Picea_abies_9F

Processing Report

07 November 2018

Survey Data

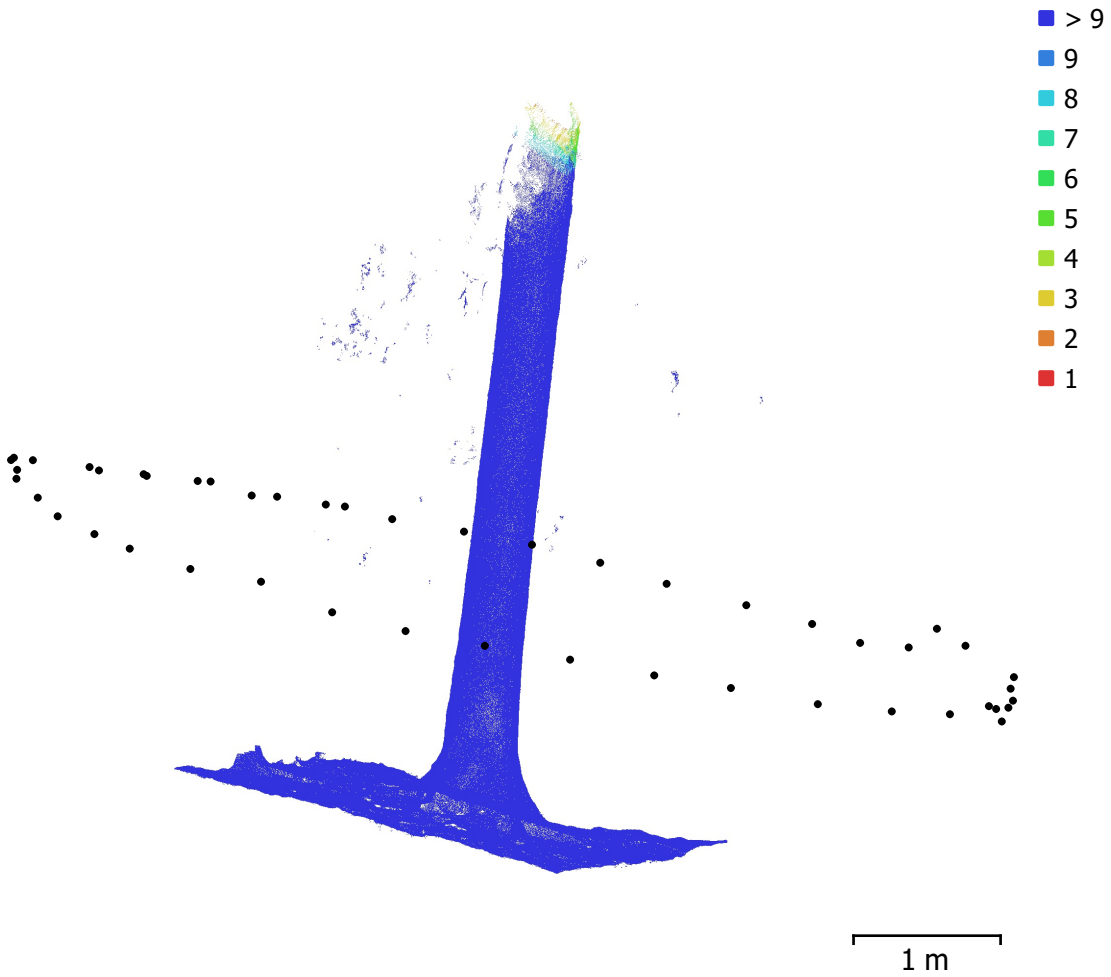

Fig. 1. Camera locations and image overlap.

Number of images:	48	Camera stations:	48
Flying altitude:	3.61 m	Tie points:	39,178
Ground resolution:	0.844 mm/pix	Projections:	96,601
Coverage area:	2.85 m²	Reprojection error:	0.443 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

