Quercus_petraea_10N

Processing Report

07 November 2018

Survey Data

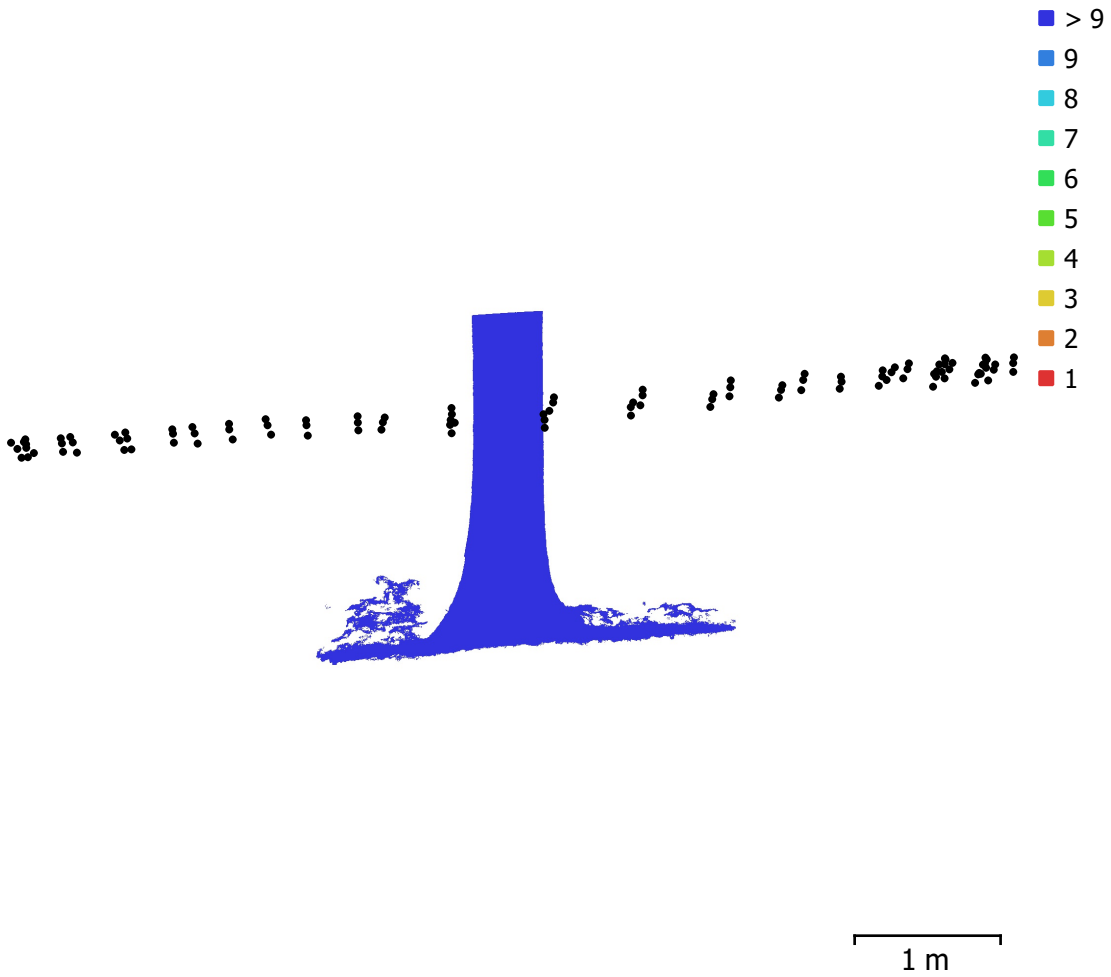

Fig. 1. Camera locations and image overlap.

Number of images:	111	Camera stations:	111
Flying altitude:	4.03 m	Tie points:	110,112
Ground resolution:	0.38 mm/pix	Projections:	358,731
Coverage area:	1.65 m²	Reprojection error:	0.735 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

