

Quality Report



Generated with PIX4Dmapper version 4.9.0



Important: Click on the different icons for:



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Additional information about the sections



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Summary



Project	Philbricks_04Apr2025
Processed	2025-04-07 14:19:31
Camera Model Name(s)	ILCE-5100_E16mmF2.8_16.0_6000x4000 (RGB)
Average Ground Sampling Distance (GSD)	1.83 cm / 0.72 in
Area Covered	0.325 km ² / 32.5012 ha / 0.13 sq. mi. / 80.3538 acres

Quality Check



Images	median of 87387 keypoints per image	
Dataset	596 out of 603 images calibrated (98%), all images enabled	
Camera Optimization	0.88% relative difference between initial and optimized internal camera parameters	
Matching	median of 13467.3 matches per calibrated image	
Georeferencing	yes, 10 GCPs (10 3D), mean RMS error = 0.013 US survey foot	

Preview

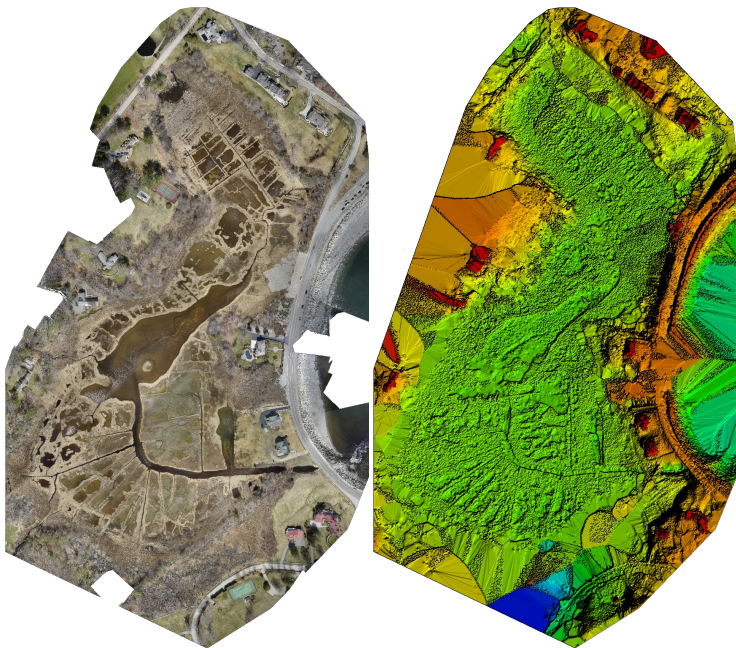


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	596 out of 603
Number of Geolocated Images	602 out of 603

