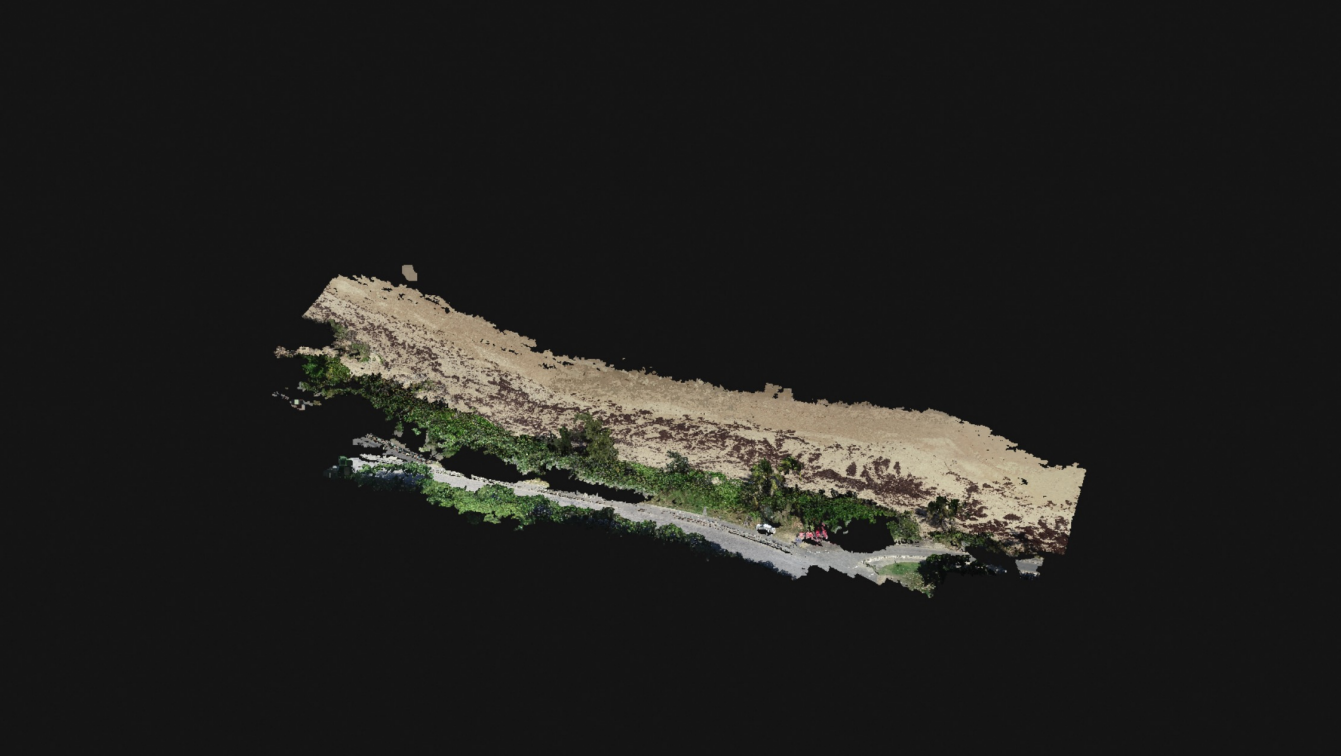# Shore Island Post, Isabela

December 20, 2022.

