

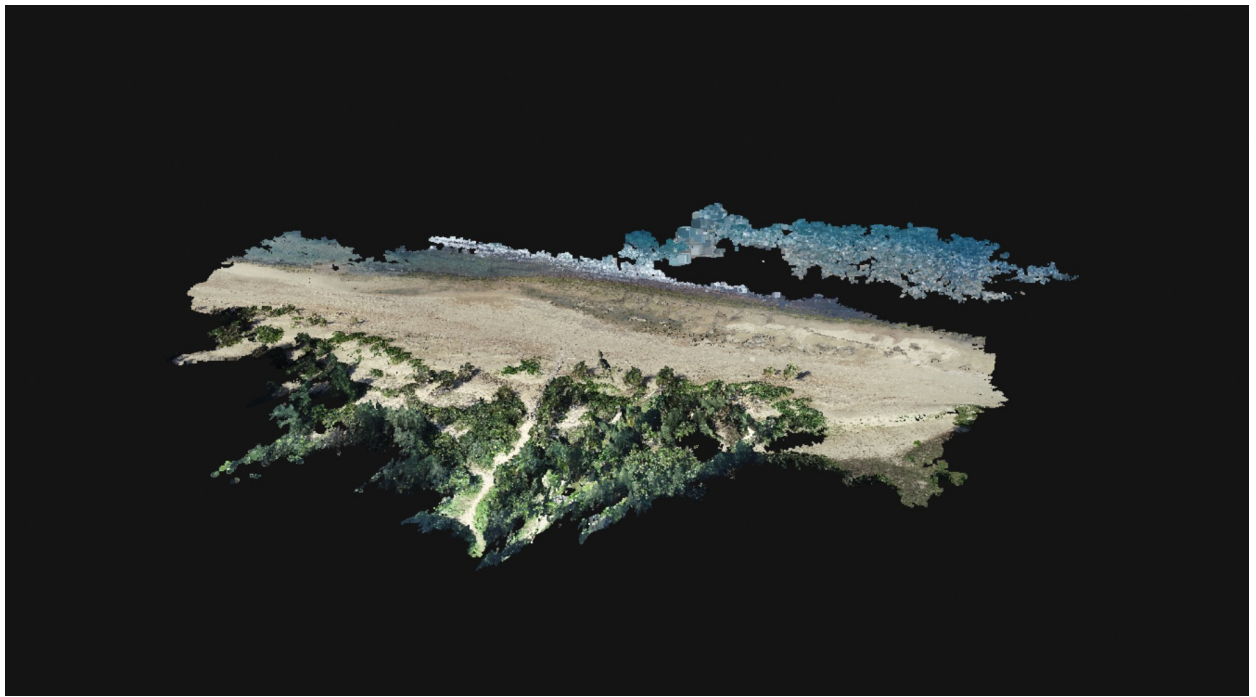
Finca Nolla Duna de Bobby Post, Camuy
January 10, 2023.



Centroid coordinates : 18.48926° N 66.84520° W

3D map

Finca Nolla Duna de Bobby Post, Camuy



2D map



Total area of site = 4.95514 ha

Beach length (m)

