Picea_abies_7N

Processing Report

07 November 2018

Survey Data

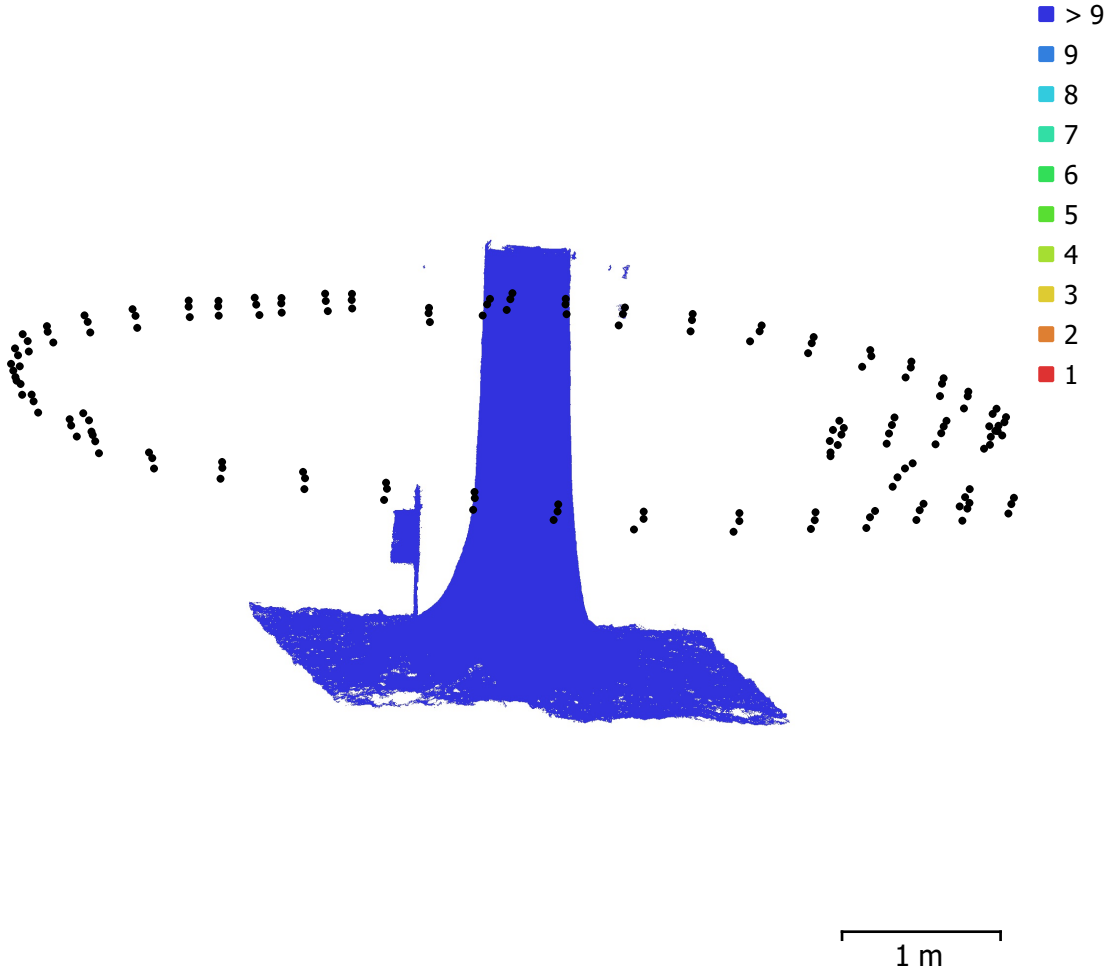

Fig. 1. Camera locations and image overlap.

