Picea_abies_8N

Processing Report

07 November 2018

Survey Data

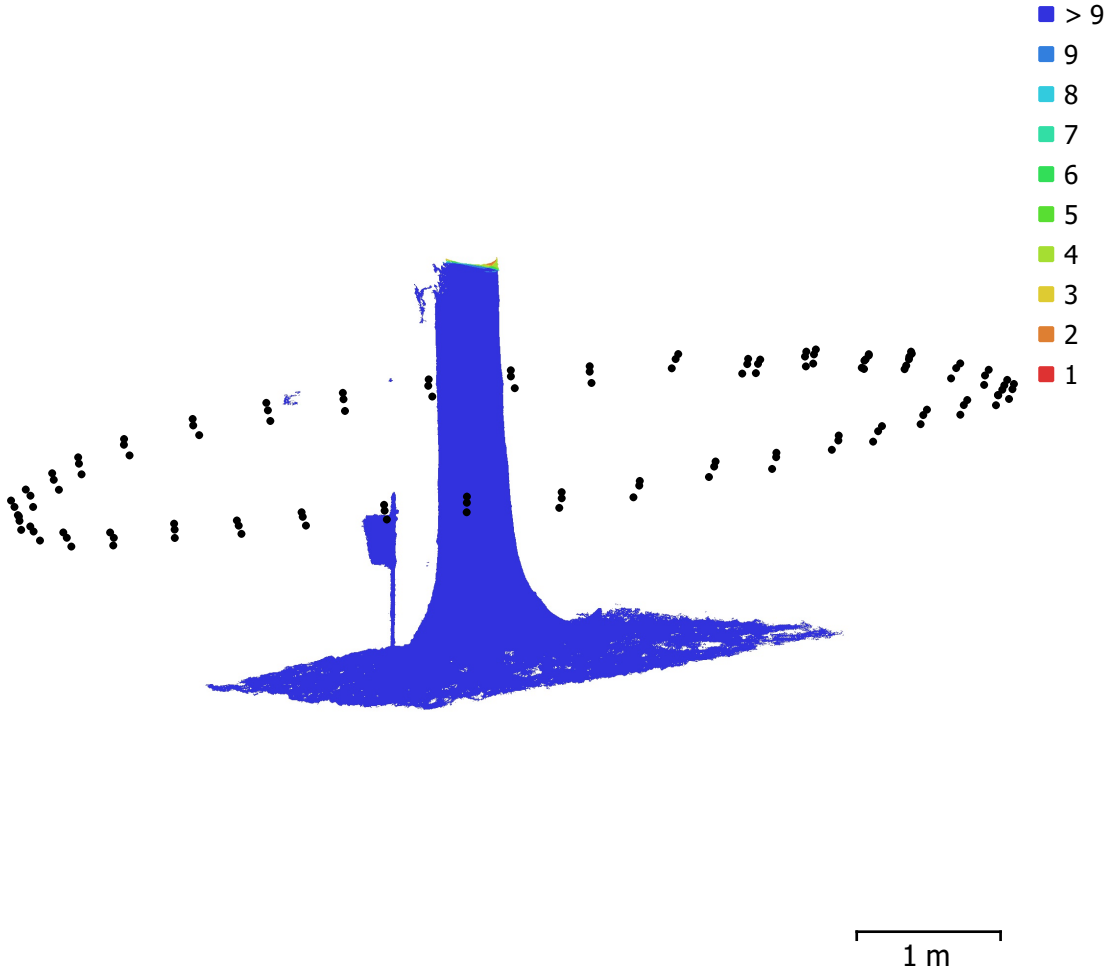

Fig. 1. Camera locations and image overlap.

Number of images:	126	Camera stations:	126
Flying altitude:	3.66 m	Tie points:	110,233
Ground resolution:	0.378 mm/pix	Projections:	401,954
Coverage area:	2.8 m²	Reprojection error:	0.624 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