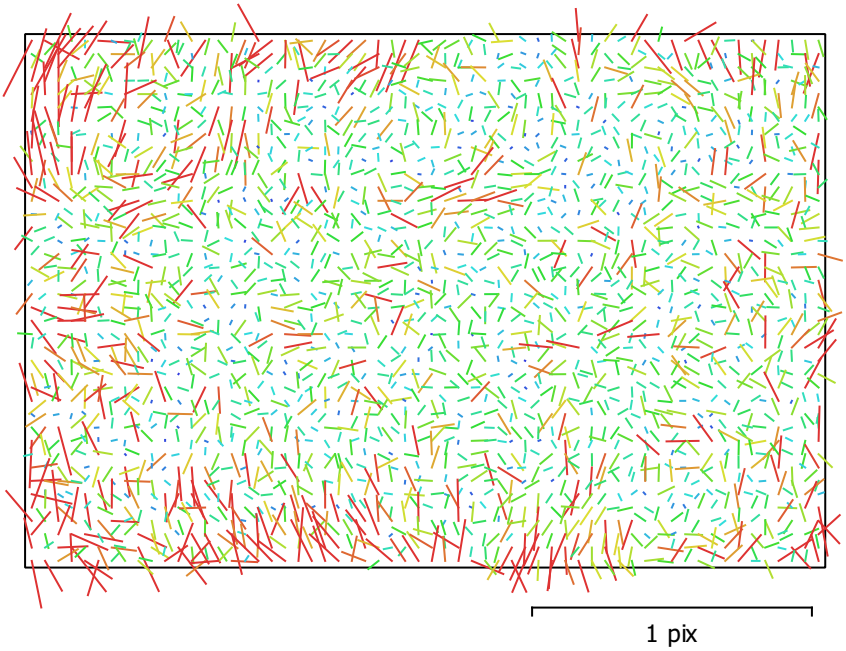

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

111 images

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

	Value	Error	F	Cx	Cy	B2	K1	K2	P1	P2
F	**8452.28**	0.55	1.00	-0.13	-0.02	0.02	0.39	0.03	-0.22	-0.04
Cx	**-38.1579**	0.28		1.00	-0.04	-0.00	-0.14	0.03	0.83	-0.01
Cy	**-18.6958**	0.5			1.00	0.23	-0.01	0.00	-0.03	0.94
B2	**0.784596**	0.092				1.00	0.01	-0.00	-0.00	0.22
K1	**-0.0762859**	9.5e-05					1.00	-0.87	-0.15	-0.02
K2	**0.0852603**	0.00061						1.00	0.03	0.00
P1	**-0.000233075**	7.7e-06							1.00	-0.00
P2	**-0.000177651**	1.2e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

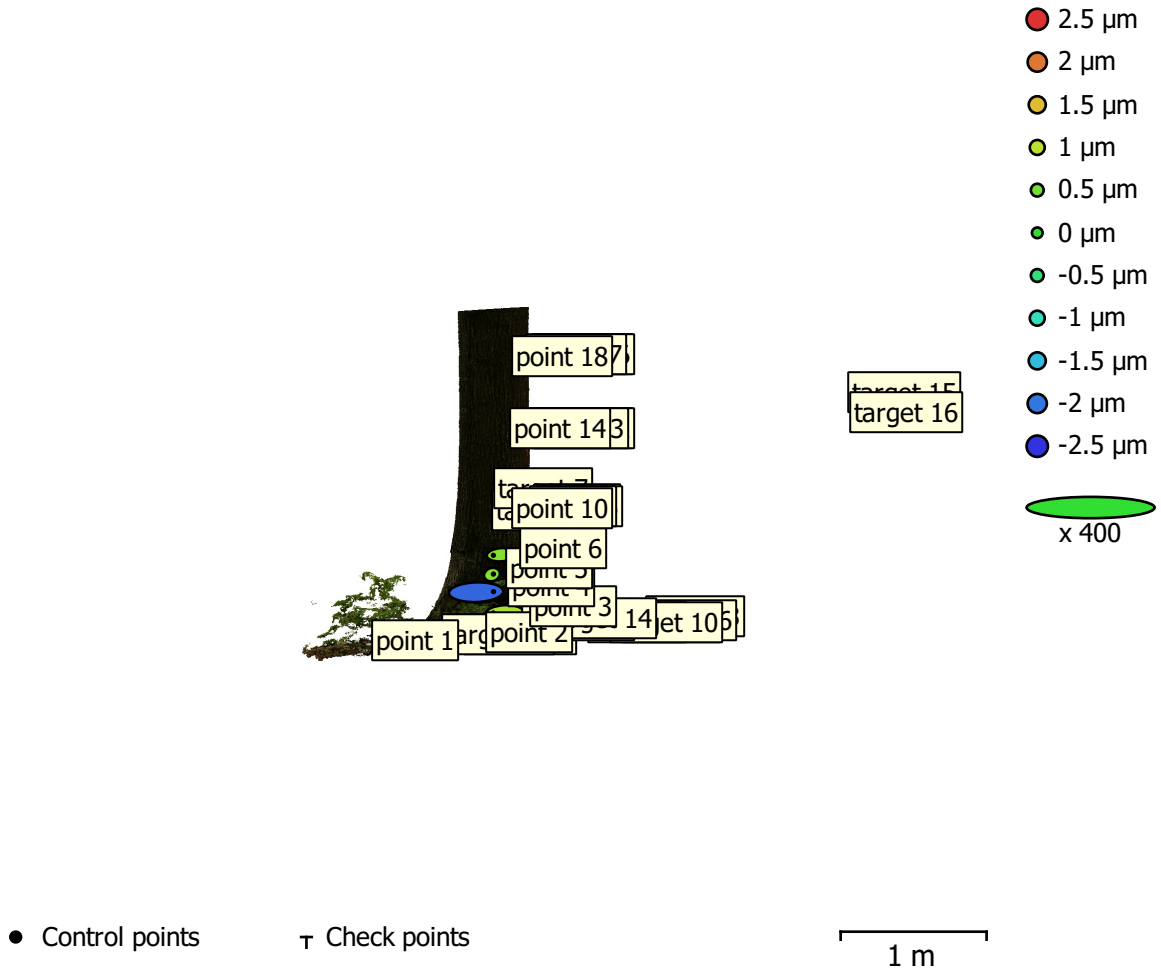

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	0.379108	0.0182746	0.0012354	0.379548	0.37955