Finca Nolla Duna de Bobby Post, Camuy



Beach length = 329.248 m

Density surface model
Finca Nolla Duna de Bobby Post, Camuy



Area of the beach

Finca Nolla Duna de Bobby Post, Camuy



Area of the beach = 1.29465 ha

Beach volume

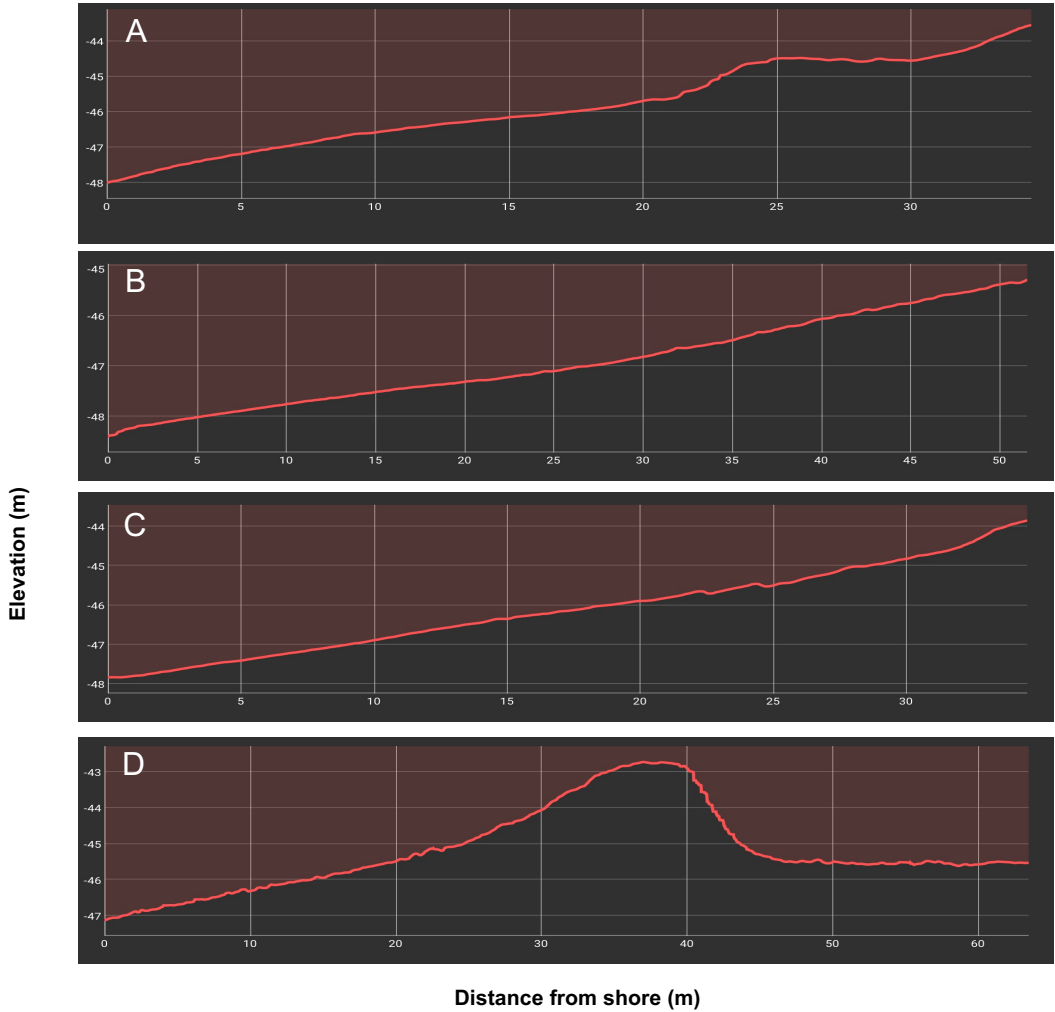
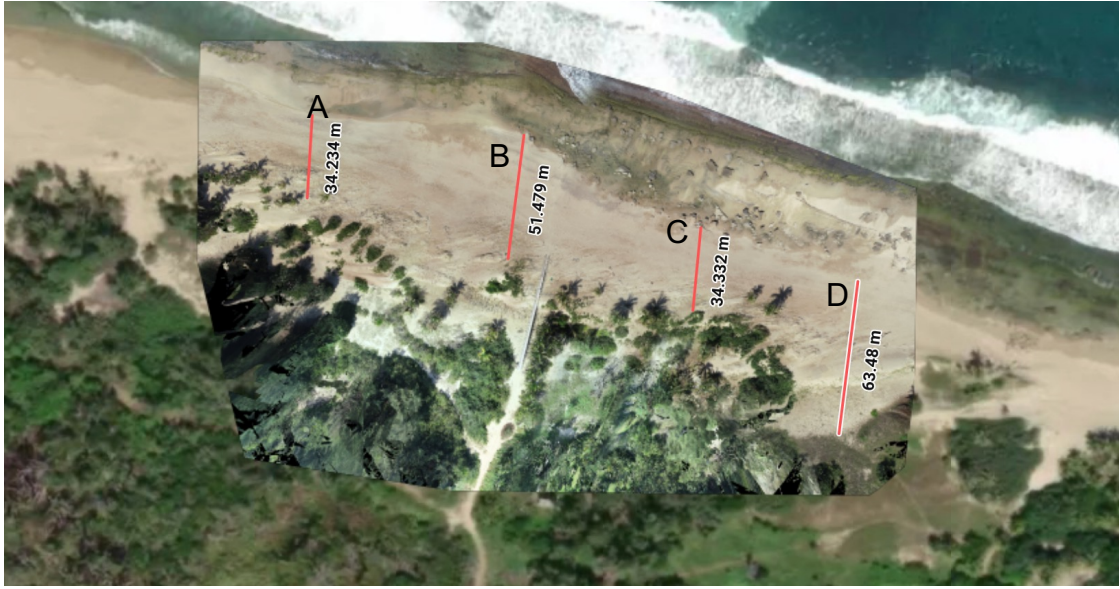
Finca Nolla Duna de Bobby Post, Camuy



