



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	ir
Processed	2020-04-27 15:13:00
Camera Model Name(s)	FC2403_0.0_640x480 IR (ir)
Average Ground Sampling Distance (GSD)	9.30 cm / 3.66 in
Area Covered	0.041 km ² / 4.1192 ha / 0.02 sq. mi. / 10.1841 acres

Quality Check



Images	median of 9141 keypoints per image	
Dataset	129 out of 151 images calibrated (85%), all images enabled, 2 blocks	
Camera Optimization	55.2% relative difference between initial and optimized internal camera parameters	
Matching	median of 2780.6 matches per calibrated image	
Georeferencing	yes, no 3D GCP	

Preview

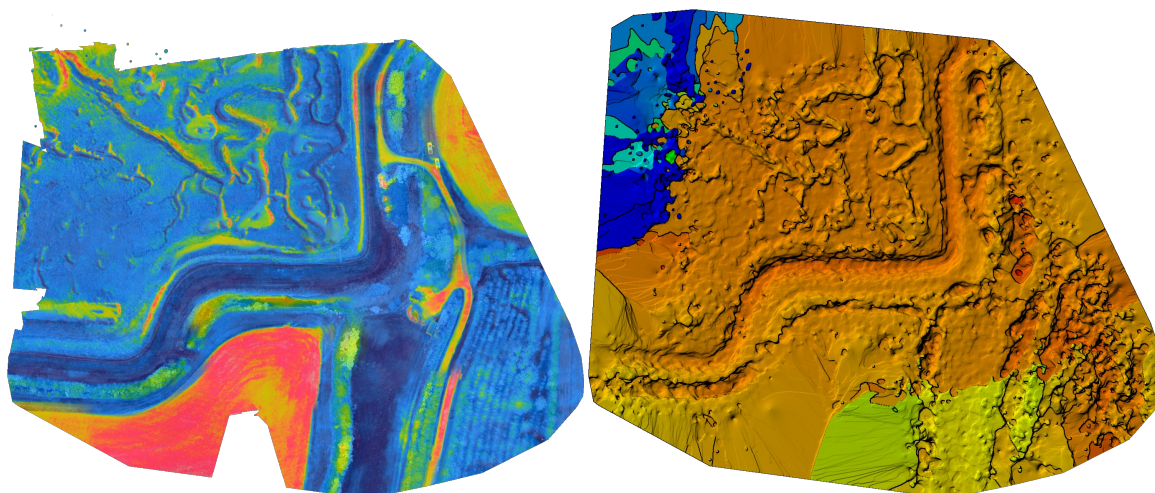


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details



Number of Calibrated Images	129 out of 151
Number of Geolocated Images	151 out of 151

