Abies_alba_1N

Processing Report

07 November 2018

Survey Data

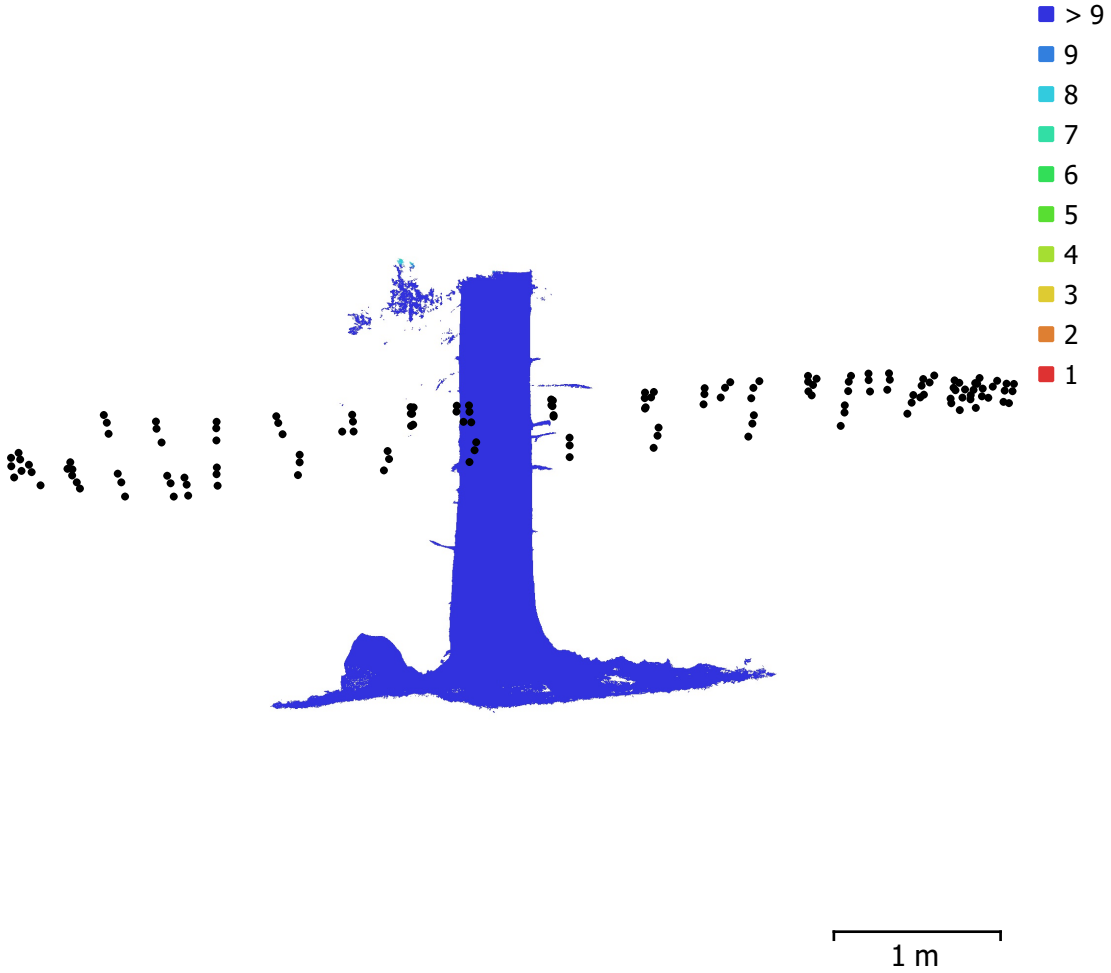

Fig. 1. Camera locations and image overlap.

