Fagus_sylvatica_3F

Processing Report

07 November 2018

Survey Data

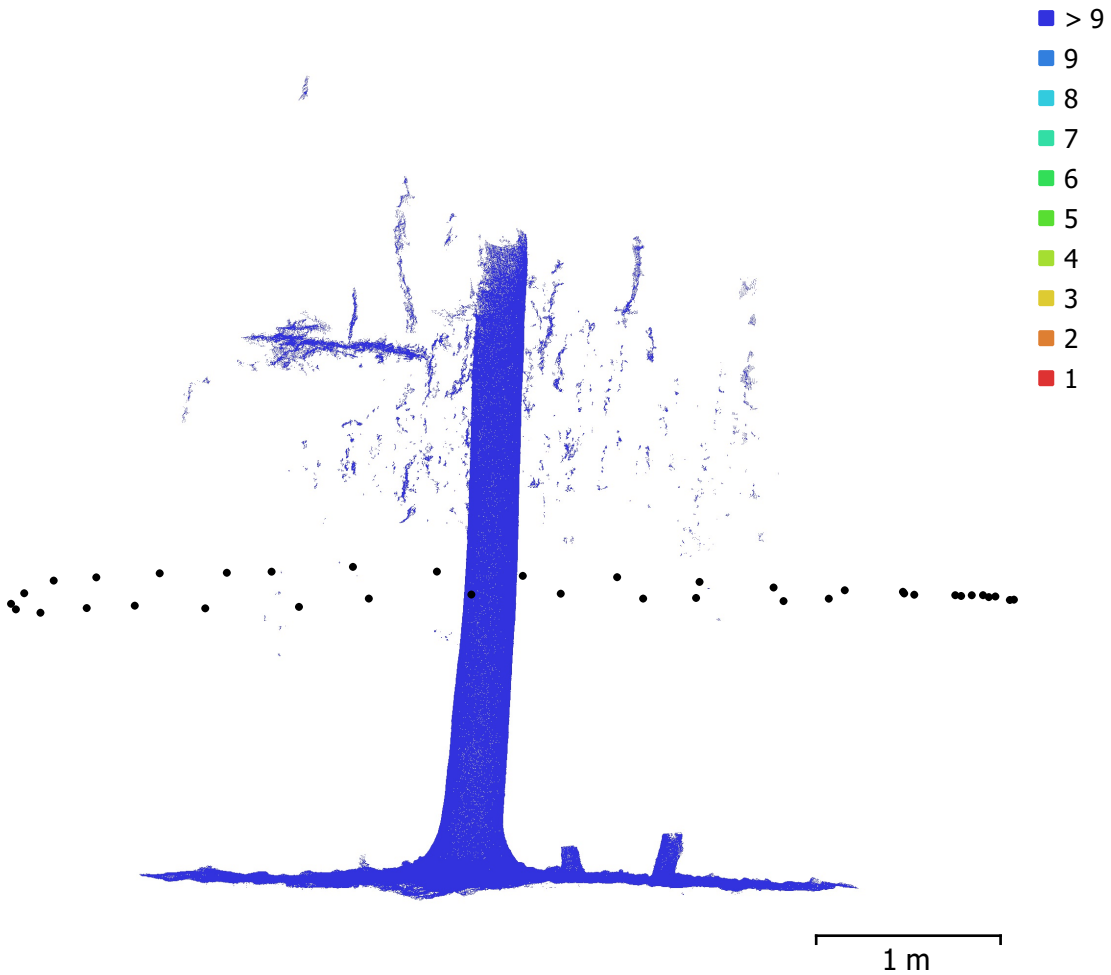

Fig. 1. Camera locations and image overlap.

Number of images:	38	Camera stations:	38
Flying altitude:	2.77 m	Tie points:	26,936
Ground resolution:	0.645 mm/pix	Projections:	64,367
Coverage area:	1.51 m²	Reprojection error:	0.53 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

