Fagus_sylvatica_6F

Processing Report

07 November 2018

Survey Data

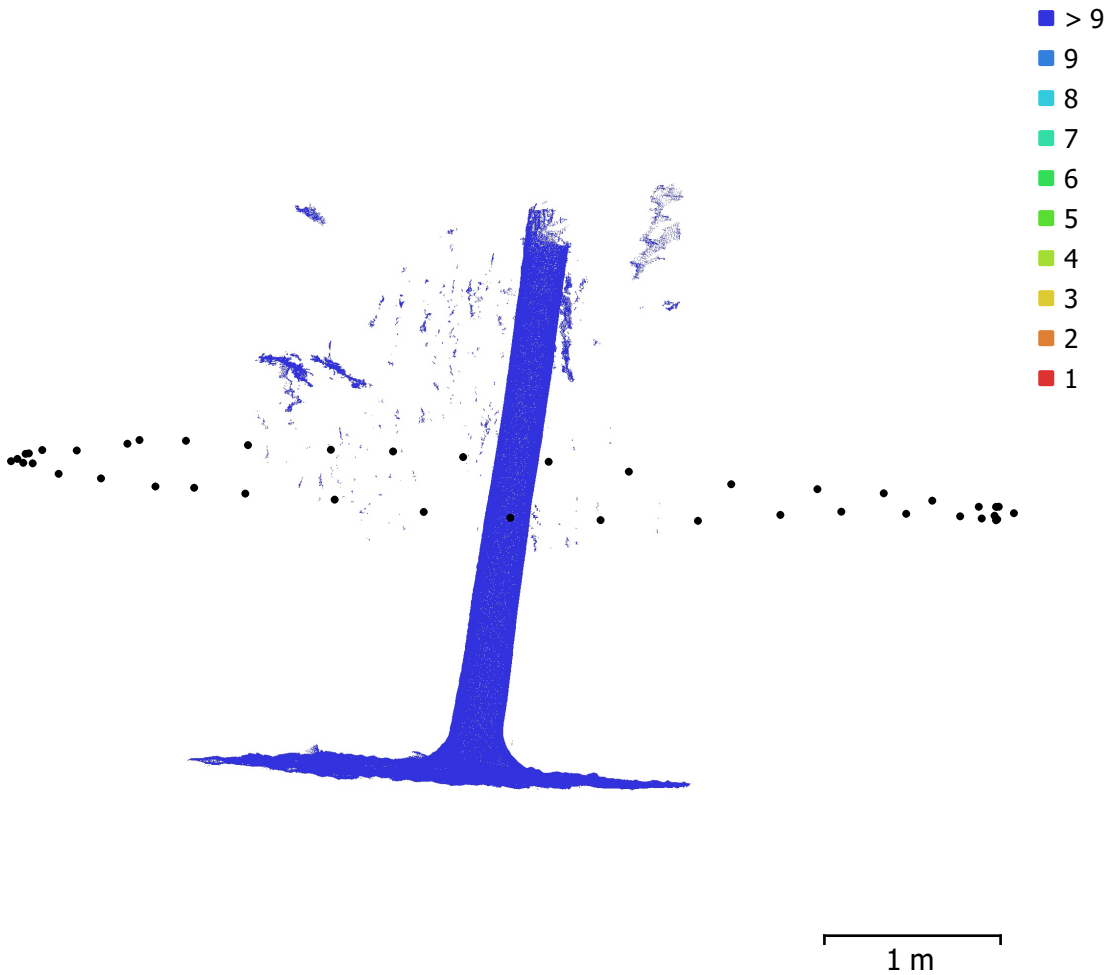

Fig. 1. Camera locations and image overlap.

Number of images:	43	Camera stations:	43
Flying altitude:	3.03 m	Tie points:	50,859
Ground resolution:	0.687 mm/pix	Projections:	141,680
Coverage area:	1.18 m²	Reprojection error:	0.595 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

