Villa Pesquera Post, Camuy
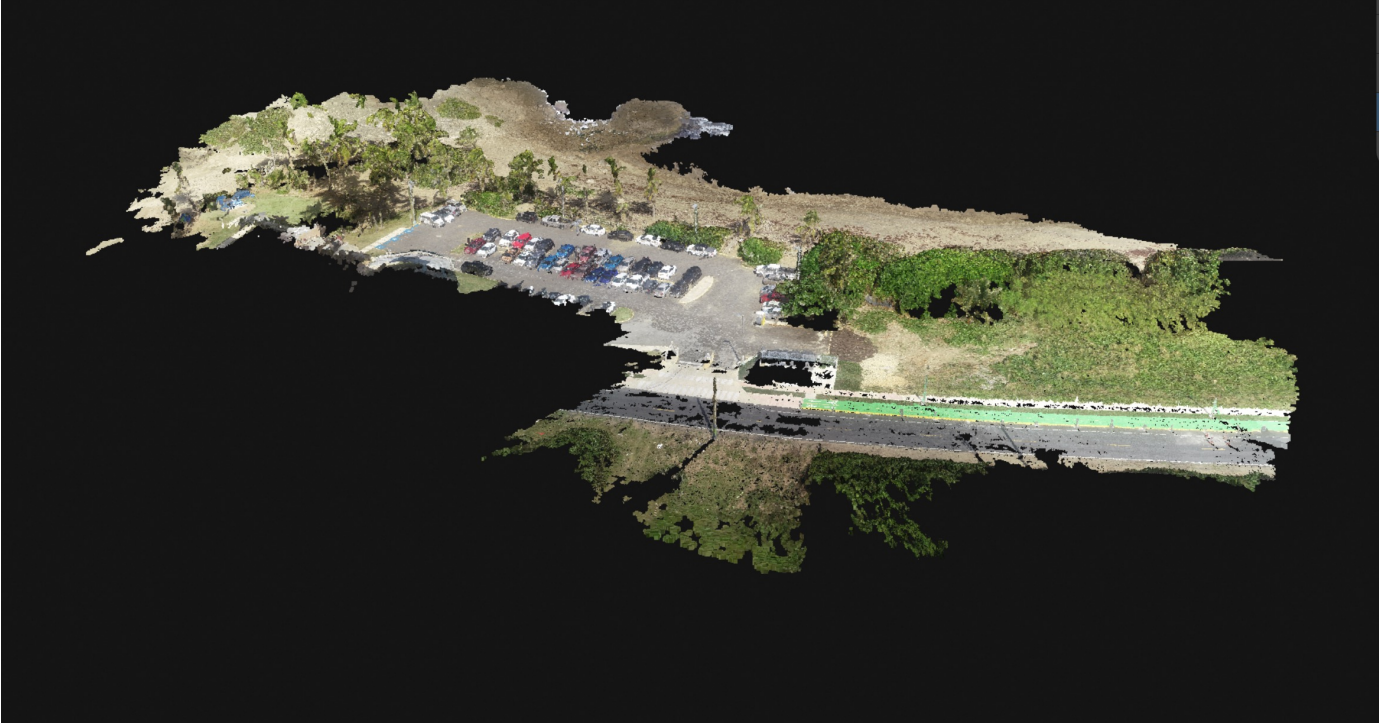December 21, 2022.