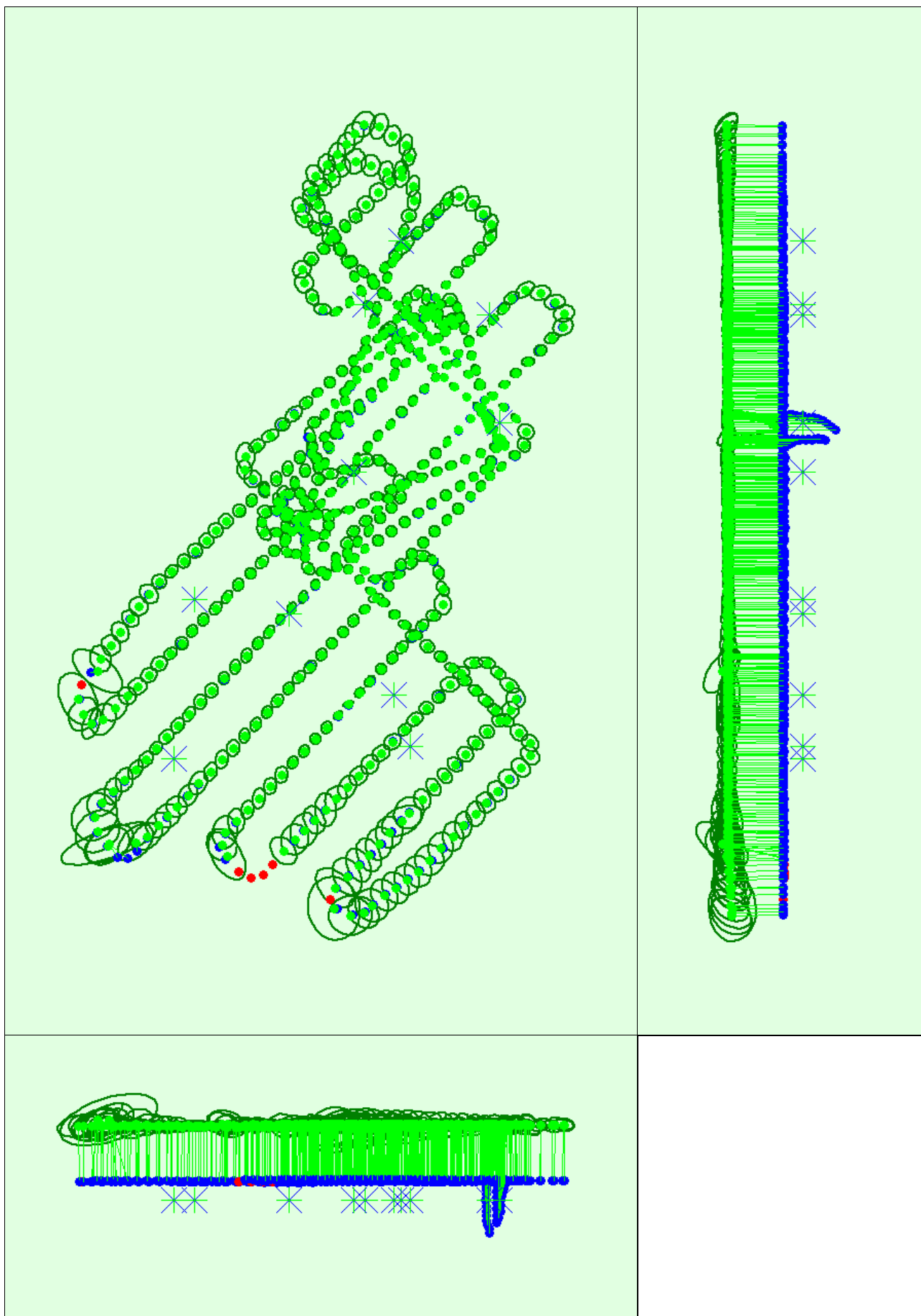
Initial Image Positions



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 500x 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[US survey foot]	Y[US survey foot]	Z[US survey foot]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.043	0.044	0.033	0.010	0.010	0.004
Sigma	0.024	0.025	0.020	0.005	0.006	0.003

