Quercus_petraea_9N

Processing Report

07 November 2018

Survey Data

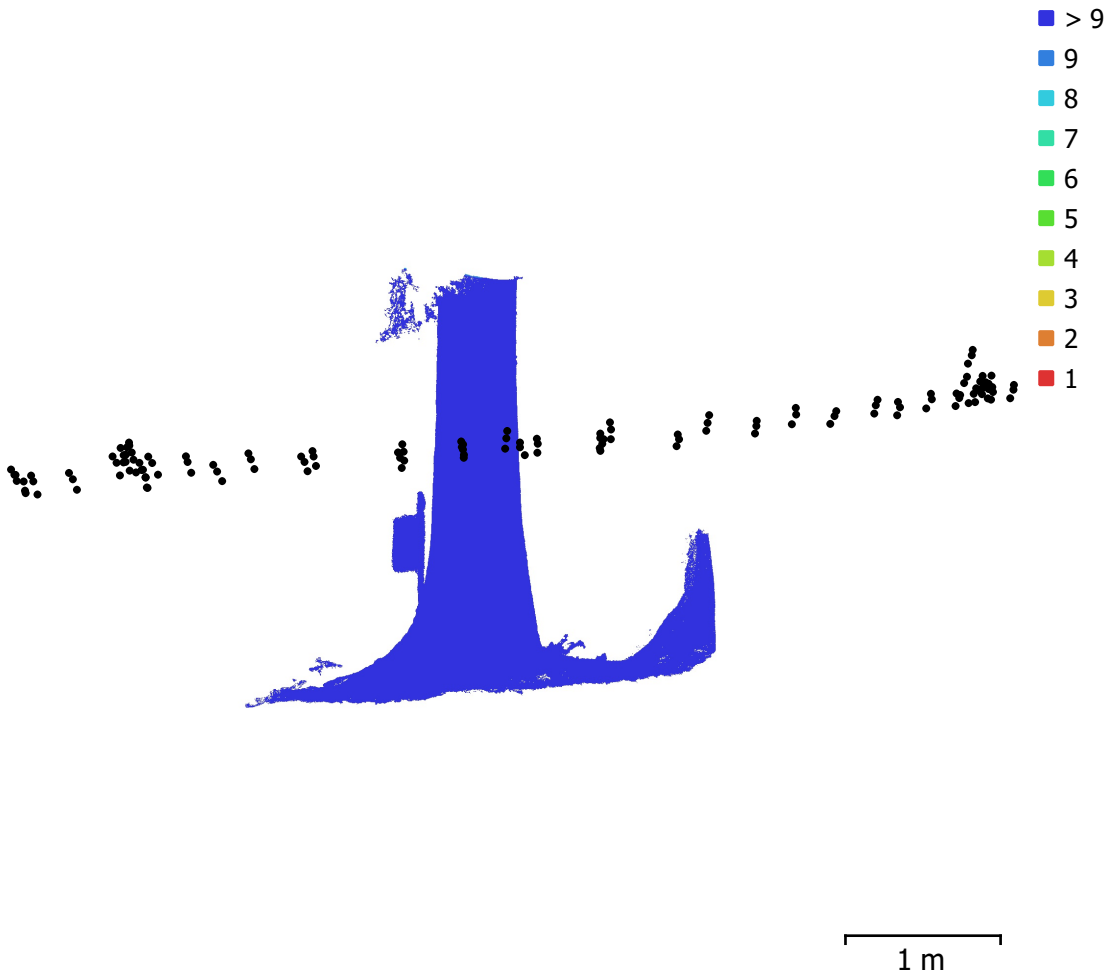

Fig. 1. Camera locations and image overlap.