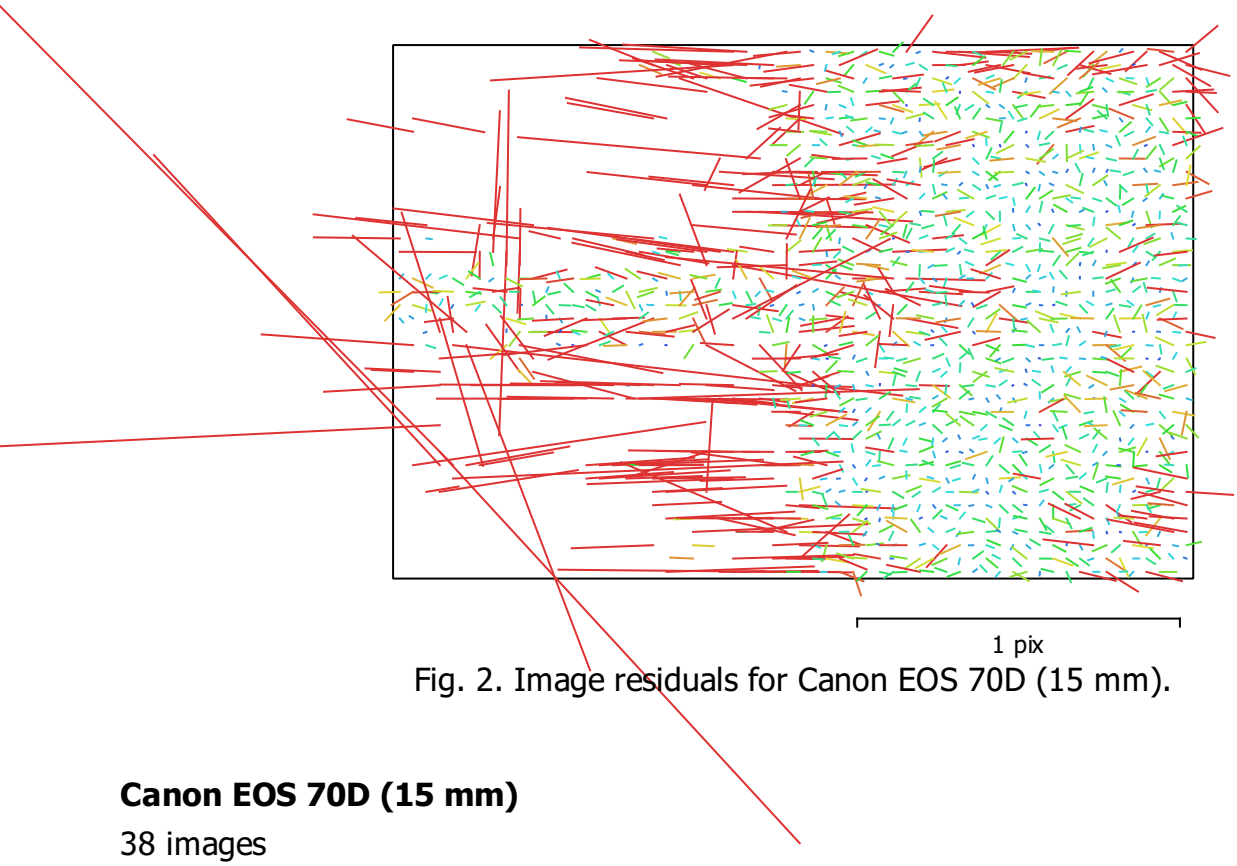

Fig. 2. Image residuals for Canon EOS 70D (15 mm).

Canon EOS 70D (15 mm)

38 images

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

	Value	Error	F	K1	K2	P1	P2
F	**3753.52**	0.35	1.00	-0.76	0.72	-0.09	0.01
K1	**-0.0373158**	0.00019		1.00	-0.89	-0.11	-0.01
K2	**0.00301653**	0.00016			1.00	-0.15	0.05
P1	**0.000865354**	2.6e-05				1.00	-0.06
P2	**-0.000285571**	1.3e-05					1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