Number of images:	149	Camera stations:	148
Flying altitude:	3.31 m	Tie points:	134,829
Ground resolution:	0.342 mm/pix	Projections:	486,496
Coverage area:	1.72 m²	Reprojection error:	0.883 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

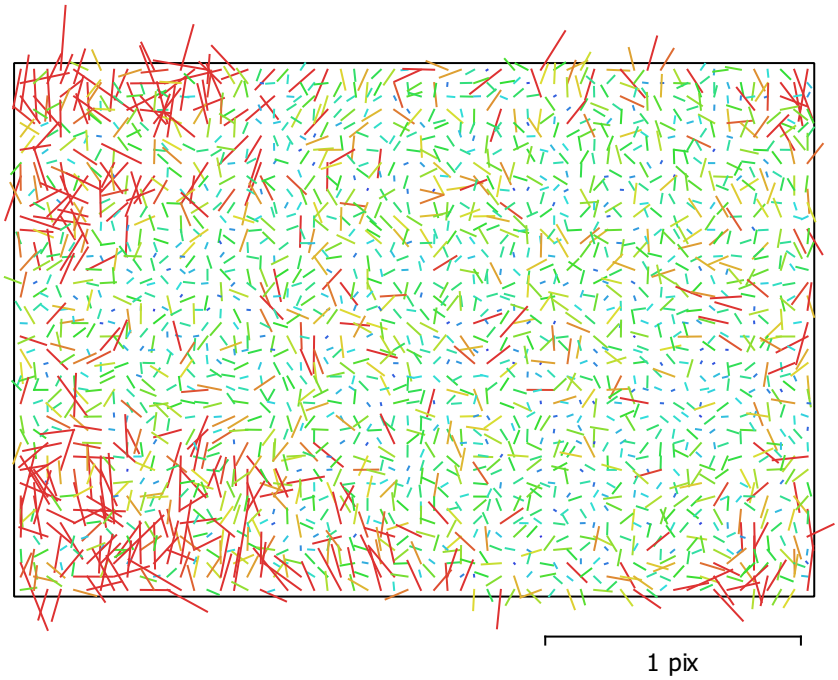

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

149 images

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

	Value	Error	F	Cx	Cy	B2	K1	K2	P1	P2
F	**8499.44**	0.47	1.00	-0.17	0.06	-0.02	0.30	0.01	-0.24	0.05
Cx	**-38.1897**	0.33		1.00	-0.01	-0.01	-0.09	-0.02	0.87	-0.02
Cy	**-19.0944**	0.52			1.00	0.35	0.03	-0.02	-0.03	0.95
B2	**-0.0645435**	0.095				1.00	-0.01	-0.00	-0.02	0.33
K1	**-0.074572**	9.9e-05					1.00	-0.91	-0.08	0.03
K2	**0.081431**	0.00067						1.00	-0.03	-0.02
P1	**-0.000303969**	8.3e-06							1.00	-0.03
P2	**-0.000185267**	1.2e-05								1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