Cut = 0.00 m³
Fill = -593,175 m³
Volume Dif. = -593,175 m³

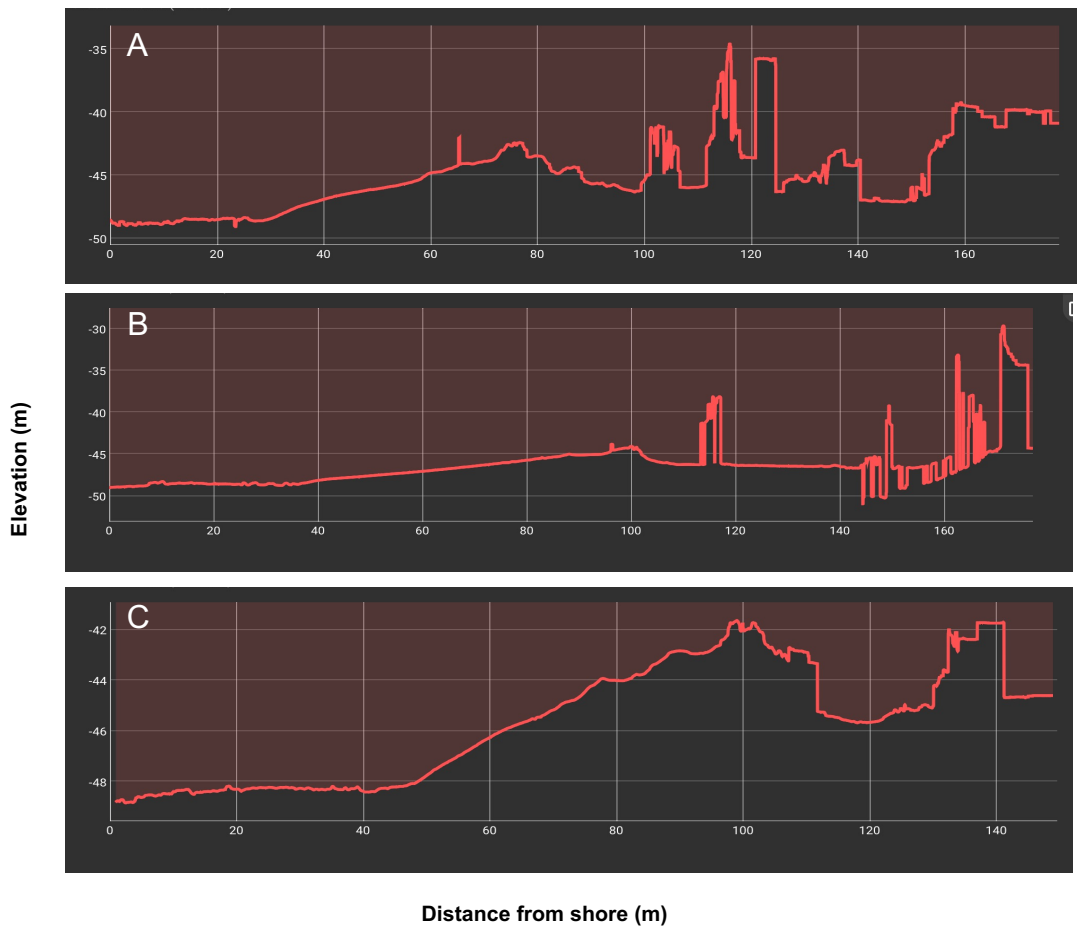
Beach elevation

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Site elevation (m)

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Dune height (m)

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Dune height

A = 1.76758 ha

Dune width (m)

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Dune width

A = 65.586 m

B = 72.834 m

C = 61.105 m

D = 78.717 m

Area and perimeter of dune

Finca Nolla Duna de Bobby Post, Camuy



Area and perimeter of dune

2D area = 1.76758 ha

3D area = 1.76758 ha

2D perimeter = 804.83 m

3D perimeter = 804.83 m

Elevation difference = 0.00 m

Volume of dune

Finca Nolla Duna de Bobby Post, Camuy



Base surface	Triangulated
Cut volume	0.00 m ³
Cut error	0.00 m ³
Fill volume	-776,449 m ³
Fill error	2,978.35 m ³
Volume difference	-776,449 m ³

Shoreline

Finca Nolla Duna de Bobby Post, Camuy



Shoreline length = 345.215 m

Shoreline geolocation

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Shoreline markers

A = 18.49005° N 66.84620° W

B = 18.48986° N 66.84566° W

C = 18.48974° N 66.84508° W

D = 18.48947° N 66.84461° W

E = 18.48933° N 66.84403° W

Shoreline extension

