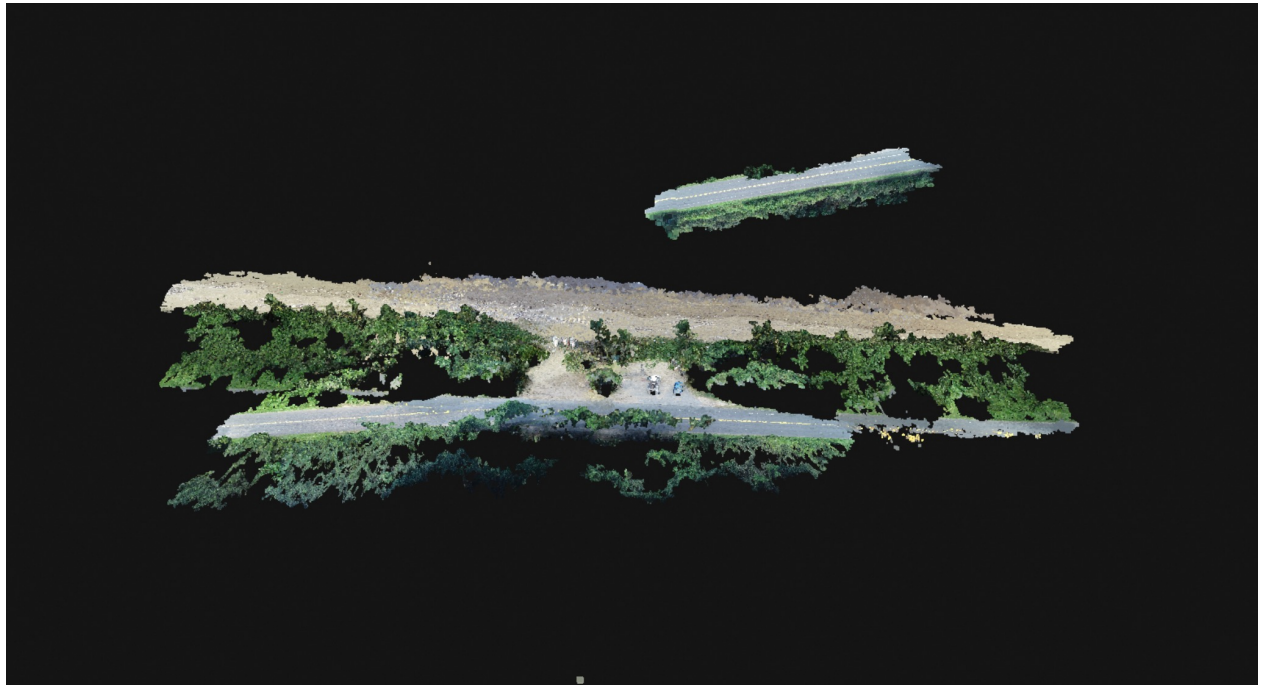# El Unico Post, Dorado
February 06, 2023.

