Fagus_sylvatica_3N

Processing Report

07 November 2018

Survey Data

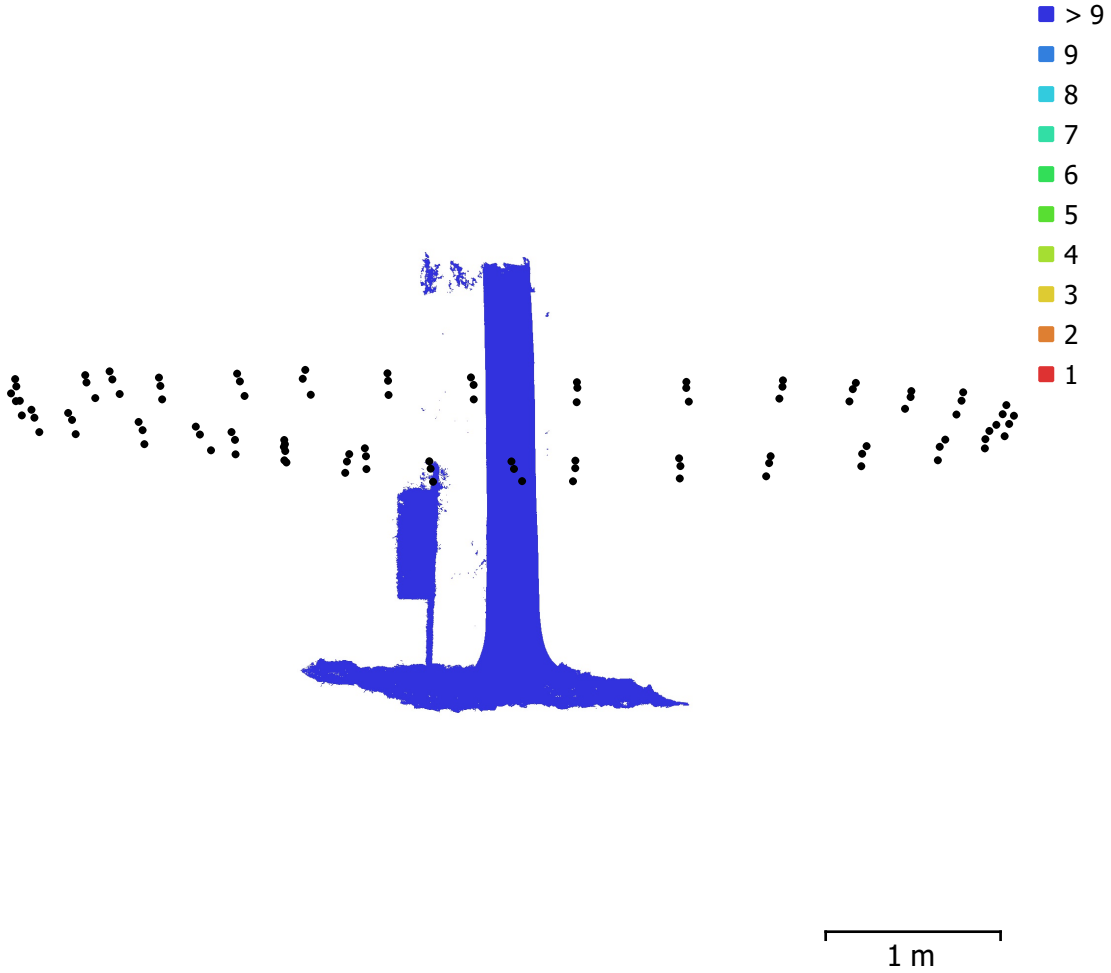

Fig. 1. Camera locations and image overlap.

Number of images:	102	Camera stations:	102
Flying altitude:	4.34 m	Tie points:	131,506
Ground resolution:	0.329 mm/pix	Projections:	362,924
Coverage area:	1.26 m²	Reprojection error:	0.727 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