2.19857 ha

Centroid coordinates : 18.49095° N 66.86601° W

3D map
Villa Pesquera Post, Camuy
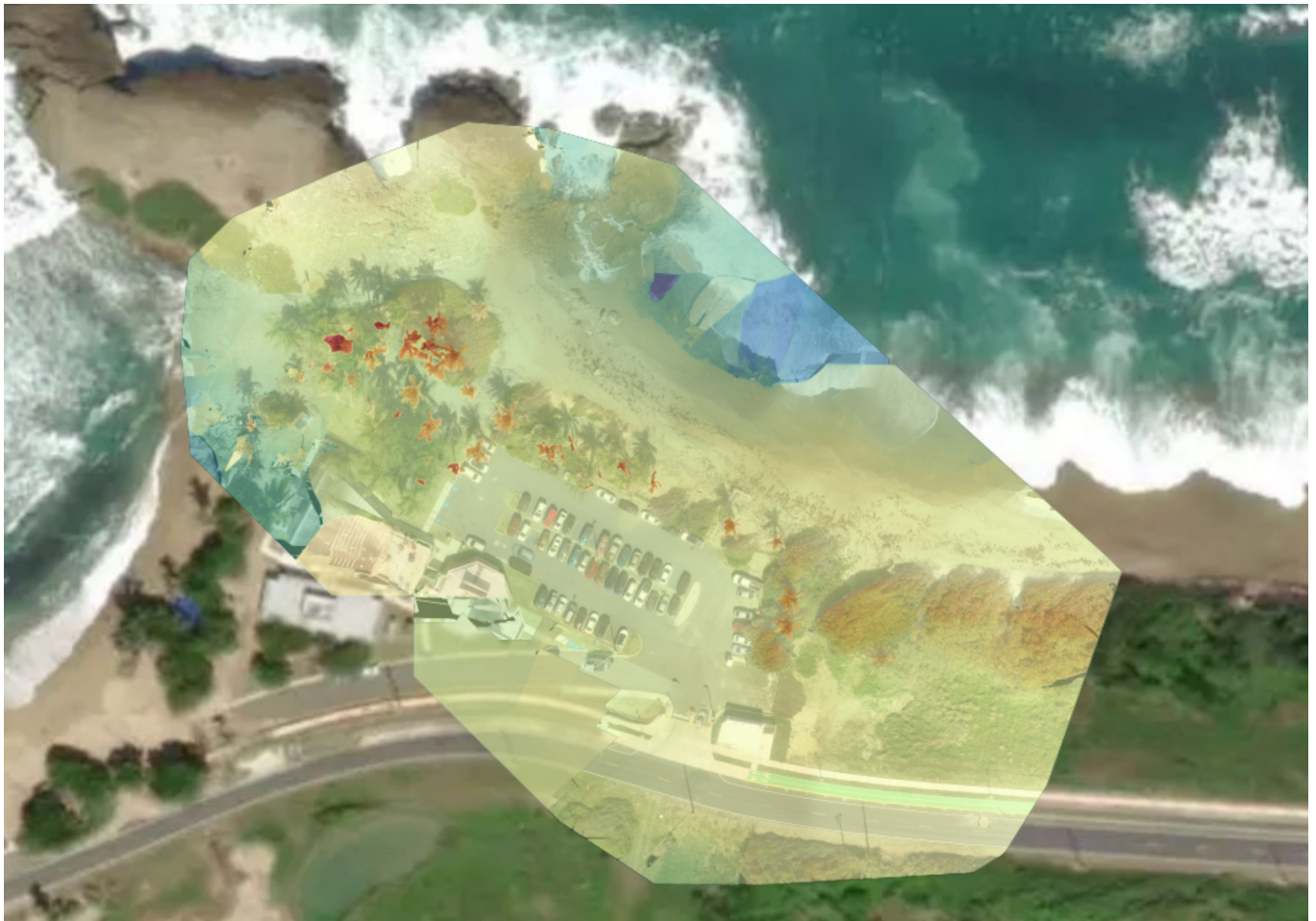

2D map

Total area of site = 2.19857 ha

Beach length (m)
Villa Pesquera Post, Camuy

Beach length = 166.853 m

Density surface model
Villa Pesquera Post, Camuy