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Shoreline extension

A = 0.117 m

B = 0.0860 m

C = 0.0340 m

Shoreline position

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Shoreline position

A = 20.157 m

B = 29.166 m

C = 35.123 m

Area of dune breaches

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Area of dune breaches

Breach = 1.76758 ha

Quality Report



Generated with Pix4Denterprise version 4.8.2
Preview

- 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	198004-Project-2023-01-11T00:02:24.878Z
Processed	2023-01-11 01:35:03
Camera Model Name(s)	FC6310R_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.41 cm / 0.55 in
Area Covered	0.049 km ² / 4.8625 ha / 0.02 sq. mi. / 12.0218 acres
Time for Initial Processing (without report)	01h:13m:15s

Quality Check

Images	median of 55396 keypoints per image	✓
Dataset	388 out of 401 images calibrated (96%), all images enabled, 5 blocks	⚠
Camera Optimization	0.15% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 23253.4 matches per calibrated image	✓
Georeferencing	yes, no 3D GCP	⚠

Preview

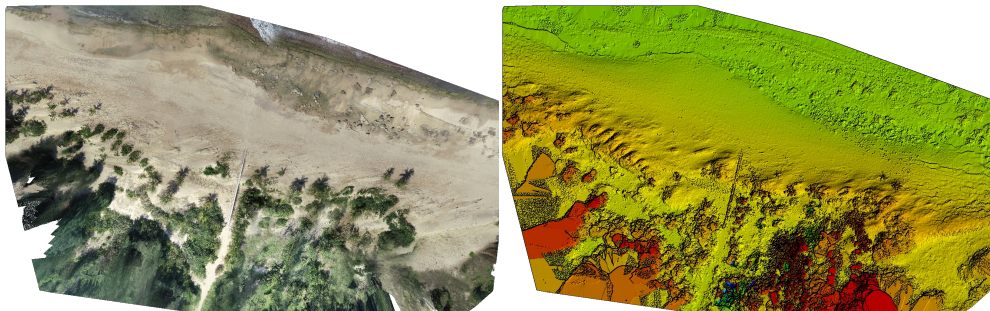


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details

Number of Calibrated Images	388 out of 401
Number of Geolocated Images	401 out of 401

