Quercus_petraea_2N

Processing Report

07 November 2018

Survey Data

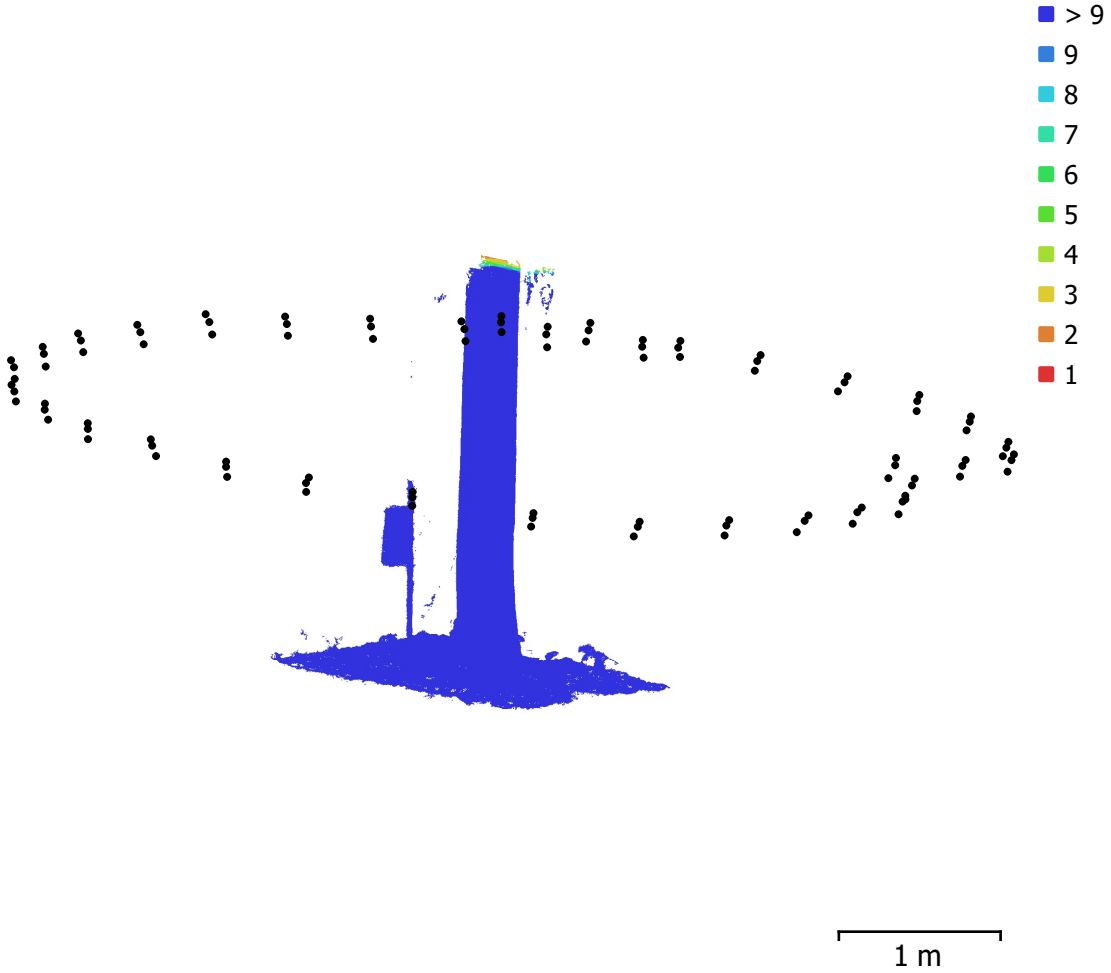

Fig. 1. Camera locations and image overlap.

Number of images:	105	Camera stations:	105
Flying altitude:	4.41 m	Tie points:	123,821
Ground resolution:	0.367 mm/pix	Projections:	359,140
Coverage area:	1.52 m²	Reprojection error:	0.657 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon EOS 70D (35 mm)	5472 x 3648	35 mm	4.17 x 4.17 µm	No

Table 1. Cameras.