Number of images:	137	Camera stations:	137
Flying altitude:	2.97 m	Tie points:	121,640
Ground resolution:	0.341 mm/pix	Projections:	467,078
Coverage area:	2.33 m²	Reprojection error:	0.761 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

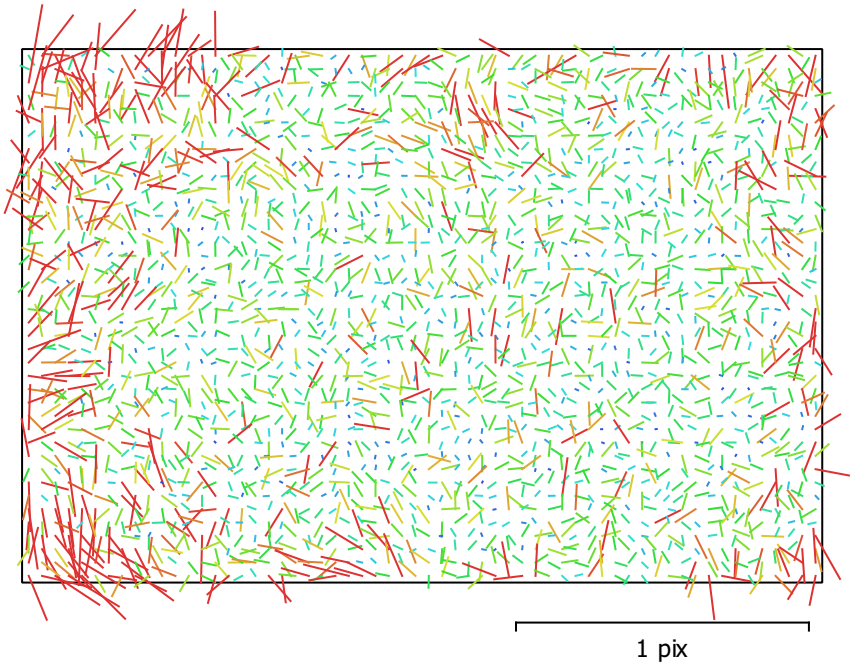

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

137 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	**8469.51**	0.34	1.00	-0.14	-0.01	-0.34	0.01	0.17	0.03	-0.14	-0.01
Cx	**-35.0846**	0.27		1.00	-0.05	0.11	-0.00	-0.05	0.03	0.90	-0.05
Cy	**-15.3537**	0.4			1.00	0.01	0.22	0.01	-0.00	-0.04	0.95
B1	**3.73797**	0.31				1.00	0.15	0.18	-0.02	0.01	0.03
B2	**1.01868**	0.076					1.00	0.05	-0.00	-0.03	0.22
K1	**-0.0756922**	8e-05						1.00	-0.92	-0.07	0.01
K2	**0.0830478**	0.00053							1.00	0.02	-0.00
P1	**-0.000236754**	6.9e-06								1.00	-0.04
P2	**-7.58826e-05**	9.5e-06									1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