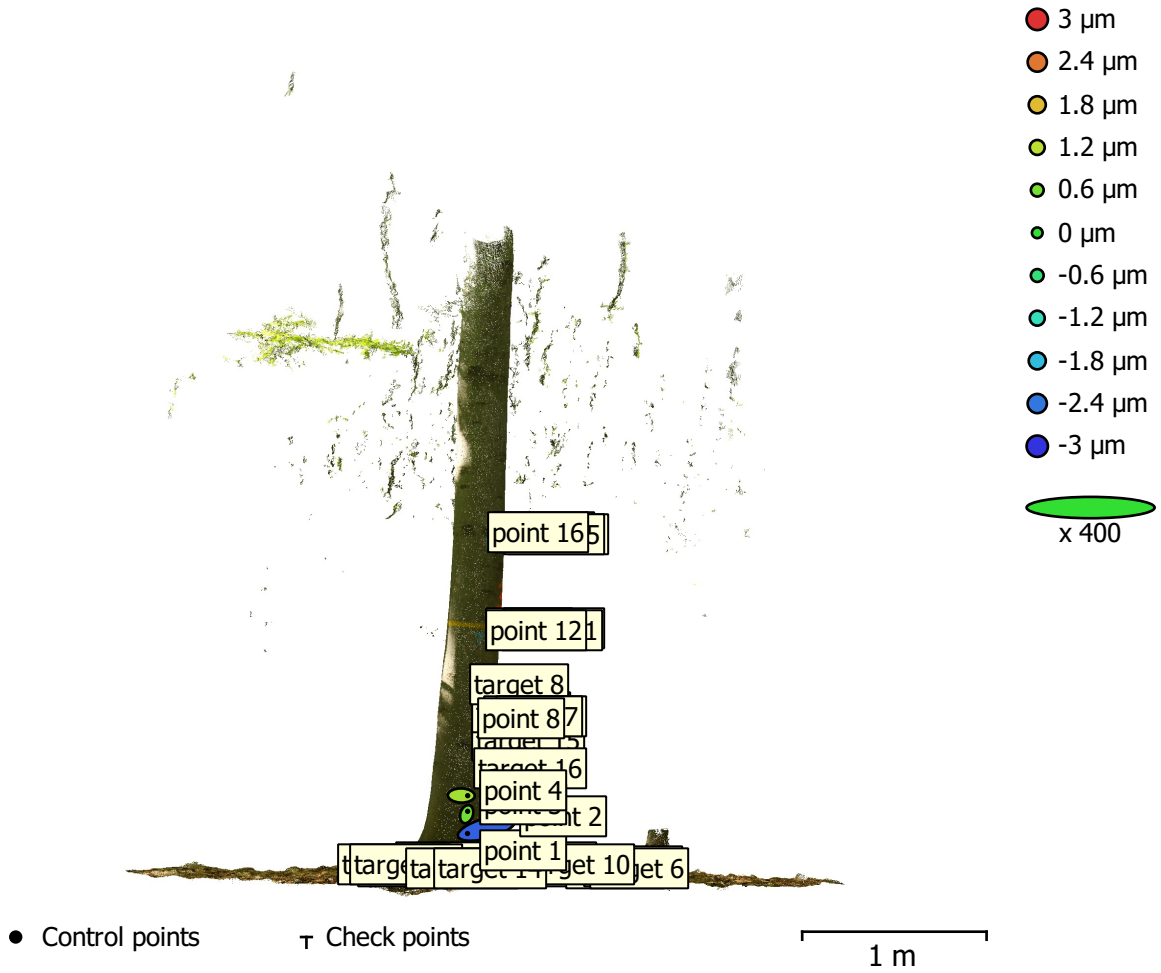

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	0.313396	0.0880741	0.0015174	0.325537	0.32554

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 1	0.315339	0.0693523	0.00108396	0.322877	0.004 (38)
point 2	-0.513008	-0.142354	-0.00260398	0.532399	0.004 (38)
point 3	0.025637	0.0770551	0.000537393	0.0812099	0.004 (38)
point 4	0.172032	-0.00405384	0.000982633	0.172083	0.004 (38)
Total	**0.313396**	**0.0880741**	**0.0015174**	**0.32554**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 1					0.281 (8)
target 2					0.465 (15)
target 3					0.526 (23)
target 4					0.851 (9)
target 5					0.349 (24)
target 6					0.394 (29)
target 9					0.510 (26)
target 10					0.533 (20)
target 11					0.607 (11)
target 12					0.808 (22)
target 13					0.765 (22)
target 14					0.503 (25)
target 15					0.484 (10)
target 16					0.683 (13)
target 7					0.004 (38)
target 8					0.004 (38)
point 5					0.004 (38)
point 6					0.004 (38)
point 7					0.004 (38)
point 8					0.004 (38)
point 9					0.004 (38)
point 10					0.004 (38)
point 11					0.004 (38)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 12					0.004 (38)
point 13					0.004 (38)
point 14					0.004 (38)
point 15					0.004 (38)
point 16					0.004 (38)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.147266	-0.000734085
target 7_target 8	0.150093	0.00209343
target 9_target 10	0.147556	-0.000443911
target 11_target 12	0.147605	-0.000395374
target 13_target 14	0.147732	-0.00026842
target 15_target 16	0.14771	-0.000290029
Total		**0.00095139**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 1_point 2	0.121869	
point 1_point 3	0.242365	
point 1_point 4	0.327304	
Total		

Table 7. Check scale bars.

