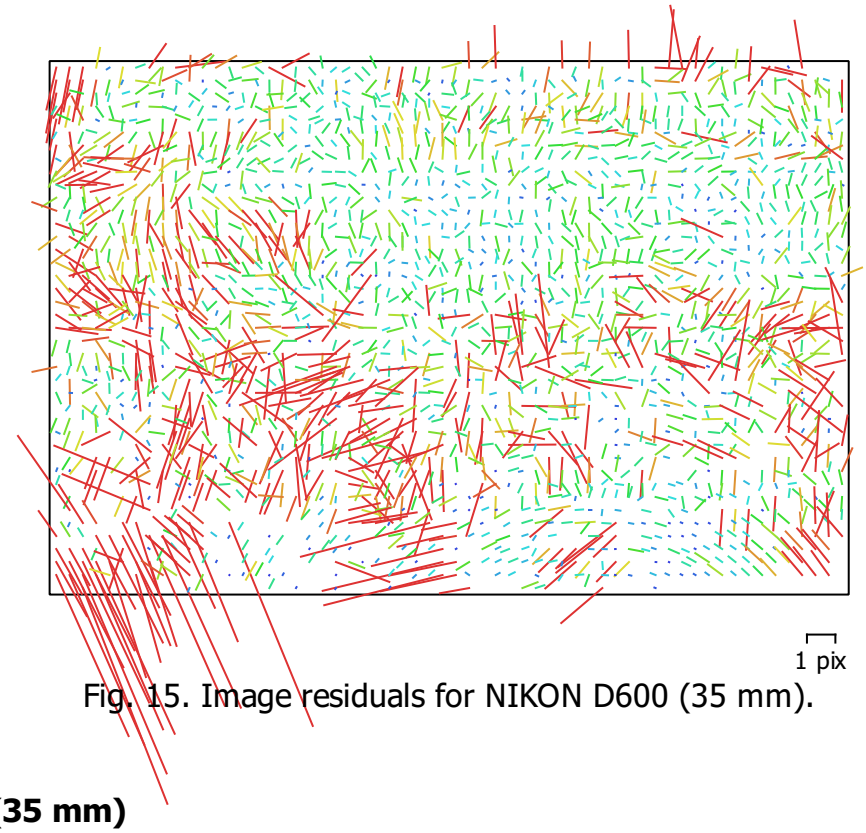

Fig. 15. Image residuals for NIKON D600 (35 mm).

NIKON D600 (35 mm)

4 images

Type	Resolution	Focal Length	Pixel Size
Frame	**6034 x 4028**	**35 mm**	**5.96 x 5.96 µm**

F:	5798.97		
Cx:	40.4793	B1:	-2.30587
Cy:	102.072	B2:	13.0597
K1:	-0.124224	P1:	0.00061622
K2:	0.212392	P2:	-0.00262824
K3:	-0.315847	P3:	0
K4:	0	P4:	0

