Quercus_petraea_5F

Processing Report

07 November 2018

Survey Data

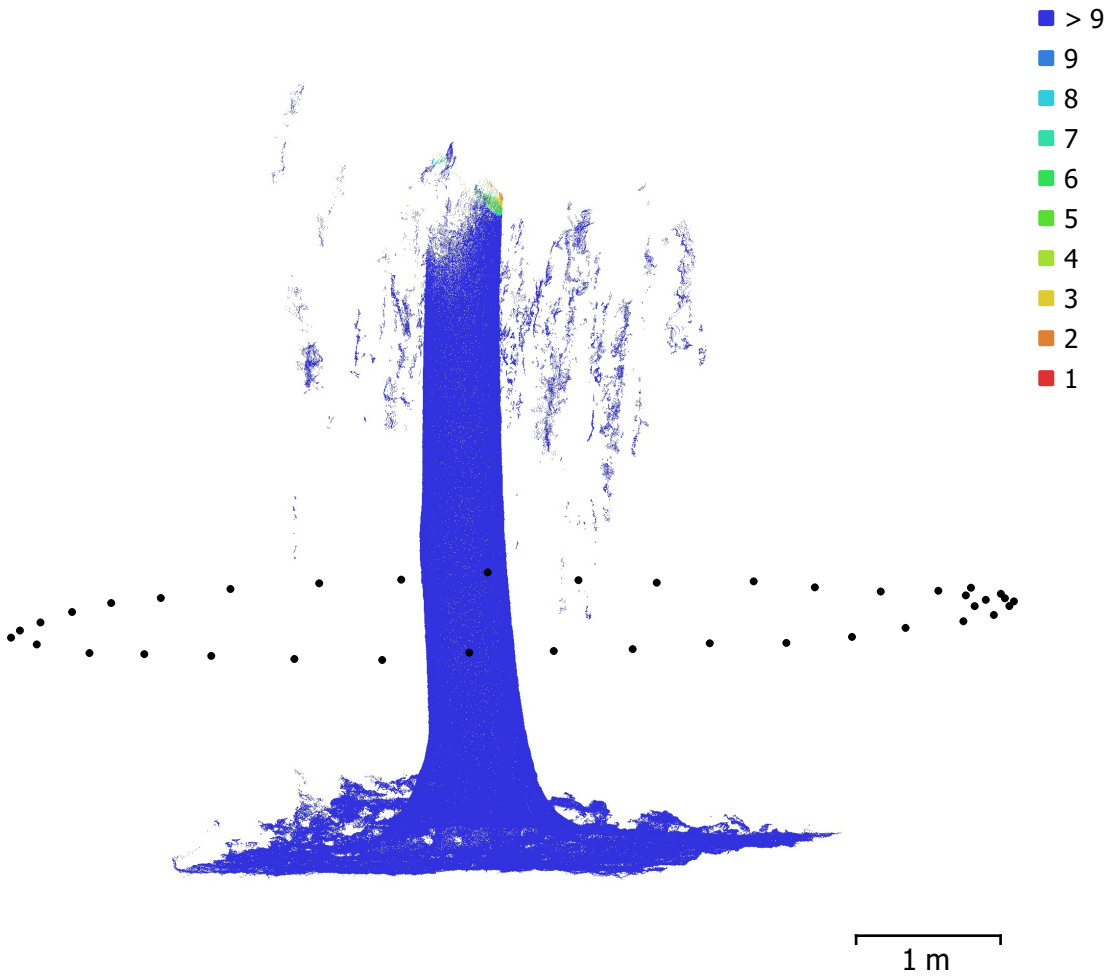

Fig. 1. Camera locations and image overlap.

Number of images:	39	Camera stations:	39
Flying altitude:	3.25 m	Tie points:	33,493
Ground resolution:	0.778 mm/pix	Projections:	91,150
Coverage area:	4.11 m²	Reprojection error:	0.442 pix

Camera Model	Resolution	Focal Length	Pixel Size	Precalibrated
Canon EOS 70D (15 mm)	5472 x 3648	15 mm	4.17 x 4.17 µm	No

Table 1. Cameras.