Initial Image Positions

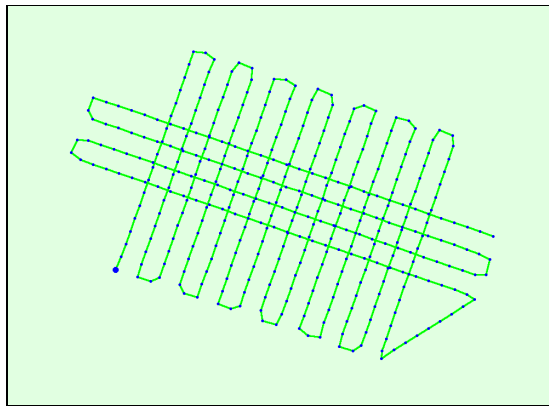
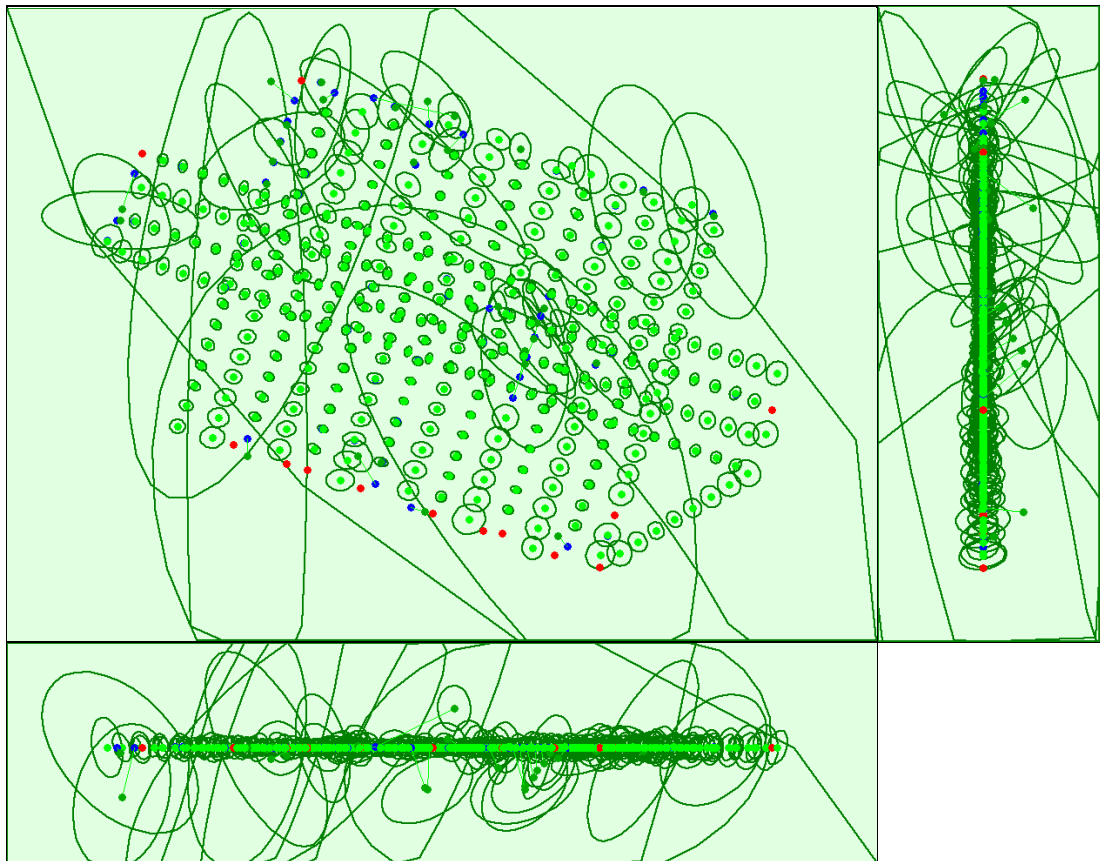