? Overlap

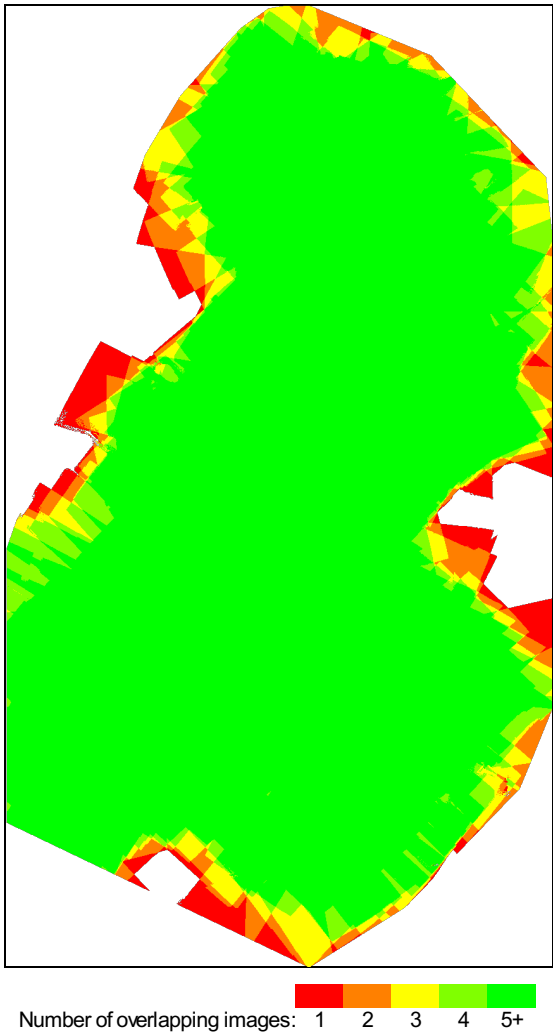


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint 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	8876001
Number of 3D Points for Bundle Block Adjustment	2919842
Mean Reprojection Error [pixels]	0.159

? Internal Camera Parameters

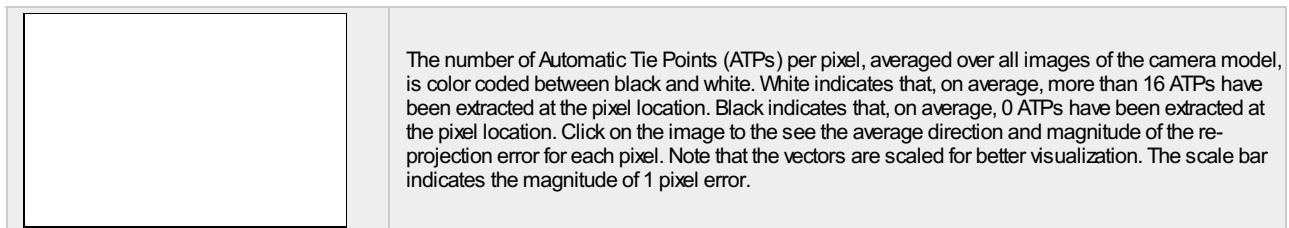
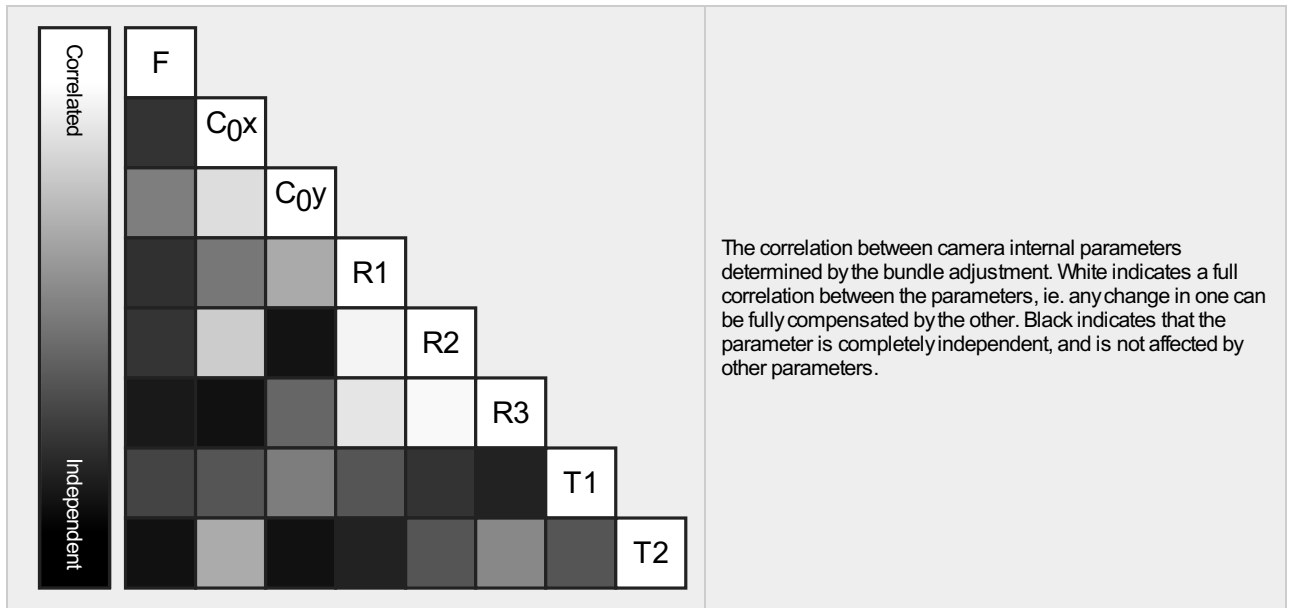
📷 ILCE-5100_E16mmF2.8_16.0_6000x4000 (RGB). Sensor Dimensions: 23.333 [mm] x 15.556 [mm]