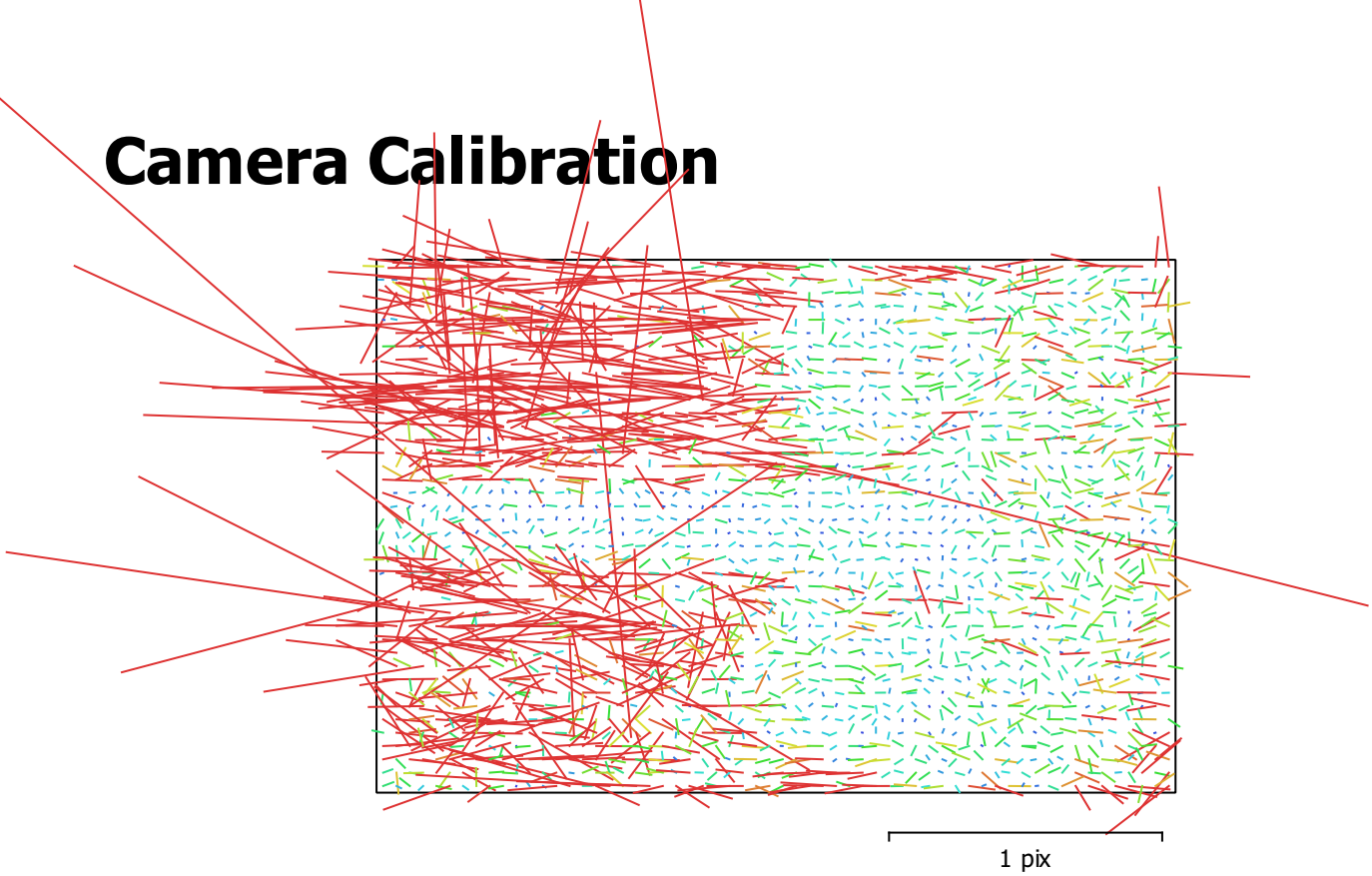

Fig. 2. Image residuals for Canon EOS 70D (15 mm).

Canon EOS 70D (15 mm)

48 images

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

	Value	Error	F	B2	K1	P1	P2
F	**3754.98**	0.31	1.00	0.03	-0.64	0.02	-0.05
B2	**4.26901**	0.084		1.00	0.09	-0.07	-0.53
K1	**-0.0336388**	5.7e-05			1.00	-0.05	-0.03
P1	**0.000970083**	1.5e-05				1.00	0.10
P2	**-0.000395287**	1.2e-05					1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