1.49051 ha

Centroid coordinates : 18.50895° N 67.02893° W

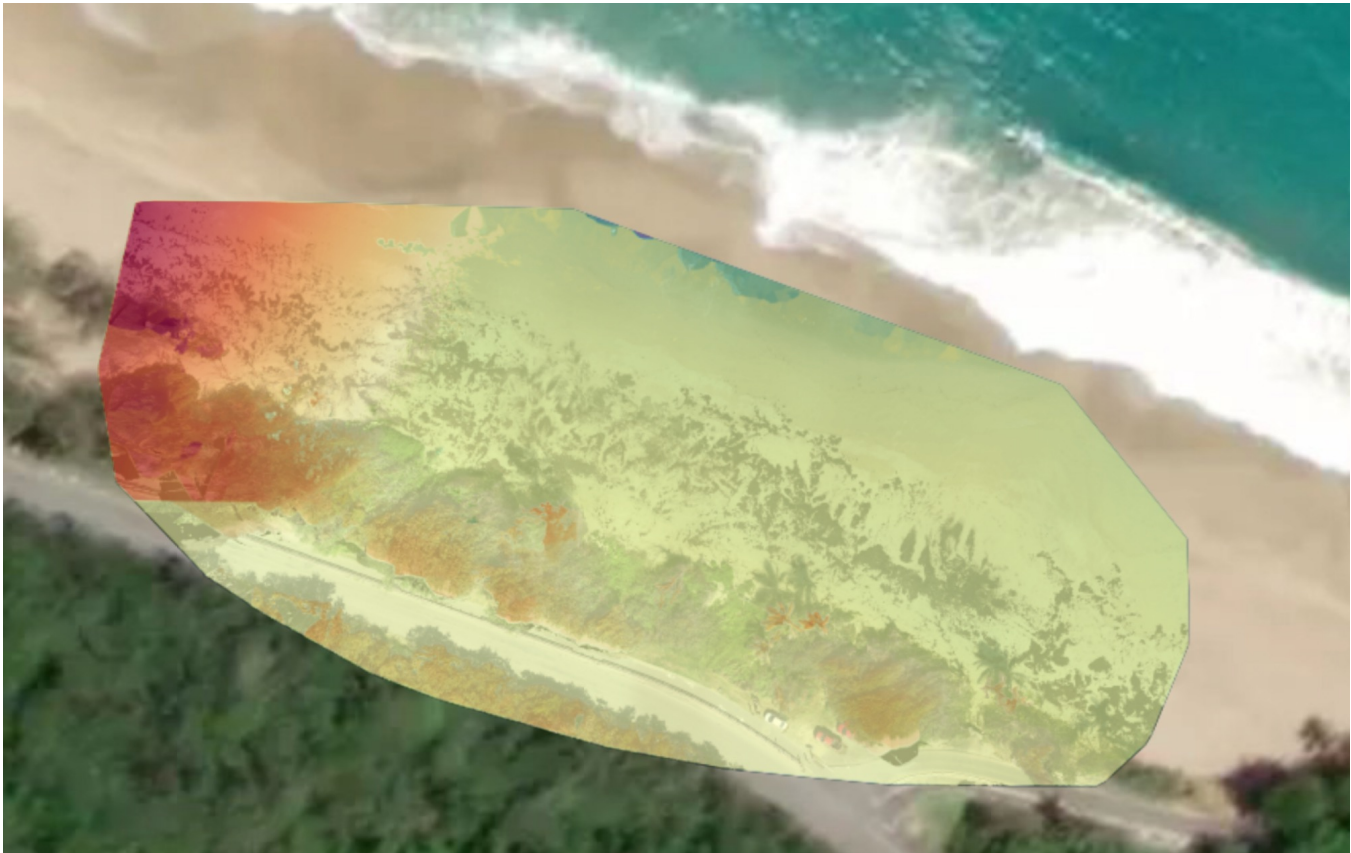**3D map**
Shore Island Post, Isabela

2D map

Total area of site = 1.49051 ha
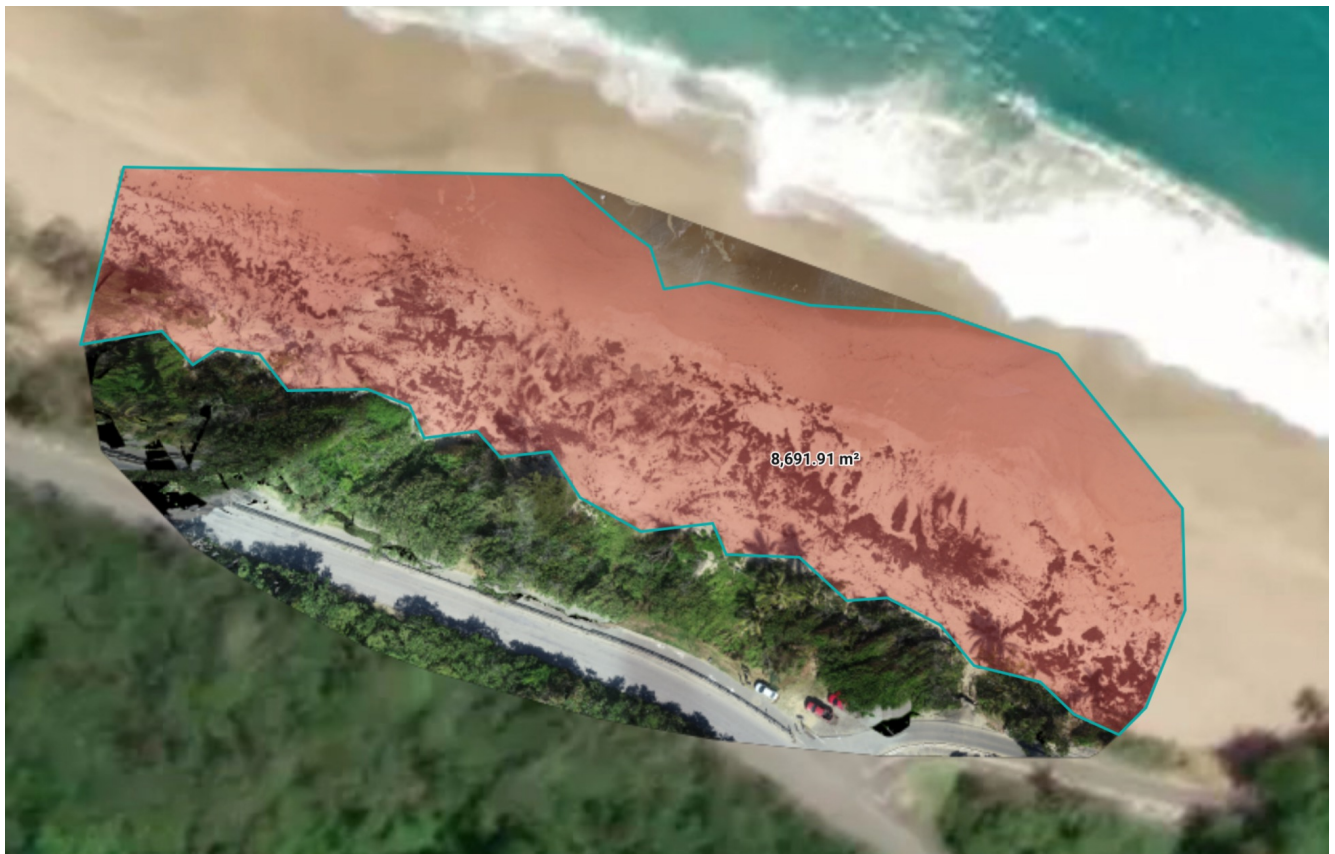
Beach length (m)
Shore Island Post, Isabela