Camera Calibration

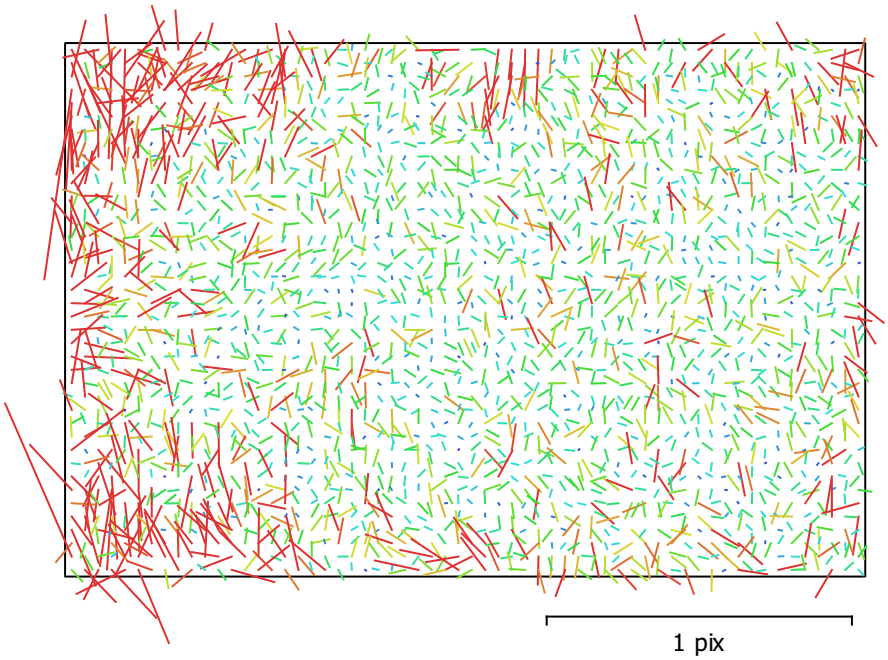

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

105 images

Type	Resolution	Focal Length	Pixel Size
Frame	**5472 x 3648**	**35 mm**	**4.17 x 4.17 µm**

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	P1	P2
F	**8478.9**	0.58	1.00	-0.17	-0.04	-0.26	0.00	0.29	0.02	-0.21	-0.04
Cx	**-42.3587**	0.35		1.00	0.01	0.17	0.05	-0.11	0.04	0.86	0.03
Cy	**-3.14351**	0.45			1.00	-0.03	0.13	-0.02	-0.00	0.01	0.92
B1	**3.69119**	0.48				1.00	0.29	0.22	-0.02	0.01	0.04
B2	**0.899717**	0.1					1.00	0.09	-0.00	-0.03	0.14
K1	**-0.0756557**	0.0001						1.00	-0.87	-0.14	0.00
K2	**0.0876222**	0.00066							1.00	0.02	-0.01
P1	**-0.000471794**	8.6e-06								1.00	0.02
P2	**0.000385304**	1.1e-05									1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

