

Quality Report



Generated with PIX4Dmapper version 4.7.5



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	Ptarm_Creek_P4RTK
Processed	2022-08-16 21:06:25
Camera Model Name(s)	FC6310R_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	3.53 cm / 1.39 in
Area Covered	1.372 km ² / 137.2103 ha / 0.53 sq. mi. / 339.2295 acres
Time for Initial Processing (without report)	47m:47s

Quality Check



Images	median of 81550 keypoints per image	
Dataset	941 out of 941 images calibrated (100%), all images enabled	
Camera Optimization	0.97% relative difference between initial and optimized internal camera parameters	
Matching	median of 35382.9 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Preview

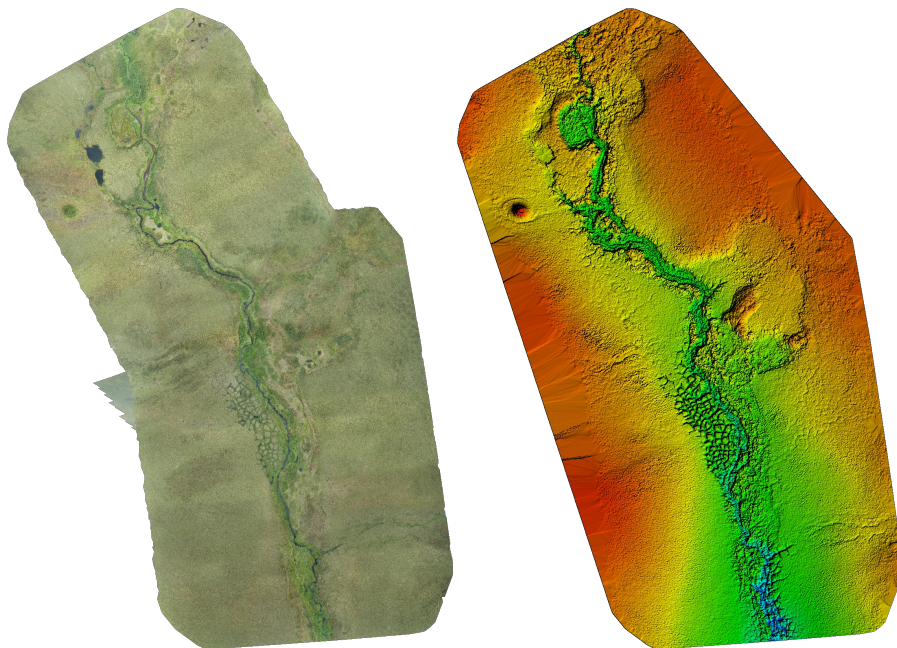


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	941 out of 941
Number of Geolocated Images	941 out of 941