Camera Calibration

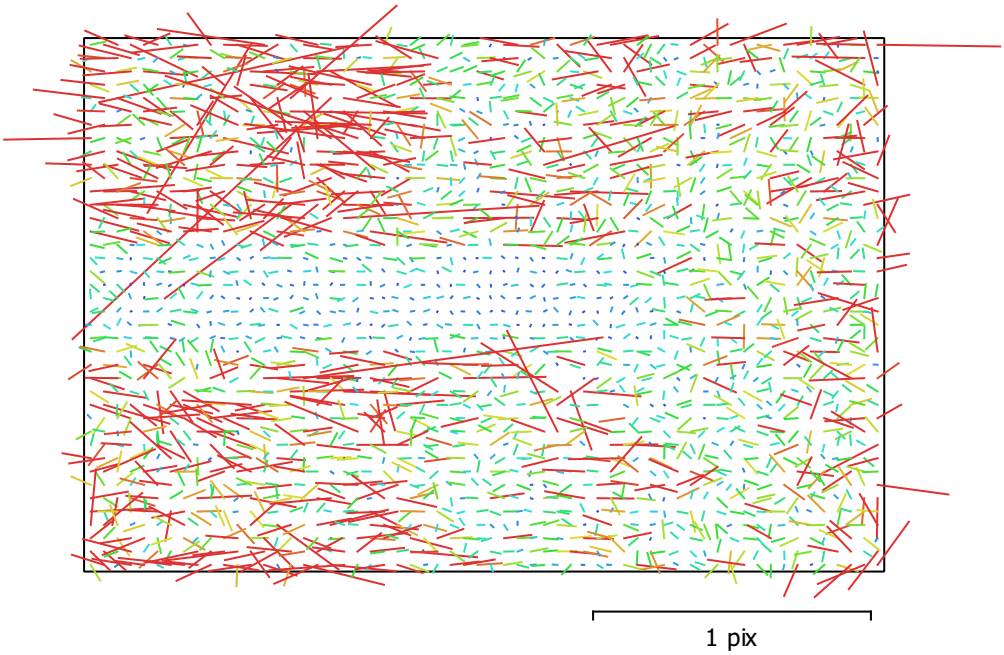

Fig. 2. Image residuals for Canon EOS 70D (15 mm).

Canon EOS 70D (15 mm)

39 images

Type	Resolution	Focal Length	Pixel Size
Fisheye	**5472 x 3648**	**15 mm**	**4.17 x 4.17 µm**

	Value	Error	Cx	Cy	B2	K1	K2	P1	P2
F	**3595.54**								
Cx	**15.0938**	0.28	1.00	-0.06	-0.09	-0.03	-0.01	-0.75	-0.02
Cy	**-51.2948**	0.21		1.00	0.34	-0.07	0.09	0.06	0.08
B2	**0.213172**	0.041			1.00	0.01	0.01	0.03	-0.10
K1	**-0.0377051**	6.3e-05				1.00	-0.93	0.16	0.01
K2	**0.00286841**	5.6e-05					1.00	-0.02	-0.03
P1	**0.000175744**	1.8e-05						1.00	-0.04
P2	**-6.86015e-05**	6e-06							1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

