Quality Report

> **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	plane 5
Processed	2016-04-18 12:25:28
Average Ground Sampling Distance (GSD)	2.23 cm / 0.88 in
Area Covered	0.1937 km^2 / 19.3683 ha / 0.0748 sq. mi. / 47.8848 acres
Time for Initial Processing (without report)	18m:39s

Quality Check

Images	median of 75977 keypoints per image	✓
Dataset	116 out of 118 images calibrated (98%), all images enabled	✓
Camera Optimization	4.48% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 27792.5 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	116 out of 118
Number of Geolocated Images	118 out of 118

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

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.

Overlap

Number of overlapping images: 1 2 3 4 5+

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	3159434
Number of 3D Points for Bundle Block Adjustment	1280985
Mean Reprojection Error [pixels]	0.160844

Internal Camera Parameters

DSC-WX500_4.1_4896x3672 (RGB). Sensor Dimensions: 5.979 [mm] x 4.484 [mm]

EXIF ID: DSC-WX500_4.1_4896x3672

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3357.257 [pixel] 4.100 [mm]	2448.000 [pixel] 2.990 [mm]	1836.000 [pixel] 2.242 [mm]	0.000	0.000	0.000	0.000	0.000
Optimized Values	3507.846 [pixel] 4.284 [mm]	2447.303 [pixel] 2.989 [mm]	1842.829 [pixel] 2.251 [mm]	0.013	0.017	-0.023	-0.000	-0.001

The number of Automatic Tie Points (ATPs) per pixel averaged over all images of the camera model is color coded between black and white. White indicates that, in average, more than 16 ATPs are extracted at this pixel location. Black indicates that, in average, 0 ATP has been extracted at this pixel location. Click on the image to the see the average direction and magnitude of the reprojection error for each pixel. Note that the vectors are scaled for better visualization.

2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	75977	27793
Min	22810	582
Max	87946	50139
Mean	70764	27237

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	930945
In 3 Images	217719
In 4 Images	73792
In 5 Images	29493
In 6 Images	14366
In 7 Images	7630
In 8 Images	3714
In 9 Images	1815
In 10 Images	869
In 11 Images	412
In 12 Images	147
In 13 Images	55
In 14 Images	21
In 15 Images	6
In 16 Images	1

2D Keypoint Matches

Number of matches   25   222   444   666   888   1111   1333   1555   1777   2000

Figure 5: Top view of the image computed positions with a link between matching 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

0 out of 116 geolocated and calibrated images have been labeled as inaccurate.

Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-15.00	2.59	25.00	3.45
-15.00	-12.00	2.59	3.45	2.59
-12.00	-9.00	4.31	0.00	0.00
-9.00	-6.00	13.79	3.45	0.00
-6.00	-3.00	20.69	0.86	0.00
-3.00	0.00	18.10	2.59	35.34
0.00	3.00	9.48	3.45	43.97
3.00	6.00	7.76	5.17	10.34
6.00	9.00	2.59	14.66	3.45
9.00	12.00	5.17	23.28	0.86
12.00	15.00	3.45	8.62	0.00
15.00	-	9.48	9.48	0.00
Mean [m]		-0.000000	-0.000000	0.000000
Sigma [m]		8.841426	15.282100	4.870985
RMS Error [m]		8.841426	15.282100	4.870985

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 intial 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]	46.55	10.34	93.97
[-2.00, 2.00]	75.86	39.66	99.14
[-3.00, 3.00]	87.93	65.52	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	10.252428
Phi	12.769448
Kappa	92.584911

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

Processing Options

Hardware	CPU: Intel(R) Core(TM) i7-4720HQ CPU @ 2.60GHz RAM: 16GB GPU: Intel(R) HD Graphics 4600 (Driver: 10.18.15.4256)
Operating System	Windows 10 Home, 64-bit
Camera Model Name	DSC-WX500_4.1_4896x3672 (RGB)
Image Coordinate System	WGS84 (egm96)
Output Coordinate System	WGS84 / UTM zone 12N (egm96)
Detected template:	3D Maps
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 yes

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, Maximum Number of Triangles: 1000000, Texture Size: 8192x8192
Advanced: Matching Window Size	7x7 pixels
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes

Advanced: Use Annotations	yes
Advanced: Limit Camera Depth Automatically	no
Time for Point Cloud Densification	25m:54s
Time for 3D Textured Mesh Generation	08m:20s

Results   ⓘ

Number of Generated Tiles	1
Number of 3D Densified Points	18270330
Average Density (per m^3)	201.69