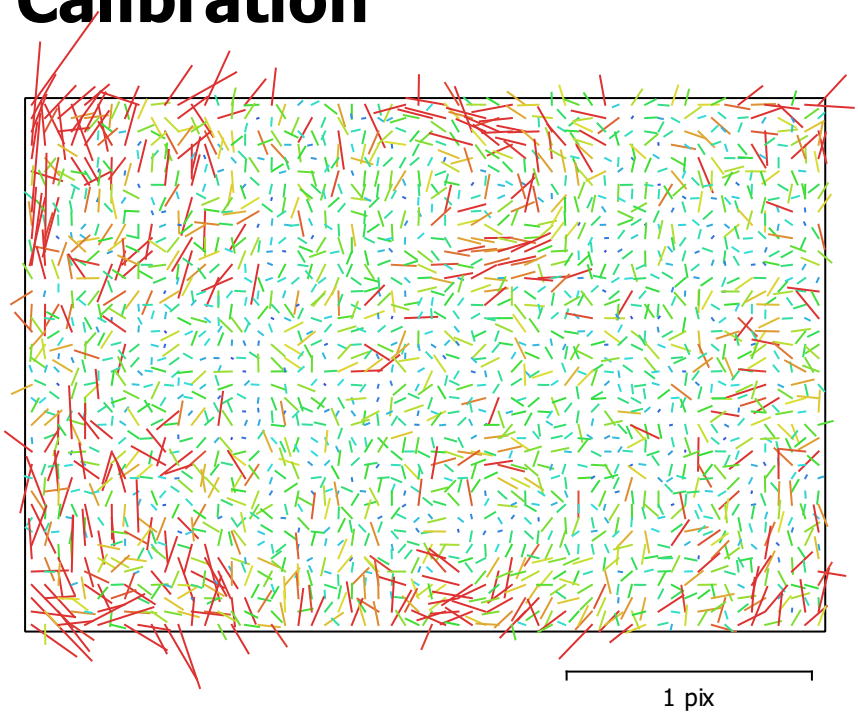

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

102 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	**8481.87**	0.6	1.00	-0.22	-0.03	-0.31	0.02	0.23	0.02	-0.24	-0.04
Cx	**-43.3651**	0.34		1.00	-0.00	0.08	-0.00	-0.06	-0.03	0.83	-0.00
Cy	**-6.95335**	0.57			1.00	0.11	0.42	0.03	0.00	-0.03	0.94
B1	**12.1326**	0.58				1.00	0.00	0.25	-0.02	-0.09	0.17
B2	**0.578847**	0.1					1.00	0.01	0.00	-0.03	0.38
K1	**-0.0760787**	0.00012						1.00	-0.88	-0.10	0.05
K2	**0.0855135**	0.00074							1.00	-0.03	-0.01
P1	**-0.000384535**	9.2e-06								1.00	-0.03
P2	**0.000556379**	1.4e-05									1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

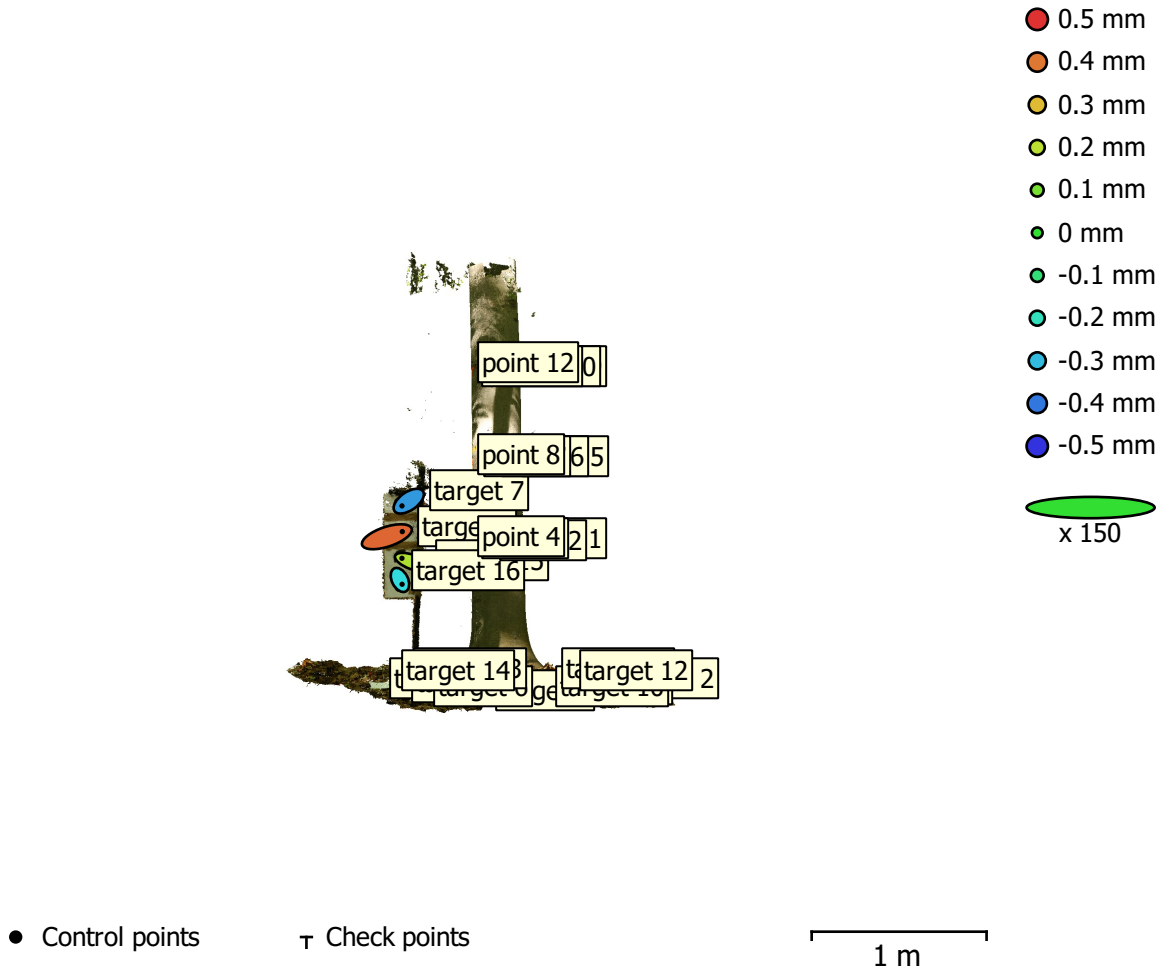

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	0.767096	0.345233	0.31667	0.841203	0.898834