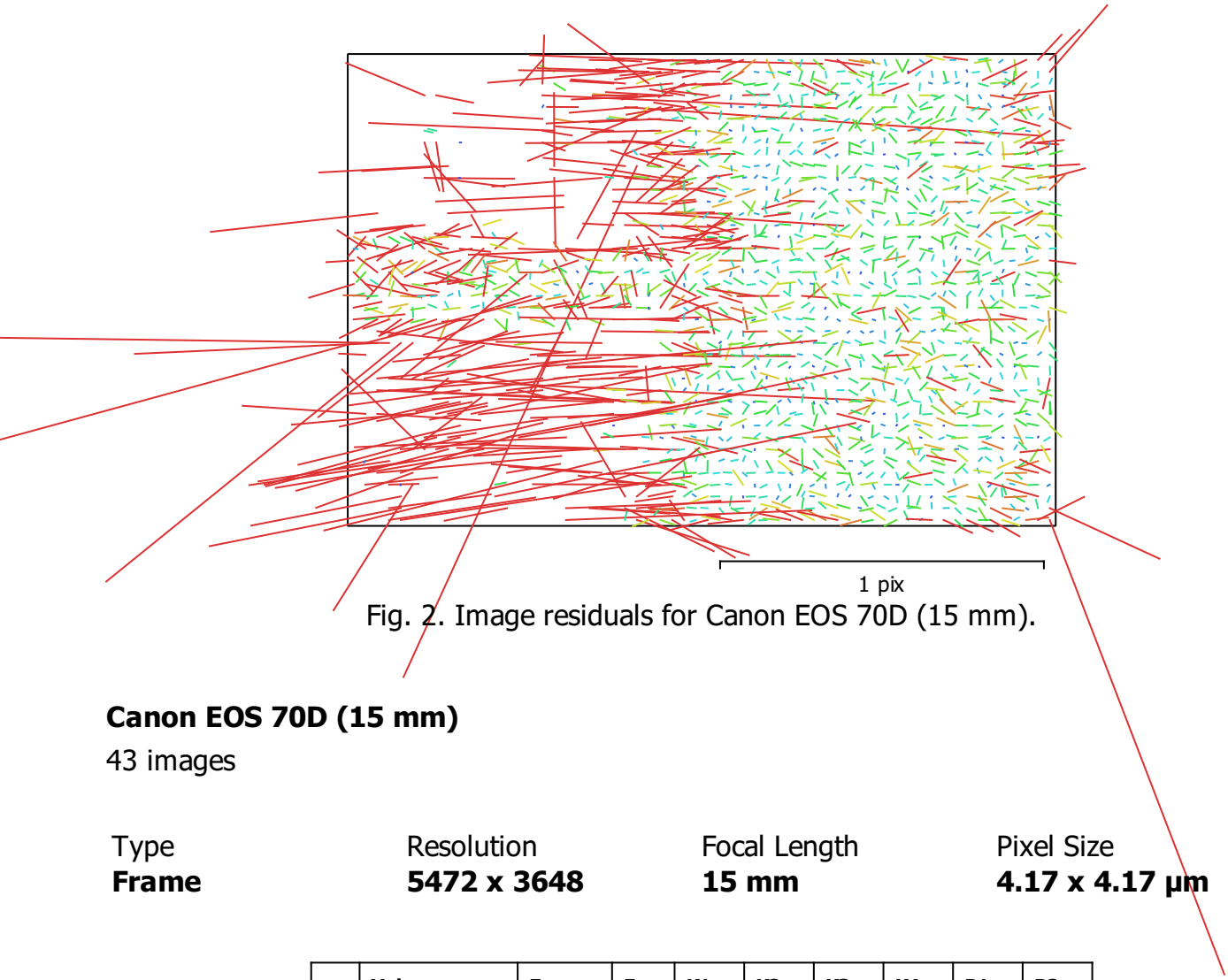

Fig. 2. Image residuals for Canon EOS 70D (15 mm).

Canon EOS 70D (15 mm)

43 images

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

	Value	Error	F	K1	K2	K3	K4	P1	P2
F	**3755.41**	0.19	1.00	-0.74	0.62	-0.52	0.45	-0.04	0.02
K1	**-0.362638**	0.00014		1.00	-0.94	0.86	-0.79	-0.02	-0.03
K2	**0.198668**	0.00033			1.00	-0.98	0.94	-0.03	0.01
K3	**-0.0856216**	0.00033				1.00	-0.99	-0.01	-0.01
K4	**0.0177934**	0.00012					1.00	0.04	0.00
P1	**0.000657069**	1.1e-05						1.00	-0.04
P2	**-8.06241e-05**	4.9e-06							1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