? Initial Image Positions

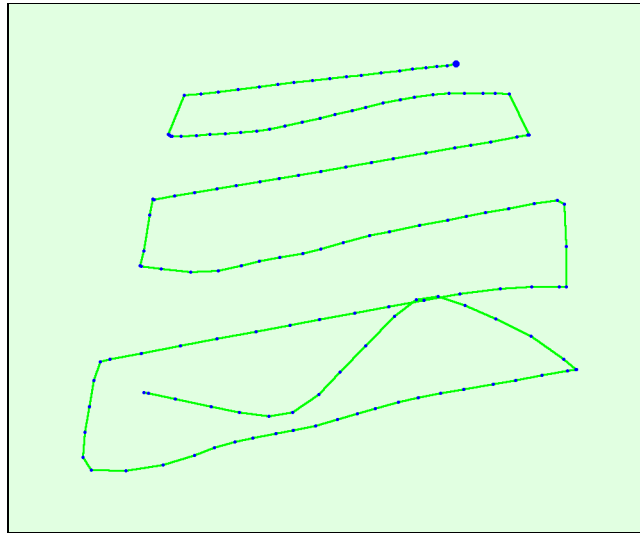
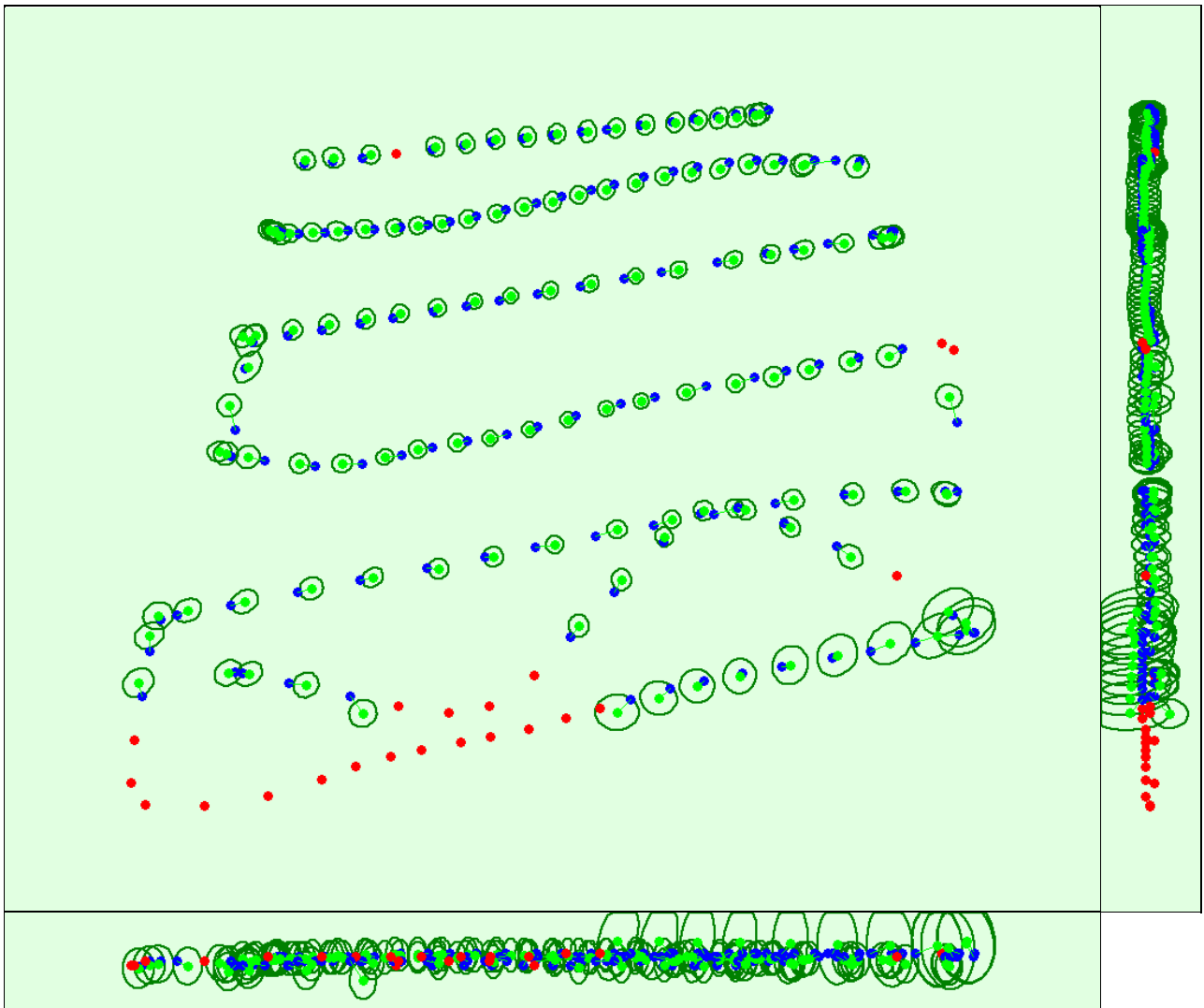


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

? Computed Image/GCPs/Manual Tie Points Positions



Uncertainty ellipses 10x 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	0.288	0.278	0.466	0.146	0.149	0.132
Sigma	0.099	0.085	0.178	0.027	0.021	0.027