1.85938 ha

Centroid coordinates : 18.46772° N 66.23711° W

3D map
El Unico Post, Dorado

2D map

Total area of site = 1.85938 ha

Beach length (m)
El Unico Post, Dorado

254.913 m

Beach length = 254.913 m

Density surface model
El Unico Post, Dorado

Area of the beach
El Unico Post, Dorado

4,239.32 m²

Area of the beach = 4,239.32 m²
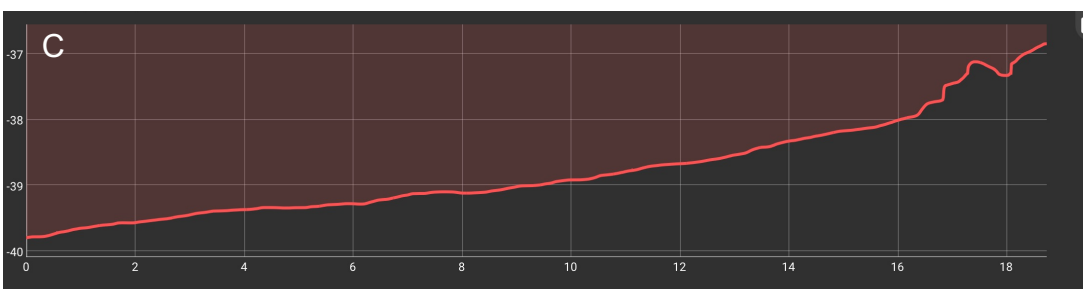
Beach volume
El Unico Post, Dorado
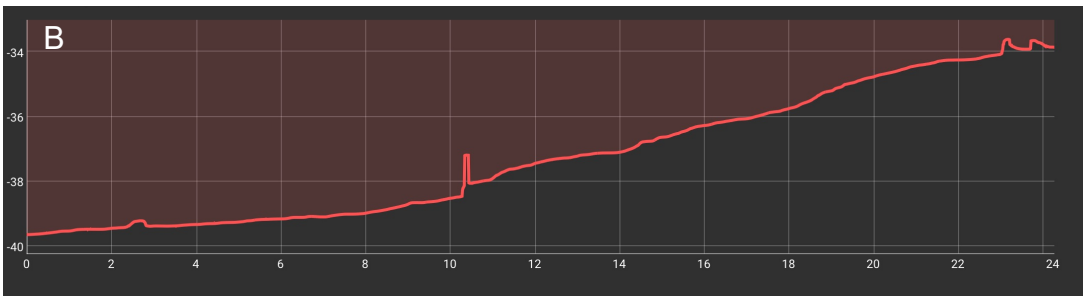

Cut: 0.00 m³
Fill: -163,431 m³
Volume Dif.: -163,431 m³
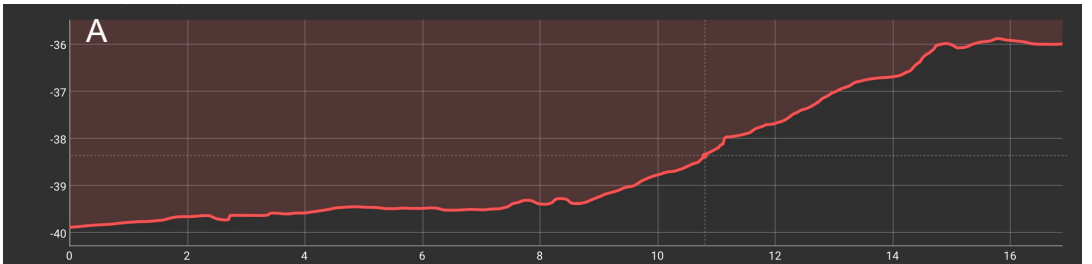
Cut = 0.00 m³
Fill = -163,431 m³
Volume Dif. = -163,431 m³
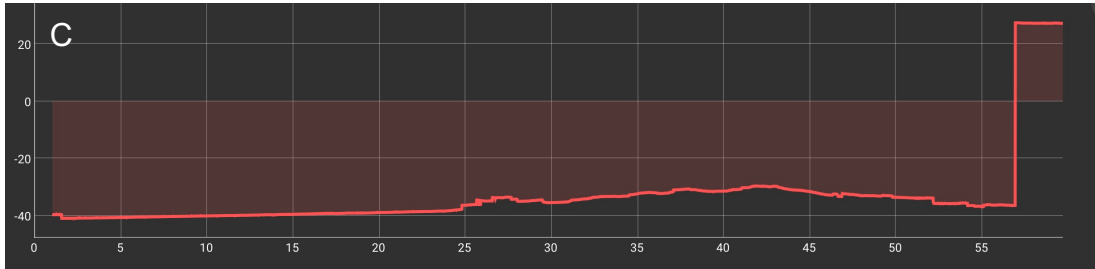
Beach elevation
El Unico Post, Dorado

