Picea_abies_6N

Processing Report

07 November 2018

Survey Data

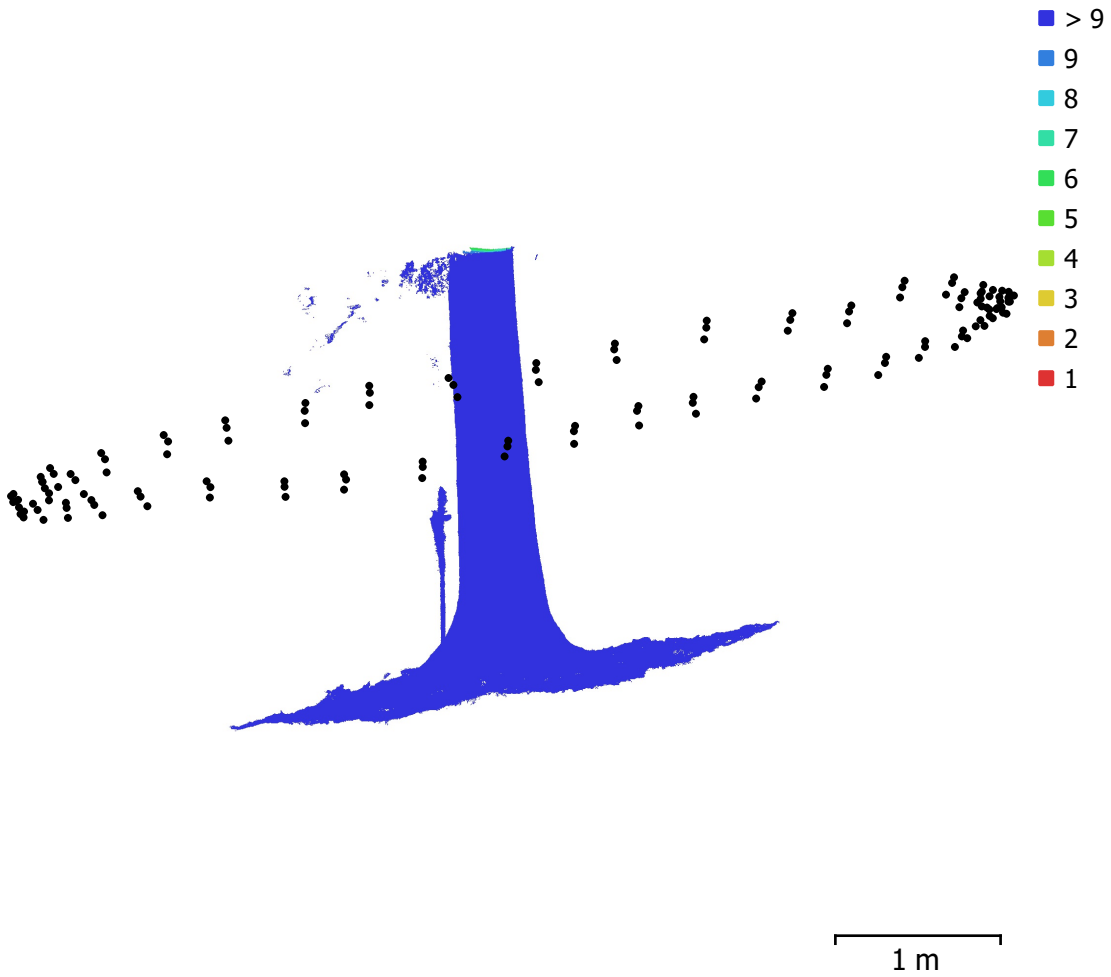

Fig. 1. Camera locations and image overlap.

Number of images:	144	Camera stations:	144
Flying altitude:	4.12 m	Tie points:	117,084
Ground resolution:	0.373 mm/pix	Projections:	470,176
Coverage area:	1.84 m²	Reprojection error:	0.824 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

