

Quality Report



Generated with Pix4Dmapper Pro version 4.2.27



Important: Click on the different icons for:



Help to analyze the results in the Quality Report



Additional information about the sections



Click [here](#) for additional tips to analyze the Quality Report

Summary



Project	sequ_4k_3_x3
Processed	2018-08-30 11:50:23
Camera Model Name(s)	FC350_3.6_4000x3000 (RGB)
Average Ground Sampling Distance (GSD)	5.21 cm / 2.05 in
Area Covered	0.694 km ² / 69.3642 ha / 0.27 sq. mi. / 171.4914 acres
Time for Initial Processing (without report)	02h:39m:15s

Quality Check



Images	median of 12362 keypoints per image	
Dataset	1988 out of 2003 images calibrated (99%), 3 images disabled	
Camera Optimization	1.06% relative difference between initial and optimized internal camera parameters	
Matching	median of 3160.76 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Preview

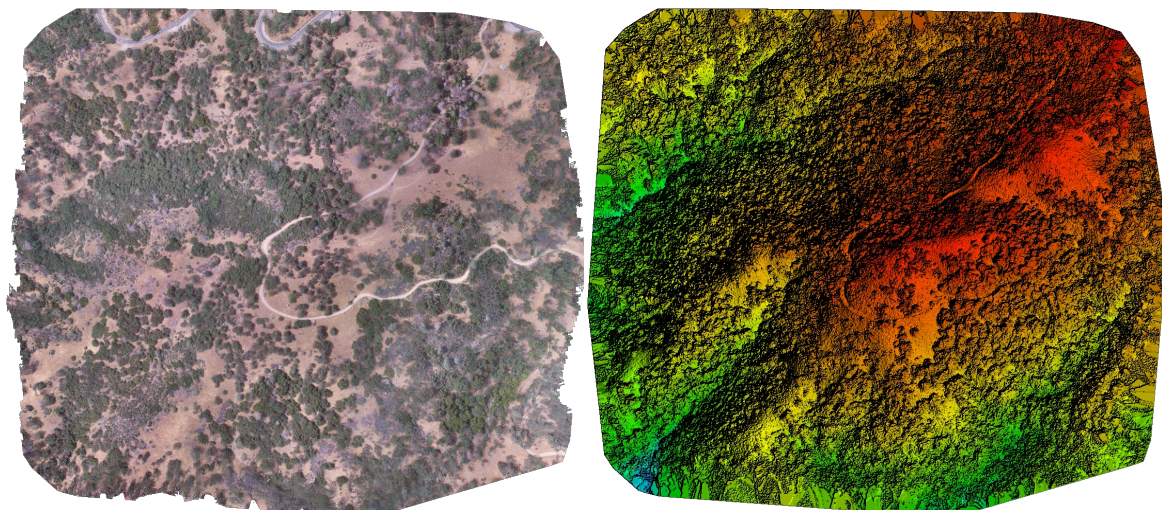


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	1988 out of 2006
-----------------------------	------------------