🔍 Overlap

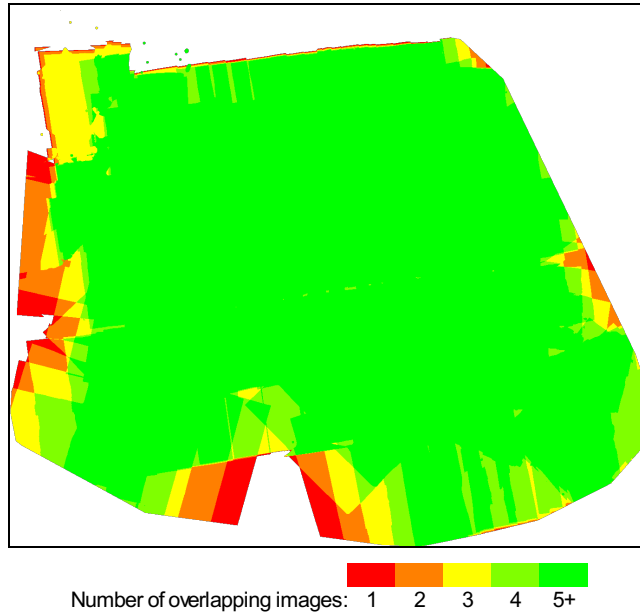


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint 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	362466
Number of 3D Points for Bundle Block Adjustment	135089
Mean Reprojection Error [pixels]	0.310

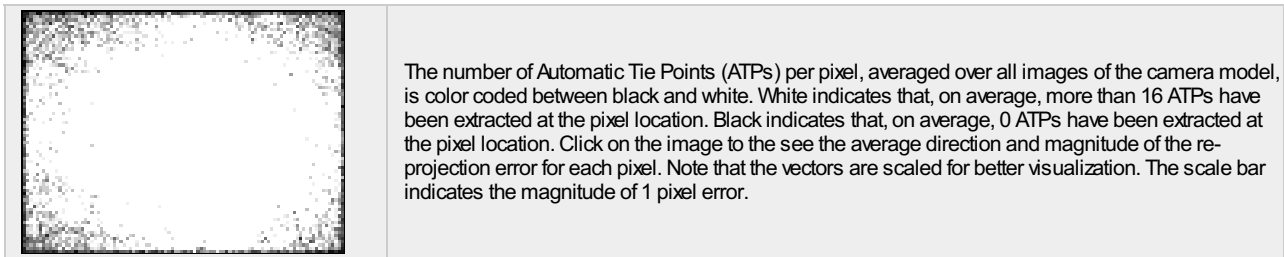
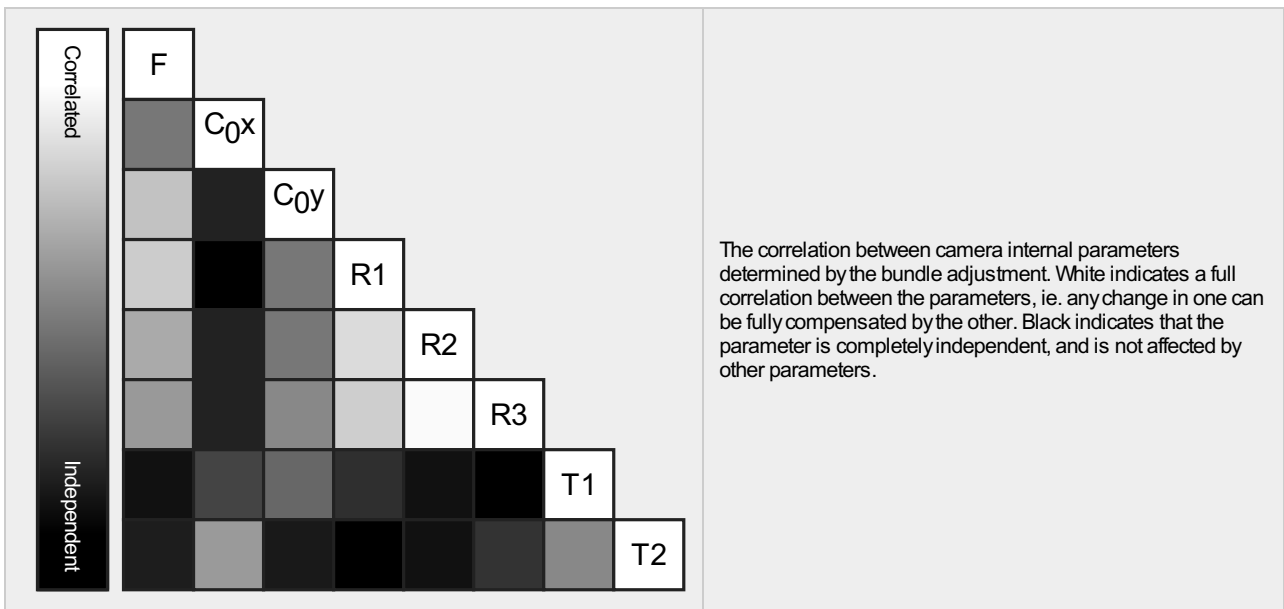
🔍 Internal Camera Parameters