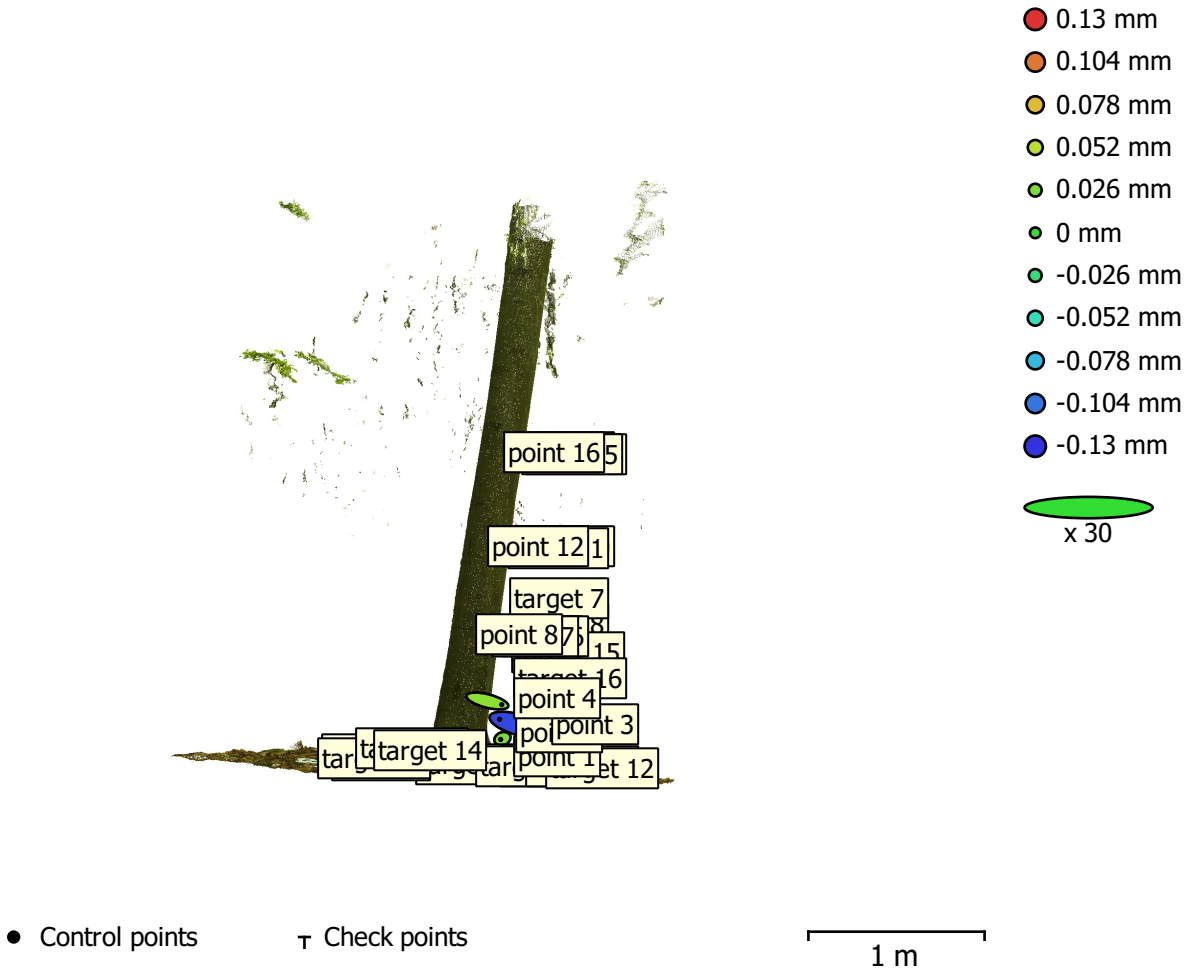

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	4.53193	1.23065	0.0714249	4.69605	4.69659

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 1	2.14291	-0.344026	0.0599194	2.17118	0.004 (43)
point 2	-0.675618	-0.262597	0.0274775	0.725377	0.004 (43)
point 3	-6.89922	1.98954	-0.121934	7.18139	0.004 (43)
point 4	5.43192	-1.38291	0.0345373	5.6053	0.004 (43)
Total	**4.53193**	**1.23065**	**0.0714249**	**4.69659**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 2					0.554 (27)
target 3					0.551 (33)
target 5					0.489 (34)
target 6					0.510 (35)
target 8					1.347 (19)
target 9					0.369 (34)
target 10					0.483 (32)
target 11					0.441 (37)
target 12					0.421 (37)
target 13					0.633 (24)
target 14					0.719 (38)
target 15					1.602 (21)
target 16					1.622 (19)
target 7					0.051 (43)
point 5					0.004 (43)
point 6					0.004 (43)
point 7					0.004 (43)
point 8					0.004 (43)
point 9					0.004 (43)
point 10					0.004 (43)
point 11					0.004 (43)
point 12					0.004 (43)
point 13					0.004 (43)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 14					0.004 (43)
point 15					0.004 (43)
point 16					0.004 (43)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.147975	-2.52194e-05
target 8_target 7	0.148455	0.000455438
target 9_target 10	0.1478	-0.000199796
target 11_target 12	0.147761	-0.000239397
target 13_target 14	0.148126	0.000126198
target 15_target 16	0.147861	-0.00013935
Total		**0.000238269**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 1_point 2	0.132269	
point 1_point 3	0.246645	
point 1_point 4	0.329721	
Total		