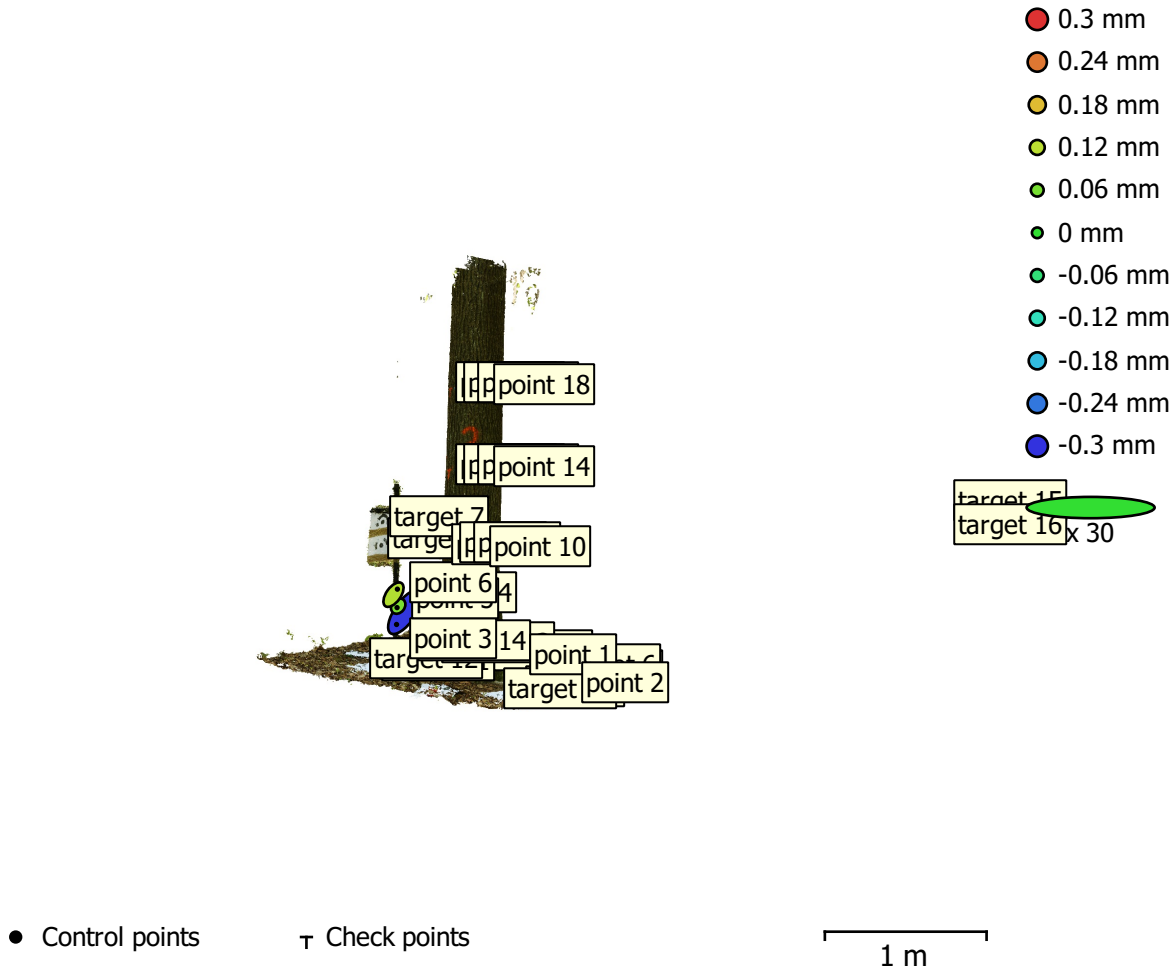

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	2.29707	3.30949	0.172592	4.02855	4.03225

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 3	2.40355	3.45621	0.122695	4.21159	0.004 (78)
point 4	-3.53705	-5.13312	-0.296394	6.24079	0.004 (86)
point 5	-0.476307	-0.595168	0.0627413	0.764872	0.004 (93)
point 6	1.6098	2.27207	0.110958	2.78677	0.004 (97)
Total	**2.29707**	**3.30949**	**0.172592**	**4.03225**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 1					0.258 (3)
target 5					1.010 (17)
target 6					1.064 (19)
target 8					0.874 (17)
target 9					1.600 (14)
target 10					2.795 (12)
target 11					1.185 (9)
target 12					1.902 (8)
target 13					1.090 (17)
target 14					1.364 (20)
target 15					0.496 (4)
target 16					0.453 (4)
target 7					0.003 (89)
point 1					21.471 (35)
point 2					30.354 (51)
point 7					0.004 (104)
point 8					0.004 (104)
point 9					0.004 (105)
point 10					0.004 (105)
point 11					0.004 (70)
point 12					0.004 (70)
point 13					0.004 (70)
point 14					0.004 (71)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 15					0.004 (69)
point 16					0.004 (69)
point 17					0.003 (69)
point 18					0.003 (69)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.147724	-0.00027579
target 8_target 7	0.148529	0.000528987
target 9_target 10	0.147661	-0.000338535
target 11_target 12	0.14835	0.000350082
target 13_target 14	0.147737	-0.000263145
target 15_target 16	0.147972	-2.78955e-05
Total		**0.000332434**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 3_point 4	0.125352	
point 3_point 5	0.229143	
point 3_point 6	0.343176	
Total		

Table 7. Check scale bars.