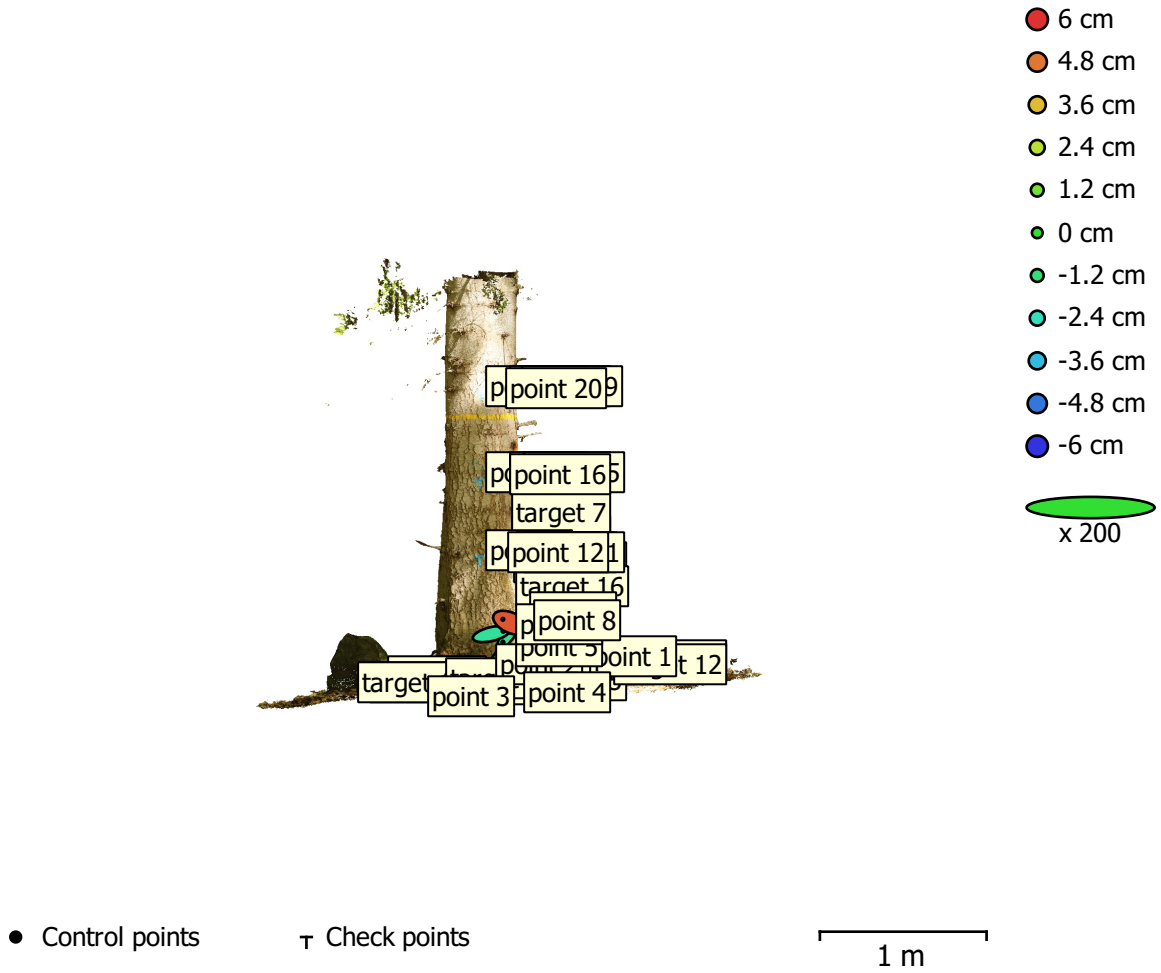

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (cm)	Y error (cm)	Z error (cm)	XY error (cm)	Total (cm)
4	0.0492701	0.0429345	3.11836	0.0653522	3.11904

Table 3. Control points RMSE.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
point 5	0.0224974	0.0355972	-1.79572	1.79622	0.004 (95)
point 6	-0.0463389	-0.0733721	-1.80125	1.80334	0.004 (95)
point 7	0.0701213	0.0167613	-1.80422	1.80566	0.004 (96)
point 8	-0.0462572	0.021022	5.40114	5.40138	0.004 (98)
Total	**0.0492701**	**0.0429345**	**3.11836**	**3.11904**	**0.004**

Table 4. Control points.

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
target 2					0.976 (4)
target 4					0.285 (2)
target 5					1.210 (8)
target 6					1.044 (10)
target 8					1.604 (11)
target 9					5.280 (4)
target 10					6.241 (4)
target 11					0.561 (14)
target 12					0.411 (3)
target 14					0.921 (10)
target 15					0.488 (3)
target 16					1.745 (3)
target 7					0.003 (77)
point 1					1.914 (31)
point 2					2.912 (32)
point 3					3.140 (58)
point 4					3.852 (56)
point 9					0.004 (148)
point 10					0.004 (148)
point 11					0.004 (148)
point 12					0.004 (148)
point 13					0.004 (98)
point 14					0.004 (98)

Label	X error (cm)	Y error (cm)	Z error (cm)	Total (cm)	Image (pix)
point 15					0.004 (103)
point 16					0.004 (104)
point 17					0.004 (94)
point 18					0.004 (94)
point 19					0.004 (97)
point 20					0.003 (96)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.148283	0.000282719
target 8_target 7	0.148883	0.000883354
target 9_target 10	0.149372	0.00137186
target 11_target 12	0.148836	0.000835746
target 15_target 16	0.150165	0.00216493
point 1_point 2	0.601136	-0.00186423
Total		**0.00139062**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 3_point 4	0.615929	
point 5_point 6	0.0686778	
point 5_point 7	0.133411	
point 5_point 8	0.205465	
Total		

Table 7. Check scale bars.

