Fagus_sylvatica_4N

Processing Report

07 November 2018

Survey Data

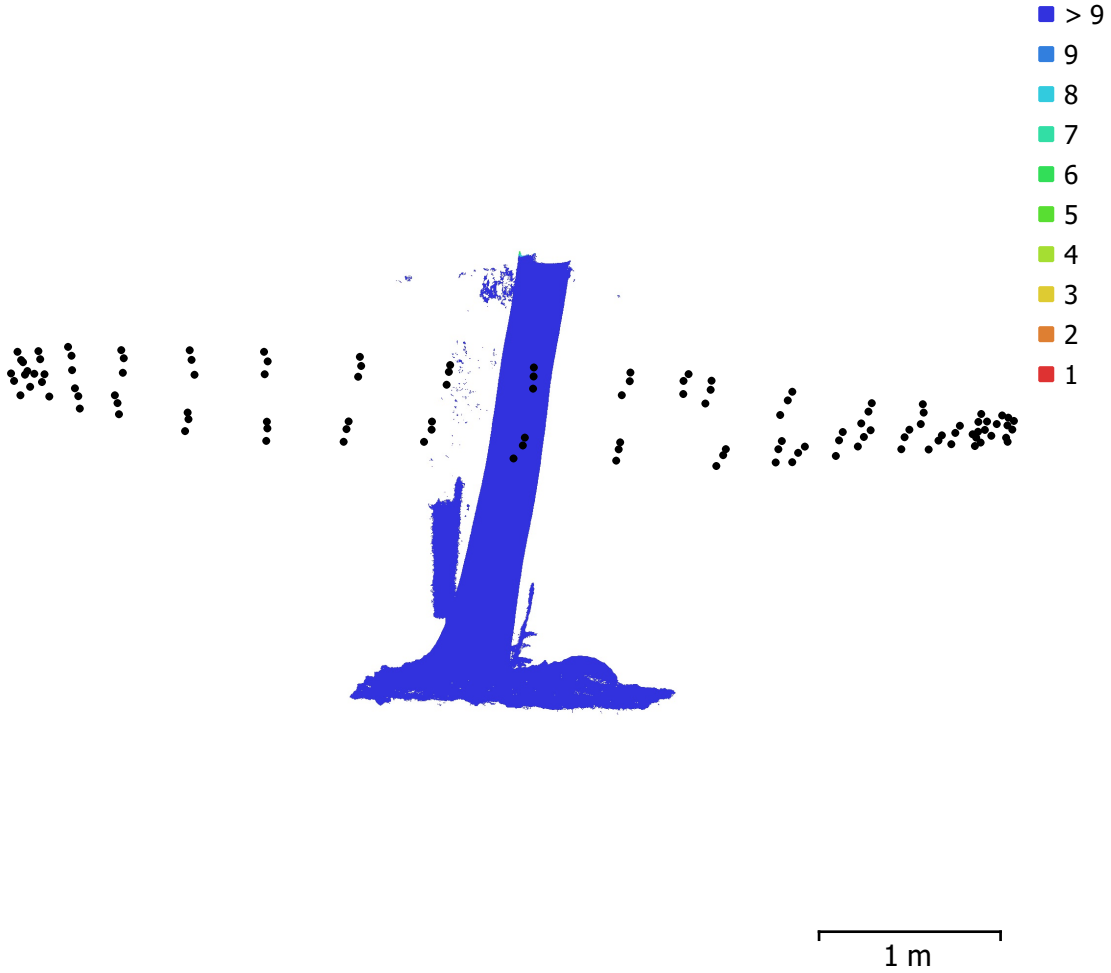

Fig. 1. Camera locations and image overlap.

Number of images:	120	Camera stations:	120
Flying altitude:	4.35 m	Tie points:	144,007
Ground resolution:	0.328 mm/pix	Projections:	404,977
Coverage area:	1.19 m²	Reprojection error:	0.765 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