Initial Image Positions

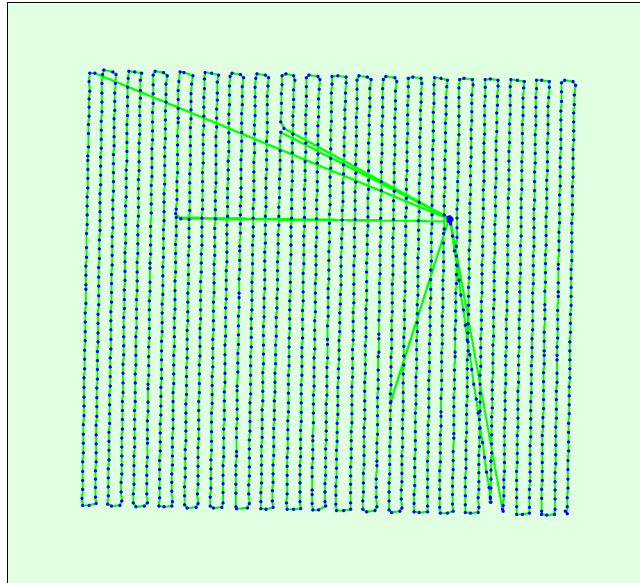
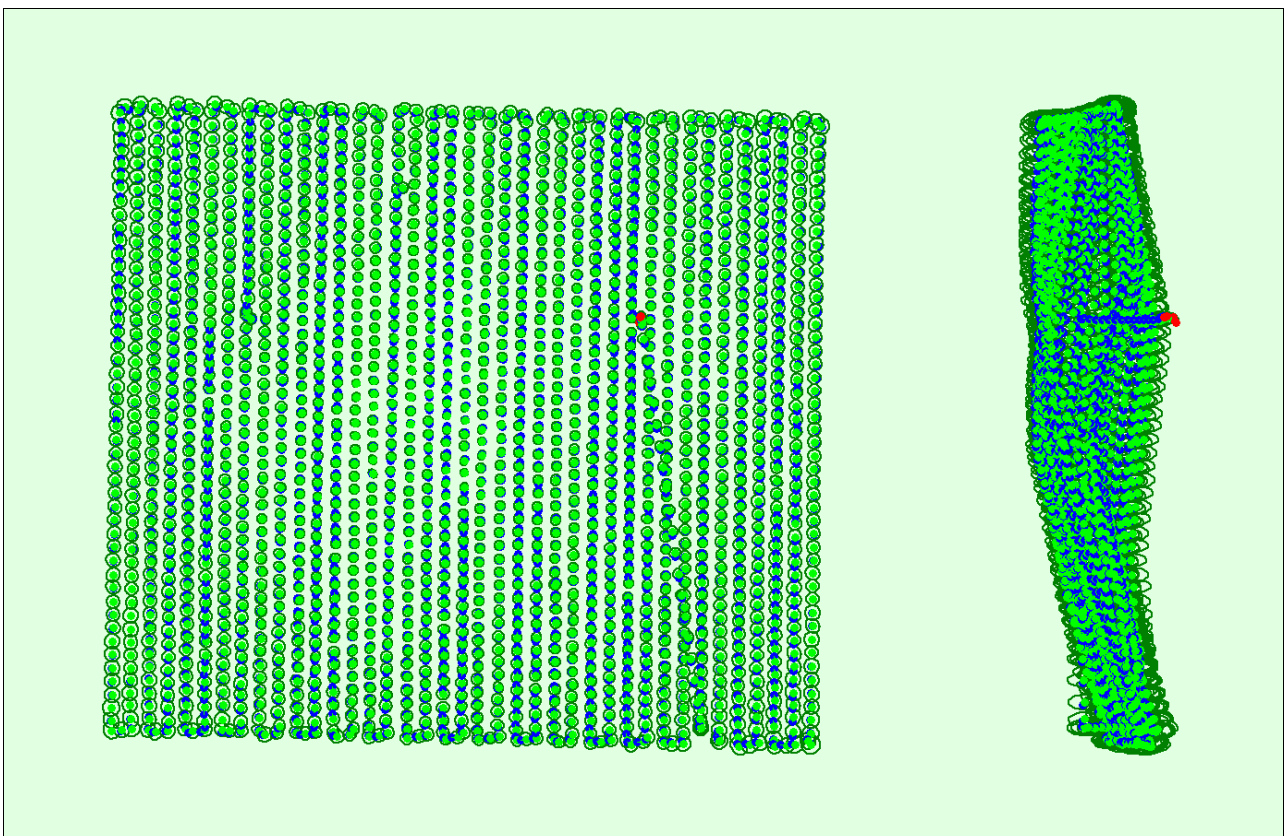
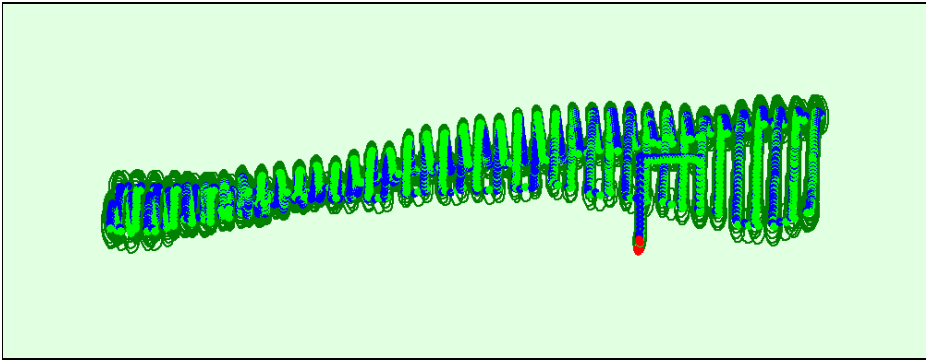


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions





Uncertainty ellipses 100x magnified

Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Red dots indicate disabled or uncalibrated images. Dark green ellipses indicate the absolute position uncertainty of the bundle block adjustment result.