📷 FC2403_0.0_640x480 IR (ir). Sensor Dimensions: 7.680 [mm] x 5.760 [mm]



EXIF ID: FC2403_0.0_640x480

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	1666.670 [pixel] 20.000 [mm]	319.999 [pixel] 3.840 [mm]	240.000 [pixel] 2.880 [mm]	0.000	0.000	0.000	0.000	0.000
Optimized Values	746.624 [pixel] 8.959 [mm]	322.446 [pixel] 3.869 [mm]	245.219 [pixel] 2.943 [mm]	-0.022	0.021	0.056	0.000	-0.002
Uncertainties (Sigma)	3.450 [pixel] 0.041 [mm]	0.220 [pixel] 0.003 [mm]	0.324 [pixel] 0.004 [mm]	0.002	0.014	0.035	0.000	0.000



2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	9141	2781
Mn	8349	586
Max	10249	5283
Mean	9234	2810

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	91166
In 3 Images	23617
In 4 Images	9369
In 5 Images	4543
In 6 Images	2324
In 7 Images	1458
In 8 Images	963
In 9 Images	617
In 10 Images	422
In 11 Images	255
In 12 Images	161
In 13 Images	81
In 14 Images	58
In 15 Images	32
In 16 Images	13
In 17 Images	7
In 18 Images	1
In 19 Images	2