EXIF ID: ILCE-5100_E16mmF2.8_16.0_6000x4000

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
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Initial Values	4114.286 [pixel] 16.000 [mm]	3000.000 [pixel] 11.667 [mm]	2000.000 [pixel] 7.778 [mm]	0.000	0.000	0.000	0.000	0.000
Optimized Values	4078.024 [pixel] 15.859 [mm]	2943.416 [pixel] 11.447 [mm]	1968.995 [pixel] 7.657 [mm]	-0.066	0.095	0.001	-0.000	-0.003
Uncertainties (Sigma)	0.300 [pixel] 0.001 [mm]	0.096 [pixel] 0.000 [mm]	0.101 [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	87387	13467
Mn	49883	43
Max	94549	41451
Mean	85776	14893

? 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	1783036
In 3 Images	547803
In 4 Images	242429
In 5 Images	122846
In 6 Images	67904
In 7 Images	42818
In 8 Images	28727
In 9 Images	19320
In 10 Images	14021
In 11 Images	10240
In 12 Images	7565
In 13 Images	5862
In 14 Images	4524
In 15 Images	3627
In 16 Images	3017
In 17 Images	2348

In 18 Images	1864
In 19 Images	1577
In 20 Images	1327
In 21 Images	1179
In 22 Images	1008
In 23 Images	837
In 24 Images	696
In 25 Images	620
In 26 Images	585
In 27 Images	441
In 28 Images	402
In 29 Images	331
In 30 Images	318
In 31 Images	270
In 32 Images	247
In 33 Images	227
In 34 Images	170
In 35 Images	165
In 36 Images	152
In 37 Images	130
In 38 Images	117
In 39 Images	120
In 40 Images	104
In 41 Images	97
In 42 Images	89
In 43 Images	89
In 44 Images	59
In 45 Images	73
In 46 Images	63
In 47 Images	41
In 48 Images	51
In 49 Images	40
In 50 Images	35
In 51 Images	43
In 52 Images	33
In 53 Images	36
In 54 Images	22
In 55 Images	15
In 56 Images	10
In 57 Images	17
In 58 Images	11
In 59 Images	8
In 60 Images	9
In 61 Images	4
In 62 Images	8
In 63 Images	5
In 64 Images	5
In 65 Images	3
In 66 Images	1
In 67 Images	1