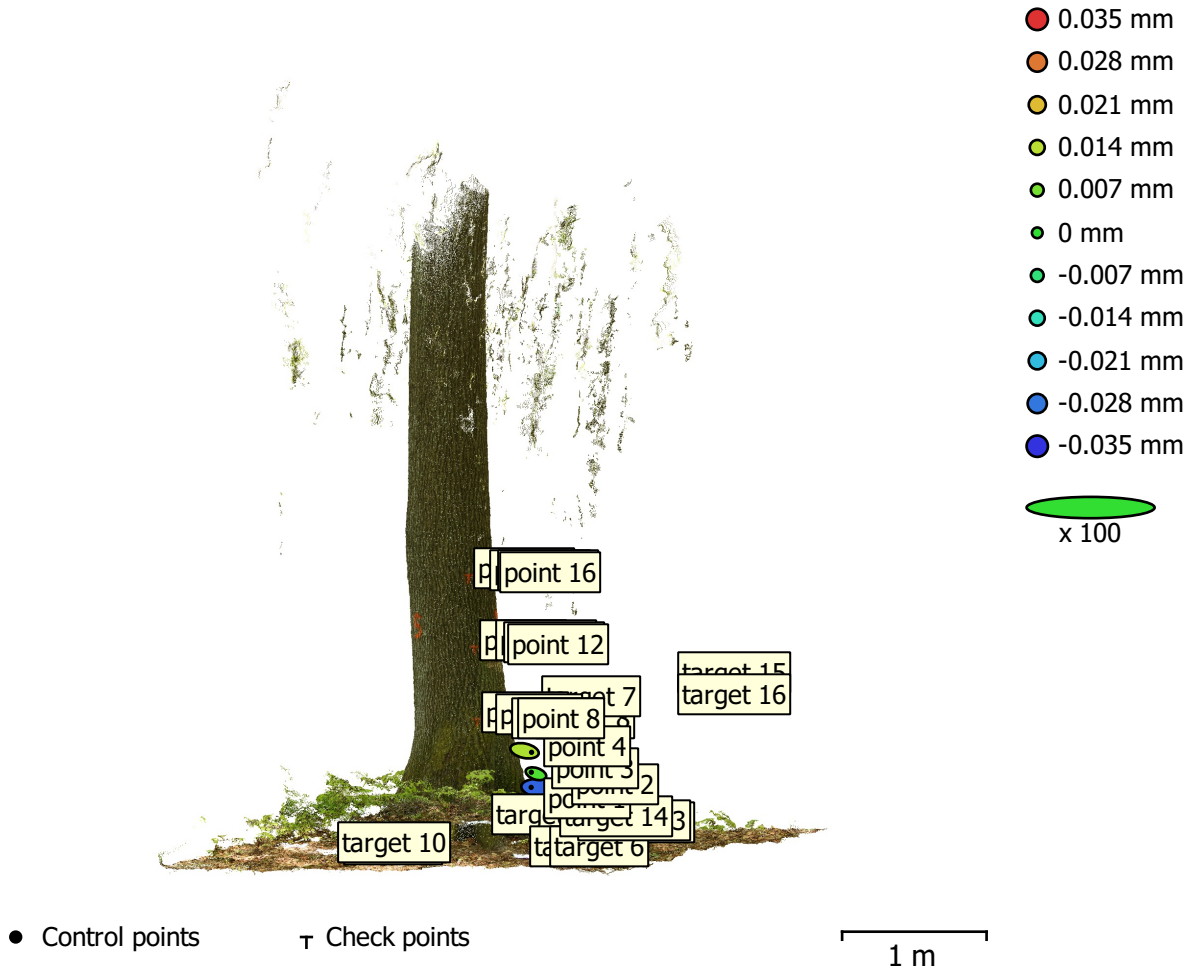

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	1.26923	0.228726	0.0178831	1.28967	1.2898

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 1	1.41734	-0.243391	0.0145923	1.43816	0.004 (39)
point 2	-1.75304	0.24389	-0.0300535	1.77018	0.004 (39)
point 3	-0.640555	0.213519	0.00294775	0.675211	0.004 (39)
point 4	0.975415	-0.212014	0.0124249	0.998268	0.004 (39)
Total	**1.26923**	**0.228726**	**0.0178831**	**1.2898**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 1					0.113 (4)
target 4					0.155 (4)
target 5					0.195 (15)
target 6					0.164 (12)
target 8					0.231 (18)
target 9					0.239 (8)
target 10					0.060 (4)
target 13					0.190 (20)
target 14					0.190 (22)
target 15					0.180 (8)
target 16					0.167 (8)
target 7					0.004 (39)
point 5					0.004 (39)
point 6					0.004 (39)
point 7					0.004 (39)
point 8					0.004 (39)
point 9					0.004 (39)
point 10					0.004 (39)
point 11					0.004 (39)
point 12					0.004 (39)
point 13					0.004 (39)
point 14					0.004 (39)
point 15					0.004 (39)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 16					0.004 (39)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.147709	-0.000290938
target 8_target 7	0.148081	8.07335e-05
target 9_target 10	0.148319	0.000318887
target 13_target 14	0.14813	0.000129636
target 15_target 16	0.147759	-0.000240713
Total		**0.000231344**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 1_point 2	0.119704	
point 1_point 3	0.224383	
point 1_point 4	0.362232	
Total		

Table 7. Check scale bars.