178.329 m

Beach length = 178.329 m

Density surface model
Shore Island Post, Isabela

Area of the beach
Shore Island Post, Isabela

8,691.91 m²

Area of the beach = 8,691.91 m²

Beach volume
Shore Island Post, Isabela

Cut: 0.00 m³
Fill: -385,656 m³
Volume Dif.: -385,656 m³
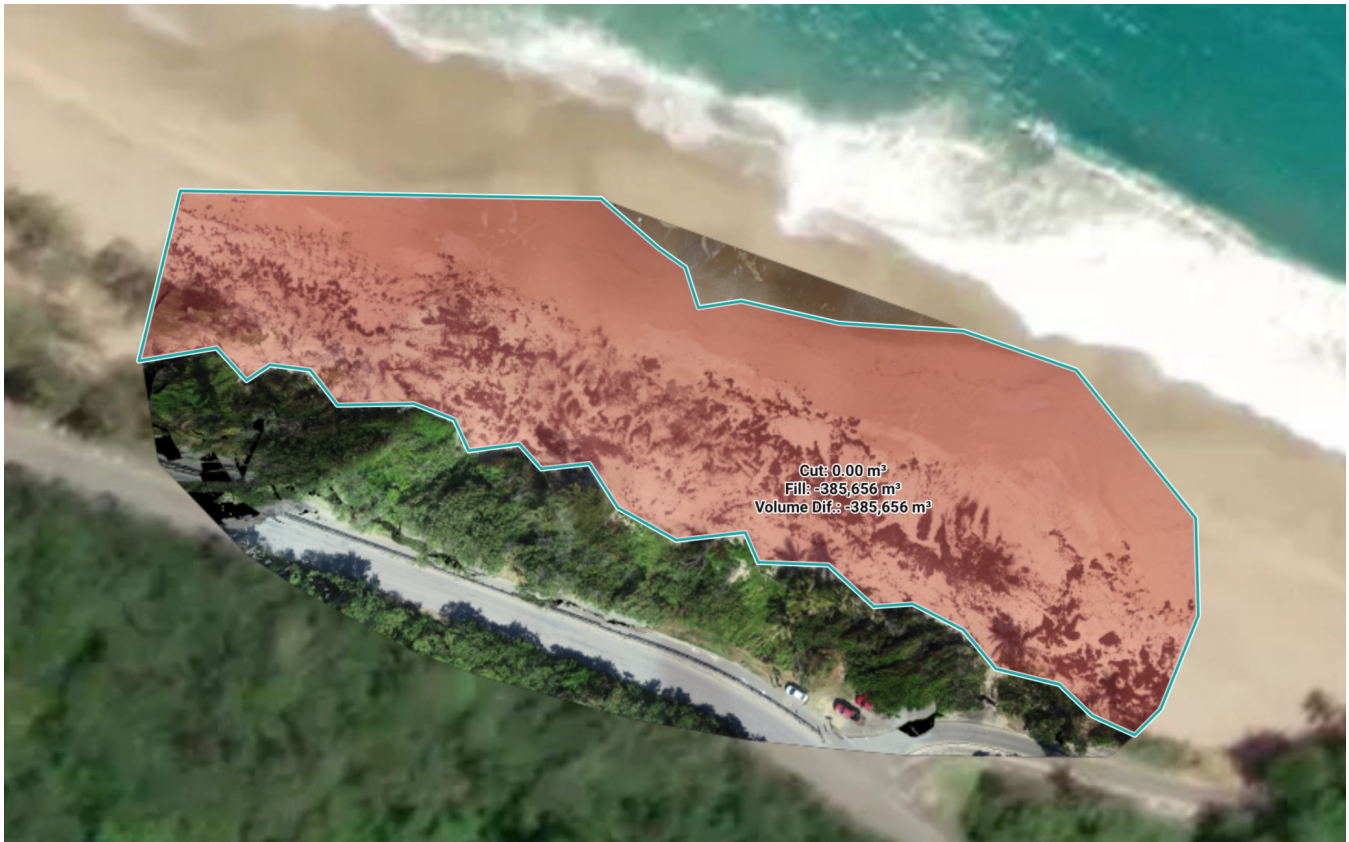
Cut = 0.00 m³
Fill = -385,656 m³
Volume Dif. = -385,656 m³

Beach elevation
Shore Island Post, Isabela
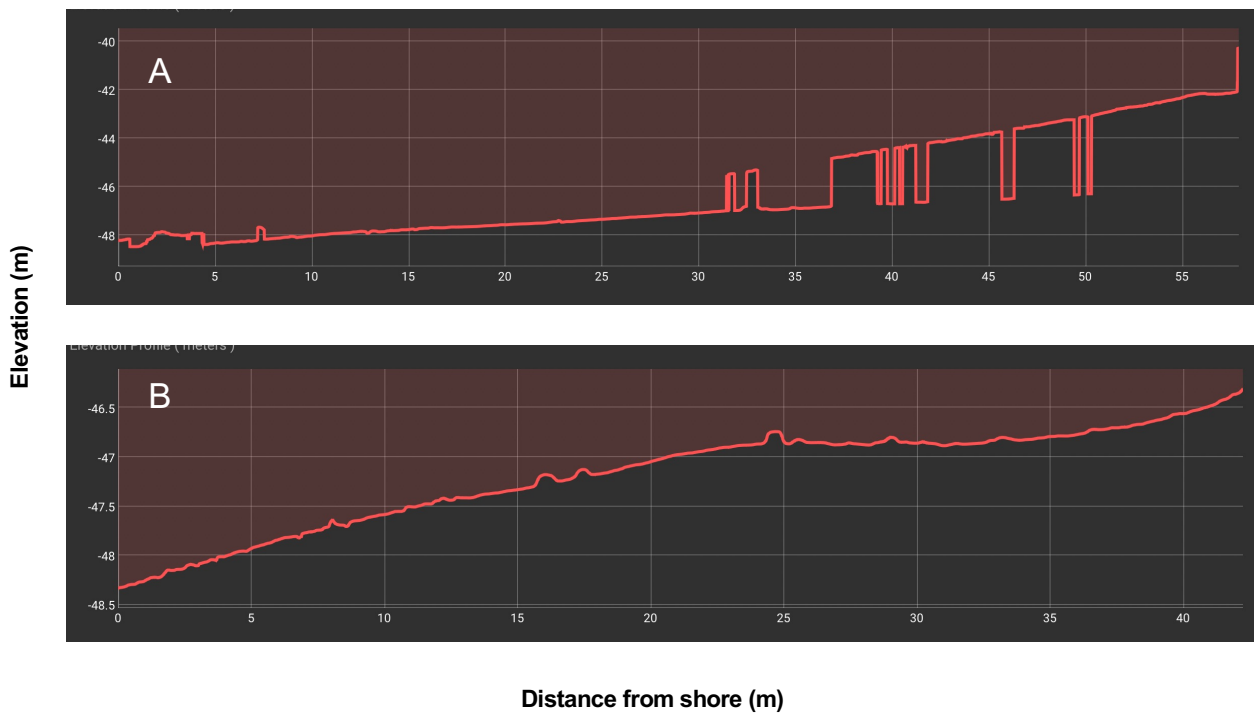
Site elevation (m)
Shore Island Post, Isabela