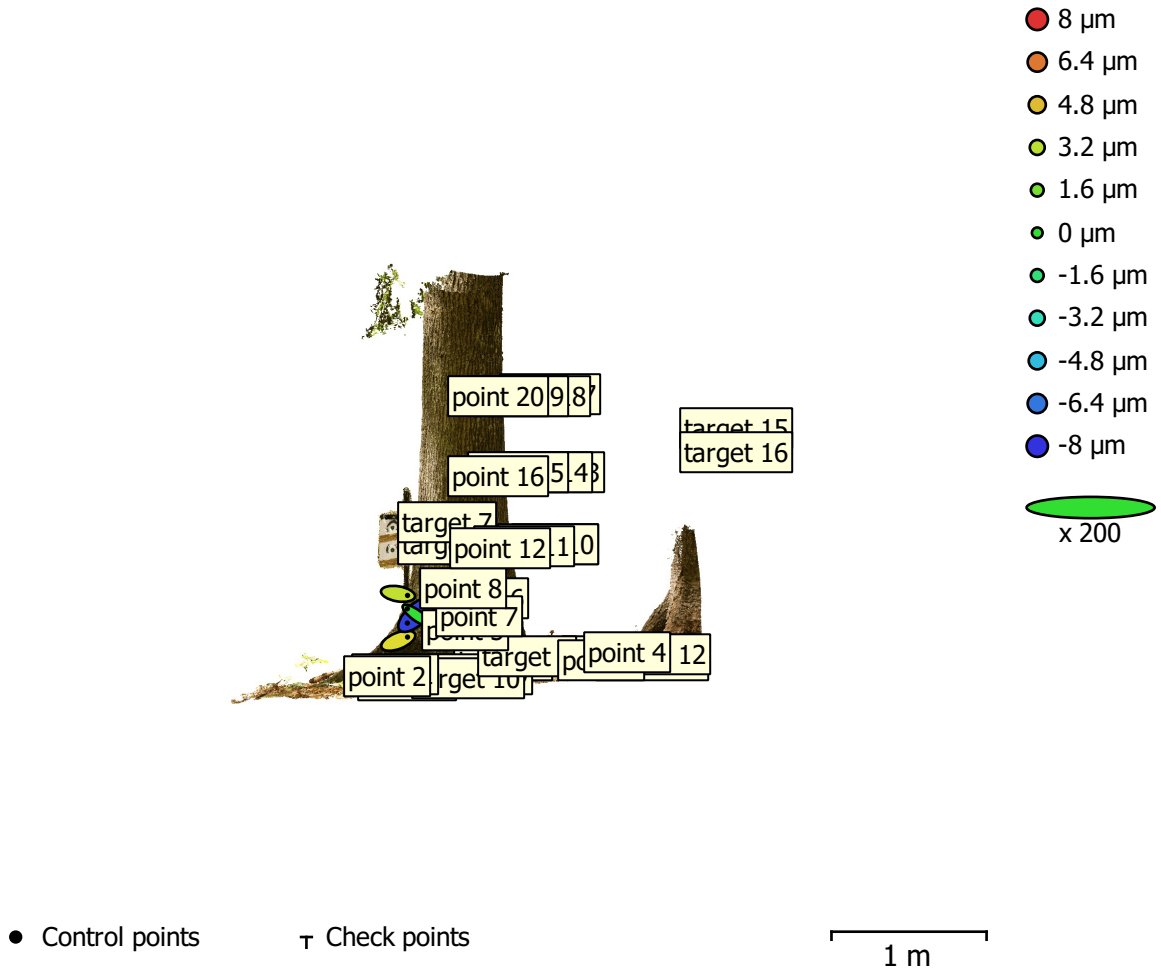

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	0.605514	0.377901	0.00466005	0.713762	0.713777

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 5	0.596366	0.237084	0.00409093	0.641777	0.004 (96)
point 6	-0.610157	-0.564588	-0.00768123	0.83133	0.003 (106)
point 7	-0.600767	0.430786	-6.15993e-05	0.739255	0.003 (110)
point 8	0.614593	-0.1034	0.00333518	0.62324	0.003 (111)
Total	**0.605514**	**0.377901**	**0.00466005**	**0.713777**	**0.003**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 3					1.292 (6)
target 4					0.363 (7)
target 6					0.575 (12)
target 8					1.798 (35)
target 9					1.523 (9)
target 10					0.076 (2)
target 11					0.752 (10)
target 12					0.729 (12)
target 15					0.204 (5)
target 16					0.241 (6)
target 7					0.003 (99)
target 5					5.205 (49)
point 1					0.056 (63)
point 2					0.194 (59)
point 3					3.778 (77)
point 4					1.214 (75)
point 9					0.004 (127)
point 10					0.004 (128)
point 11					0.004 (129)
point 12					0.004 (129)
point 13					0.004 (102)
point 14					0.004 (102)
point 15					0.004 (102)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 16					0.004 (103)
point 17					0.003 (88)
point 18					0.003 (88)
point 19					0.003 (87)
point 20					0.004 (87)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 9_target 10	0.146238	-0.00176164
target 11_target 12	0.146856	-0.00114387
target 15_target 16	0.146905	-0.00109516
target 8_target 7	0.146835	-0.00116513
target 6_target 5	0.151747	0.00374689
point 1_point 2	0.146641	-0.00135895
point 3_point 4	0.603643	0.000642624
Total		**0.00182317**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 5_point 6	0.0903248	
point 5_point 7	0.182792	
point 5_point 8	0.26838	
Total		

Table 7. Check scale bars.