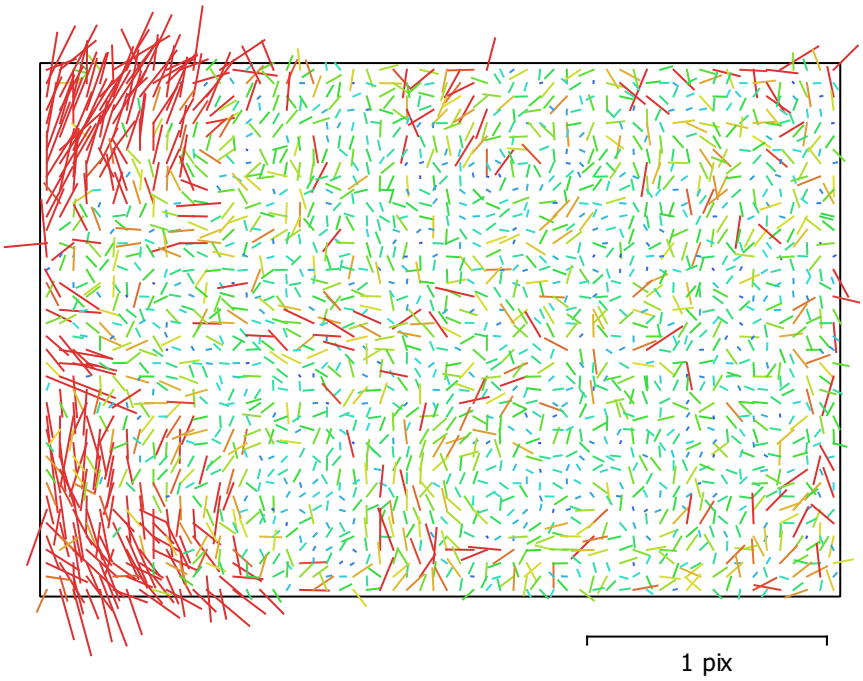

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

120 images

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

	Value	Error	F	B2	K1	K2	P1	P2
F	**8466.72**	0.49	1.00	0.05	0.26	0.00	-0.18	0.02
B2	**2.26093**	0.089		1.00	0.02	-0.01	-0.04	-0.09
K1	**-0.0770136**	0.00012			1.00	-0.93	-0.05	0.02
K2	**0.0847522**	0.00081				1.00	0.01	-0.02
P1	**0.000824795**	4.8e-06					1.00	0.02
P2	**0.000247288**	4.1e-06						1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

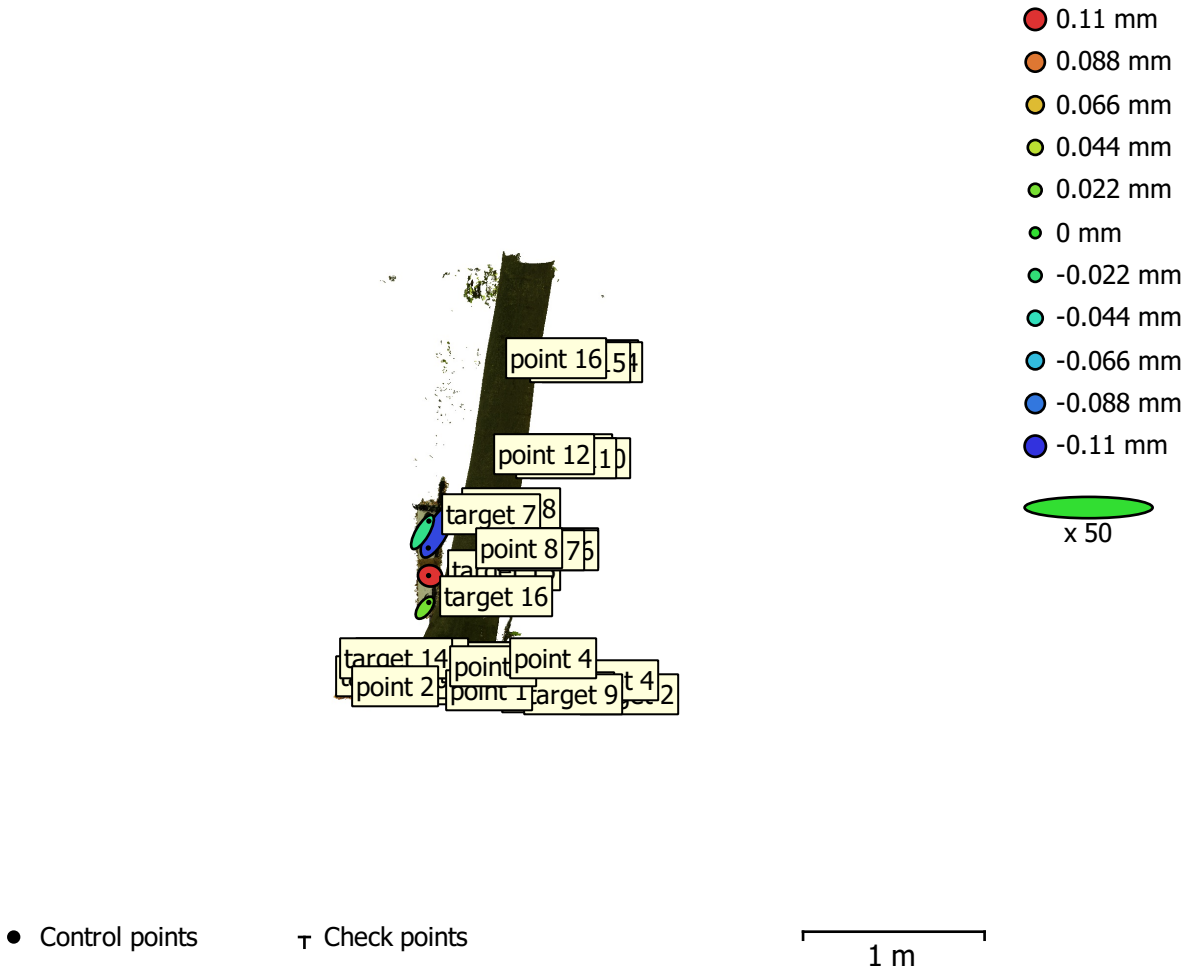

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	1.29275	2.25944	0.0773635	2.60313	2.60428