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 3	-0.391708	-0.0177471	0.000911152	0.392111	0.004 (74)
point 4	0.595635	0.0192334	-0.00212907	0.59595	0.004 (80)
point 5	0.049496	0.0172825	0.000604723	0.05243	0.004 (93)
point 6	-0.253423	-0.0187689	0.00061318	0.254118	0.004 (108)
Total	**0.379108**	**0.0182746**	**0.0012354**	**0.37955**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 3					0.350 (3)
target 5					0.251 (2)
target 6					1.297 (3)
target 8					1.264 (32)
target 9					0.368 (12)
target 10					1.223 (10)
target 11					0.639 (4)
target 12					0.078 (2)
target 13					0.630 (13)
target 14					1.256 (3)
target 15					0.309 (4)
target 16					0.204 (4)
target 7					0.003 (92)
point 1					0.418 (19)
point 2					0.291 (22)
point 7					0.004 (110)
point 8					0.004 (110)
point 9					0.004 (109)
point 10					0.004 (109)
point 11					0.004 (74)
point 12					0.004 (74)
point 13					0.004 (74)
point 14					0.004 (74)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 15					0.003 (73)
point 16					0.003 (73)
point 17					0.004 (74)
point 18					0.004 (74)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.148017	1.72009e-05
target 9_target 10	0.14826	0.000259571
target 11_target 12	0.148006	5.66715e-06
target 13_target 14	0.149265	0.00126515
target 15_target 16	0.14668	-0.00131977
target 8_target 7	0.149343	0.00134265
point 1_point 2	0.803705	-0.000295189
Total		**0.000870133**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 3_point 4	0.145897	
point 3_point 5	0.266579	
point 3_point 6	0.394976	
Total		

Table 7. Check scale bars.

Digital Elevation Model

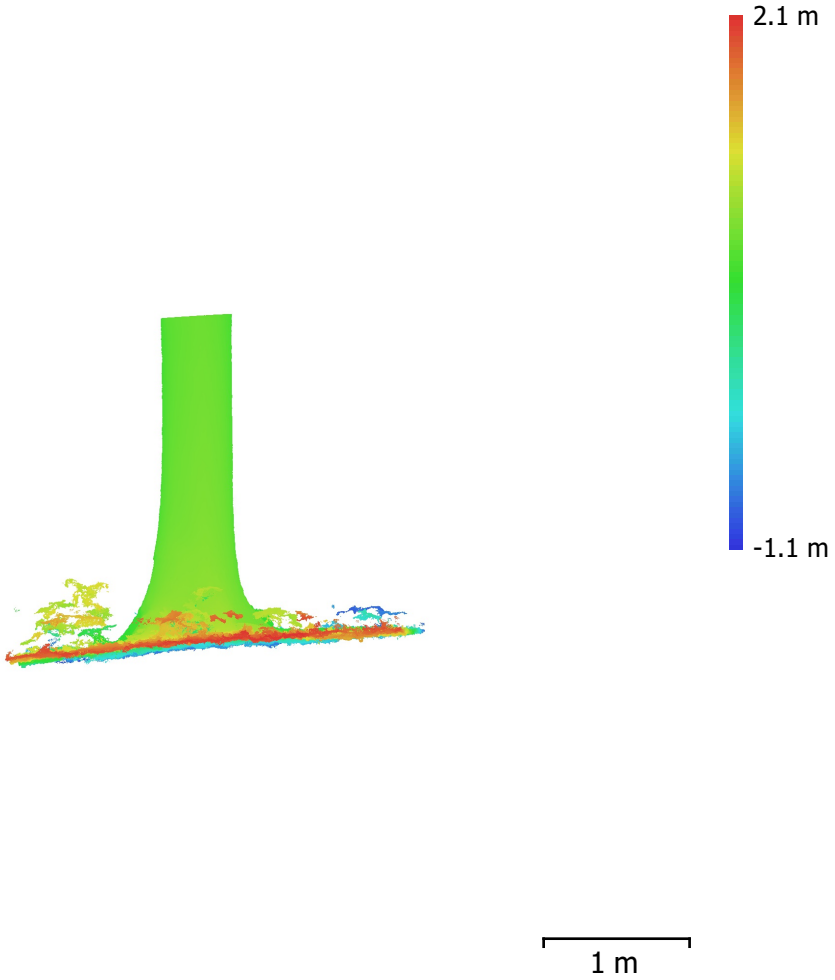

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	111
Aligned cameras	111
Markers	32
Scale bars	10
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	110,112 of 144,009
RMS reprojection error	0.140414 (0.735329 pix)
Max reprojection error	0.428986 (17.1305 pix)
Mean key point size	5.04894 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.53945
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	45 minutes 27 seconds
Alignment time	1 minutes 23 seconds
Depth Maps	
Count	111
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	2 hours 46 minutes
Dense Point Cloud	
Points	5,651,165
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	2 hours 46 minutes
Dense cloud generation time	30 minutes 41 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64