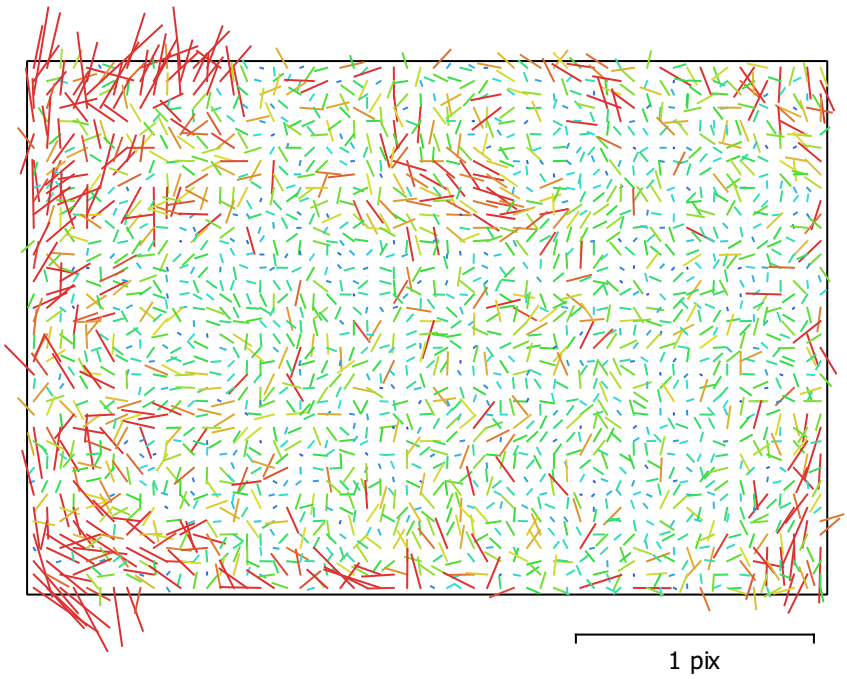

Fig. 2. Image residuals for Canon EOS 70D (35 mm).

Canon EOS 70D (35 mm)

144 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	**8480.88**	0.4	1.00	-0.24	-0.02	-0.33	-0.05	0.16	0.03	-0.27	-0.01
Cx	**-33.8254**	0.3		1.00	-0.01	0.14	0.03	-0.09	0.01	0.88	-0.02
Cy	**-19.9369**	0.3			1.00	-0.04	0.25	-0.02	0.00	-0.01	0.92
B1	**8.26407**	0.41				1.00	0.35	0.22	-0.03	0.00	-0.05
B2	**0.918874**	0.067					1.00	0.09	-0.01	-0.02	0.19
K1	**-0.0757246**	9.2e-05						1.00	-0.91	-0.12	-0.02
K2	**0.0855663**	0.0006							1.00	0.01	0.00
P1	**-8.35671e-05**	7.6e-06								1.00	-0.01
P2	**0.000143975**	7.7e-06									1.00

Table 2. Calibration coefficients and correlation matrix.