Elevation (m)
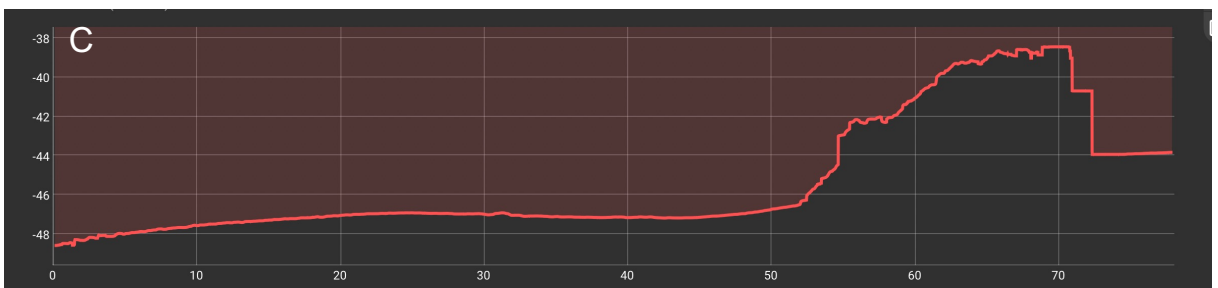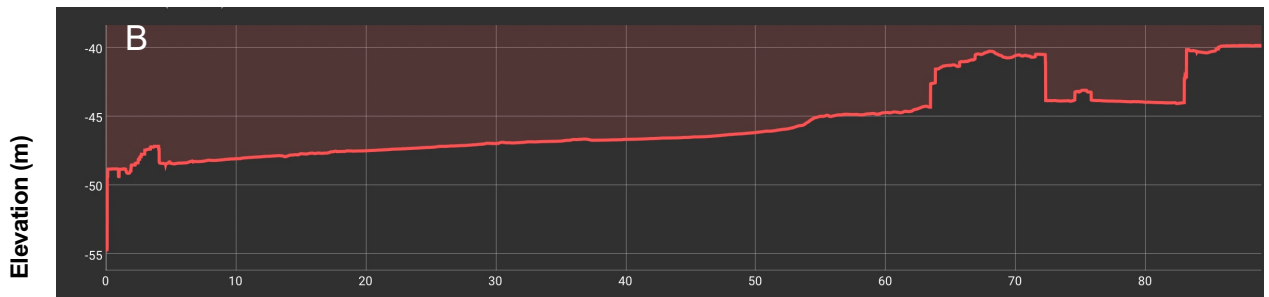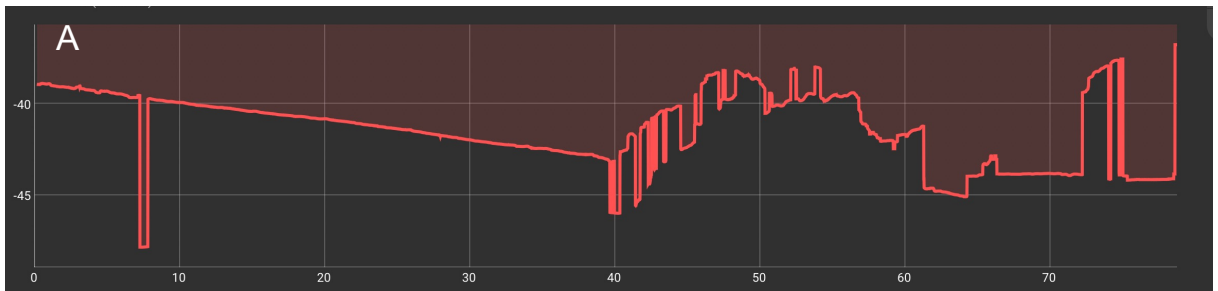
Distance from shore (m)

Dune height (m)
Shore Island Post, Isabela

Dune height

A = 3.273 m
B = 5.084 m
C = 5.118 m
D = 6.813 m
E = 4.985 m

Dune width (m)
Shore Island Post, Isabela

Dune width
A = 17.469 m
B = 21.505 m
C = 17.474 m
D = 18.937 m
E = 10.388 m

Area and perimeter of dune
Shore Island Post, Isabela

A- Area and perimeter of dune	B- Area and perimeter of dune
2D area = 3,219.18 m²	**2D area** = 204.343 m²
3D area = 3,381.87 m²	**3D area** = 204.343 m²
2D perimeter = 373.24 m	**2D perimeter** = 71.344 m
3D perimeter = 383.514 m	**3D perimeter** = 71.344 m
Elevation difference = 17.232 m	**Elevation difference** = 0.00 m

Volume of dune
Shore Island Post, Isabela

A		
Base surface		**Triangulated**
Cut volume		5,190.03 m³
Cut error		150.946 m³
Fill volume		-792.682 m³
Fill error		54.7607 m³
Volume difference		4,397.35 m³

B		
Base surface		**Triangulated**
Cut volume		0.00 m³
Cut error		0.00 m³
Fill volume		-8,987.14 m³
Fill error		3.25663 m³
Volume difference		-8,987.14 m³