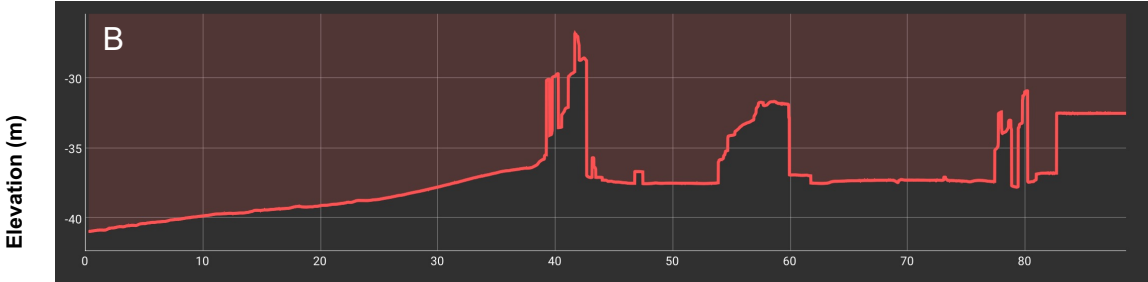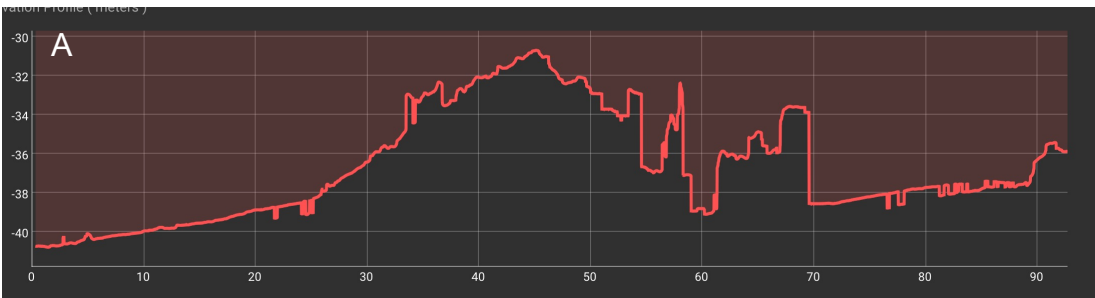**Elevation (m)**

Distance from shore (m)

Site elevation (m)
El Unico Post, Dorado
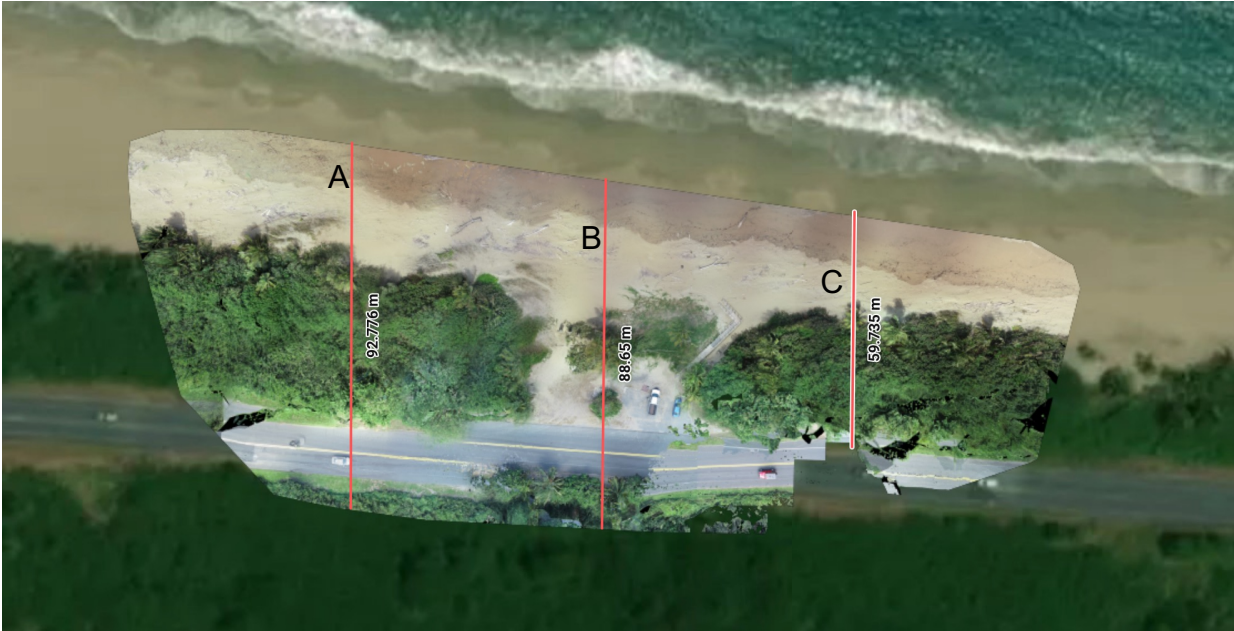
Dune height (m)
El Unico Post, Dorado