? Absolute camera position and orientation uncertainties

	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.055	0.055	0.122	0.025	0.024	0.009
Sigma	0.009	0.008	0.025	0.006	0.007	0.001

? Overlap

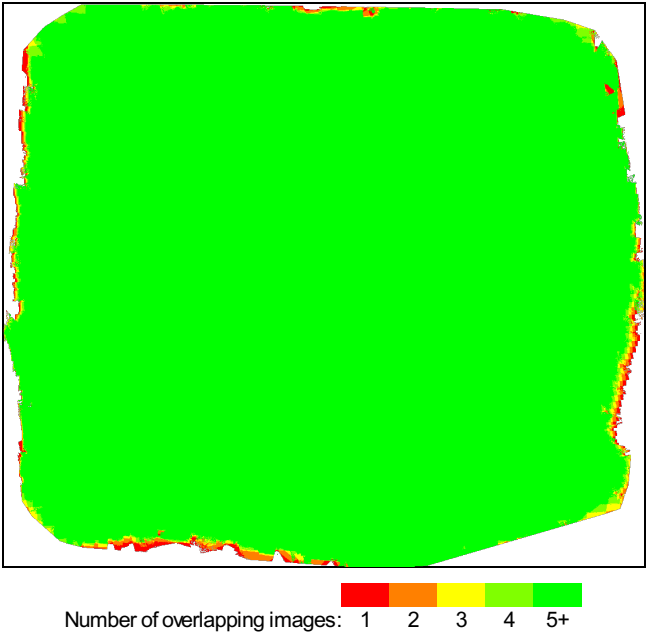


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).

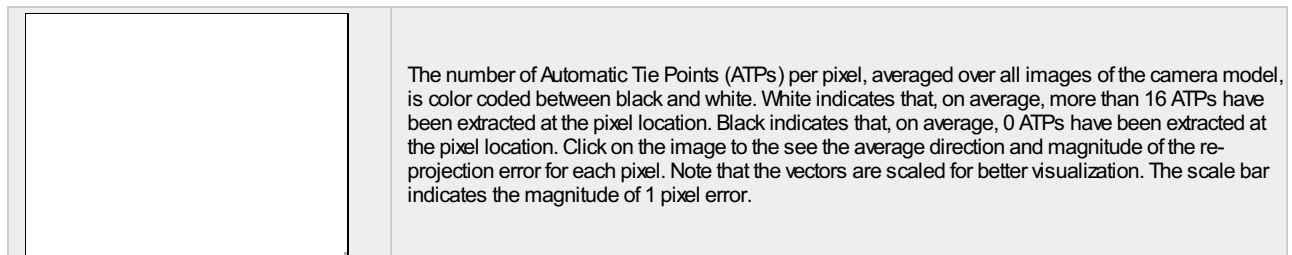
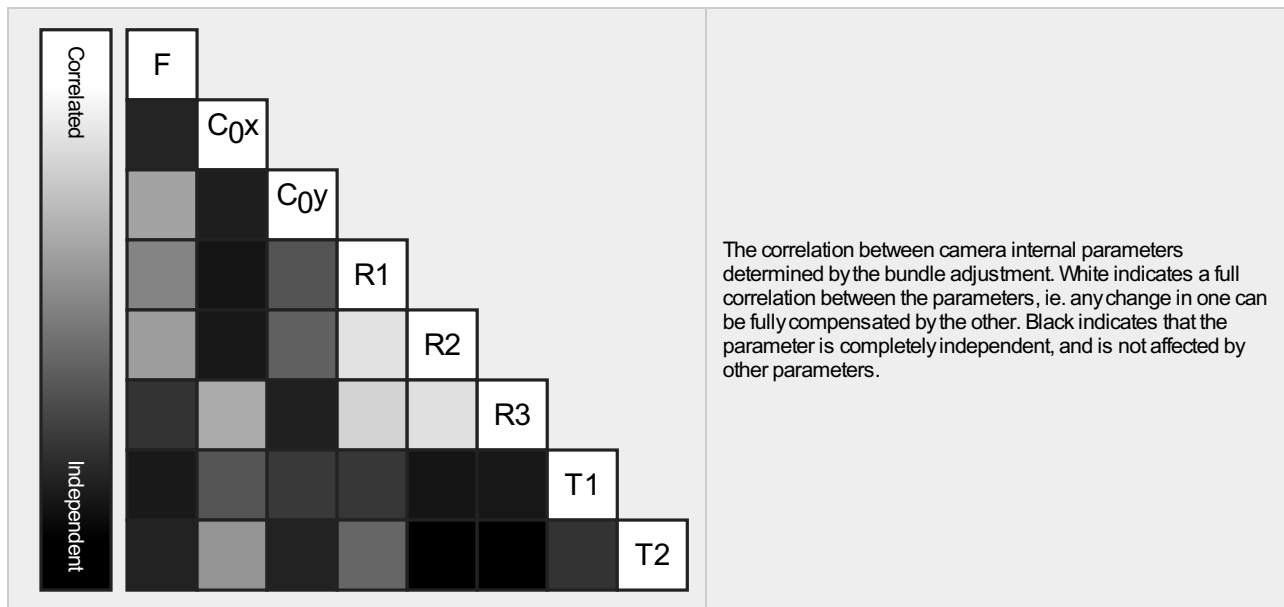
Bundle Block Adjustment Details