Shoreline
Shore Island Post, Isabela

Shoreline length = 180.7 m

Shoreline geolocation
Shore Island Post, Isabela
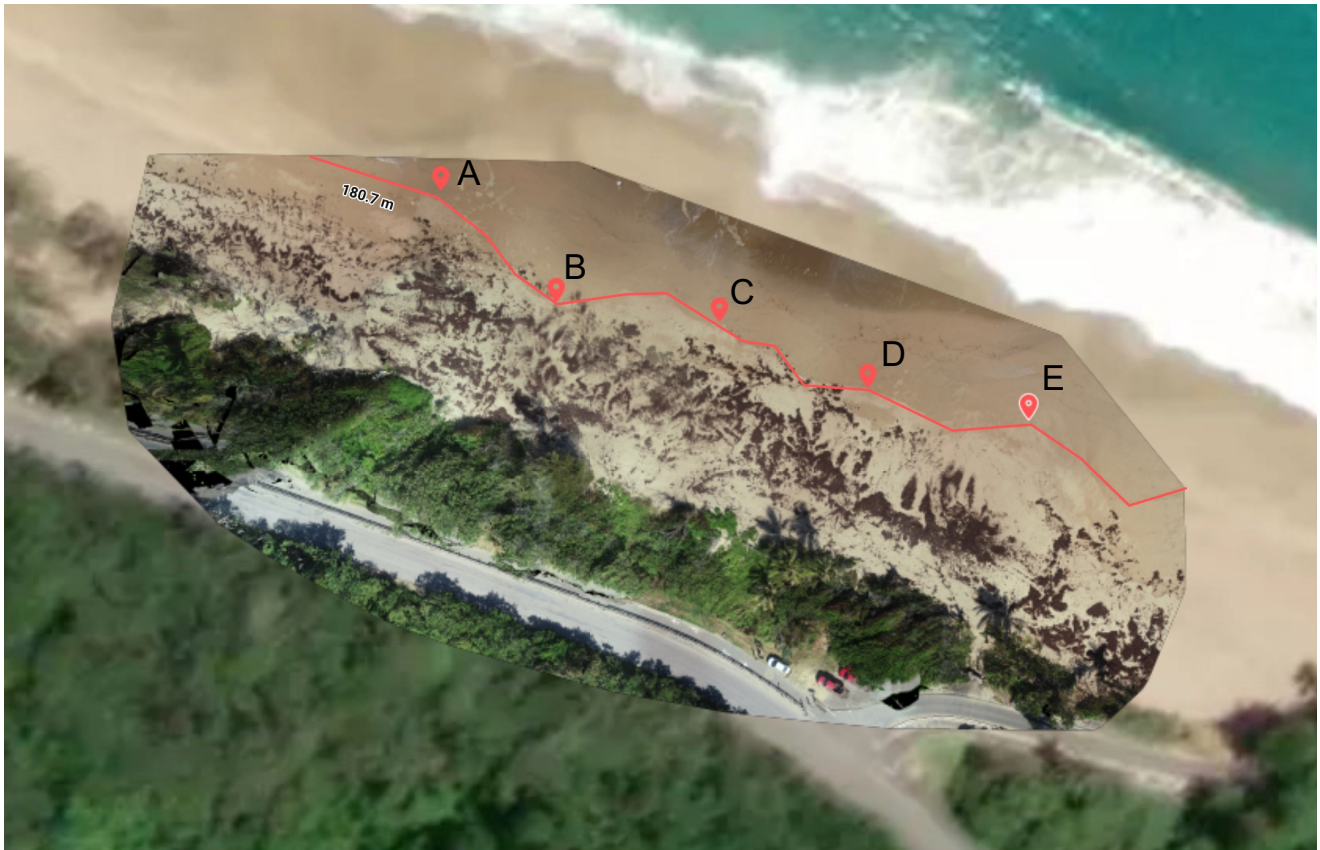
Shoreline markers

A = 18.50937° N 67.02922° W
B = 18.50919° N 67.02902° W
C = 18.50916° N 67.02874° W
D = 18.50905° N 67.02849° W
E = 18.50900° N 67.02821° W

Shoreline extension
Shore Island Post, Isabela

Shoreline extension

A = 13.173 m
B = 22.939 m
C = 19.911 m
D = 10.189 m

Shoreline position
Shore Island Post, Isabela
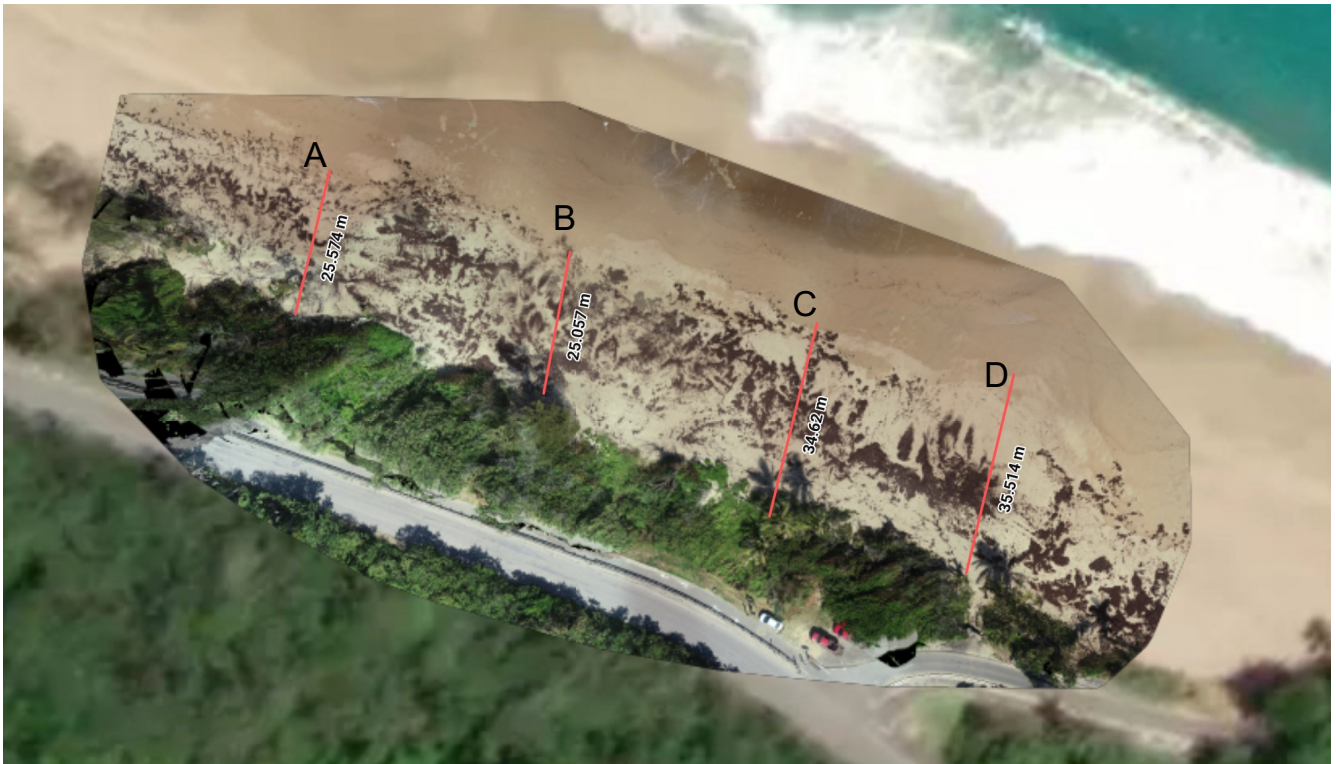
Shoreline position