Dune height

A = 42.334 m
B = 21.721 m
C = 32.408 m

Dune width (m)
El Unico Post, Dorado

Dune width

A = 55.942 m
B = 28.941 m
C = 40.988 m

Area and perimeter of dune
El Unico Post, Dorado

A - Area and perimeter of dune
2D area = 3,833.18 m²
3D area =3,844.63 m²
2D perimeter = 270.905 m
3D perimeter = 271.445 m
Elevation difference =3.767 m

B - Area and perimeter of dune
2D area = 841.629 m²
3D area = 853.065 m²
2D perimeter = 133.643 m
3D perimeter = 134.398 m
Elevation difference = 3.01 m

C - Area and perimeter of dune
2D area =2,691.91 m²
3D area =2,691.91 m²
2D perimeter =232.144 m
3D perimeter = 232.144 m
Elevation difference =0.00 m

Volume of dune
El Unico Post, Dorado

A		
Base surface		**Triangulated**
Cut volume		13,626.9 m³
Cut error		111.221 m³
Fill volume		-443.164 m³
Fill error		13,183.7 m³
Volume difference		10.7983 m³

B		
Base surface		**Triangulated**
Cut volume		750.34 m³
Cut error		8.25419 m³
Fill volume		-199.087 m³
Fill error		5.15295 m³
Volume difference		551.253 m³

C		
Base surface		**Triangulated**
Cut volume		3,052.95 m³
Cut error		5.18502 m³
Fill volume		-84,510.6 m³
Fill error		80.4933 m³
Volume difference		-81,457.6 m³

Shoreline
El Unico Post, Dorado

Shoreline length = 256.913 m

Shoreline geolocation
El Unico Post, Dorado

Shoreline markers
A = 18.46811° N 66.23789° W
B = 18.46808° N 66.23737° W
C = 18.46796° N 66.23675° W
D = 18.46791° N 66.23620° W

Shoreline extension
El Unico Post, Dorado

Shoreline extension

A = 11.851 m
B = 12.543 m

Shoreline position
El Unico Post, Dorado

Shoreline position

A = 21.411 m
B = 15.48 m
C = 10.201 m

Area of dune breaches
El Unico Post, Dorado

Cut: 13,626.9 m³
Fill: -443.164 m³
Volume Dif.: 13,183.7 m³

Cut: 3,052.95 m³
Fill: -84,510.6 m³
Volume Dif.: -81,457.6 m³

A Area of dune breaches **Breach** =3,833.18 m²	B Area of dune breaches **Breach** =841.629 m²	C Area of dune breaches **Breach** = 2,691.91 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

Project	201643-Project-2023-02-06T22:42:32.987Z
Processed	2023-02-06 23:31:36
Camera Model Name(s)	FC6310R_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.06 cm / 0.42 in
Area Covered	0.018 km^2 / 1.8003 ha / 0.01 sq. mi. / 4.4508 acres
Time for Initial Processing (without report)	33m:22s

Quality Check

Images	median of 46075 keypoints per image	✓
Dataset	280 out of 316 images calibrated (88%), all images enabled, 5 blocks	⚠
Camera Optimization	0.1% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 5471.28 matches per calibrated image	✓
Georeferencing	yes, no 3D GCP	⚠

Preview

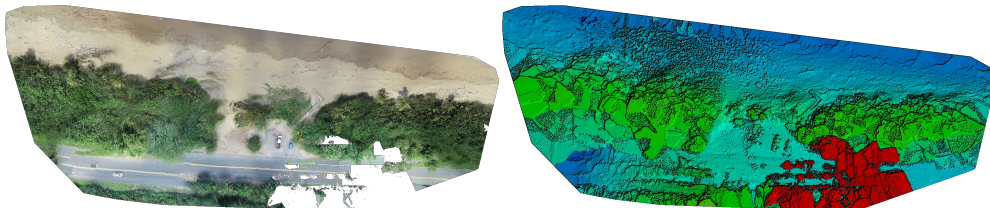**Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.**