Number of 2D Keypoint Observations for Bundle Block Adjustment	6464017
Number of 3D Points for Bundle Block Adjustment	1998051
Mean Reprojection Error [pixels]	0.124

? Internal Camera Parameters

EXIF ID: FC350_3.6_4000x3000

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	2285.722 [pixel] 3.610 [mm]	2000.006 [pixel] 3.159 [mm]	1500.003 [pixel] 2.369 [mm]	-0.130	0.106	-0.016	-0.000	0.000
Optimized Values	2309.965 [pixel] 3.648 [mm]	1985.030 [pixel] 3.135 [mm]	1503.042 [pixel] 2.374 [mm]	-0.126	0.108	-0.013	0.001	0.000
Uncertainties (Sigma)	0.424 [pixel] 0.001 [mm]	0.025 [pixel] 0.000 [mm]	0.030 [pixel] 0.000 [mm]	0.000	0.000	0.000	0.000	0.000



2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	12362	3161
Min	7168	217
Max	14219	8108
Mean	12283	3252

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	1203706
In 3 Images	361514
In 4 Images	160545
In 5 Images	85635
In 6 Images	51307
In 7 Images	32808
In 8 Images	22586
In 9 Images	16210
In 10 Images	12051
In 11 Images	9073

In 12 Images	7127
In 13 Images	5490
In 14 Images	4565
In 15 Images	3578
In 16 Images	2968
In 17 Images	2471
In 18 Images	2006
In 19 Images	1736
In 20 Images	1451
In 21 Images	1279
In 22 Images	1117
In 23 Images	905
In 24 Images	796
In 25 Images	723
In 26 Images	614
In 27 Images	523
In 28 Images	448
In 29 Images	434
In 30 Images	382
In 31 Images	343
In 32 Images	351
In 33 Images	232
In 34 Images	236
In 35 Images	221
In 36 Images	209
In 37 Images	180
In 38 Images	154
In 39 Images	151
In 40 Images	127
In 41 Images	126
In 42 Images	130
In 43 Images	106
In 44 Images	101
In 45 Images	80
In 46 Images	77
In 47 Images	76
In 48 Images	56
In 49 Images	76
In 50 Images	78
In 51 Images	56
In 52 Images	41
In 53 Images	45
In 54 Images	54
In 55 Images	43
In 56 Images	35
In 57 Images	46
In 58 Images	34
In 59 Images	34
In 60 Images	18
In 61 Images	21
In 62 Images	23
In 63 Images	33
In 64 Images	16
In 65 Images	19
In 66 Images	20
In 67 Images	24
In 68 Images	17
In 69 Images	14
In 70 Images	17