A =
B = 64.927 m
C = 49.76 m
D = 19.704 m

Area of dune breaches
Shore Island Post, Isabela

Cut: 5,190.03 m³
Fill: -792.682 m²
Volume Dif.: 4,397.35 m³

A

B

Area of dune breaches

Breach A= 3,219.18 m²
Breach B= 204.343 m²

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	196270-Project-2022-12-20T18:37:37.579Z
Processed	2022-12-20 19:23:58
Camera Model Name(s)	FC6310R_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.06 cm / 0.42 in
Area Covered	0.015 km^2 / 1.4849 ha / 0.01 sq. mi. / 3.6712 acres
Time for Initial Processing (without report)	36m:53s

Quality Check

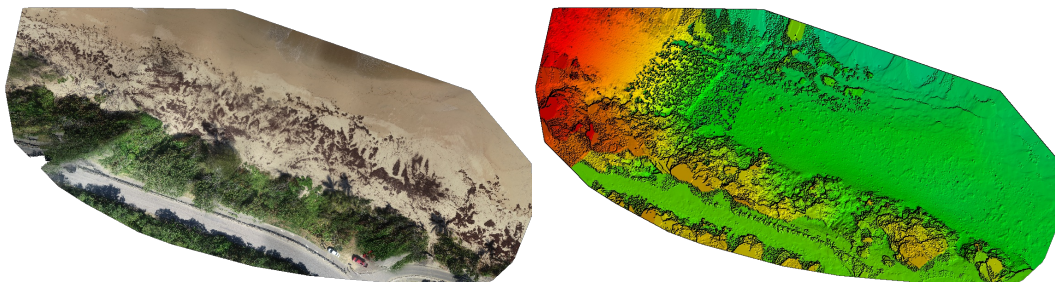| Images	median of 47409 keypoints per image	✓
Dataset	193 out of 214 images calibrated (90%), all images enabled, 4 blocks	⚠
Camera Optimization	0.09% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 17992.6 matches per calibrated image	✓
Georeferencing	yes, no 3D GCP	⚠

Preview

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

Calibration Details

Number of Calibrated Images	193 out of 214
Number of Geolocated Images	214 out of 214

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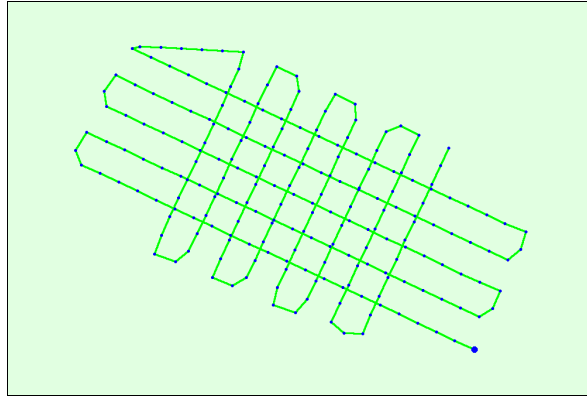
Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

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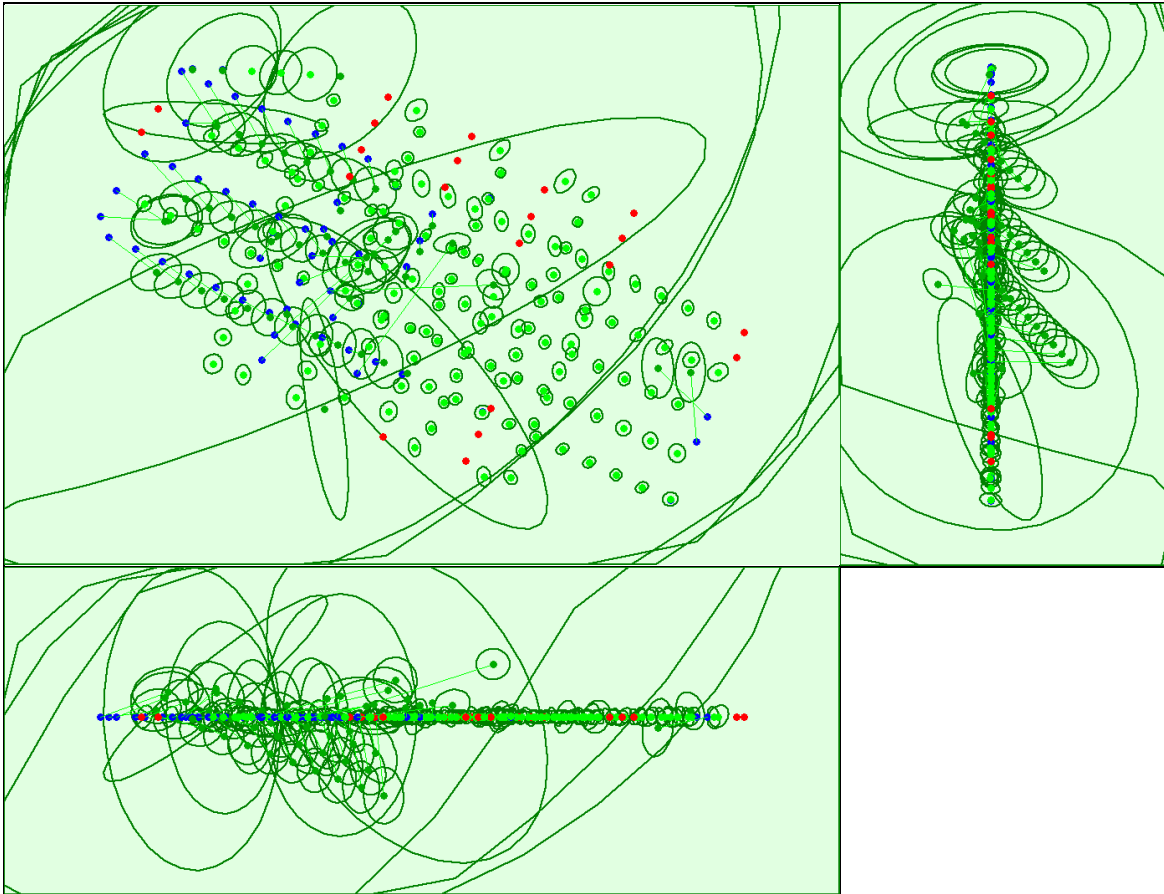
Uncertainty ellipses 1000x magnified