Calibration Details

Number of Calibrated Images	280 out of 316
Number of Geolocated Images	316 out of 316

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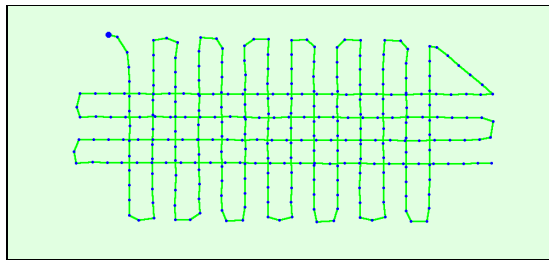
Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions
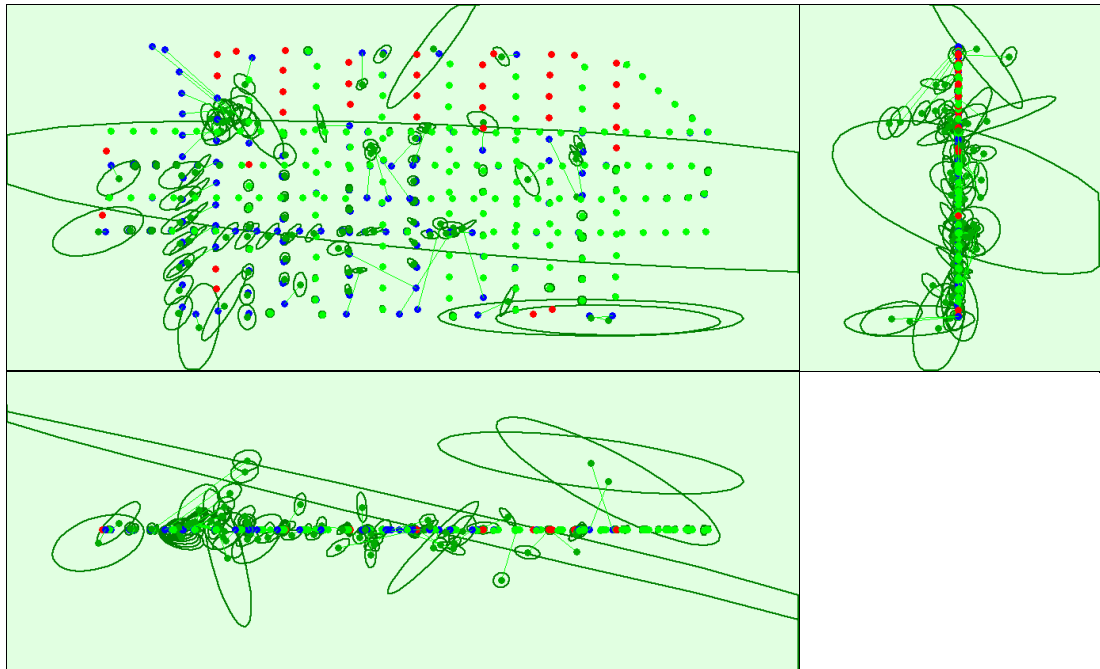
Uncertainty ellipses 100x magnified

Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well 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	0.022	0.015	0.016	0.036	0.054	0.058
Sigma	0.105	0.021	0.030	0.080	0.178	0.234

Overlap

19
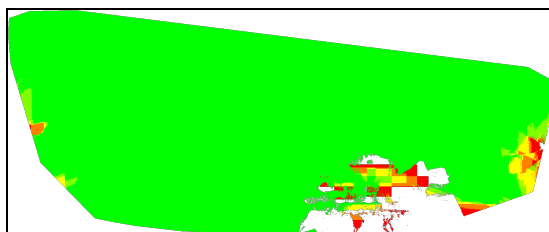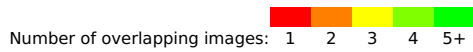
Figure 4: Number of overlapping images computed for each pixel of the orthomosaic.
Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint 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	1664945
Number of 3D Points for Bundle Block Adjustment	661491
Mean Reprojection Error [pixels]	0.191