Table 7. Check scale bars.

Digital Elevation Model

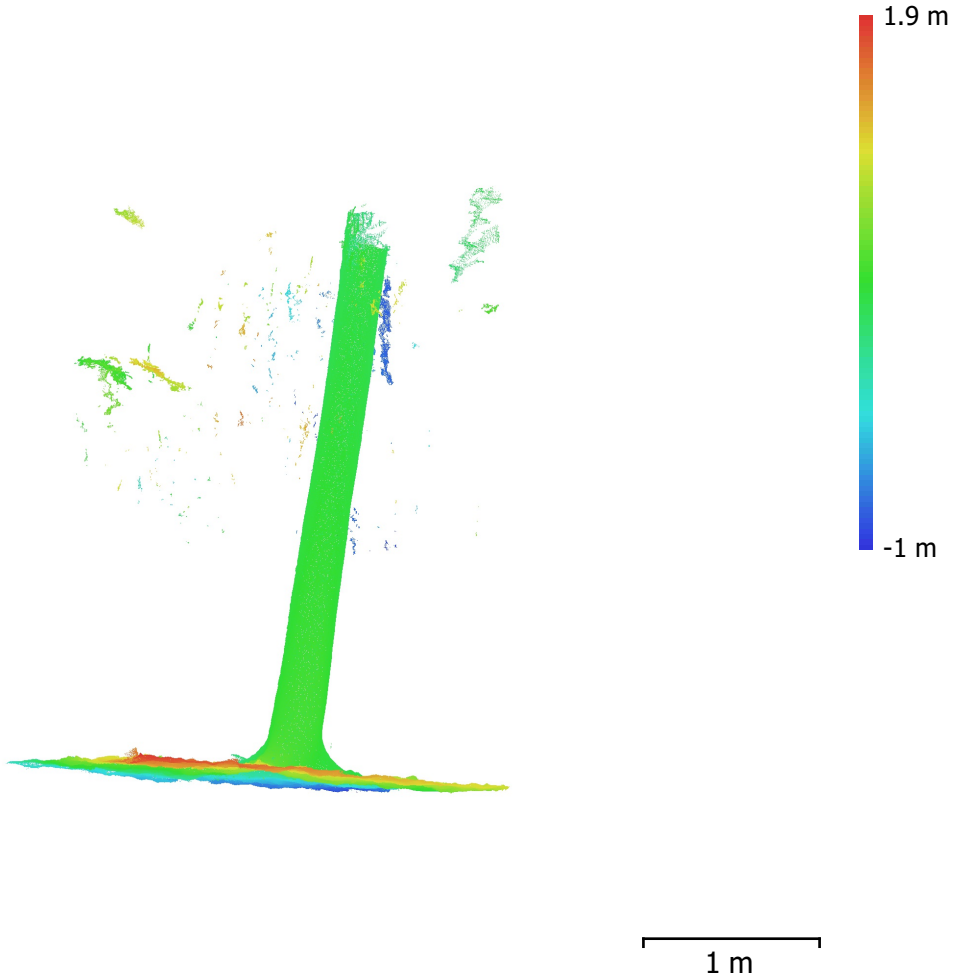

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	43
Aligned cameras	43
Markers	30
Scale bars	9
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	50,859 of 54,732
RMS reprojection error	0.0899844 (0.595184 pix)
Max reprojection error	0.272373 (27.3335 pix)
Mean key point size	5.2803 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.94636
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	7 minutes 9 seconds
Alignment time	25 seconds
Depth Maps	
Count	43
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	1 hours 10 minutes
Dense Point Cloud	
Points	1,457,691
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	1 hours 10 minutes
Dense cloud generation time	6 minutes 17 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64