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 8	1.1745	0.390452	0.425317	1.30874	1.231 (18)
target 15	-0.826345	0.29644	0.179839	0.896139	1.538 (34)
target 16	0.16568	-0.327479	-0.253682	0.446147	1.931 (21)
target 7	-0.513813	-0.359405	-0.351467	0.718822	0.948 (69)
Total	**0.767096**	**0.345233**	**0.31667**	**0.898834**	**1.322**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 1					0.169 (2)
target 2					0.195 (2)
target 3					1.026 (11)
target 5					1.103 (22)
target 6					1.335 (15)
target 9					1.362 (32)
target 10					1.332 (30)
target 11					1.111 (9)
target 12					1.303 (10)
target 13					0.770 (10)
target 14					0.936 (7)
point 1					0.004 (102)
point 2					0.004 (102)
point 3					0.004 (102)
point 4					0.004 (102)
point 5					0.004 (68)
point 6					0.004 (68)
point 7					0.004 (68)
point 8					0.004 (68)
point 9					0.003 (61)
point 10					0.004 (61)
point 11					0.003 (61)
point 12					0.004 (60)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.148156	0.000155862
target 8_target 7	0.147235	-0.000765194
target 9_target 10	0.148436	0.0004356
target 11_target 12	0.148399	0.000398696
target 13_target 14	0.148838	0.000837756
target 15_target 16	0.148438	0.000438146
target 8_target 15	0.152475	
Total		**0.000555627**

Table 6. Check scale bars.

Digital Elevation Model

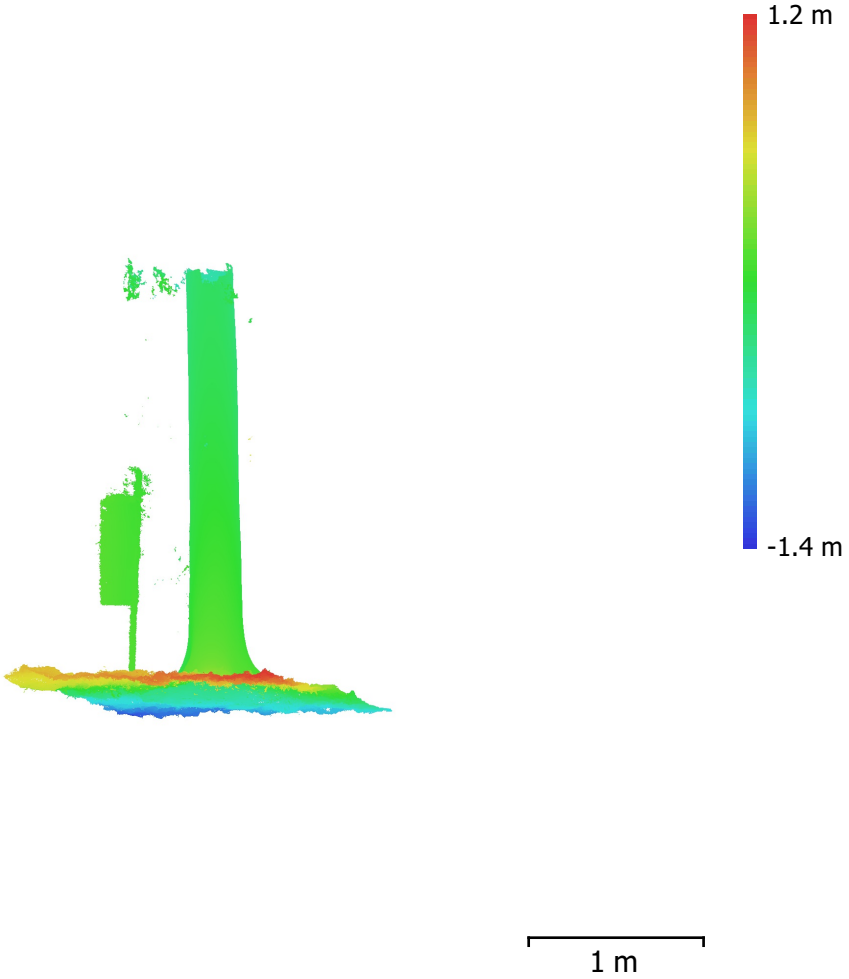

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	102
Aligned cameras	102
Markers	27
Scale bars	7
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	131,506 of 155,788
RMS reprojection error	0.138858 (0.727307 pix)
Max reprojection error	0.421023 (27.3851 pix)
Mean key point size	5.22266 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.92033
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	33 minutes 45 seconds
Alignment time	1 minutes 54 seconds
Depth Maps	
Count	102
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	2 hours 28 minutes
Dense Point Cloud	
Points	4,389,656
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	2 hours 28 minutes
Dense cloud generation time	24 minutes 24 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64