Area of the beach
Villa Pesquera Post, Camuy

5,860.72 m²
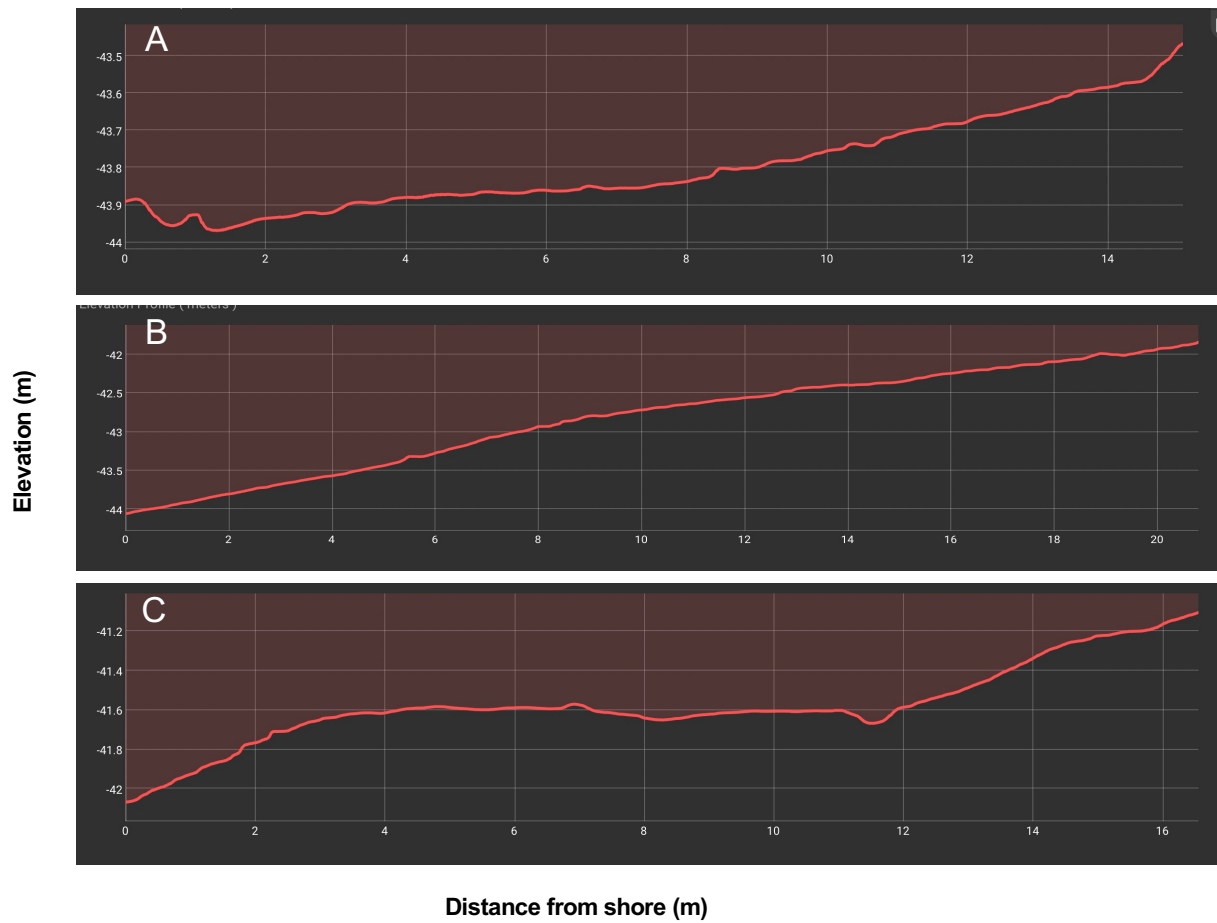
Area of the beach = 5,860.72 m²

Beach volume
Villa Pesquera Post, Camuy

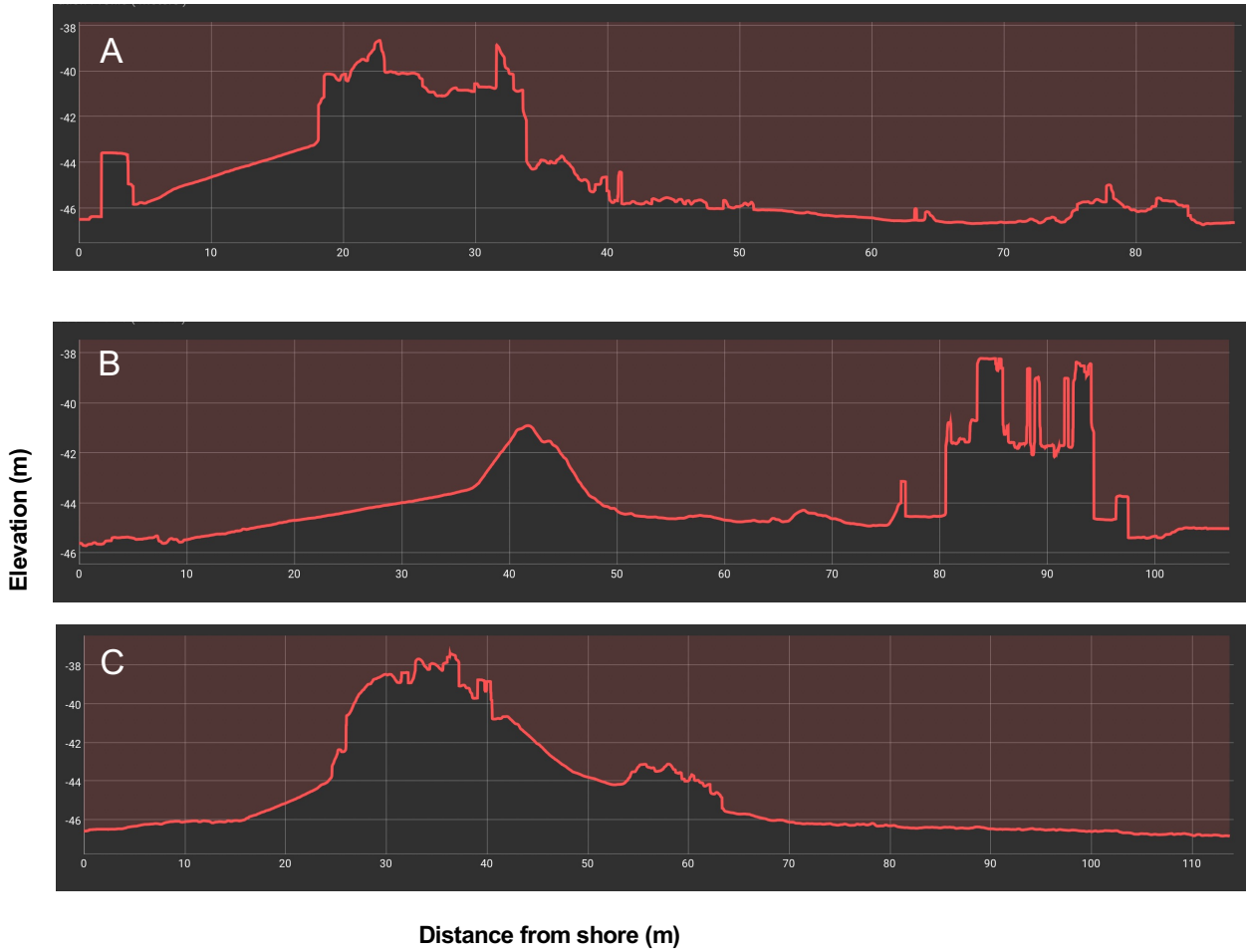> **Cut** = 0.00 m³
> **Fill** = -248,763 m³
> **Volume Dif.** = -248,763 m³