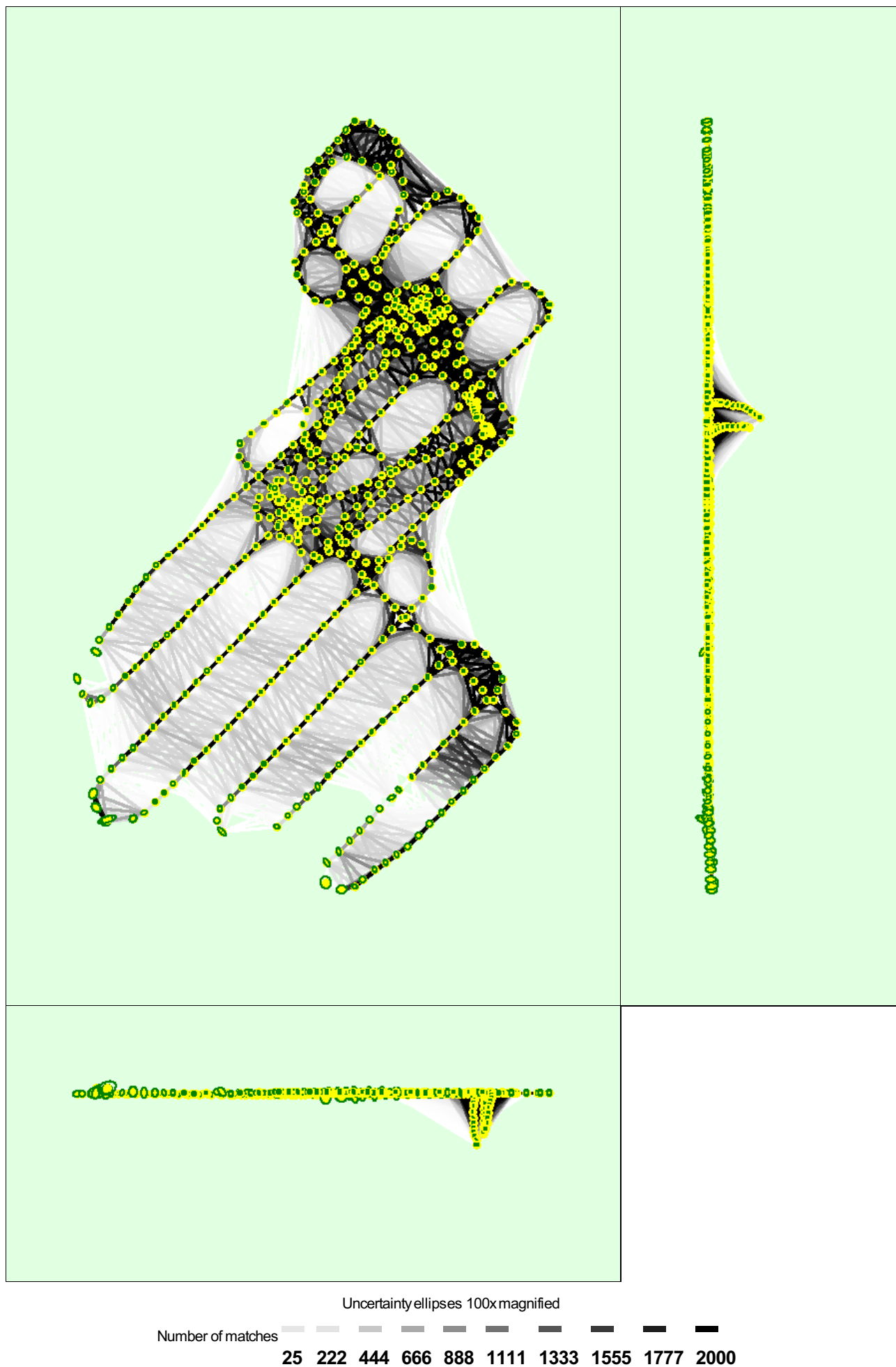


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty of the bundle block adjustment result.

? Relative camera position and orientation uncertainties



	X [US survey foot]	Y [US survey foot]	Z [US survey foot]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.047	0.050	0.059	0.012	0.013	0.006
Sigma	0.025	0.025	0.034	0.005	0.006	0.003

