Jobos, Isabela
August 3, 2022

Centroid coordinates : 18.51377° N 67.07555° W

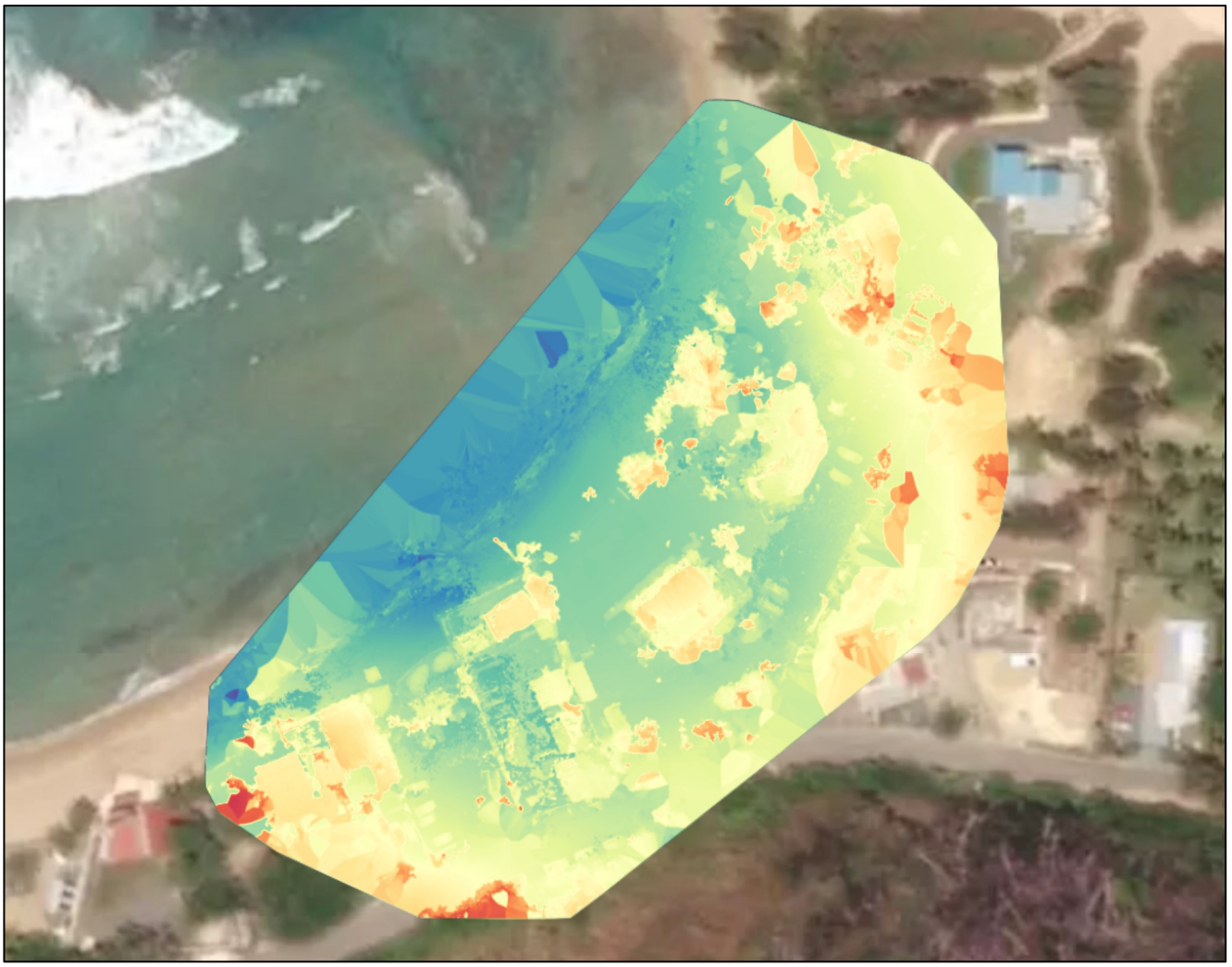
3D map
Jobos, Isabela

Total area of site : 2.10095 ha

Beach length (m)
Jobos, Isabela

Beach length = 195.252 m

Density surface model
Jobos, Isabela



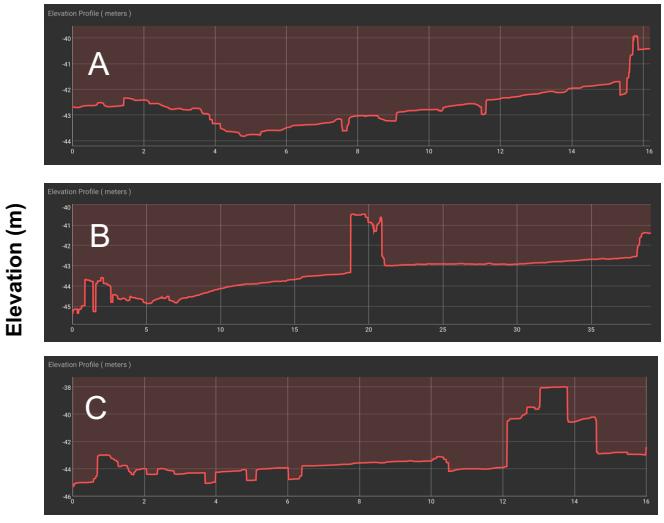
Area of the beach
Jobos, Isabela

Area of the beach = **3,278.81** m^2

Beach volume
Jobos, Isabela

Cut = 568.547 m^3
Fill = -3,070.74 m^3
Volume Dif. = -2,502.19 m^3

Beach elevation
Jobos, Isabela



Shoreline extension (m)
Jobos, Isabela

Shoreface extension A = 7.267 m
Shoreface extension B = 4.323 m
Shoreface extension C = 8.397 m
Shoreface extension D = 8.181 m

Shoreline
Guajataca, Isabela

Shoreline length = 191.159 m

Shoreline geolocation
Guajataca, Isabela

Shoreline markers

A = 18.51337° N 67.07647° W
B = 18.51349° N 67.07623° W
C = 18.51363° N 67.07602° W
D = 18.51379° N 67.07583° W
E = 18.51400° N 67.07569° W
F = 18.51422° N 67.07554° W
G = 18.51449° N 67.07544° W

Shoreline position
Los Bravos, Isabela

Shoreline position