Beach elevation
Villa Pesquera Post, Camuy

Elevation (m)

Distance from shore (m)

Site elevation (m)
Villa Pesquera Post, Camuy

Dune height (m)
Villa Pesquera Post, Camuy
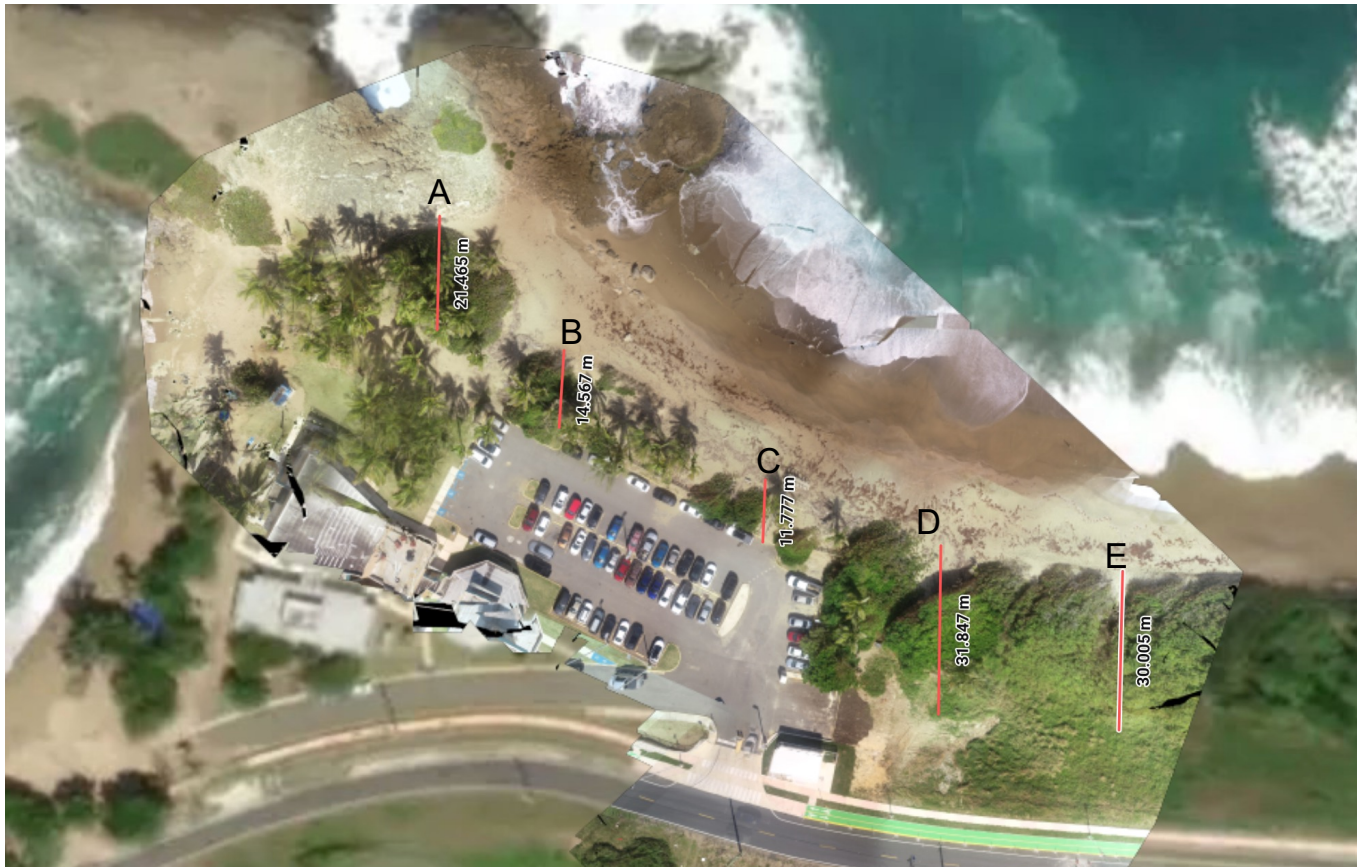
Dune height