Initial Image Positions

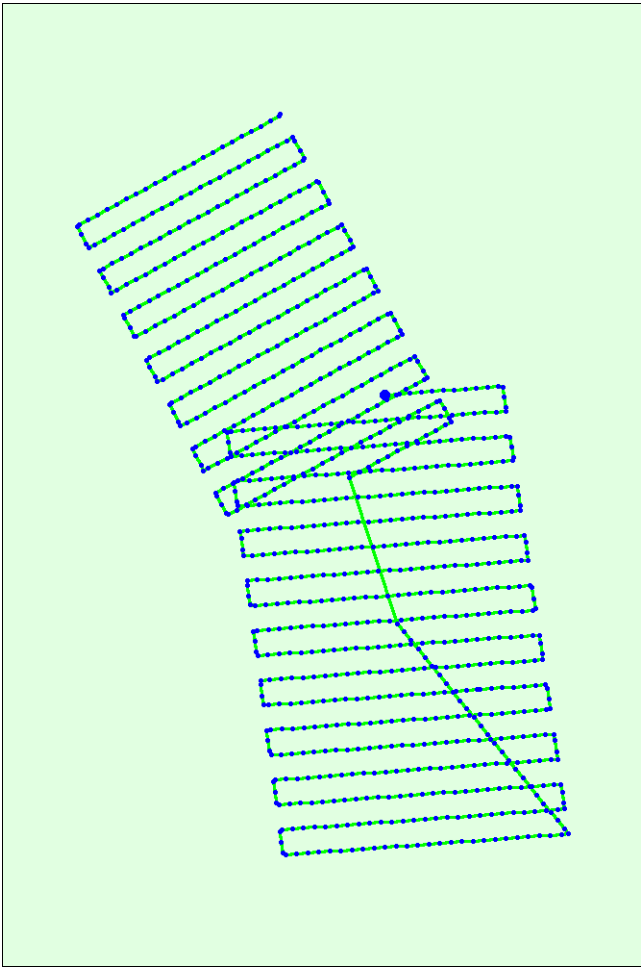
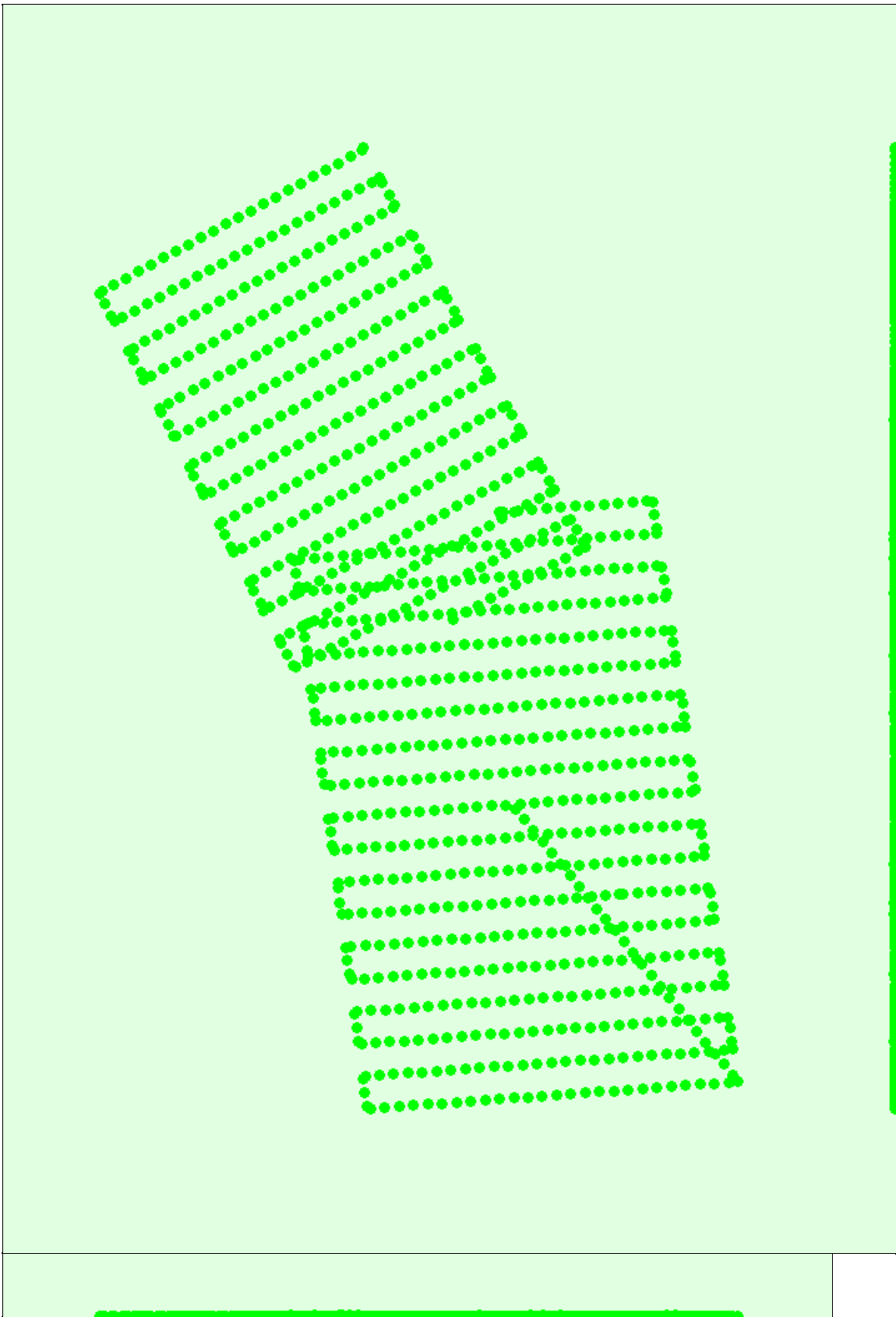


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions





Uncertainty ellipses 1000x 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). 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	0.003	0.003	0.002	0.001	0.001	0.001
Sigma	0.000	0.000	0.000	0.000	0.000	0.000