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions



Uncertainty ellipses 1000x magnified

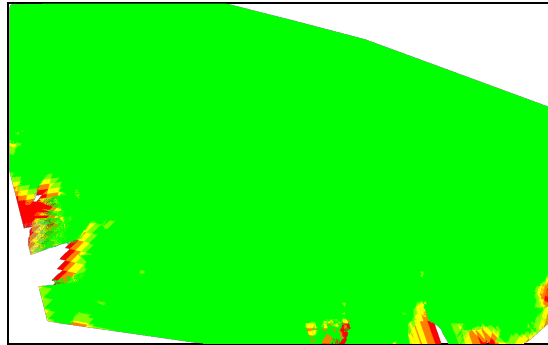
Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Red dots indicate disabled 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	0.004	0.004	0.004	0.009	0.007	0.009

Sigma	0.016	0.020	0.011	0.029	0.017	0.037
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Overlap i



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 i

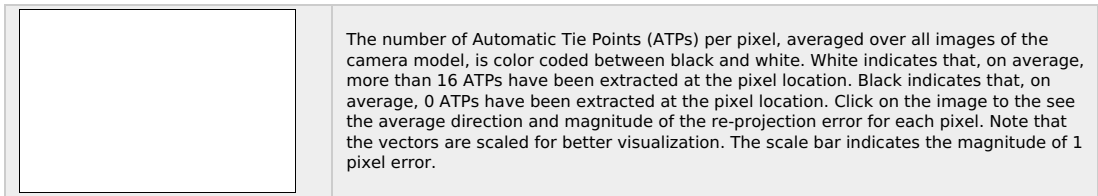
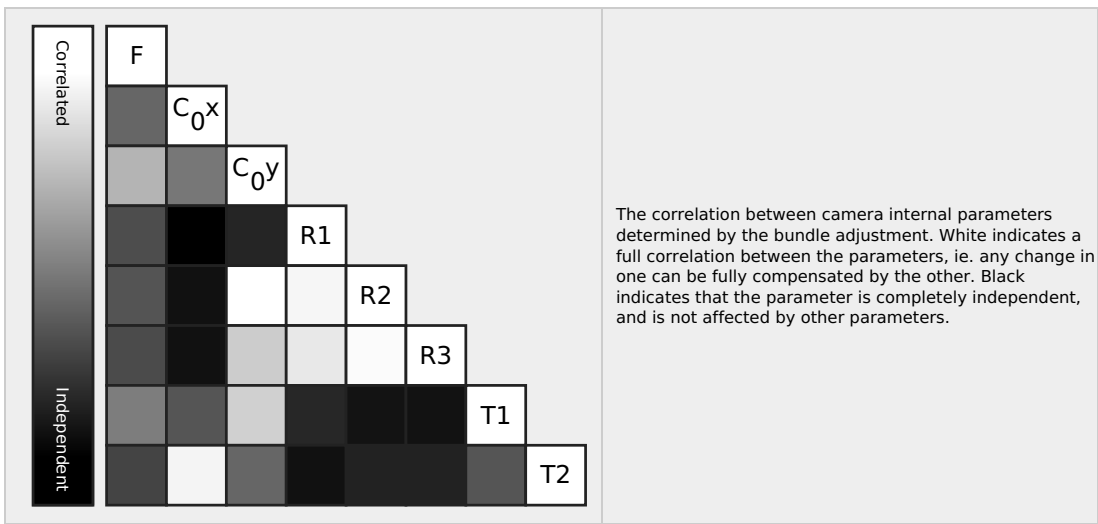
Number of 2D Keypoint Observations for Bundle Block Adjustment	7953168
Number of 3D Points for Bundle Block Adjustment	2765804
Mean Reprojection Error [pixels]	0.166