A = 7.075 m
B = 8.019 m
C = 0.551 m
D = 0.220 m
E = 0.742 m

Dune width (m)
Villa Pesquera Post, Camuy

Dune width
A =21.465 m
B =14.567 m
C =11.777 m
D =31.847 m
E =30.005 m

Area and perimeter of dune
Villa Pesquera Post, Camuy

Area and perimeter of dune

2D area = 30.005 m
3D area = 30.015 m
2D perimeter = -41.335 m
3D perimeter = -40.593 m
Elevation difference = 0.742 m

Volume of dune
Villa Pesquera Post, Camuy

Base surface	Triangulated
Cut volume	6,846.33 m³
Cut error	157.089 m³
Fill volume	-316.598 m³
Fill error	47.4155 m³
Volume difference	6,529.73 m³

Shoreline
Villa Pesquera Post, Camuy

166.604 m

Shoreline length = 166.604 m

Shoreline geolocation
Villa Pesquera Post, Camuy

Shoreline markers

A = 18.49166° N 66.86634° W
B = 18.49140° N 66.86623° W
C = 18.49119° N 66.86598° W
D = 18.49107° N 66.86565° W
E = 18.49095° N 66.86535° W

Shoreline extension
Villa Pesquera Post, Camuy

Shoreline extension

A = 17.305 m
B = 16.609 m
C = 15.818 m
D = 14.614 m

Shoreline position
Villa Pesquera Post, Camuy

Shoreline position
A = 17.702 m
B = 24.796 m
C = 18.91 m
D = 18.262 m

Area of dune breaches
Villa Pesquera Post, Camuy

Cut: 6,846.33 m³
Fill: -316.598 m³
Volume Dif.: 6,529.73 m³

Area of dune breaches
Breach = 3,233.83 m²

Quality Report

⚠ **Important**: Click on the different icons for:

❓ Help to analyze the results in the Quality Report

ℹ Additional information about the sections

💡 Click here for additional tips to analyze the Quality Report

Summary ℹ

Project	196444-Project-2022-12-21T19:13:40.709Z
Processed	2022-12-21 19:49:25
Camera Model Name(s)	FC6310R_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.05 cm / 0.41 in
Area Covered	0.022 km^2 / 2.1803 ha / 0.01 sq. mi. / 5.3904 acres
Time for Initial Processing (without report)	21m:53s

Quality Check ℹ

❓ **Images**	median of 50261 keypoints per image	✅
❓ **Dataset**	151 out of 279 images calibrated (54%), all images enabled, 3 blocks	🔺
❓ **Camera Optimization**	0.16% relative difference between initial and optimized internal camera parameters	✅
❓ **Matching**	median of 12518.2 matches per calibrated image	✅
❓ **Georeferencing**	yes, no 3D GCP	⚠

❓ **Preview** ℹ

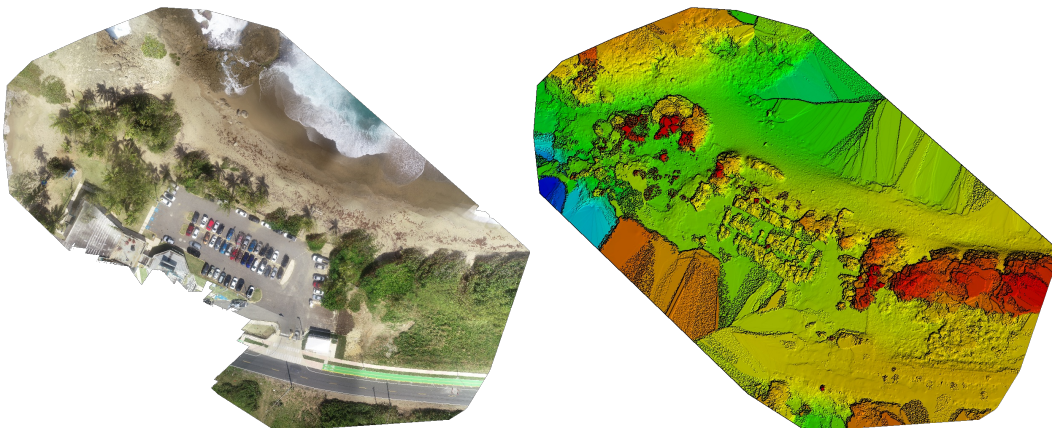**Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.**