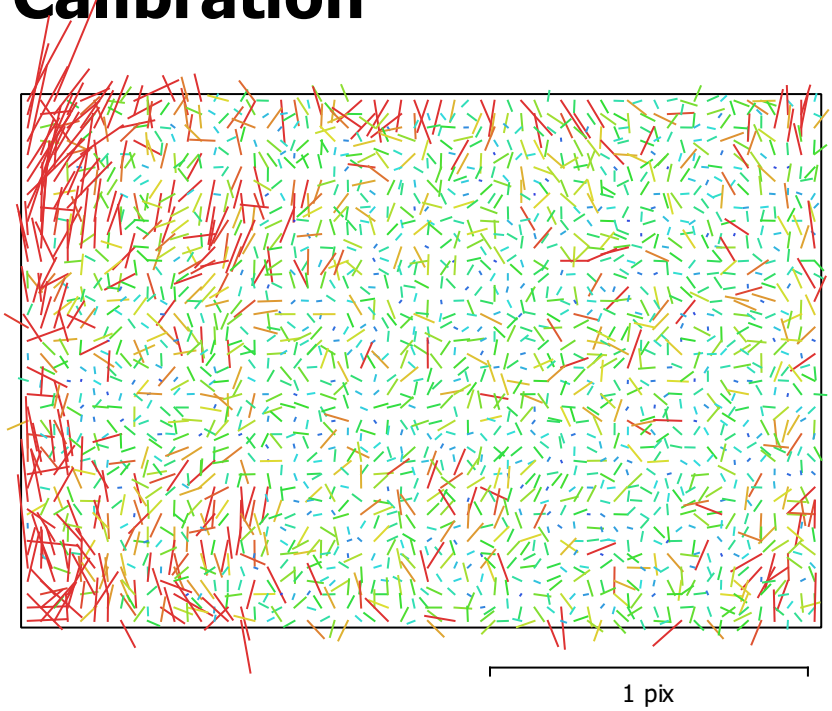

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

126 images

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

	Value	Error	F	Cx	Cy	K1	K2	P1	P2
F	**8458.84**	0.38	1.00	-0.17	-0.08	0.33	0.01	-0.26	-0.08
Cx	**-47.0414**	0.24		1.00	0.01	-0.14	0.03	0.86	0.02
Cy	**-16.119**	0.36			1.00	-0.04	0.02	0.02	0.94
K1	**-0.0760289**	7.6e-05				1.00	-0.90	-0.14	-0.03
K2	**0.082627**	0.00049					1.00	0.02	0.01
P1	**-0.000569823**	6.3e-06						1.00	0.02
P2	**-4.70919e-05**	8.7e-06							1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

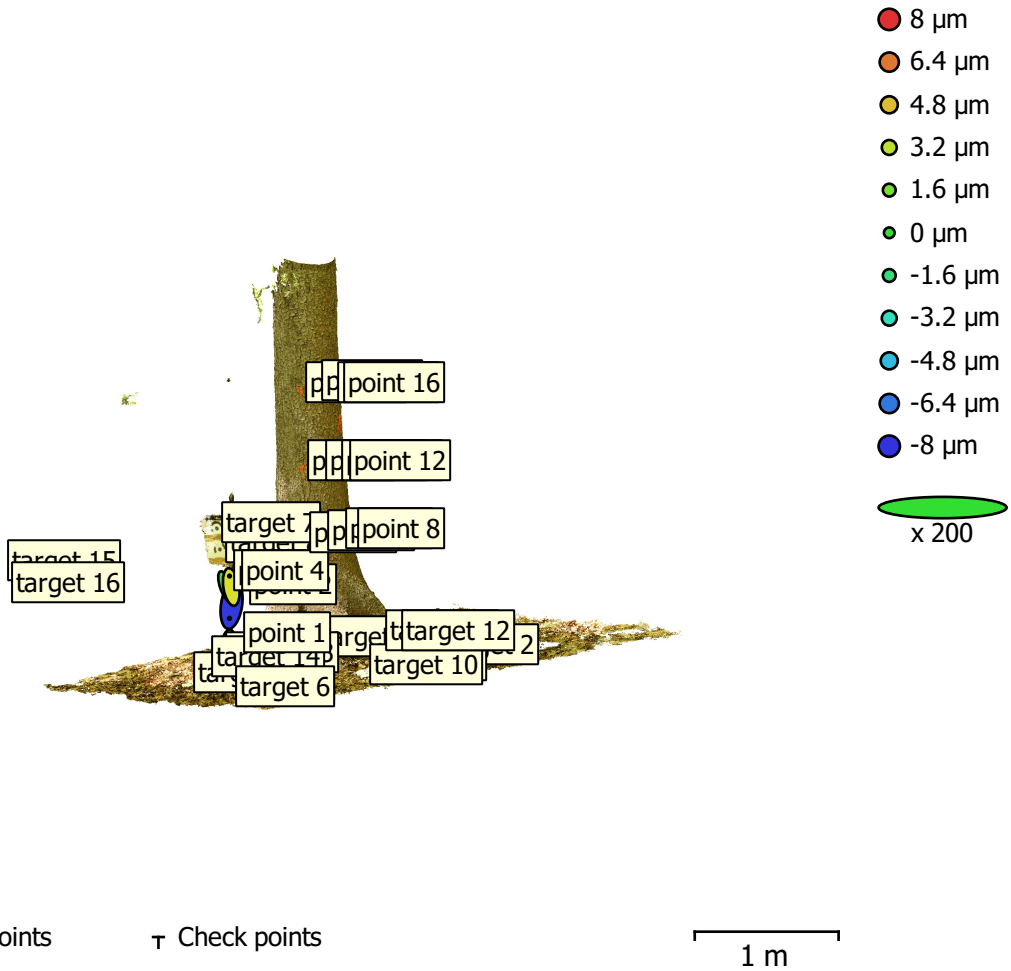

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	0.156569	0.821158	0.00495323	0.835951	0.835966