Digital Elevation Model

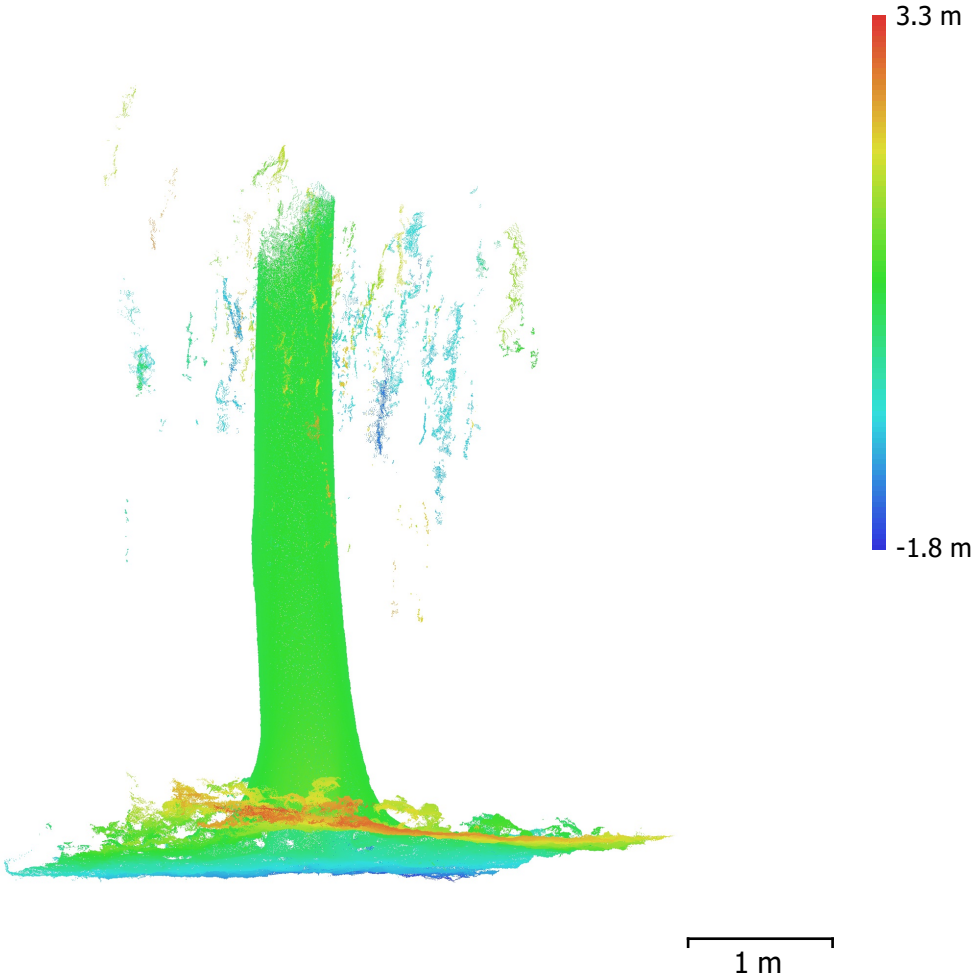

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	39
Aligned cameras	39
Markers	28
Scale bars	8
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	33,493 of 37,160
RMS reprojection error	0.098009 (0.442256 pix)
Max reprojection error	0.299035 (18.9011 pix)
Mean key point size	3.56119 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.83471
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	6 minutes 22 seconds
Alignment time	17 seconds
Depth Maps	
Count	39
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	42 minutes 43 seconds
Dense Point Cloud	
Points	2,508,256
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	42 minutes 43 seconds
Dense cloud generation time	7 minutes 46 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64