Calibration Details ℹ

Number of Calibrated Images	151 out of 279
Number of Geolocated Images	279 out of 279

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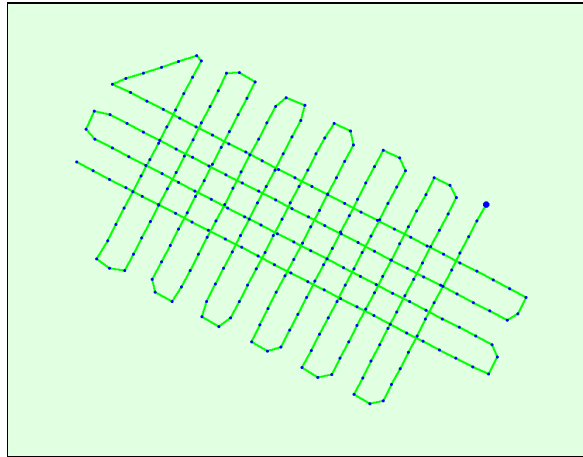
Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions
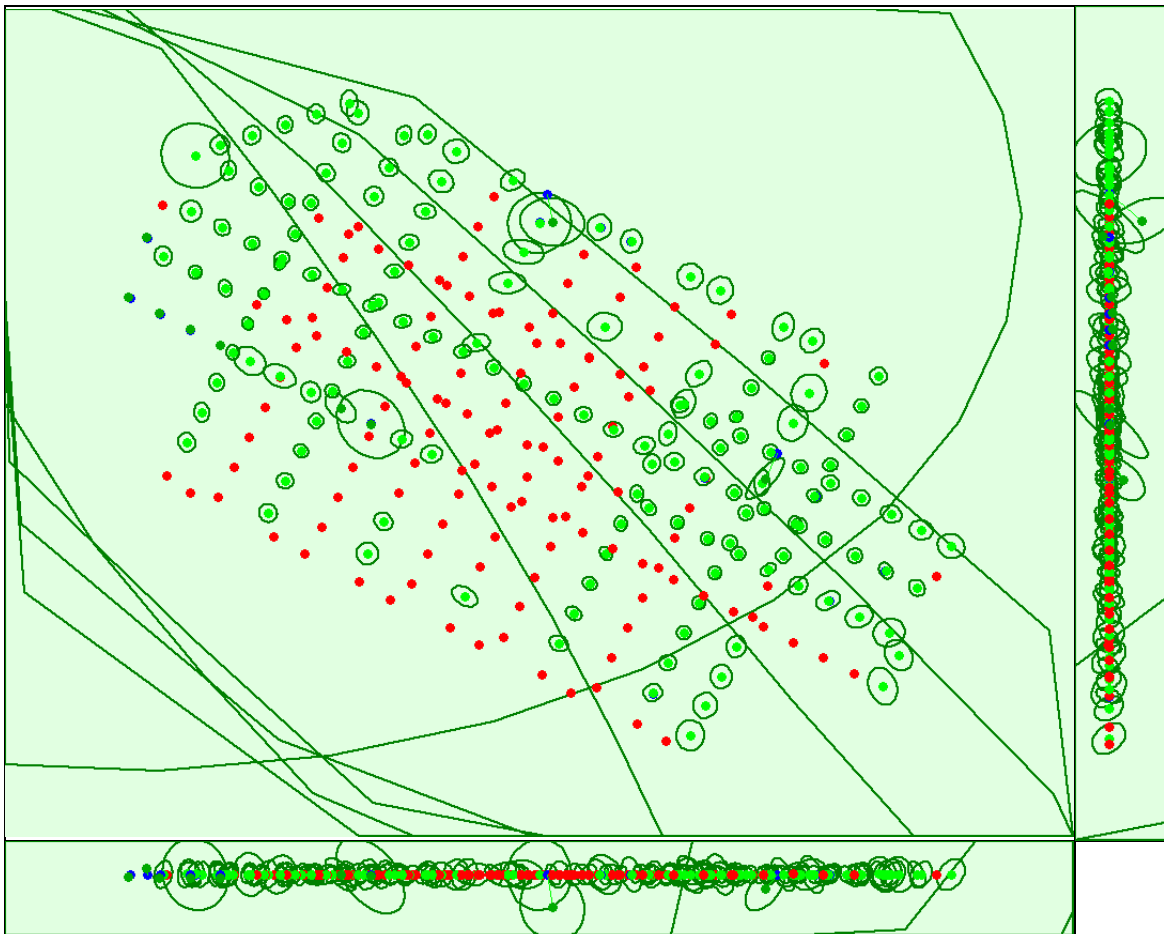
Uncertainty ellipses 1000x magnified