Internal Camera Parameters

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

EXIF ID: FC6310R_8.8_5472x3648

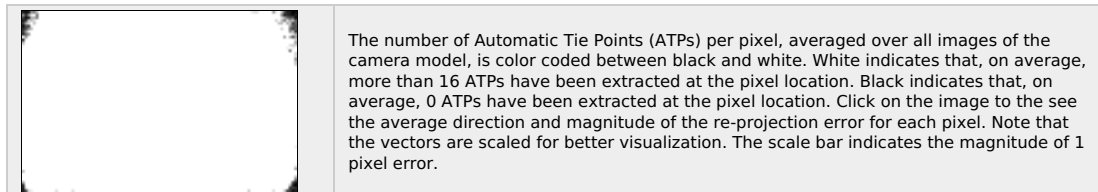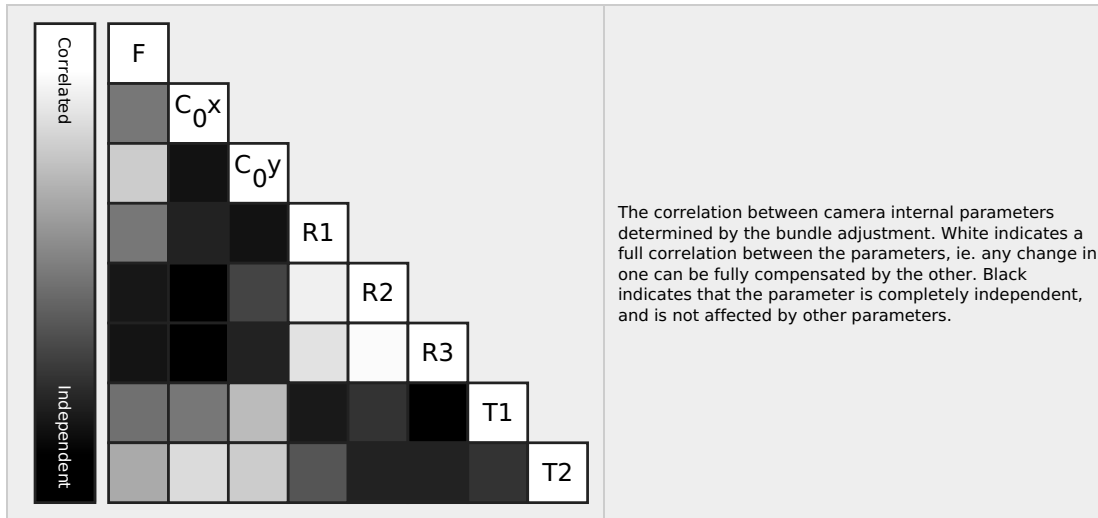|	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	3658.300 [pixel] 8.580 [mm]	2722.500 [pixel] 6.385 [mm]	1835.100 [pixel] 4.304 [mm]	-0.269	0.112	-0.033	0.000	-0.001
Optimized Values	3662.300 [pixel] 8.589 [mm]	2734.608 [pixel] 6.413 [mm]	1809.846 [pixel] 4.245 [mm]	0.000	-0.015	0.015	-0.001	-0.001
Uncertainties (Sigma)	0.785 [pixel] 0.002 [mm]	0.511 [pixel] 0.001 [mm]	0.904 [pixel] 0.002 [mm]	0.000	0.001	0.001	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	46075	5471
Min	20904	30

Max	79500	20483
Mean	47682	5946

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	483394
In 3 Images	100664
In 4 Images	38933
In 5 Images	18073
In 6 Images	9266
In 7 Images	4862
In 8 Images	2642
In 9 Images	1353
In 10 Images	774
In 11 Images	563
In 12 Images	360
In 13 Images	234
In 14 Images	131
In 15 Images	88
In 16 Images	61
In 17 Images	36
In 18 Images	22
In 19 Images	22
In 20 Images	5
In 21 Images	6
In 22 Images	1
In 26 Images	1