 Overlap

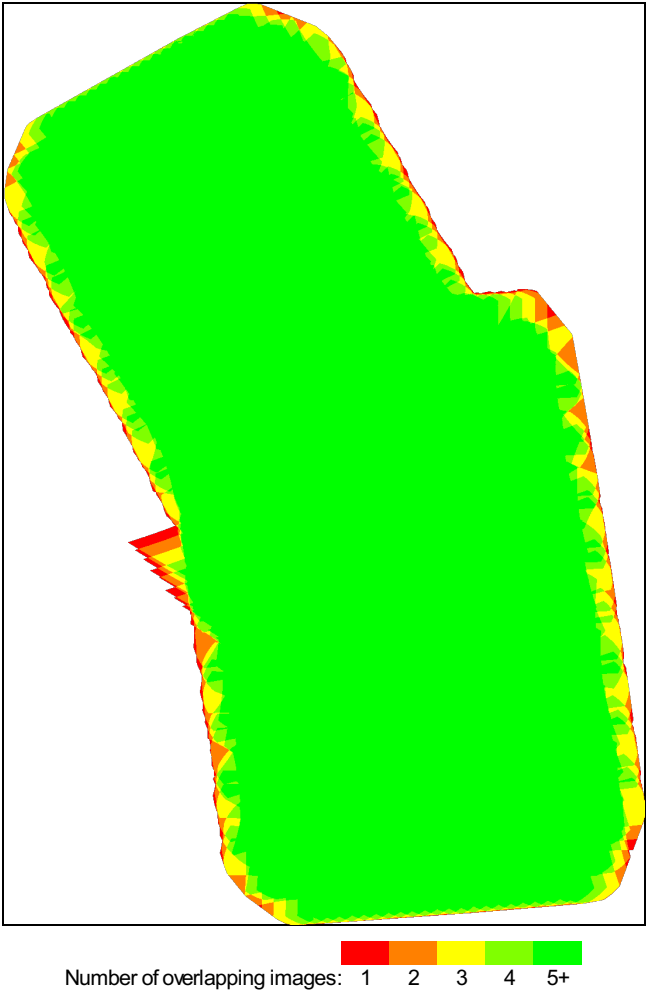


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint 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	32157133
Number of 3D Points for Bundle Block Adjustment	10647261
Mean Reprojection Error [pixels]	0.093

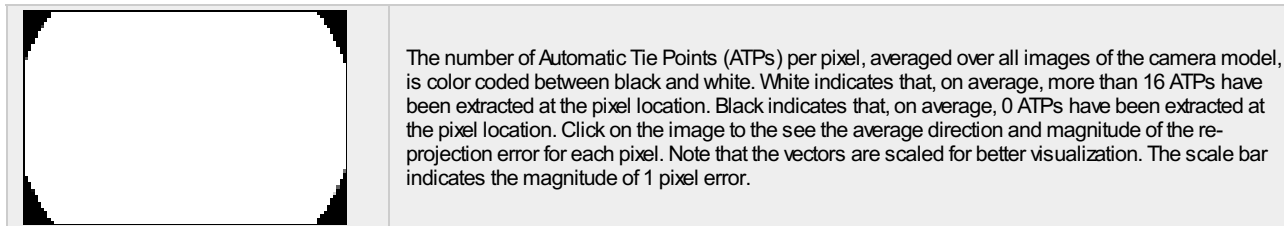
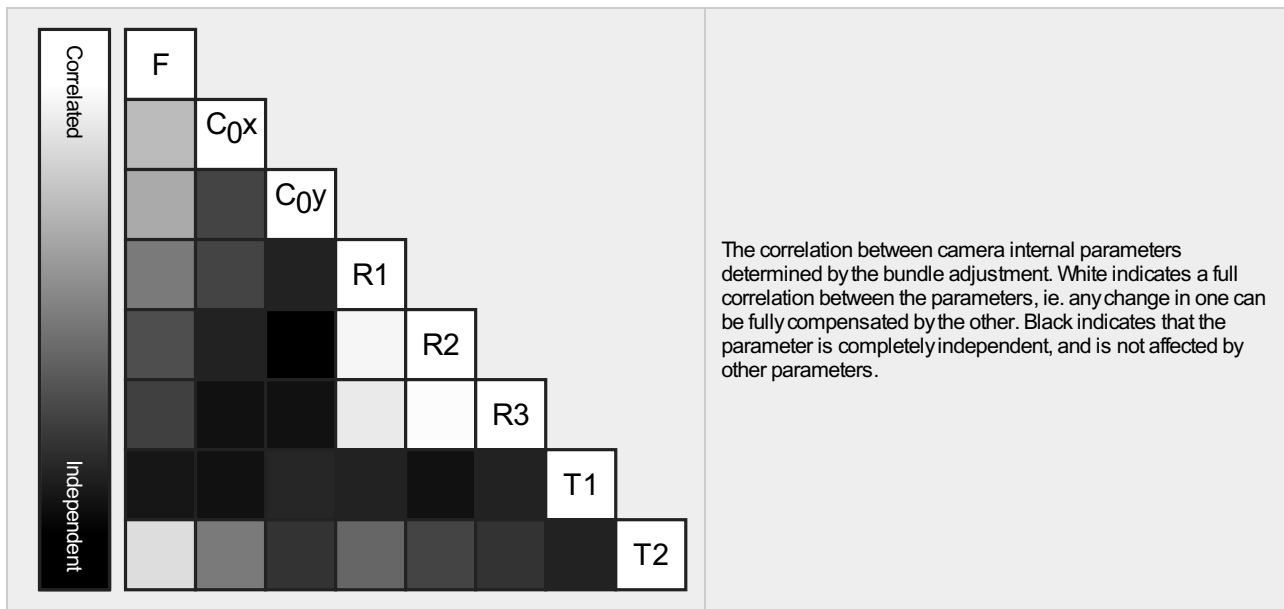
 Internal Camera Parameters