Digital Elevation Model

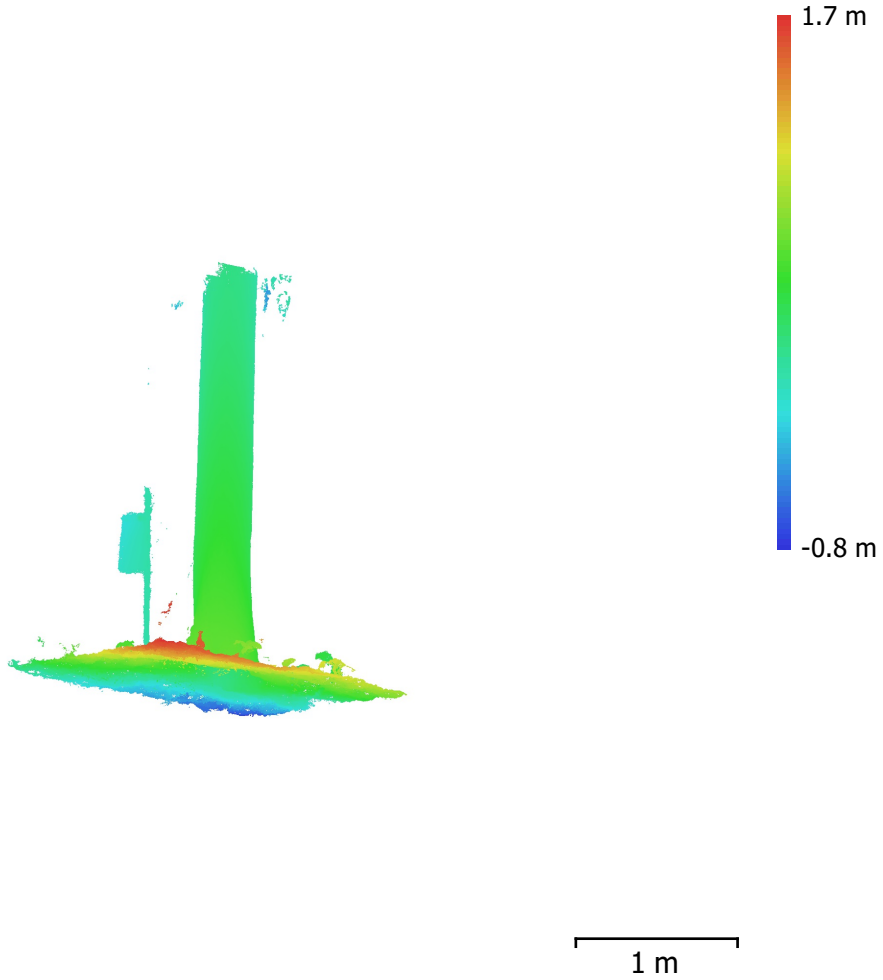

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	105
Aligned cameras	105
Markers	32
Scale bars	9
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	123,821 of 155,064
RMS reprojection error	0.136564 (0.656824 pix)
Max reprojection error	0.415246 (15.3854 pix)
Mean key point size	4.70605 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.14301
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	36 minutes 50 seconds
Alignment time	1 minutes 40 seconds
Depth Maps	
Count	105
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	2 hours 22 minutes
Dense Point Cloud	
Points	3,937,186
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	2 hours 22 minutes
Dense cloud generation time	24 minutes 15 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64