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	0.008	0.007	0.010	0.008	0.015	0.014
Sigma	0.035	0.030	0.041	0.018	0.062	0.062

Overlap
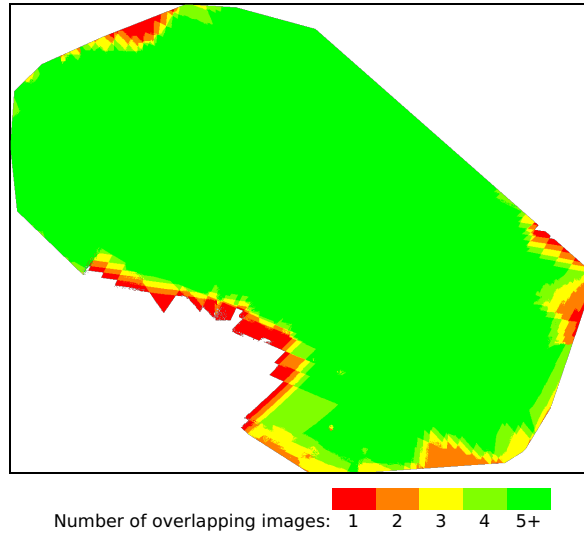

Number of overlapping images: 1 2 3 4 5+

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	1809456
Number of 3D Points for Bundle Block Adjustment	706458
Mean Reprojection Error [pixels]	0.159

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	3652.335 [pixel] 8.566 [mm]	2735.098 [pixel] 6.415 [mm]	1822.498 [pixel] 4.274 [mm]	-0.001	-0.012	0.012	-0.000	-0.001
Uncertainties (Sigma)	0.162 [pixel] 0.000 [mm]	0.099 [pixel] 0.000 [mm]	0.182 [pixel] 0.000 [mm]	0.000	0.000	0.000	0.000	0.000

The correlation between camera internal parameters determined by the bundle adjustment. White indicates a full correlation between the parameters, ie. any change in one can be fully compensated by the other. Black indicates that the parameter is completely independent, and is not affected by other parameters.

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, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the pixel location. Click on the image to the see the average direction and magnitude of the re-projection error for each pixel. Note that the vectors are scaled for better visualization. The scale bar indicates the magnitude of 1 pixel error.

2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	50261	12518
Min	21426	242
Max	78258	23882
Mean	50927	11983

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	506317
In 3 Images	113095
In 4 Images	42180
In 5 Images	19620
In 6 Images	10661
In 7 Images	5721
In 8 Images	3415
In 9 Images	2006
In 10 Images	1171
In 11 Images	759
In 12 Images	540
In 13 Images	288
In 14 Images	206
In 15 Images	151
In 16 Images	112
In 17 Images	57
In 18 Images	50
In 19 Images	41
In 20 Images	26
In 21 Images	15
In 22 Images	12
In 23 Images	8