 **FC6310R_8.8_5472x3648 (RGB). Sensor Dimensions: 12.833 [mm] x 8.556 [mm]**



EXIF ID: FC6310R_8.8_5472x3648

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3658.300 [pixel] 8.580 [mm]	2722.500 [pixel] 6.385 [mm]	1835.100 [pixel] 4.304 [mm]	-0.269	0.112	-0.033	0.000	-0.001
Optimized Values	3694.001 [pixel] 8.663 [mm]	2727.817 [pixel] 6.397 [mm]	1804.638 [pixel] 4.232 [mm]	-0.284	0.126	-0.036	-0.000	-0.000
Uncertainties (Sigma)	0.055 [pixel] 0.000 [mm]	0.023 [pixel] 0.000 [mm]	0.015 [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	81550	35383
Min	55888	10382
Max	88415	53642
Mean	80799	34173

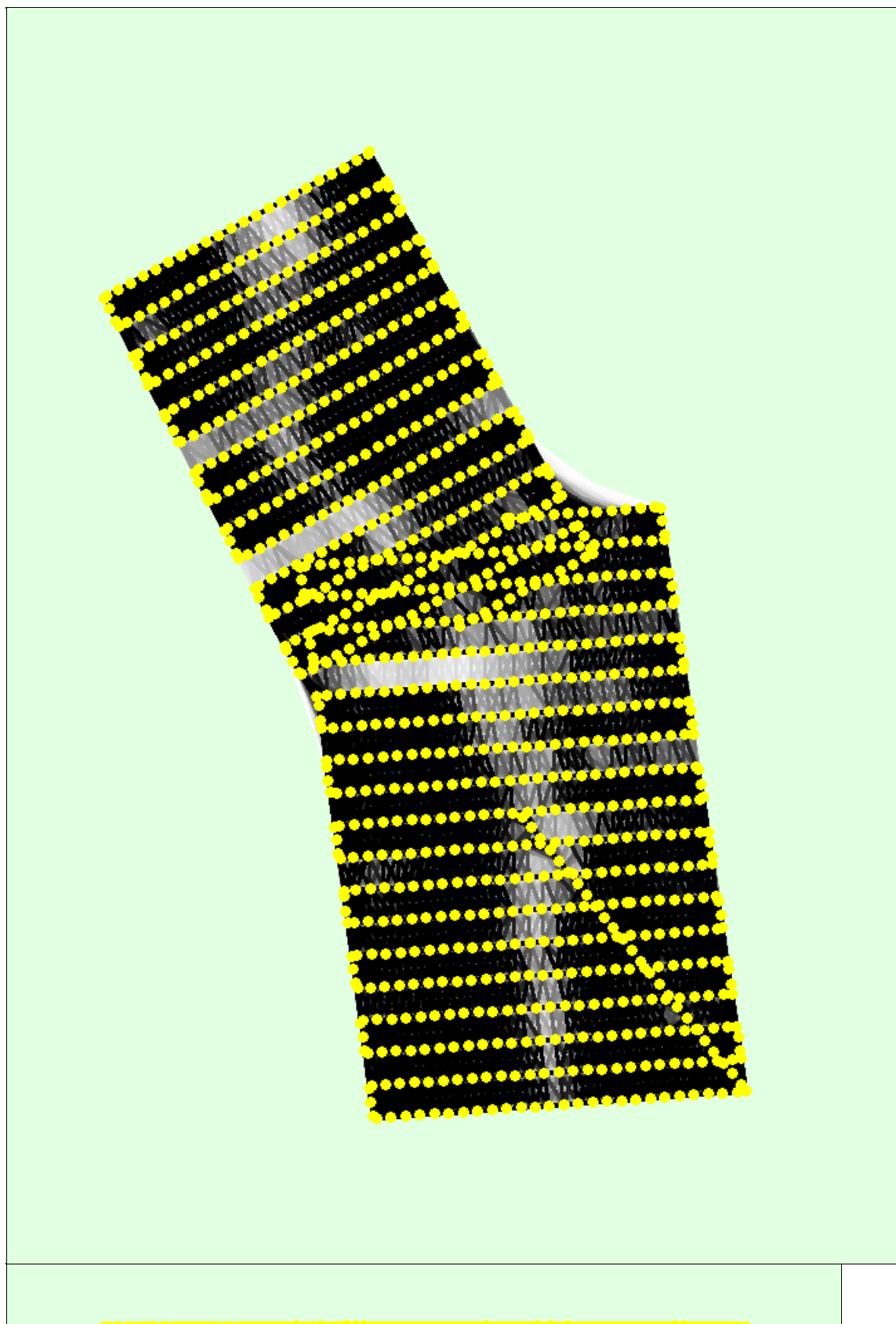
3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	6120258
In 3 Images	2185721
In 4 Images	985297
In 5 Images	518387
In 6 Images	290365
In 7 Images	173963
In 8 Images	114475
In 9 Images	78182
In 10 Images	53757
In 11 Images	36895
In 12 Images	25265
In 13 Images	18196
In 14 Images	13355
In 15 Images	9666
In 16 Images	7056
In 17 Images	4784
In 18 Images	3352
In 19 Images	2476
In 20 Images	1699
In 21 Images	1263
In 22 Images	862
In 23 Images	565