Digital Elevation Model

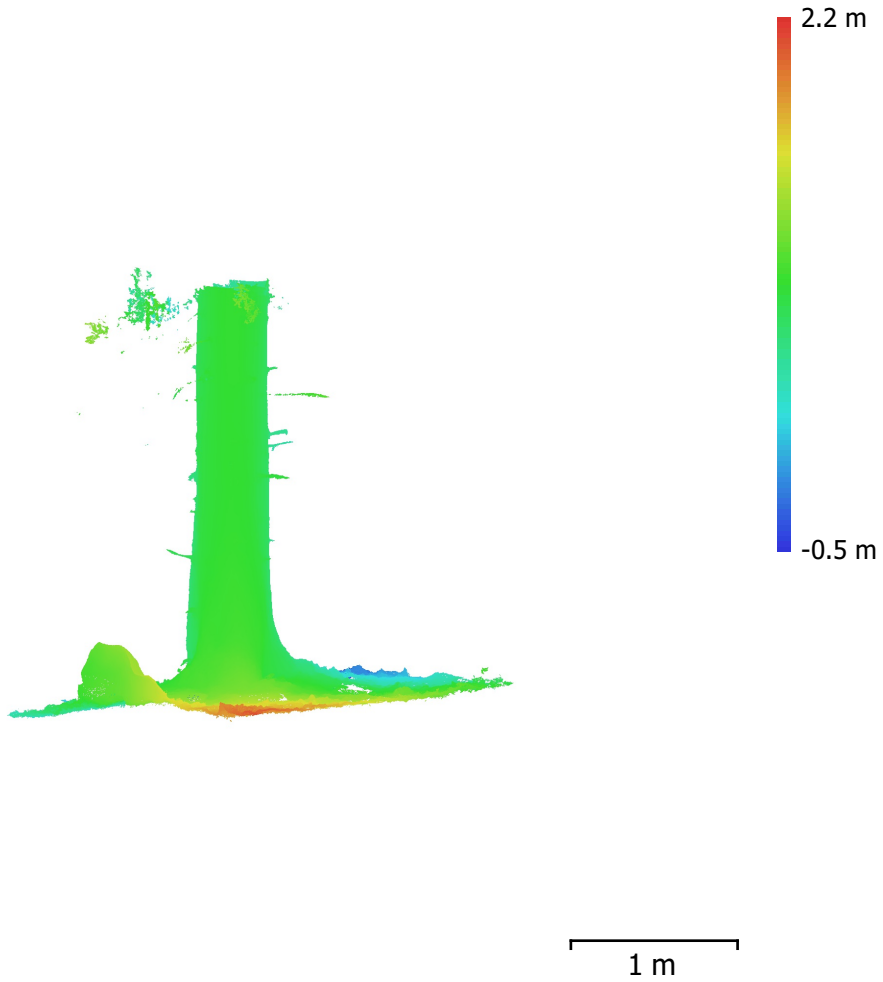

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	149
Aligned cameras	148
Markers	36
Scale bars	11
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	134,829 of 160,264
RMS reprojection error	0.172036 (0.882791 pix)
Max reprojection error	0.523044 (26.294 pix)
Mean key point size	5.16044 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	4.10428
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 10 minutes
Alignment time	3 minutes 20 seconds
Depth Maps	
Count	148
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	5 hours 23 minutes
Dense Point Cloud	
Points	5,831,837
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	5 hours 23 minutes
Dense cloud generation time	1 hours 9 minutes
Software	
Version	1.4.4 build 6848
Platform	Windows 64