Number of images:	161	Camera stations:	161
Flying altitude:	3.07 m	Tie points:	102,702
Ground resolution:	0.345 mm/pix	Projections:	509,687
Coverage area:	3.15 m²	Reprojection error:	0.847 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

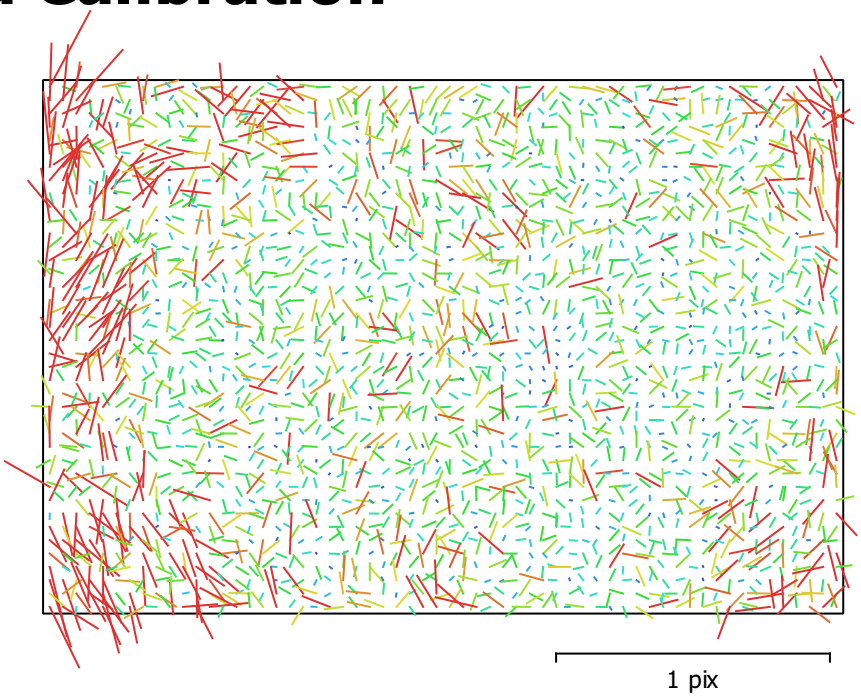

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

161 images

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

	Value	Error	F	Cx	Cy	B1	B2	K1	K2	P1	P2
F	**8463.01**	0.27	1.00	-0.17	-0.05	-0.38	-0.03	0.09	0.05	-0.18	-0.05
Cx	**-26.0847**	0.26		1.00	0.01	0.11	0.01	-0.06	0.01	0.89	0.01
Cy	**-28.8394**	0.29			1.00	0.05	0.42	0.00	-0.00	-0.00	0.93
B1	**-1.28769**	0.25				1.00	0.06	0.15	-0.02	0.01	0.04
B2	**-0.200847**	0.047					1.00	0.01	-0.00	-0.00	0.36
K1	**-0.0772826**	7.7e-05						1.00	-0.93	-0.06	0.00
K2	**0.0878032**	0.00052							1.00	-0.01	-0.01
P1	**0.000181669**	6.6e-06								1.00	0.01
P2	**-0.000192021**	7.1e-06									1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