In 71 Images	12
In 72 Images	10
In 73 Images	8
In 74 Images	10
In 75 Images	9
In 76 Images	9
In 77 Images	7
In 78 Images	7
In 79 Images	8
In 80 Images	11
In 81 Images	11
In 82 Images	11
In 83 Images	7
In 84 Images	11
In 85 Images	11
In 86 Images	7
In 87 Images	4
In 88 Images	3
In 89 Images	3
In 90 Images	5
In 91 Images	2
In 92 Images	6
In 93 Images	4
In 94 Images	2
In 95 Images	5
In 96 Images	2
In 98 Images	2
In 99 Images	1
In 100 Images	6
In 101 Images	6
In 102 Images	1
In 103 Images	2
In 104 Images	2
In 105 Images	7
In 106 Images	5
In 107 Images	4
In 108 Images	3
In 109 Images	2
In 110 Images	2
In 111 Images	1
In 113 Images	1
In 114 Images	2
In 115 Images	2
In 116 Images	4
In 117 Images	1
In 118 Images	1
In 119 Images	2
In 120 Images	3
In 121 Images	3
In 122 Images	2
In 124 Images	1
In 125 Images	2
In 127 Images	1
In 128 Images	3
In 129 Images	1
In 130 Images	3
In 132 Images	1
In 136 Images	1
In 137 Images	1

In 138 Images	1
In 139 Images	1
In 141 Images	1
In 142 Images	2
In 143 Images	3
In 144 Images	1
In 146 Images	3
In 147 Images	2
In 149 Images	1
In 151 Images	1
In 153 Images	1
In 156 Images	1
In 158 Images	1