Ground Control Points

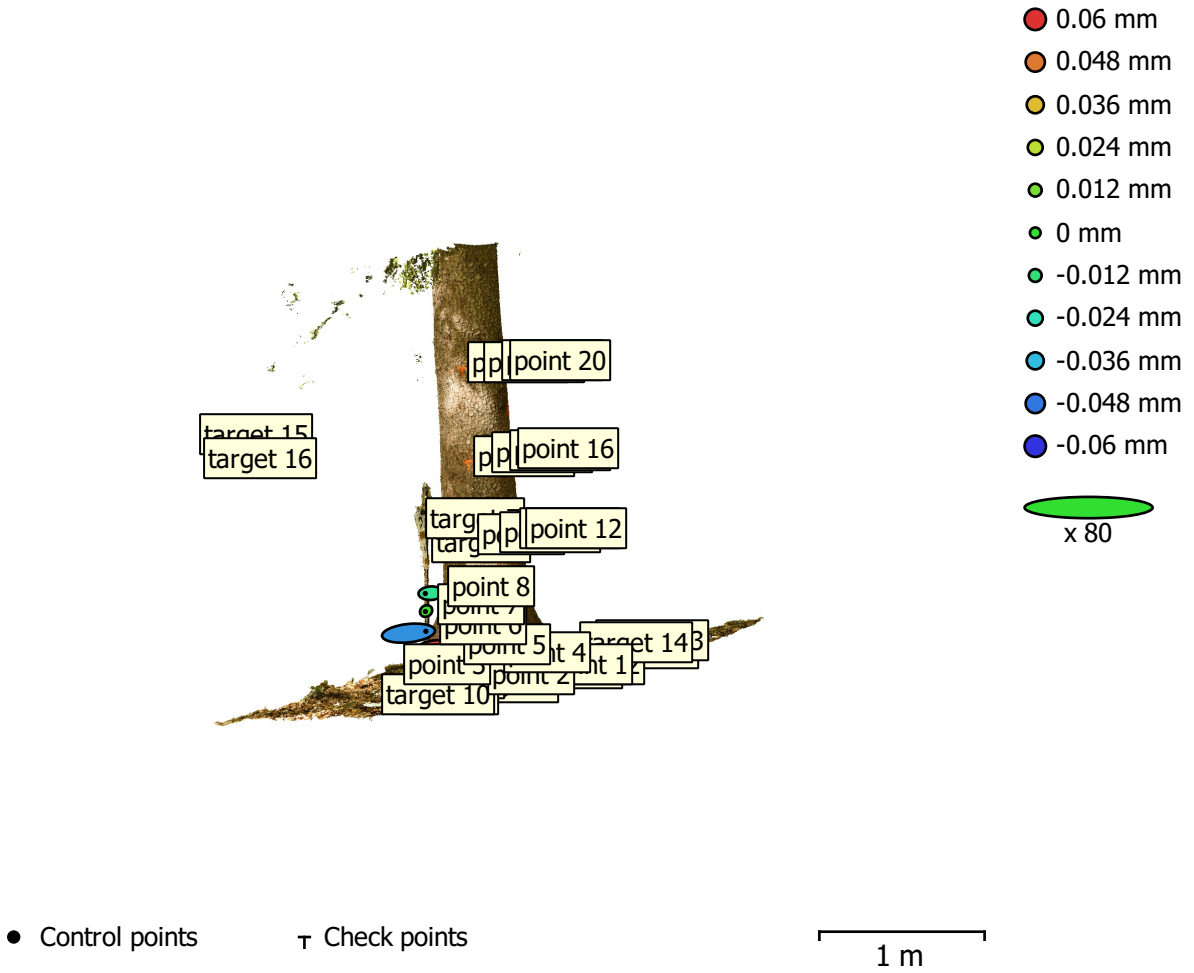

Fig. 3. GCP locations and error estimates.
Z error is represented by ellipse color. X,Y errors are represented by ellipse shape.
Estimated GCP locations are marked with a dot or crossing.

Count	X error (mm)	Y error (mm)	Z error (mm)	XY error (mm)	Total (mm)
4	1.60994	0.165599	0.0368349	1.61843	1.61885

Table 3. Control points RMSE.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 5	-1.66844	-0.156478	0.057234	1.67673	0.004 (94)
point 6	2.61963	0.277938	-0.0434217	2.63469	0.004 (118)
point 7	-0.108813	-0.0777674	0.00233193	0.133767	0.004 (125)
point 8	-0.842382	-0.0436931	-0.0161443	0.843669	0.004 (130)
Total	**1.60994**	**0.165599**	**0.0368349**	**1.61885**	**0.004**

Table 4. Control points.

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
target 1					1.045 (24)
target 3					0.520 (14)
target 4					0.568 (4)
target 5					0.614 (8)
target 6					0.299 (4)
target 8					0.991 (20)
target 9					0.791 (7)
target 10					0.879 (19)
target 11					0.555 (17)
target 12					0.866 (35)
target 13					1.021 (22)
target 14					0.441 (9)
target 15					0.605 (8)
target 16					0.484 (8)
target 7					0.003 (142)
point 1					0.170 (47)
point 2					0.094 (48)
point 3					2.602 (39)
point 4					3.716 (46)
point 9					0.004 (144)
point 10					0.004 (144)
point 11					0.004 (143)
point 12					0.004 (143)

Label	X error (mm)	Y error (mm)	Z error (mm)	Total (mm)	Image (pix)
point 13					0.004 (96)
point 14					0.004 (96)
point 15					0.004 (96)
point 16					0.004 (96)
point 17					0.004 (94)
point 18					0.004 (94)
point 19					0.003 (94)
point 20					0.004 (94)
Total					

Table 5. Check points.

Scale Bars

Label	Distance (m)	Error (m)
target 5_target 6	0.148052	5.15114e-05
target 8_target 7	0.147497	-0.000502715
target 9_target 10	0.147277	-0.00072257
target 11_target 12	0.148264	0.000263617
target 13_target 14	0.147786	-0.000213666
target 15_target 16	0.147299	-0.000701336
point 1_point 2	0.402516	0.000516083
point 3_point 4	0.614343	
point 5_point 6	0.123408	
point 5_point 7	0.243077	
point 5_point 8	0.352373	
Total		**0.000485628**

Table 6. Check scale bars.