Internal Camera Parameters

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

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	3652.734 [pixel] 8.567 [mm]	2735.905 [pixel] 6.416 [mm]	1821.756 [pixel] 4.273 [mm]	-0.001	-0.011	0.012	-0.000	-0.001
Uncertainties (Sigma)	0.068 [pixel] 0.000 [mm]	0.101 [pixel] 0.000 [mm]	0.121 [pixel] 0.000 [mm]	0.000	0.000	0.000	0.000	0.000



2D Keypoints Table

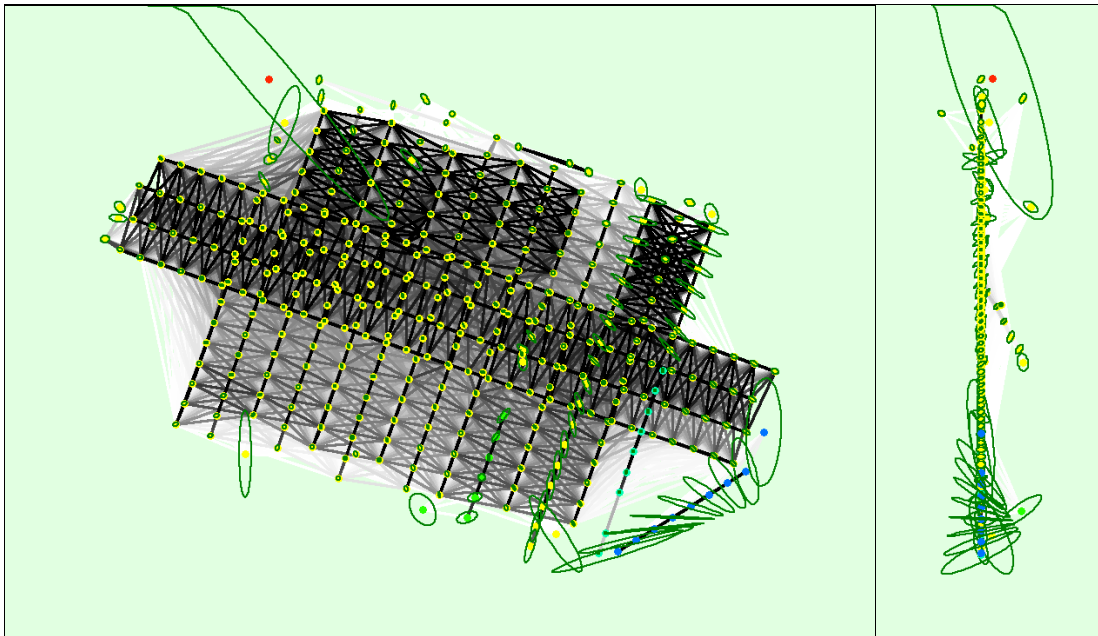
	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	55396	23253
Min	36697	122
Max	79926	33429
Mean	57131	20498