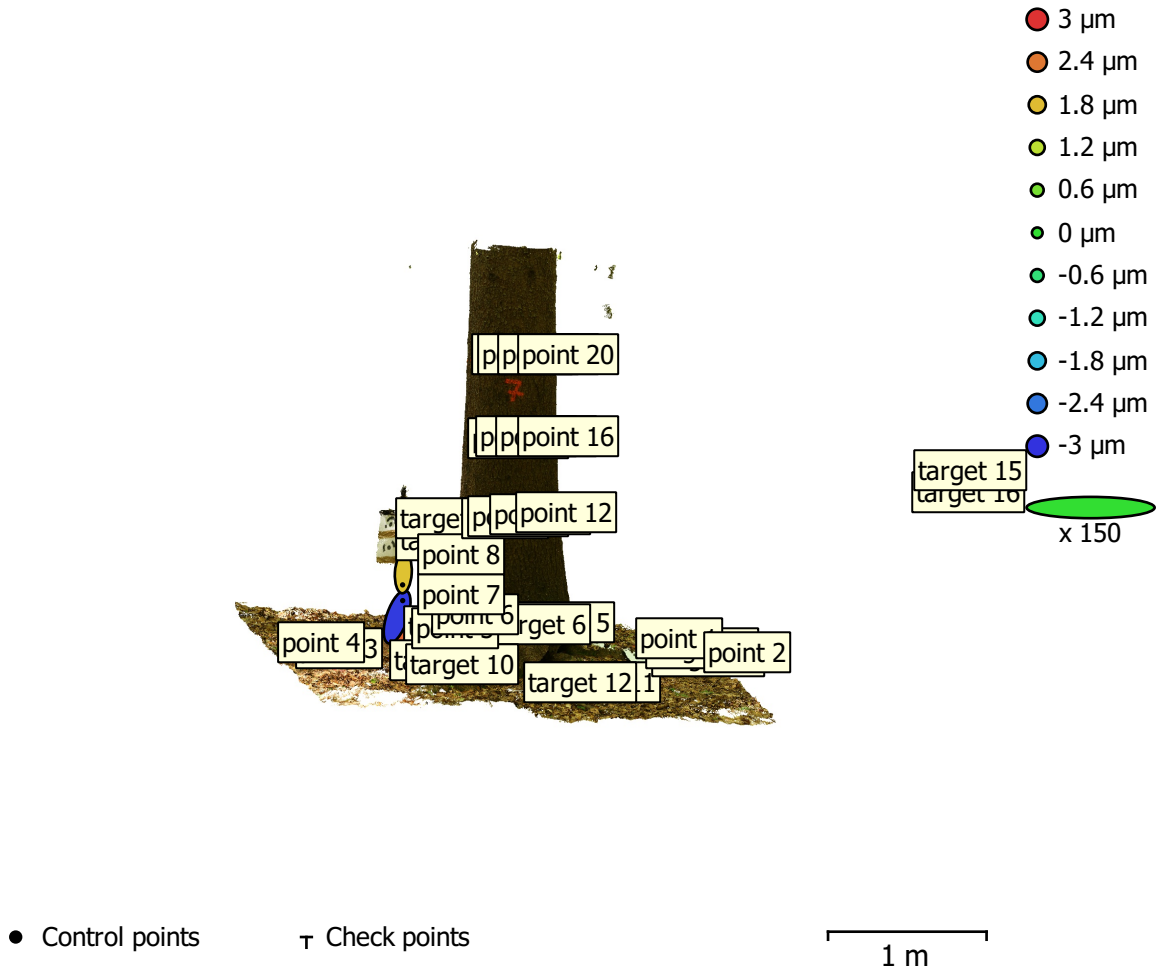

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	0.447339	0.870782	0.00223475	0.978966	0.978968

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 5	0.293226	-0.370459	0.00255459	0.47247	0.004 (80)
point 6	-0.701622	0.00914516	-0.00136589	0.701683	0.004 (97)
point 7	0.467636	1.37029	-0.00292652	1.44789	0.004 (101)
point 8	-0.0592392	-1.00898	0.00173789	1.01071	0.004 (99)
Total	**0.447339**	**0.870782**	**0.00223475**	**0.978968**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 3					0.652 (8)
target 5					0.787 (20)
target 6					0.644 (16)
target 8					1.009 (7)
target 9					0.157 (2)
target 10					0.536 (4)
target 11					0.149 (2)
target 12					0.545 (11)
target 13					0.255 (6)
target 14					0.475 (6)
target 16					0.544 (6)
target 7					0.003 (87)
target 15					0.172 (14)
point 1					5.607 (30)
point 2					0.225 (32)
point 3					0.668 (48)
point 4					0.068 (43)
point 9					0.004 (152)
point 10					0.004 (151)
point 11					0.003 (151)
point 12					0.004 (150)
point 13					0.004 (106)
point 14					0.004 (106)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 15					0.004 (106)
point 16					0.004 (106)
point 17					0.004 (99)
point 18					0.004 (99)
point 19					0.004 (99)
point 20					0.004 (98)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.147705	-0.000295299
target 8_target 7	0.147374	-0.000626249
target 9_target 10	0.147765	-0.000234841
target 11_target 12	0.148621	0.000620746
target 13_target 14	0.147685	-0.00031493
target 16_target 15	0.148294	0.000293629
point 1_point 2	0.60326	0.000260447
point 3_point 4	0.200621	-0.000379435
Total		**0.000405751**

Table 6. Control scale bars.