Digital Elevation Model

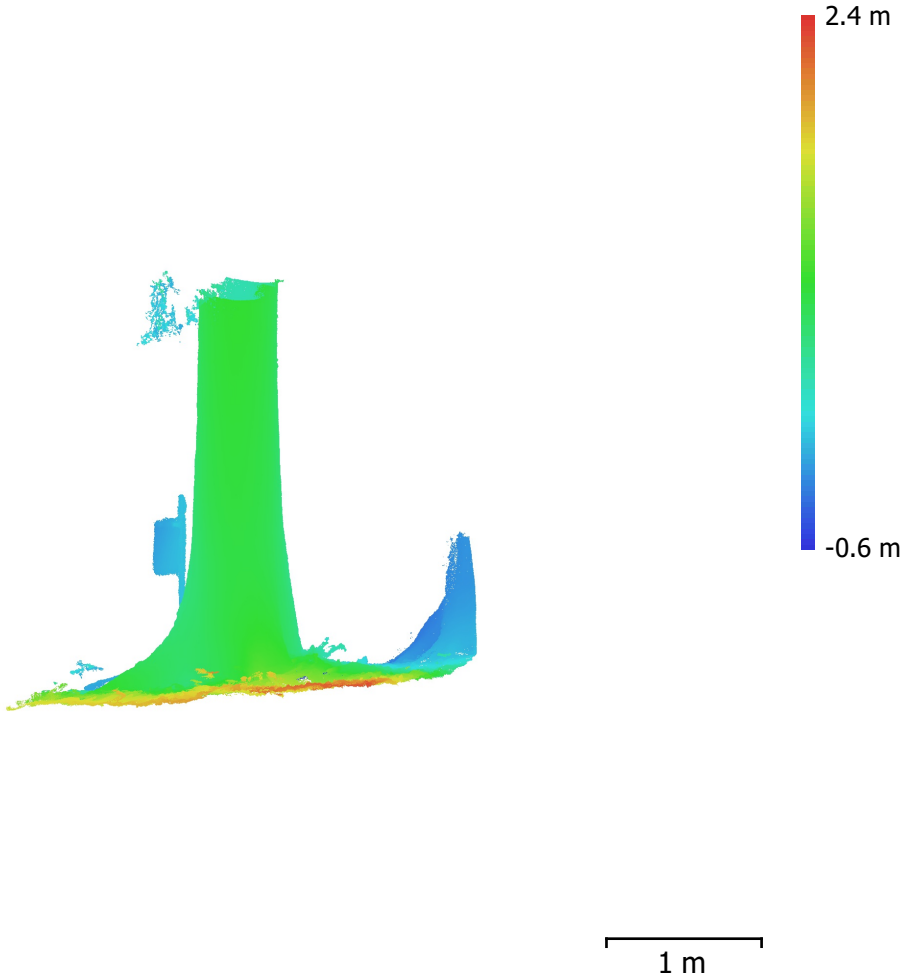

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	137
Aligned cameras	137
Markers	32
Scale bars	10
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	121,640 of 153,667
RMS reprojection error	0.165208 (0.761048 pix)
Max reprojection error	0.502283 (24.8447 pix)
Mean key point size	4.57352 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	4.10869
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	59 minutes 38 seconds
Alignment time	2 minutes 2 seconds
Depth Maps	
Count	137
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	4 hours 20 minutes
Dense Point Cloud	
Points	7,382,623
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	4 hours 20 minutes
Dense cloud generation time	45 minutes 43 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64