Digital Elevation Model

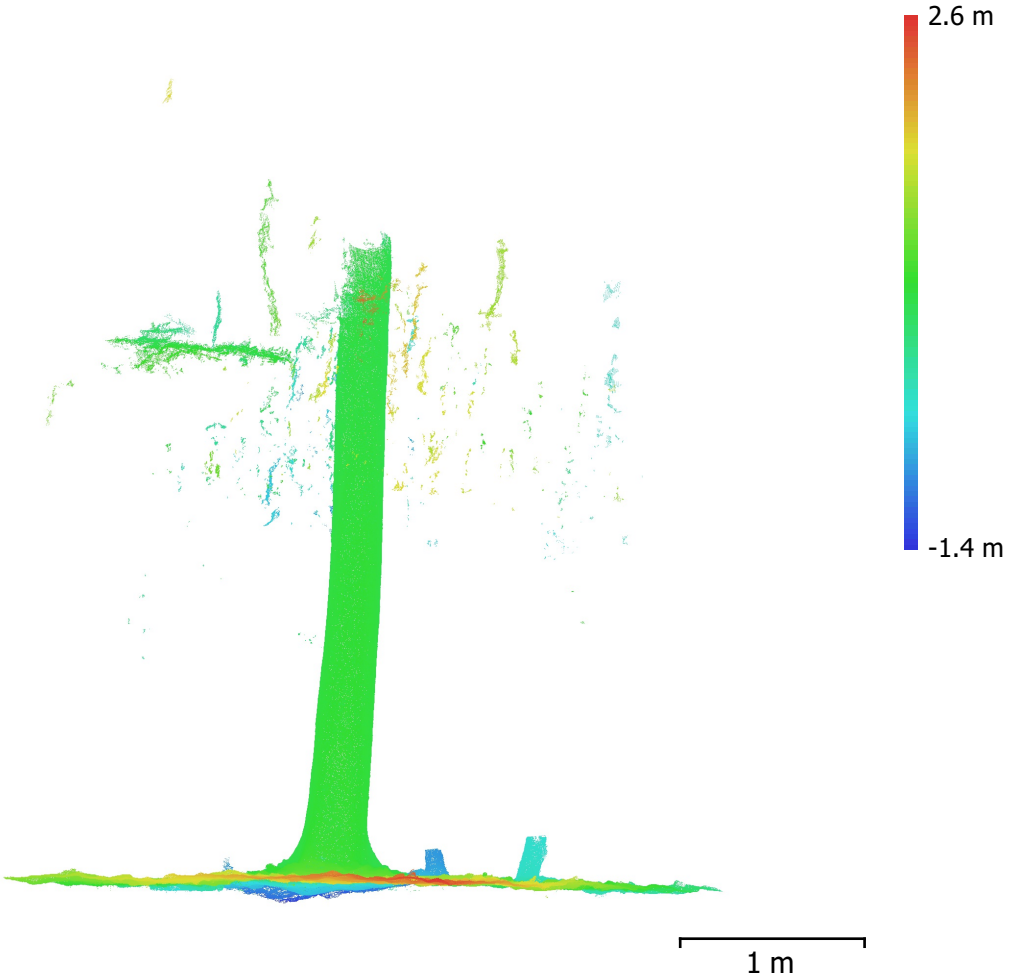

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	38
Aligned cameras	38
Markers	33
Scale bars	9
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	26,936 of 28,563
RMS reprojection error	0.0859097 (0.529917 pix)
Max reprojection error	0.259379 (11.577 pix)
Mean key point size	5.11656 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.46091
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	4 minutes 49 seconds
Alignment time	12 seconds
Depth Maps	
Count	38
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	43 minutes 40 seconds
Dense Point Cloud	
Points	2,238,314
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	43 minutes 40 seconds
Dense cloud generation time	13 minutes 32 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64