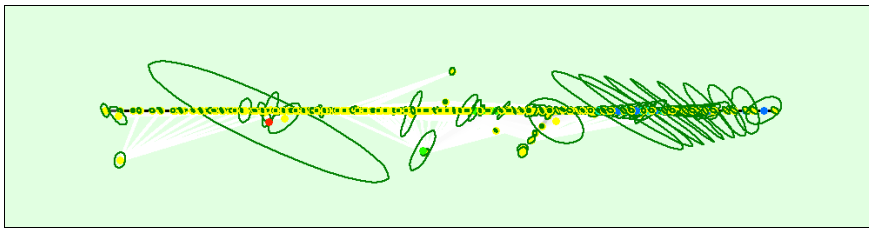
3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	1747622
In 3 Images	497762
In 4 Images	218810
In 5 Images	115369
In 6 Images	67237
In 7 Images	40210
In 8 Images	25559
In 9 Images	16128
In 10 Images	10769
In 11 Images	7299
In 12 Images	5144
In 13 Images	3550
In 14 Images	2487
In 15 Images	1736
In 16 Images	1364
In 17 Images	1084
In 18 Images	761
In 19 Images	617
In 20 Images	457
In 21 Images	390
In 22 Images	298
In 23 Images	228

In 24 Images	186
In 25 Images	138
In 26 Images	106
In 27 Images	92
In 28 Images	71
In 29 Images	51
In 30 Images	45
In 31 Images	37
In 32 Images	29
In 33 Images	30
In 34 Images	21
In 35 Images	15
In 36 Images	17
In 37 Images	17
In 38 Images	8
In 39 Images	8
In 40 Images	8
In 41 Images	9
In 42 Images	2
In 43 Images	4
In 44 Images	4
In 45 Images	6
In 46 Images	2
In 47 Images	2
In 48 Images	1
In 49 Images	3
In 50 Images	2
In 52 Images	2
In 53 Images	1
In 54 Images	1
In 55 Images	2
In 56 Images	2
In 82 Images	1

2D Keypoint Matches





Uncertainty ellipses 100x magnified

Number of matches

25 222 444 666 888 1111 1333 1555 1777 2000

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	0.010	0.010	0.009	0.023	0.019	0.020
Sigma	0.023	0.024	0.015	0.060	0.042	0.054

Geolocation Details

Absolute Geolocation Variance

Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-0.80	0.00	0.00	0.00
-0.80	-0.64	0.00	0.00	0.00
-0.64	-0.48	0.00	0.00	0.00
-0.48	-0.32	0.00	0.00	0.00
-0.32	-0.16	0.00	0.00	0.00
-0.16	0.00	53.35	47.49	41.90
0.00	0.16	46.65	52.51	58.10
0.16	0.32	0.00	0.00	0.00
0.32	0.48	0.00	0.00	0.00
0.48	0.64	0.00	0.00	0.00
0.64	0.80	0.00	0.00	0.00
0.80	-	0.00	0.00	0.00
Mean [m]		0.000462	0.000530	0.000208
Sigma [m]		0.014928	0.013959	0.027302
RMS Error [m]		0.014935	0.013969	0.027303

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]	84.08	81.01	75.14
[-2.00, 2.00]	96.65	96.09	94.13
[-3.00, 3.00]	99.16	98.04	98.04
Mean of Geolocation Accuracy [m]	0.017513	0.017513	0.031164

Sigma of Geolocation Accuracy [m]	0.029759	0.029759	0.053603
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Images X, Y, Z represent the percentage of images with a relative geolocation error in X, Y, Z.

Geolocation Orientational Variance	RMS [degree]
Omega	2.071
Phi	4.313
Kappa	4.801

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) Xeon(R) Platinum 8124M CPU @ 3.00GHz RAM: 69GB GPU: no info (Driver: unknown)
Operating System	Linux 5.15.0-1026-aws x86_64

Coordinate Systems

Image Coordinate System	WGS 84
Output Coordinate System	WGS 84 / UTM zone 19N

Processing Options

Detected Template	 cloud-3d-maps-1*
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
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	19m:32s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	08m:35s

Results



Number of Generated Tiles	1
Number of 3D Densified Points	32208516
Average Density (per m ³)	1225.17

DSM, Orthomosaic and Index Details



Processing Options



DSM and Orthomosaic Resolution	1 x GSD (1.41 [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	08m:16s
Time for Orthomosaic Generation	21m:35s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s

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