Ground Control Points

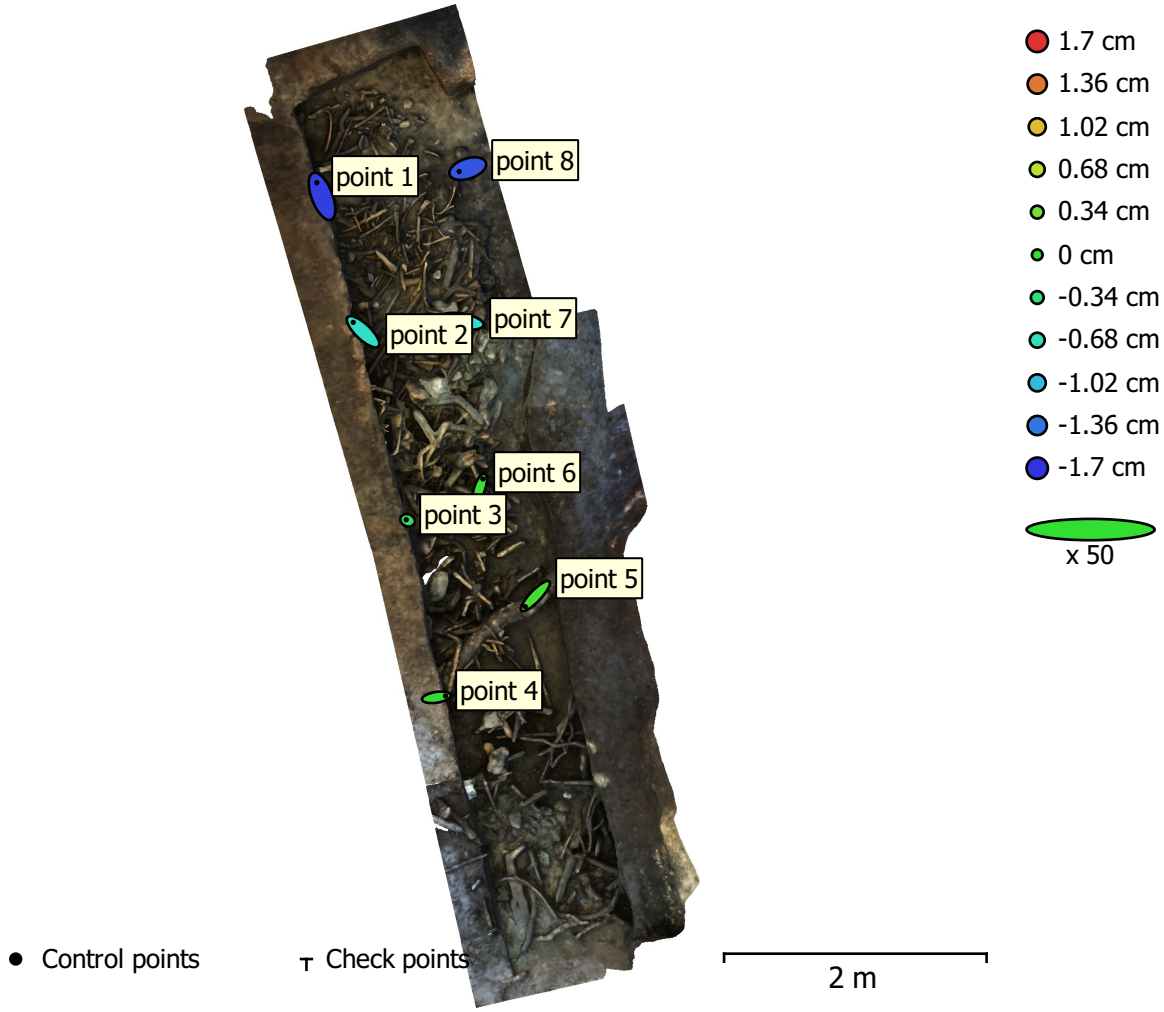

Fig. 16. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
8	2.62575	2.37385	8.80178	3.53974	9.48689

Table 2. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 1	-1.59406	4.17031	-16.3961	16.993	1.476 (16)
point 2	-2.99859	2.85536	-7.40823	8.48684	1.707 (18)
point 3	-0.428688	0.173067	-2.21781	2.26548	2.592 (16)
point 4	2.76209	0.418502	-0.179649	2.79938	1.313 (17)
point 5	-3.07684	-3.22154	0.991735	4.56386	3.363 (21)
point 6	0.936417	2.76257	0.584242	2.9749	2.634 (16)
point 7	-4.31046	0.745997	-7.65939	8.82059	1.277 (29)
point 8	-2.62434	-0.874738	-15.2025	15.4521	1.164 (29)
Total	**2.62575**	**2.37385**	**8.80178**	**9.48689**	**2.017**

Table 3. Control points.

Digital Elevation Model

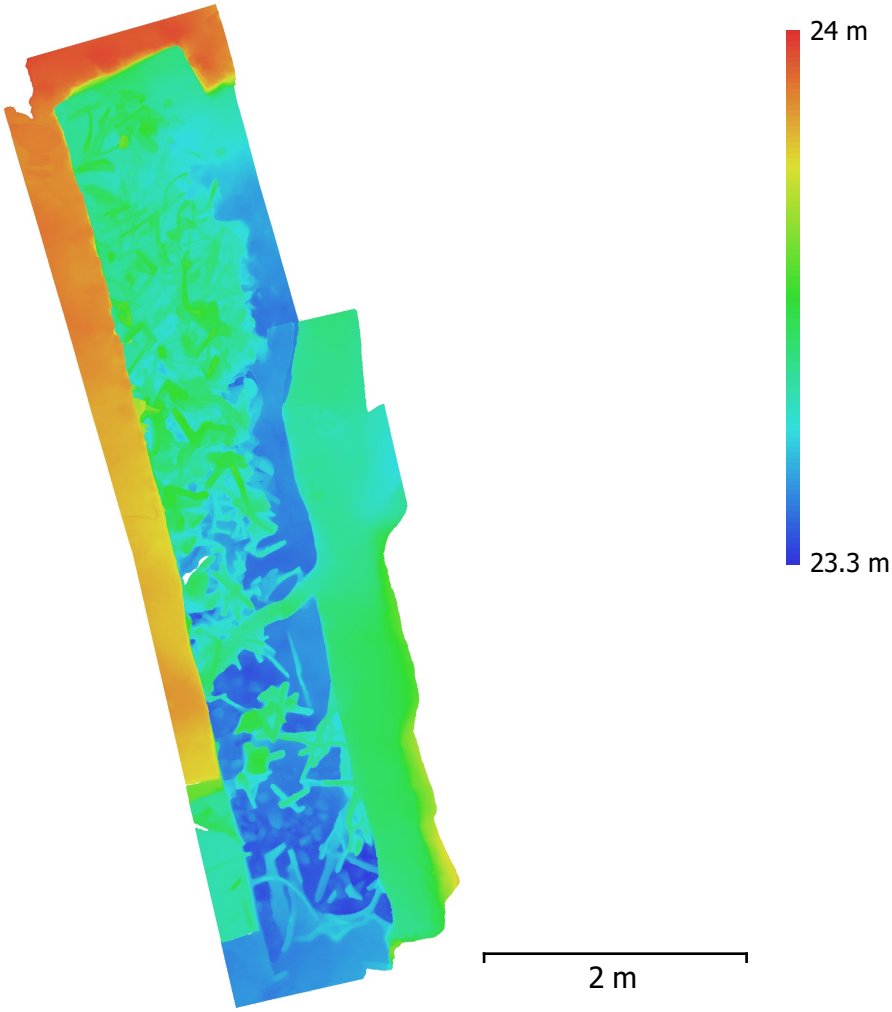

Fig. 17. Reconstructed digital elevation model.

Resolution:	0.727 mm/pix
Point density:	1.89e+03 points/mm²

Processing Parameters

General	
Cameras	92
Aligned cameras	92
Markers	8
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	323,652 of 478,093
Point colors	3 bands, uint8
Reprojection error	1.53461 (24.7957 max)
Effective overlap	3.09194
Dense Point Cloud	
Points	60,129,743
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	High
Depth filtering	Aggressive
Model	
Faces	400,000
Vertices	203,044
Vertex colors	3 bands, uint8
Reconstruction parameters	
Surface type	Arbitrary
Source data	Dense
Interpolation	Enabled
Quality	High
Depth filtering	Aggressive
Face count	30,000,000
Software	
Version	1.4.1 build 5925
Platform	Windows 64