2D Keypoint Matches

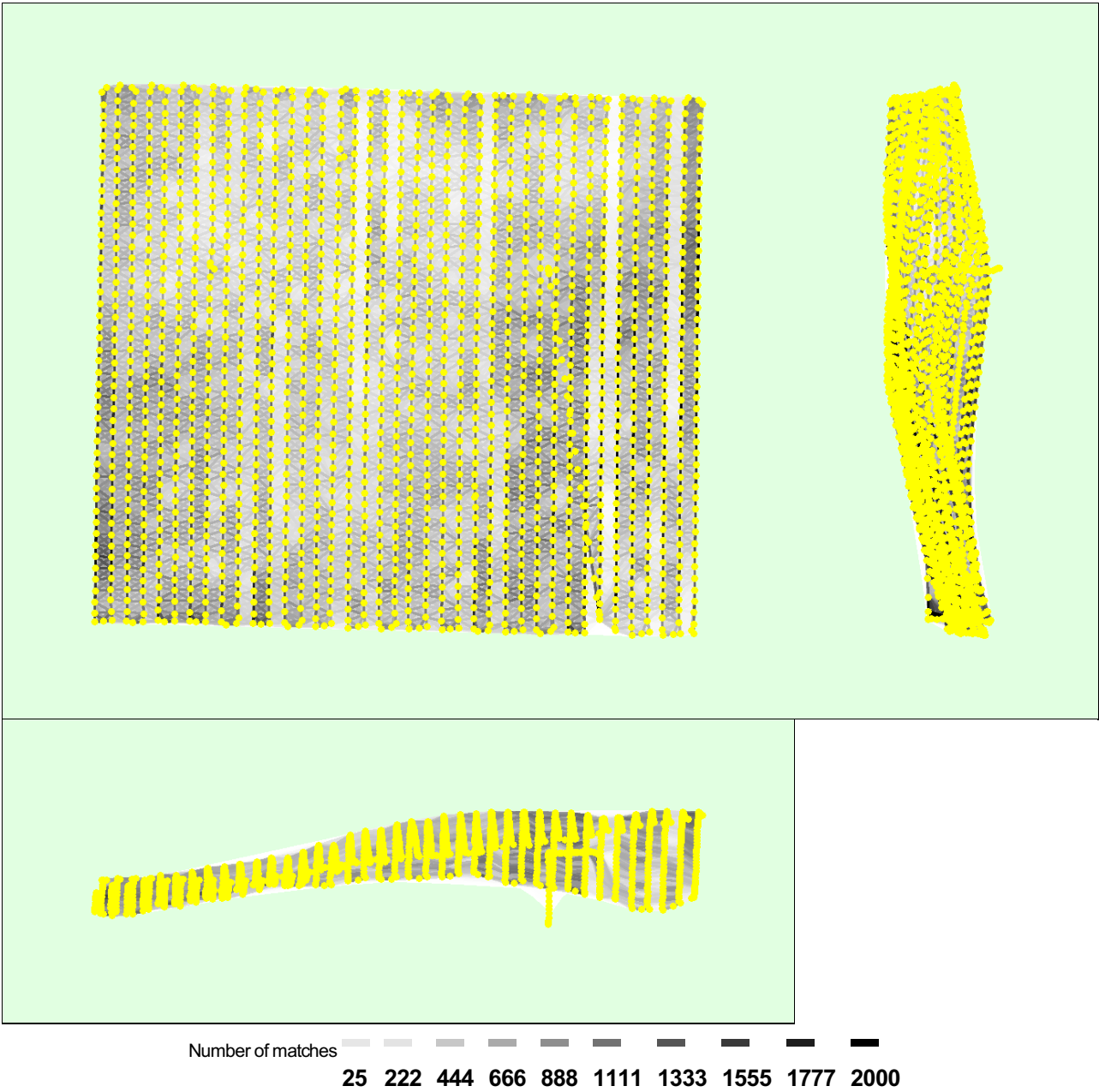


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images.

Geolocation Details



🔍 Absolute Geolocation Variance



Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-15.00	0.00	0.00	0.00
-15.00	-12.00	0.00	0.00	0.00
-12.00	-9.00	0.00	0.00	0.00
-9.00	-6.00	0.05	0.20	0.00
-6.00	-3.00	0.91	14.59	4.53
-3.00	0.00	48.89	36.72	42.71
0.00	3.00	50.15	32.75	49.09
3.00	6.00	0.00	15.69	3.42
6.00	9.00	0.00	0.05	0.25
9.00	12.00	0.00	0.00	0.00
12.00	15.00	0.00	0.00	0.00
15.00	-	0.00	0.00	0.00
Mean [m]		0.000000	-0.000000	0.000000
Sigma [m]		0.831159	2.630668	1.943013
RMS Error [m]		0.831159	2.630668	1.943013

Min Error and Max Error represent geolocation error intervals between -1.5 and 1.5 times the maximum accuracy of all the images. Columns X, Y, Z show the percentage of images with geolocation errors within the predefined error intervals. The geolocation error is the difference between the initial and computed image positions. Note that the image geolocation errors do not correspond to the accuracy of the observed 3D points.

🔍 Relative Geolocation Variance



Relative Geolocation Error	Images X [%]	Images Y [%]	Images Z [%]
[-1.00, 1.00]	99.85	96.08	100.00
[-2.00, 2.00]	100.00	100.00	100.00
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [m]	5.000000	5.000000	10.000000
Sigma of Geolocation Accuracy [m]	0.000000	0.000000	0.000000

Images X, Y, Z represent the percentage of images with a relative geolocation error in X, Y, Z.

Geolocation Orientational Variance	RMS [degree]
Omega	0.761
Phi	1.698
Kappa	4.810

Geolocation RMS error of the orientation angles given by the difference between the initial and computed image orientation angles.

Initial Processing Details



System Information



Hardware	CPU: Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz RAM: 64GB GPU: NVIDIA GeForce GTX 1080 Ti (Driver: 24.21.13.9882), Intel(R) UHD Graphics 630 (Driver: 22.20.16.4758)
Operating System	Windows 10 Education, 64-bit

Coordinate Systems



Image Coordinate System	WGS84 (egm96)
Output Coordinate System	WGS 84 / UTMzone 11N (egm96)

Processing Options



Detected Template	RGB Local structure bark beetle severity*
Keypoints Image Scale	Custom, Image Scale: 0.5
Advanced: Matching Image Pairs	Aerial Grid or Corridor
Advanced: Matching Strategy	Use Geometrically Verified Matching: no
Advanced: Keypoint Extraction	Targeted Number of Keypoints: Automatic
Advanced: Calibration	Calibration Method: Standard Internal Parameters Optimization: All External Parameters Optimization: All Rematch: Auto, no

Point Cloud Densification details



Processing Options



Image Scale	multiscale, 1/2 (Half image size, Default)
Point Density	Optimal
Minimum Number of Matches	3
3D Textured Mesh Generation	yes
3D Textured Mesh Settings:	Resolution: Medium Resolution (default) Color Balancing: no
LOD	Generated: no
Advanced: 3D Textured Mesh Settings	Sample Density Divider: 1
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes
Time for Point Cloud Densification	06h:59m:06s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	36m:14s

Results



Number of Generated Tiles	4
Number of 3D Densified Points	88858984
Average Density (per m ³)	41.9

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (5.21 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Raster DSM	Generated: yes Method: Triangulation Merge Tiles: yes
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no
Time for DSM Generation	07m:32s
Time for Orthomosaic Generation	03h:41m:34s
Time for DTM Generation	00s

Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s