Geolocation Details



? Ground Control Points



GCP Name	Accuracy XYZ [US survey foot]	Error X [US survey foot]	Error Y [US survey foot]	Error Z [US survey foot]	Projection Error [pixel]	Verified/Marked
1 (3D)	0.020/ 0.020	0.009	0.009	-0.019	0.305	10 / 10
2 (3D)	0.020/ 0.020	-0.006	-0.018	0.030	0.363	10 / 10
3 (3D)	0.020/ 0.020	-0.003	0.000	-0.006	0.213	9 / 9
4 (3D)	0.020/ 0.020	-0.002	0.008	0.010	0.600	10 / 10
5 (3D)	0.020/ 0.020	0.004	-0.002	-0.014	0.363	10 / 10
6 (3D)	0.020/ 0.020	0.000	-0.014	-0.011	0.056	5 / 5
7 (3D)	0.020/ 0.020	-0.014	0.018	0.014	0.402	8 / 8
8 (3D)	0.020/ 0.020	-0.002	0.014	0.009	0.421	7 / 7
9 (3D)	0.020/ 0.020	0.010	-0.001	-0.003	0.179	7 / 7
10 (3D)	0.020/ 0.020	0.016	-0.030	-0.029	0.244	7 / 7
Mean [US survey foot]		0.001185	-0.001529	-0.001986		
Sigma [US survey foot]		0.008256	0.014480	0.016946		
RMS Error [US survey foot]		0.008340	0.014560	0.017062		

Localisation accuracy per GCP and mean errors in the three coordinate directions. The last column counts the number of calibrated images where the GCP has been automatically verified v.s. manually marked.

? Absolute Geolocation Variance



Mn Error [US survey foot]	Max Error [US survey foot]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-49.21	0.00	0.00	0.00
-49.21	-39.37	0.00	0.34	0.00
-39.37	-29.53	0.00	0.00	0.00
-29.53	-19.68	0.17	0.17	0.00
-19.68	-9.84	0.00	0.00	0.34
-9.84	0.00	66.11	31.21	72.48
0.00	9.84	33.39	68.29	26.17
9.84	19.69	0.00	0.00	1.01
19.69	29.53	0.17	0.00	0.00
29.53	39.37	0.00	0.00	0.00
39.37	49.21	0.00	0.00	0.00
49.21	-	0.17	0.00	0.00
Mean [US survey foot]		0.218259	-0.367036	-176.925280
Sigma [US survey foot]		3.047929	2.835048	1.977184
RMS Error [US survey foot]		3.055734	2.858708	176.936328

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.

Geolocation Bias	X	Y	Z
Translation [US survey foot]	0.216243	-0.365240	-176.924662

Bias between image initial and computed geolocation given in output coordinate system.

? Relative Geolocation Variance



Relative Geolocation Error	Images X[%]	Images Y[%]	Images Z[%]
[-1.00, 1.00]	99.50	99.50	100.00
[-2.00, 2.00]	99.83	99.66	100.00
[-3.00, 3.00]	99.83	100.00	100.00
Mean of Geolocation Accuracy [US survey foot]	16.404167	16.404167	32.808333
Sigma of Geolocation Accuracy [US survey foot]	0.000002	0.000002	0.000005

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

Geolocation Orientational Variance	RMS [degree]
Omega	0.722
Phi	0.738
Kappa	0.654

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: AMD Ryzen 7 1800X Eight-Core Processor RAM: 64GB GPU: NVIDIA GeForce GTX 1080 (Driver: 32.0.15.7216)
Operating System	Windows 10 Pro, 64-bit

Coordinate Systems



Image Coordinate System	WGS 84 (EGM96 Geoid)
Ground Control Point (GCP) Coordinate System	NAD83(2011) / New Hampshire (ftUS) (2D)
Output Coordinate System	NAD83(2011) / New Hampshire (ftUS) (2D)

Processing Options



Detected Template	No Template Available
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: 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
Mnimum Number of Matches	3
3D Textured Mesh Generation	no
LOD	Generated: no
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes
Time for Point Cloud Densification	01h:06m:16s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	NA

Results



Number of Generated Tiles	6
Number of 3D Densified Points	73393882
Average Density (per US survey foot ³)	12.55

DSM, Orthomosaic and Index Details



Processing Options



DSMand Orthomosaic Resolution	1 x GSD (1.83 [cm/pixel])
DSMFilters	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	28m:42s
Time for Orthomosaic Generation	51m:42s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s