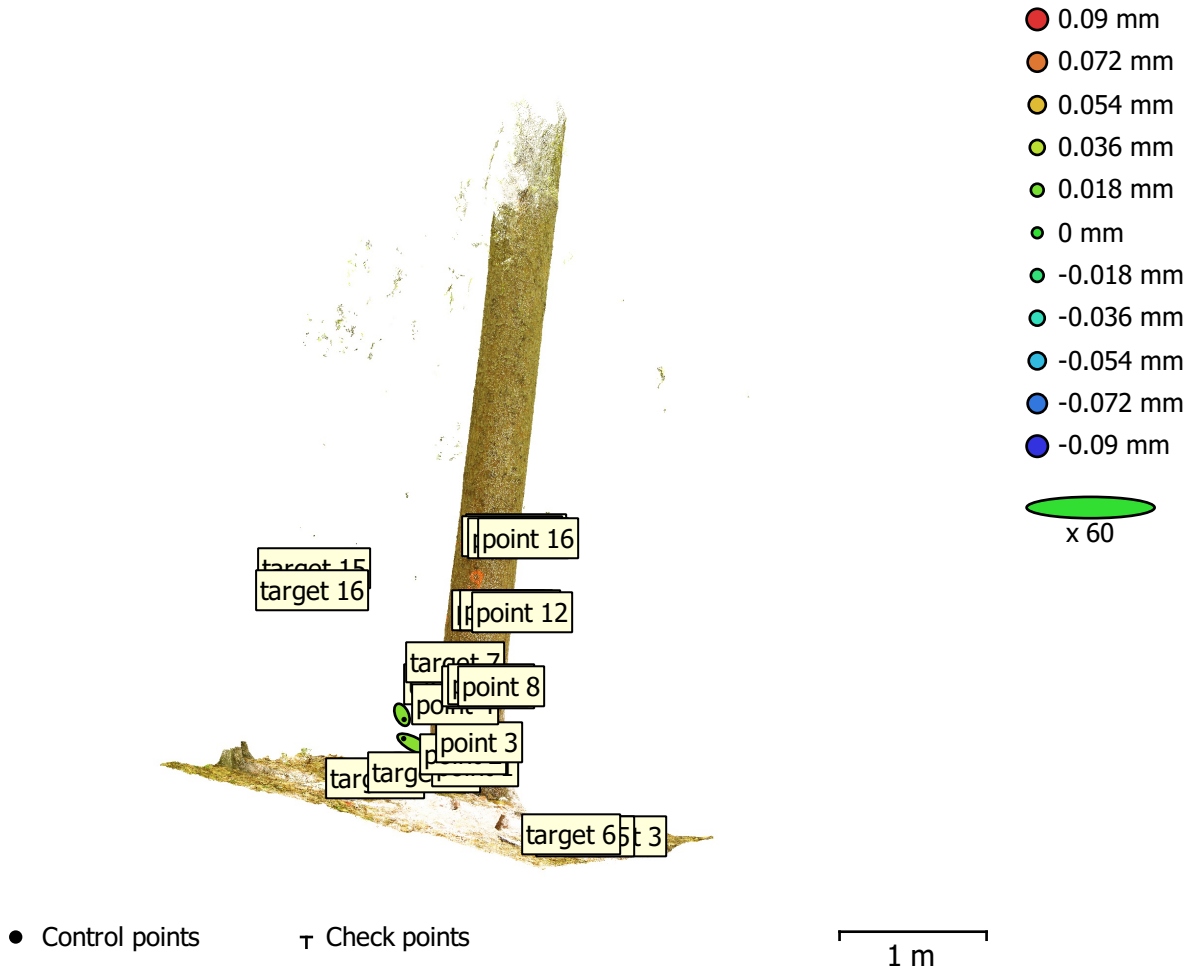

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	2.32018	0.980629	0.0479429	2.5189	2.51936

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 1	-1.72018	-0.855308	0.0386658	1.92147	0.004 (48)
point 2	3.58444	0.676802	-0.081939	3.6487	0.004 (48)
point 3	-2.34453	1.23671	0.0228787	2.65081	0.004 (48)
point 4	0.478416	-1.06183	0.0214847	1.16483	0.004 (48)
Total	**2.32018**	**0.980629**	**0.0479429**	**2.51936**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 3					1.628 (9)
target 4					1.367 (5)
target 5					2.965 (4)
target 6					2.161 (3)
target 8					0.230 (8)
target 11					0.133 (4)
target 15					1.321 (11)
target 16					1.767 (15)
target 7					0.004 (48)
point 5					0.004 (48)
point 6					0.004 (48)
point 7					0.004 (48)
point 8					0.004 (48)
point 9					0.004 (48)
point 10					0.004 (48)
point 11					0.004 (48)
point 12					0.004 (48)
point 13					0.004 (48)
point 14					0.004 (48)
point 15					0.004 (48)
point 16					0.004 (48)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 15_target 16	0.148759	0.000758918
target 5_target 6	0.14722	-0.000779996
Total		**0.000769529**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
target 8_target 7	0.151935	0.00393479
point 1_point 2	0.130032	
point 1_point 3	0.283474	
point 1_point 4	0.41381	
Total		**0.00393479**