In 24 Images	399
In 25 Images	271
In 26 Images	204
In 27 Images	166
In 28 Images	101
In 29 Images	80
In 30 Images	52
In 31 Images	49
In 32 Images	31
In 33 Images	21
In 34 Images	12
In 35 Images	4
In 36 Images	14
In 37 Images	6
In 38 Images	3
In 39 Images	7
In 41 Images	1
In 42 Images	1

2D Keypoint Matches





Number of matches

25	222	444	666	888	1111	1333	1555	1777	2000
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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 [%]
-	-0.03	0.00	0.00	0.00
-0.03	-0.03	0.00	0.00	0.00
-0.03	-0.02	0.00	0.00	0.11
-0.02	-0.01	0.00	0.00	2.44
-0.01	-0.01	0.00	0.00	14.45
-0.01	0.00	47.82	49.52	33.69
0.00	0.01	52.07	50.48	32.73
0.01	0.01	0.11	0.00	13.71
0.01	0.02	0.00	0.00	2.66
0.02	0.03	0.00	0.00	0.21
0.03	0.03	0.00	0.00	0.00
0.03	-	0.00	0.00	0.00
Mean [m]		0.000003	-0.000003	-0.000015
Sigma [m]		0.001498	0.001769	0.007066
RMS Error [m]		0.001499	0.001769	0.007066

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]	100.00	100.00	99.57
[-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]	0.010214	0.010214	0.020336
Sigma of Geolocation Accuracy [m]	0.000343	0.000343	0.000577

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

Geolocation Orientational Variance	RMS [degree]
Omega	0.635
Phi	0.892
Kappa	3.217

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) i7-10850H CPU @ 2.70GHz RAM 128GB GPU: Intel(R) UHD Graphics (Driver: 30.0.101.1338), NVIDIA Quadro T2000 (Driver: 30.0.15.1236)
Operating System	Windows 10 Enterprise, 64-bit

Coordinate Systems



Image Coordinate System	WGS 84
Output Coordinate System	WGS 84 / UTMzone 3N

Processing Options



Detected Template	P4RTK*
Keypoints Image Scale	Full, Image Scale: 1
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: Geolocation Based 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	01h:33m:00s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	22m:05s

Results



Number of Generated Tiles	5
Number of 3D Densified Points	95646971
Average Density (per m ³)	90.05

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (3.53 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Raster DSM	Generated: yes Method: Inverse Distance Weighting Merge Tiles: yes
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no
Time for DSM Generation	42m:47s
Time for Orthomosaic Generation	01h:19m:12s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s