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 1	0.0120122	0.87077	0.00466006	0.870865	0.004 (71)
point 2	-0.141537	-0.935383	-0.00783311	0.946063	0.004 (83)
point 3	0.251162	-0.696368	-0.00065288	0.740278	0.004 (92)
point 4	-0.121638	0.760982	0.00382594	0.770652	0.004 (93)
Total	**0.156569**	**0.821158**	**0.00495323**	**0.835966**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 1					0.309 (7)
target 2					0.223 (4)
target 4					0.398 (12)
target 5					0.863 (7)
target 8					1.594 (12)
target 9					0.118 (2)
target 10					0.719 (3)
target 11					0.318 (18)
target 12					0.412 (12)
target 13					1.226 (7)
target 14					0.717 (6)
target 15					0.373 (9)
target 16					0.250 (6)
target 7					0.003 (74)
target 6					26.736 (53)
point 5					0.004 (126)
point 6					0.004 (126)
point 7					0.004 (125)
point 8					0.004 (125)
point 9					0.004 (85)
point 10					0.004 (85)
point 11					0.004 (85)
point 12					0.004 (85)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 13					0.004 (78)
point 14					0.004 (79)
point 15					0.003 (79)
point 16					0.003 (79)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 8_target 7	0.147368	-0.000632415
target 9_target 10	0.147892	-0.000107899
target 11_target 12	0.147993	-6.86627e-06
target 13_target 14	0.148168	0.000168427
target 15_target 16	0.148574	0.000574095
Total		**0.000392324**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 1_point 2	0.137917	
point 1_point 3	0.287024	
point 1_point 4	0.432179	
Total		

Table 7. Check scale bars.

Digital Elevation Model

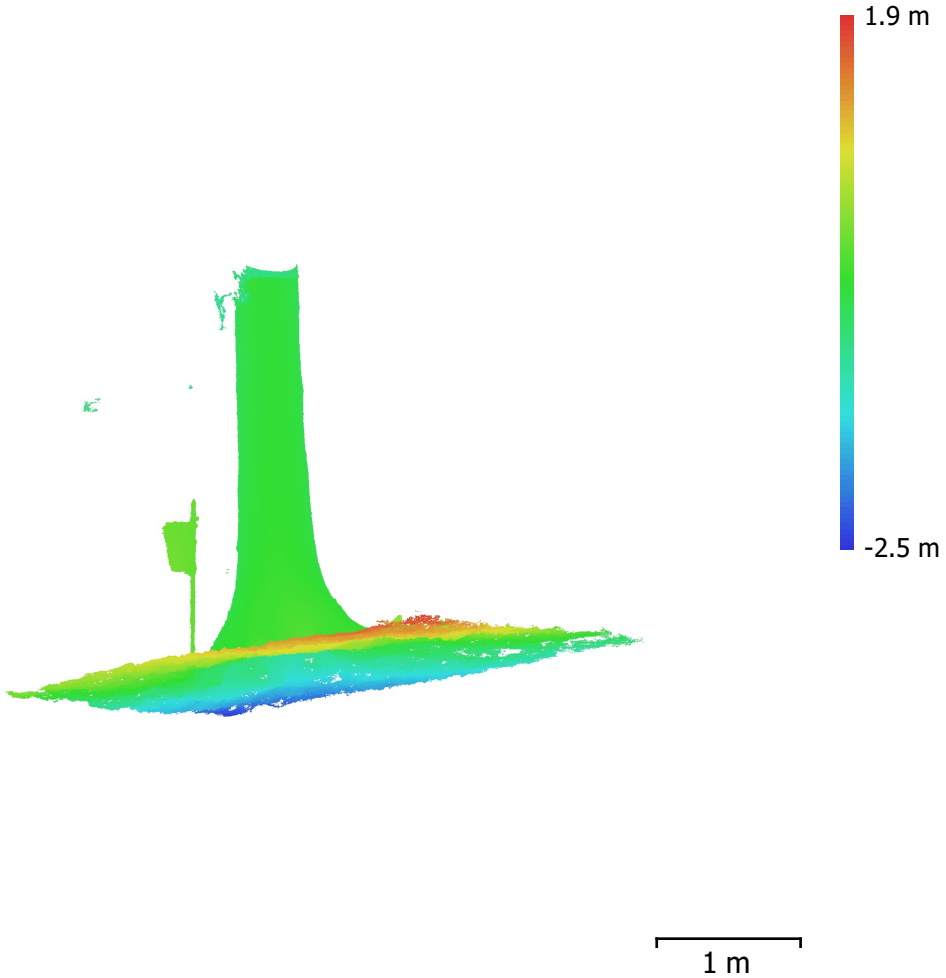

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	126
Aligned cameras	126
Markers	31
Scale bars	8
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	110,233 of 143,178
RMS reprojection error	0.15886 (0.624086 pix)
Max reprojection error	0.482593 (17.0596 pix)
Mean key point size	3.82067 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	3.94942
Alignment parameters	
Accuracy	High
Generic preselection	Yes
Key point limit	40,000
Tie point limit	4,000
Adaptive camera model fitting	Yes
Matching time	52 minutes 44 seconds
Alignment time	1 minutes 4 seconds
Depth Maps	
Count	126
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	3 hours 53 minutes
Dense Point Cloud	
Points	7,294,438
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	3 hours 53 minutes
Dense cloud generation time	35 minutes 55 seconds
Software	
Version	1.4.4 build 6848
Platform	Windows 64