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 8	-1.95857	-3.63728	-0.103254	4.13237	1.192 (50)
target 15	-0.318421	0.0598819	0.109872	0.342125	1.280 (52)
target 16	0.860016	1.16096	0.0210337	1.44496	1.113 (39)
target 7	1.41697	2.41643	-0.0276524	2.80138	0.160 (111)
Total	**1.29275**	**2.25944**	**0.0773635**	**2.60428**	**0.907**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 2					0.683 (4)
target 3					1.522 (3)
target 4					0.840 (14)
target 5					0.896 (17)
target 6					0.832 (14)
target 10					1.223 (18)
target 11					0.912 (41)
target 12					0.768 (35)
target 13					0.513 (8)
target 14					1.205 (8)
target 9					0.060 (52)
point 1					4.764 (28)
point 2					0.513 (29)
point 3					0.355 (42)
point 4					9.449 (55)
point 5					0.004 (120)
point 6					0.004 (120)
point 7					0.004 (120)
point 8					0.004 (120)
point 9					0.004 (80)
point 10					0.004 (80)
point 11					0.004 (80)
point 12					0.004 (80)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 13					0.004 (67)
point 14					0.003 (67)
point 15					0.004 (69)
point 16					0.004 (69)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.147958	-4.15144e-05
target 8_target 7	0.148238	0.000237733
target 10_target 9	0.147575	-0.000425227
target 11_target 12	0.147714	-0.000285996
target 13_target 14	0.147486	-0.00051432
target 15_target 16	0.148098	9.76206e-05
target 8_target 15	0.15204	
point 1_point 2	0.604669	0.00166947
point 3_point 4	0.395984	-0.00601615
Total		**0.00222419**

Table 6. Check scale bars.

Digital Elevation Model

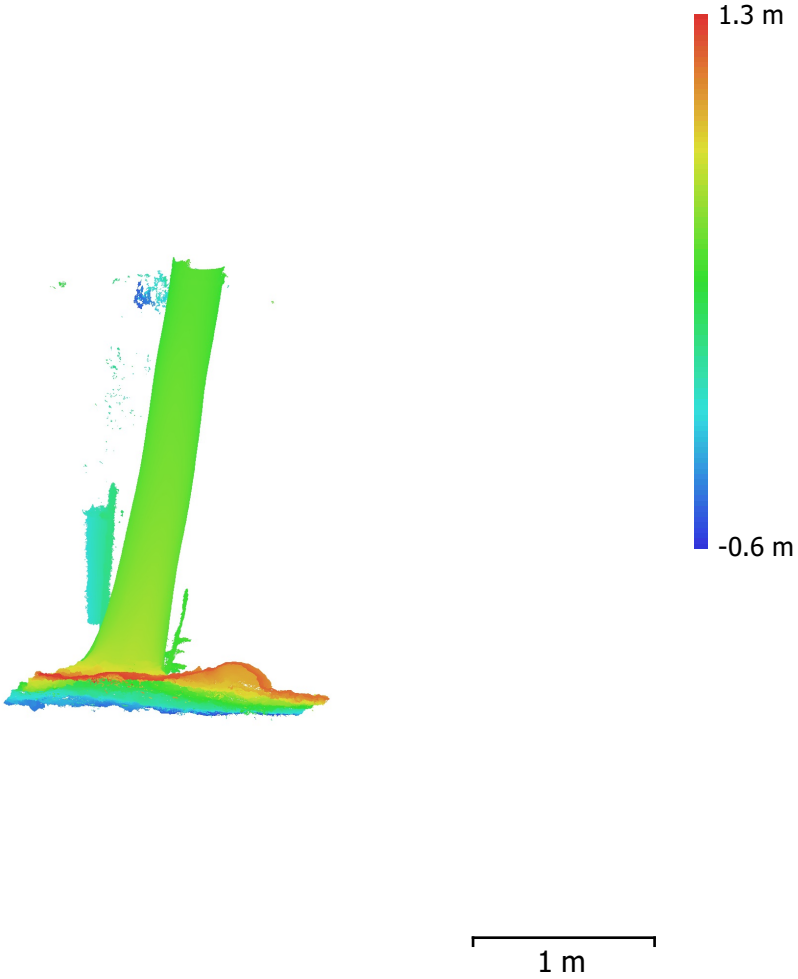

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	120
Aligned cameras	120
Markers	31
Scale bars	9
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	144,007 of 170,810
RMS reprojection error	0.15018 (0.765003 pix)
Max reprojection error	0.458158 (24.6061 pix)
Mean key point size	5.02018 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.0533
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	1 hours 25 minutes
Alignment time	1 minutes 55 seconds
Depth Maps	
Count	119
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	4 hours 10 minutes
Dense Point Cloud	
Points	4,256,795
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	4 hours 10 minutes
Dense cloud generation time	40 minutes 38 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64