Digital Elevation Model

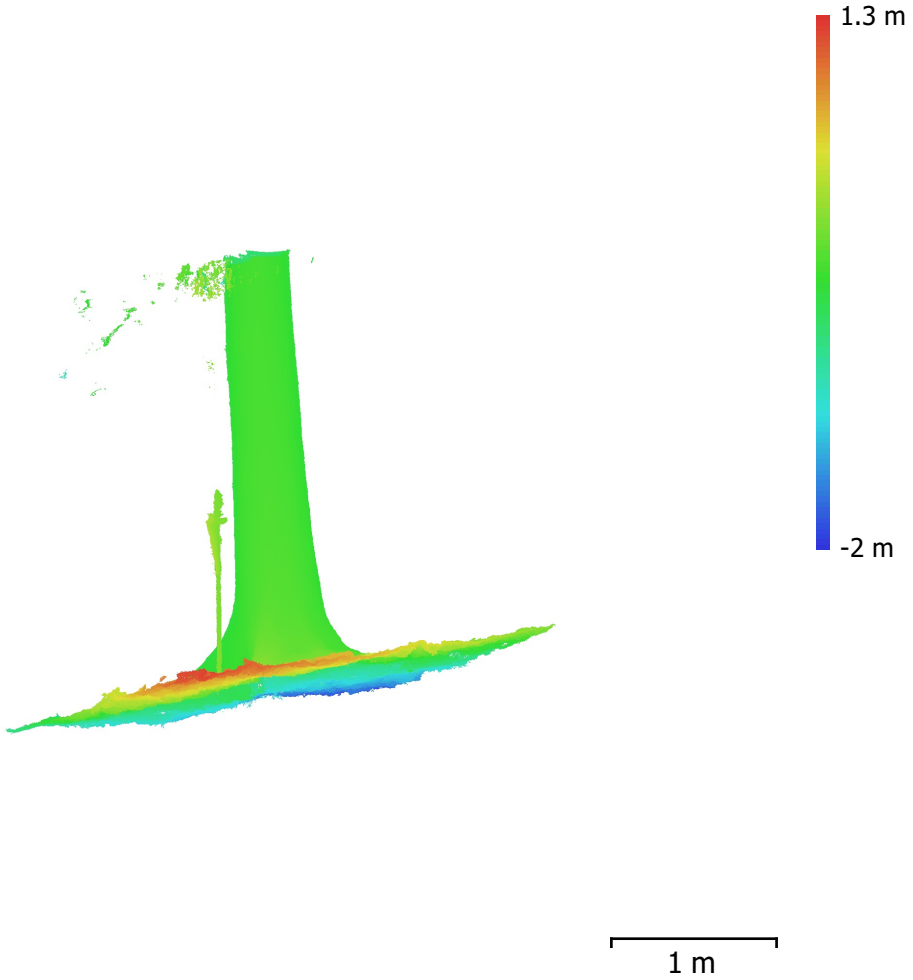

Fig. 4. Reconstructed digital elevation model.

Resolution:	unknown
Point density:	unknown

Processing Parameters

General	
Cameras	144
Aligned cameras	144
Markers	36
Scale bars	11
Coordinate system	Local Coordinates (m)
Rotation angles	Yaw, Pitch, Roll
Point Cloud	
Points	117,084 of 151,082
RMS reprojection error	0.171653 (0.824435 pix)
Max reprojection error	0.520261 (25.3324 pix)
Mean key point size	4.76622 pix
Point colors	3 bands, uint8
Key points	No
Average tie point multiplicity	4.30528
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 6 minutes
Alignment time	2 minutes 8 seconds
Depth Maps	
Count	144
Reconstruction parameters	
Quality	Medium
Filtering mode	Aggressive
Processing time	6 hours 28 minutes
Dense Point Cloud	
Points	5,986,895
Point colors	3 bands, uint8
Reconstruction parameters	
Quality	Medium
Depth filtering	Aggressive
Depth maps generation time	6 hours 28 minutes
Dense cloud generation time	1 hours 10 minutes
Software	
Version	1.4.4 build 6848
Platform	Windows 64