Label	Distance (m)	Error (m)
point 5_point 6	0.150843	
point 5_point 7	0.273555	
point 5_point 8	0.372882	
Total		

Table 7. Check scale bars.

Digital Elevation Model

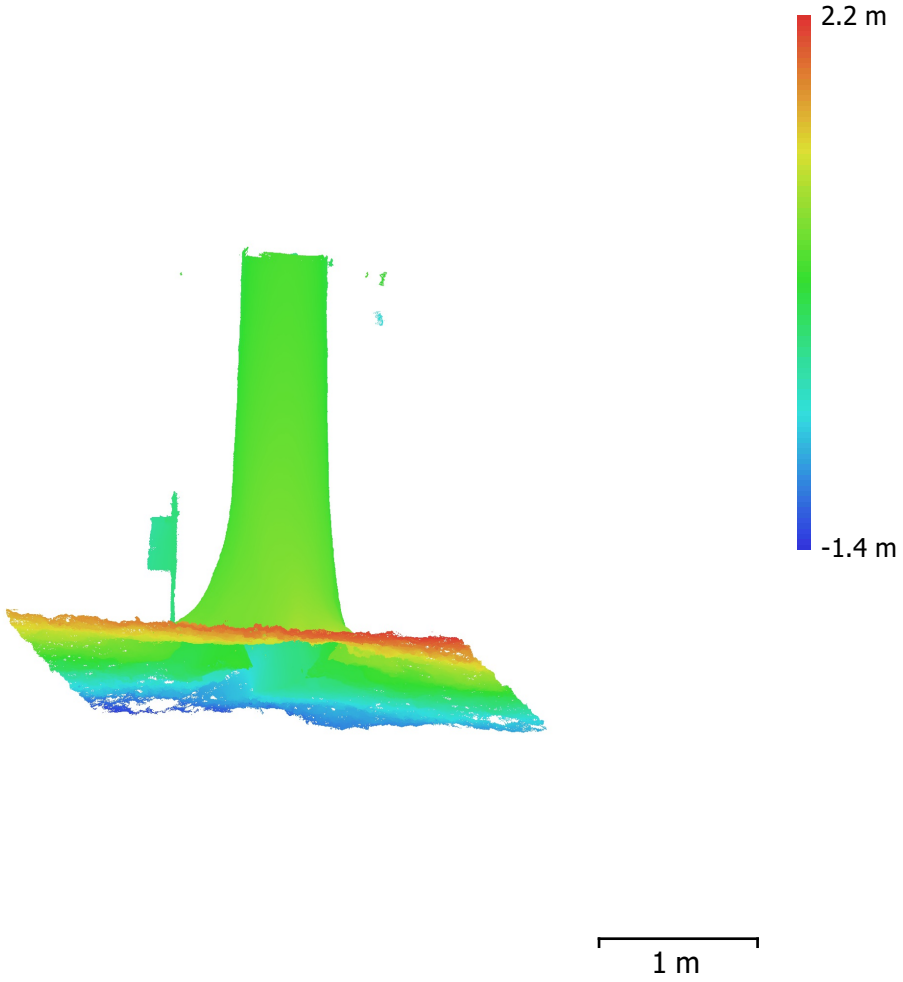

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	161
Aligned cameras	161
Markers	36
Scale bars	11
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	102,702 of 137,229
RMS reprojection error	0.191952 (0.846986 pix)
Max reprojection error	0.582618 (25.3872 pix)
Mean key point size	4.40499 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	5.52046
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 33 minutes
Alignment time	2 minutes 15 seconds
Depth Maps	
Count	161
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	8 hours 49 minutes
Dense Point Cloud	
Points	9,071,912
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	8 hours 49 minutes
Dense cloud generation time	1 hours 10 minutes
Software	
Version	1.4.4 build 6848
Platform	Windows 64