Table 7. Check scale bars.

Digital Elevation Model

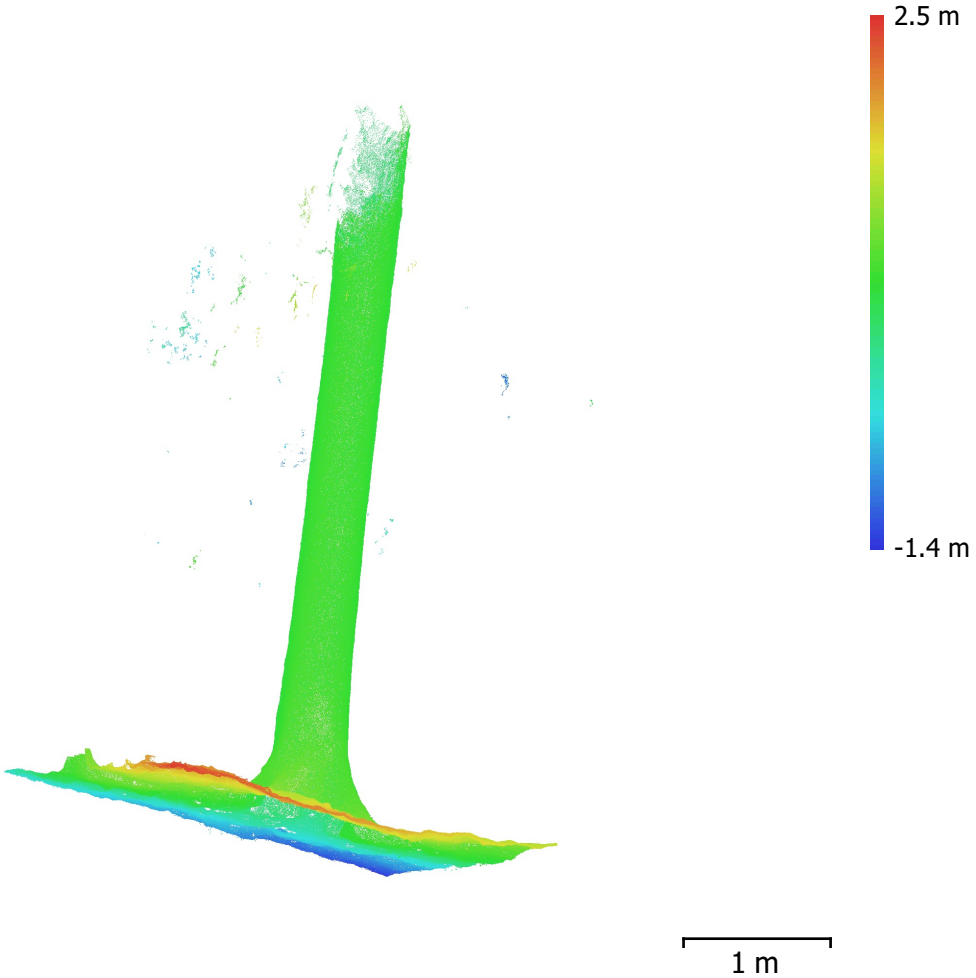

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	48
Aligned cameras	48
Markers	25
Scale bars	6
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	39,178 of 42,573
RMS reprojection error	0.100411 (0.442762 pix)
Max reprojection error	0.303151 (25.7775 pix)
Mean key point size	3.43531 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	2.55188
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 15 seconds
Alignment time	33 seconds
Depth Maps	
Count	48
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	29 minutes 35 seconds
Dense Point Cloud	
Points	1,712,222
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	29 minutes 35 seconds
Dense cloud generation time	23 minutes 33 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64