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	0.006	0.005	0.006	0.015	0.011	0.009
Sigma	0.018	0.017	0.015	0.039	0.025	0.020

Overlap

Number of overlapping images: 1 2 3 4 5+

Figure 4: Number of overlapping images computed for each pixel of the orthomosaic.
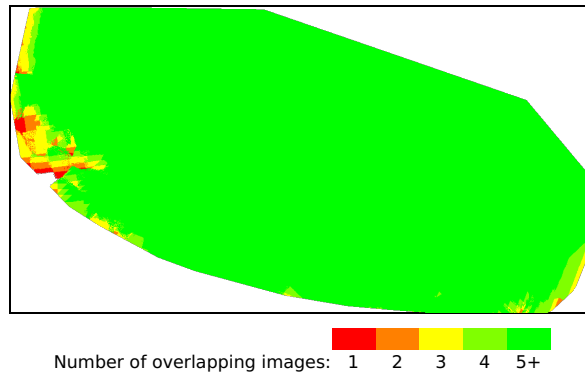Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).

Bundle Block Adjustment Details

Number of 2D Keypoint Observations for Bundle Block Adjustment	3232910
Number of 3D Points for Bundle Block Adjustment	907327
Mean Reprojection Error [pixels]	0.168

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	3654.677 [pixel] 8.571 [mm]	2737.192 [pixel] 6.419 [mm]	1824.272 [pixel] 4.278 [mm]	0.001	-0.016	0.015	-0.000	-0.000
Uncertainties (Sigma)	0.154 [pixel] 0.000 [mm]	0.078 [pixel] 0.000 [mm]	0.166 [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.

20
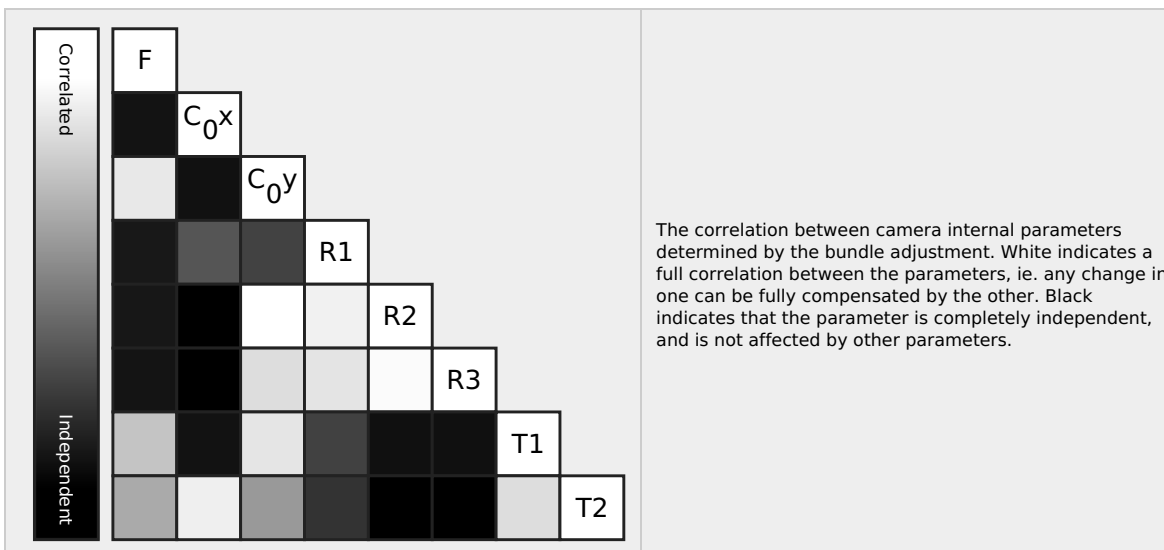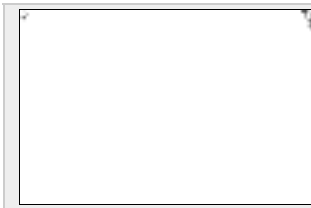
The number of Automatic Tie Points (ATPs) per pixel, averaged over all images of the camera model, is color coded between black and white. White indicates that, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the 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	47409	17993
Min	21120	180
Max	78630	34418
Mean	49057	16751

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	525942
In 3 Images	150787
In 4 Images	72126
In 5 Images	42249
In 6 Images	27545
In 7 Images	19001
In 8 Images	13530
In 9 Images	10172
In 10 Images	7893
In 11 Images	6226
In 12 Images	5037
In 13 Images	4054
In 14 Images	3270
In 15 Images	2805
In 16 Images	2405
In 17 Images	1908
In 18 Images	1681
In 19 Images	1356
In 20 Images	1199
In 21 Images	990
In 22 Images	871
In 23 Images	758
In 24 Images	641
In 25 Images	585
In 26 Images	492
In 27 Images	408
In 28 Images	391
In 29 Images	331
In 30 Images	303
In 31 Images	237
In 32 Images	235
In 33 Images	204
In 34 Images	191
In 35 Images	155
In 36 Images	164
In 37 Images	146
In 38 Images	134
In 39 Images	119
In 40 Images	99