2D Keypoint Matches

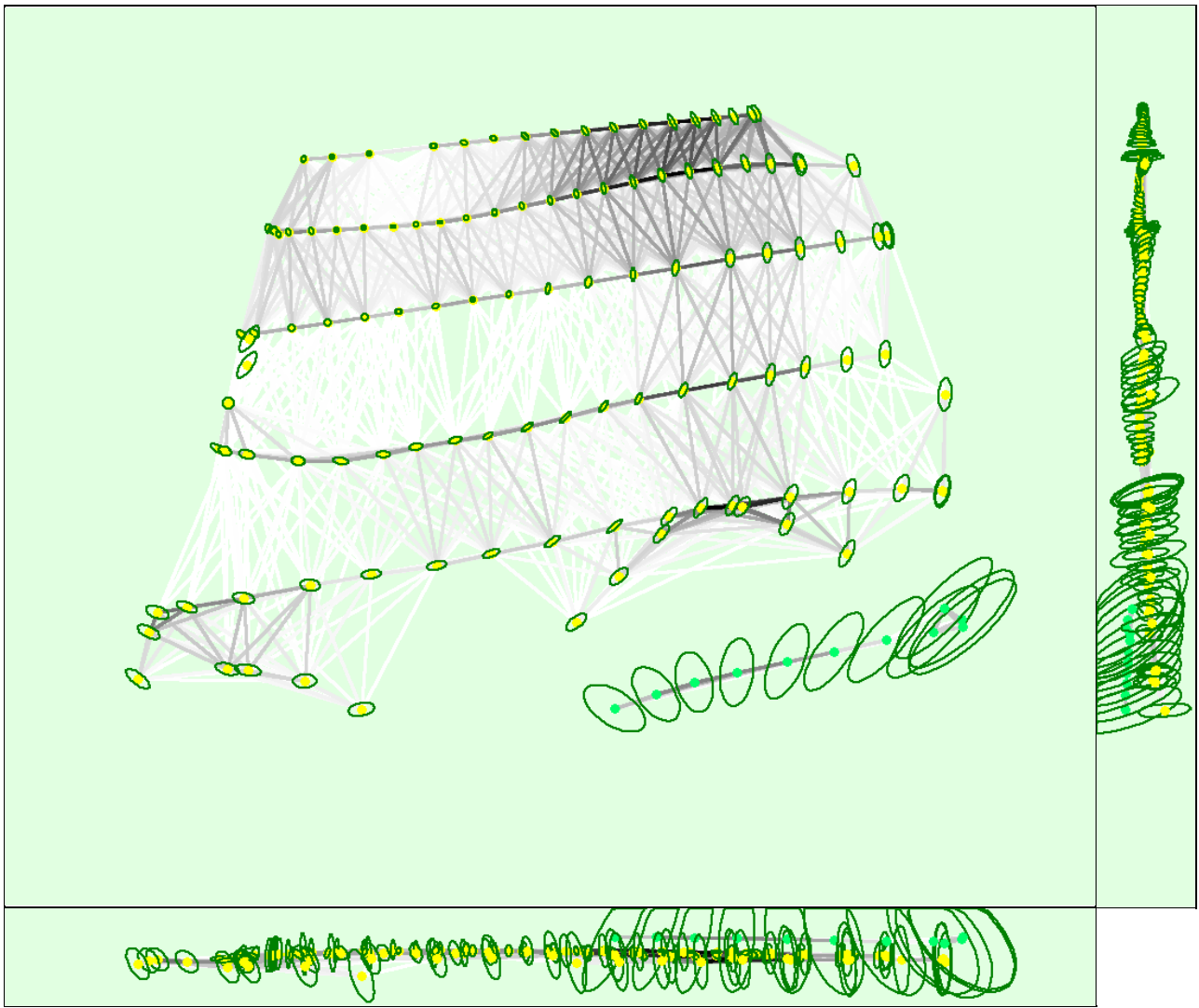


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty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

Relative camera position and orientation uncertainties

	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.210	0.244	0.427	0.508	0.272	0.157
Sigma	0.246	0.259	0.365	0.095	0.135	0.032

Geolocation Details

Absolute Geolocation Variance

Mn 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	0.00	1.55	0.00
-6.00	-3.00	13.18	2.33	1.55

-3.00	0.00	35.66	41.86	44.96
0.00	3.00	39.53	52.71	52.71
3.00	6.00	10.85	1.55	0.78
6.00	9.00	0.78	0.00	0.00
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]		0.080815	-0.026552	-0.015898
Sigma [m]		2.633656	1.428303	1.342720
RMS Error [m]		2.634895	1.428550	1.342814

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]	96.12	98.45	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	1.777
Phi	2.641
Kappa	9.985

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) i7-6700 CPU @ 3.40GHz RAM: 16GB GPU: NVIDIA GeForce GTX 1070 (Driver: 26.21.14.4575), Intel(R) HD Graphics 530 (Driver: 26.20.100.7263)
Operating System	Windows 10 Home, 64-bit

Coordinate Systems

Image Coordinate System	WGS 84 (EGM96 Geoid)
Output Coordinate System	WGS 84 / UTMzone 31N (EGM96 Geoid)

Processing Options

Detected Template	No Template Available
Keypoints Image Scale	Full, Image Scale: 2
Advanced: Matching Image Pairs	Aerial Grid or Corridor
Advanced: Matching Strategy	Use Geometrically Verified Matching: yes
Advanced: Keypoint Extraction	Targeted Number of Keypoints: Automatic

Advanced: Calibration

Calibration Method: Alternative
Internal Parameters Optimization: All
External Parameters Optimization: All
Rematch: Auto, yes

Point Cloud Densification details



Processing Options



Image Scale	multiscale, 1 (Original image size, Slow)
Point Density	Optimal
Minimum Number of Matches	3
3D Textured Mesh Generation	no
LOD	Generated: no
Advanced: Image Groups	Thermal IR
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes

Results



Number of Generated Tiles	1
Number of 3D Densified Points	916339
Average Density (per m ³)	12.06

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (9.3 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no
Index Calculator: Reflectance Map	Generated: yes Resolution: 1 x GSD (9.3 [cm/pixel]) Merge Tiles: no