In 24 Images	1
In 25 Images	5
In 26 Images	1

② 2D Keypoint Matches

Uncertainty ellipses 500x magnified

Number of matches

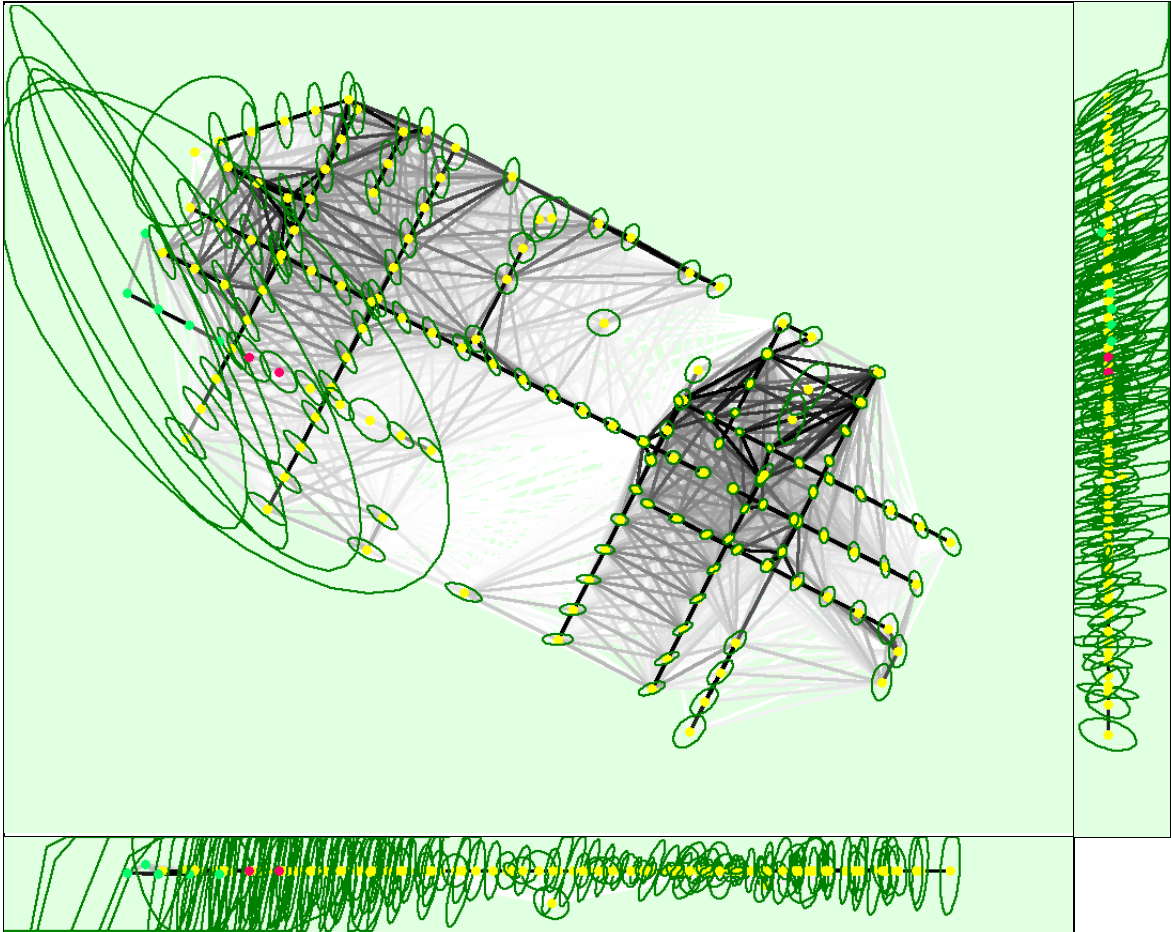**25 222 444 666 888 1111 1333 1555 1777 2000**

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.

② Relative camera position and orientation uncertainties

	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.005	0.008	0.018	0.025	0.009	0.012
Sigma	0.009	0.014	0.033	0.006	0.012	0.030

Geolocation Details

② Absolute Geolocation Variance

Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]

-	-0.10	0.00	0.00	0.00
-0.10	-0.08	0.00	0.00	0.00
-0.08	-0.06	0.00	0.00	1.41
-0.06	-0.04	0.00	0.00	2.82
-0.04	-0.02	0.00	1.41	11.27
-0.02	0.00	45.07	47.89	31.69
0.00	0.02	53.52	49.30	40.14
0.02	0.04	1.41	0.70	9.15
0.04	0.06	0.00	0.70	2.82
0.06	0.08	0.00	0.00	0.70
0.08	0.10	0.00	0.00	0.00
0.10	-	0.00	0.00	0.00
Mean [m]		0.000285	-0.000109	-0.001078
Sigma [m]		0.007709	0.009657	0.022595
RMS Error [m]		0.007714	0.009658	0.022621

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]	92.96	92.96	85.21
[-2.00, 2.00]	100.00	100.00	98.59
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [m]	0.015923	0.015923	0.032049
Sigma of Geolocation Accuracy [m]	0.007980	0.007980	0.010474

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

Geolocation Orientational Variance	RMS [degree]
Omega	1.146
Phi	0.980
Kappa	2.019

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	05m:56s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	06m:49s

Results ⓘ

Number of Generated Tiles	1
Number of 3D Densified Points	16363138
Average Density (per m^3)	2874.93

DSM, Orthomosaic and Index Details ⓘ

Processing Options ⓘ

DSM and Orthomosaic Resolution	1 x GSD (1.05 [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	05m:02s
Time for Orthomosaic Generation	08m:56s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s

Villa Pesquera Post, Camuy