In 41 Images	73
In 42 Images	78
In 43 Images	73
In 44 Images	60
In 45 Images	60
In 46 Images	40
In 47 Images	51
In 48 Images	39
In 49 Images	39
In 50 Images	33
In 51 Images	29
In 52 Images	20
In 53 Images	19
In 54 Images	12
In 55 Images	12
In 56 Images	3
In 57 Images	12
In 58 Images	9
In 59 Images	6
In 60 Images	2
In 61 Images	6
In 62 Images	5
In 63 Images	3
In 64 Images	1
In 65 Images	2

2D Keypoint Matches
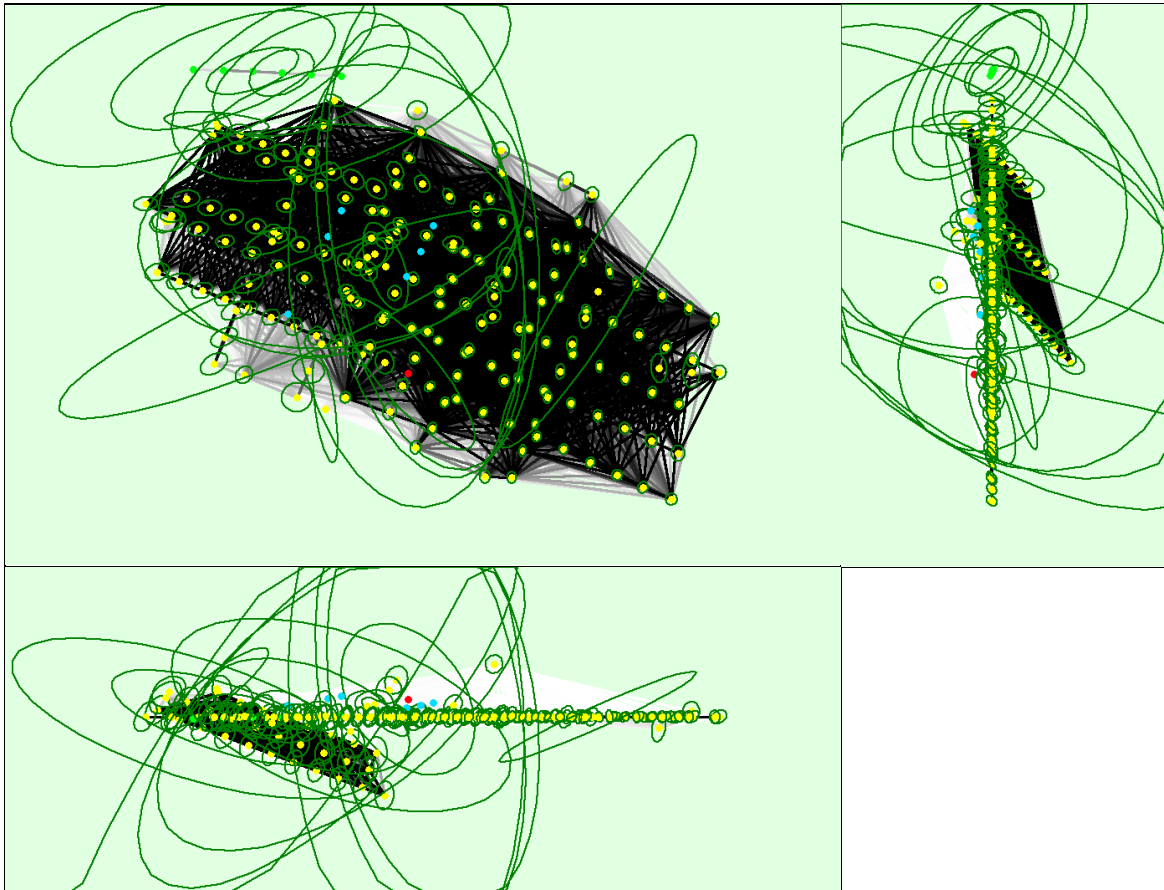
Uncertainty ellipses 500x magnified

Number of 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	0.007	0.006	0.007	0.023	0.013	0.012
Sigma	0.013	0.014	0.016	0.065	0.029	0.028

Geolocation Details

Absolute Geolocation Variance

Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-0.09	0.00	0.00	0.71
-0.09	-0.07	0.00	0.00	0.71
-0.07	-0.05	0.00	0.00	0.00
-0.05	-0.03	0.00	0.00	3.55
-0.03	-0.02	0.00	1.42	10.64
-0.02	0.00	53.90	48.94	37.59
0.00	0.02	43.97	49.65	26.24
0.02	0.03	2.13	0.00	17.02
0.03	0.05	0.00	0.00	2.84
0.05	0.07	0.00	0.00	0.00
0.07	0.09	0.00	0.00	0.00
0.09	-	0.00	0.00	0.71
Mean [m]		0.000127	-0.000018	-0.000556
Sigma [m]		0.007027	0.006351	0.022423
RMS Error [m]		0.007028	0.006351	0.022430

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]	95.04	97.16	84.40
[-2.00, 2.00]	100.00	100.00	97.87
[-3.00, 3.00]	100.00	100.00	100.00
Mean of Geolocation Accuracy [m]	0.013929	0.013929	0.029715
Sigma of Geolocation Accuracy [m]	0.003403	0.003403	0.008002

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

Geolocation Orientational Variance	RMS [degree]
Omega	0.739
Phi	0.556
Kappa	3.096

Initial Processing Details ⓘ

System Information ⓘ

Hardware	CPU: Intel(R) Xeon(R) Platinum 8223CL 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	08m:22s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	02m:29s

Results ⓘ

Number of Generated Tiles	1
Number of 3D Densified Points	15463019
Average Density (per m^3)	2904.98

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:00s
Time for Orthomosaic Generation	09m:42s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s

Shore Island Post, Isabela