2D Keypoint Matches

Uncertainty ellipses 10x magnified

Number of matches

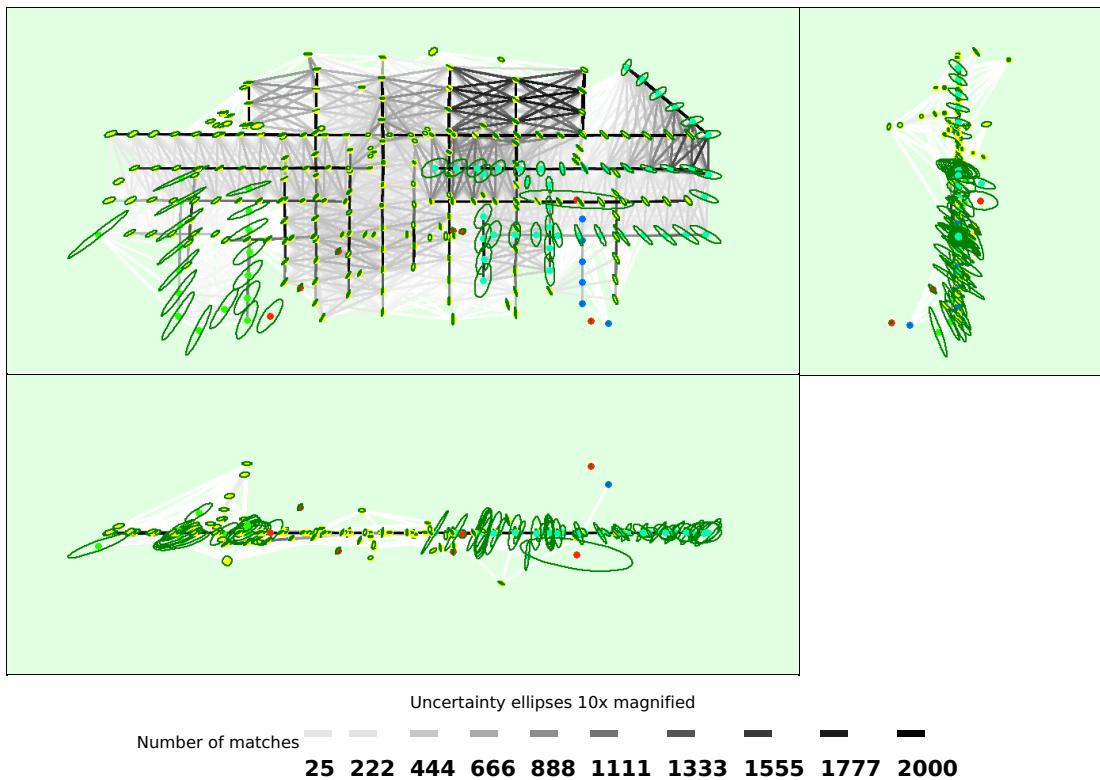25 222 444 666 888 1111 1333 1555 1777 2000

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

❓ Relative camera position and orientation uncertainties ℹ️

	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.134	0.125	0.129	0.219	0.191	0.159
Sigma	0.151	0.122	0.127	0.179	0.200	0.182

Geolocation Details ℹ️

❓ Absolute Geolocation Variance ℹ️

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	0.54	0.00	0.00
-0.16	0.00	49.19	46.49	48.65
0.00	0.16	50.27	53.51	51.35
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]		-0.001720	-0.000239	0.002480
Sigma [m]		0.025357	0.014615	0.032214
RMS Error [m]		0.025415	0.014617	0.032309

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 ℹ️

Relative Geolocation Error	Images X [%]	Images Y [%]	Images Z [%]
[-1.00, 1.00]	78.38	82.70	78.38
[-2.00, 2.00]	95.14	95.68	96.22
[-3.00, 3.00]	97.30	98.92	100.00
Mean of Geolocation Accuracy [m]	0.019215	0.019215	0.036447
Sigma of Geolocation Accuracy [m]	0.028840	0.028840	0.053788

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

Geolocation Orientational Variance	RMS [degree]
Omega	19.892
Phi	1.721
Kappa	28.899

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 5.15.0-1028-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	12m:11s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	06m:37s

Results

Number of Generated Tiles	1
Number of 3D Densified Points	19920742
Average Density (per m^3)	2388.57

DSM, Orthomosaic and Index Details

Processing Options

DSM and Orthomosaic Resolution	1 x GSD (1.06 [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	03m:53s
Time for Orthomosaic Generation	11m:50s
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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