A = 3.509 m
B = 4.883 m
C =7.506m
D = 33.351 m
E = 8.244 m
F = 7.801 m

High Resolution Orthomosaic
Jobos, Isabela

Quality Report

Generated with Pix4Denterprise version 4.8.0 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	Jobos_08_03_2022
Processed	2022-08-04 12:31:32
Camera Model Name(s)	FC6310R_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.08 cm / 0.42 in
Area Covered	0.022 km^2 / 2.1777 ha / 0.01 sq. mi. / 5.3839 acres
Time for Initial Processing (without report)	01h:06m:40s

Quality Check

Images	median of 59330 keypoints per image	✓
Dataset	322 out of 379 images calibrated (84%), all images enabled, 5 blocks	⚠
Camera Optimization	6.93% relative difference between initial and optimized internal camera parameters	⚠
Matching	median of 6209.13 matches per calibrated image	✓
Georeferencing	yes, no 3D GCP	⚠

Preview

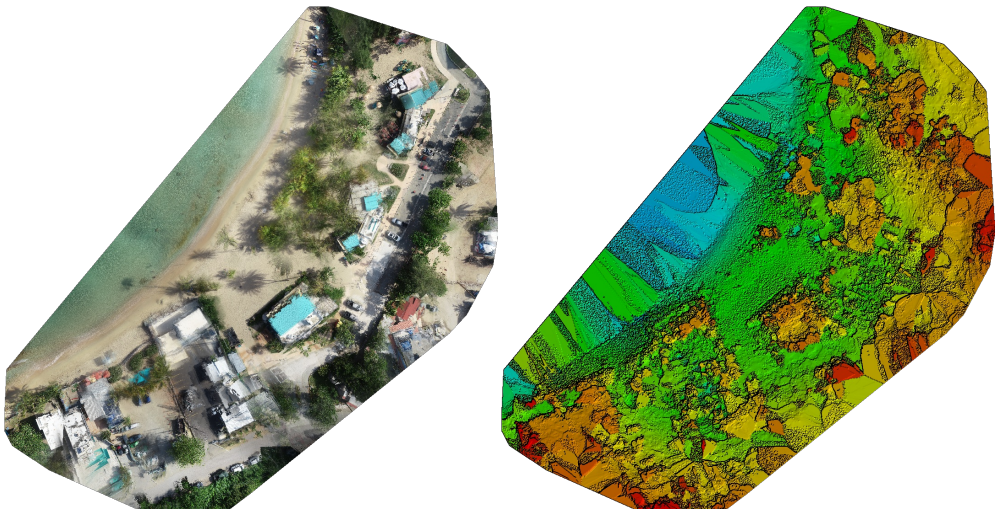


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Calibration Details

Number of Calibrated Images	322 out of 379
Number of Geolocated Images	379 out of 379

Initial Image Positions

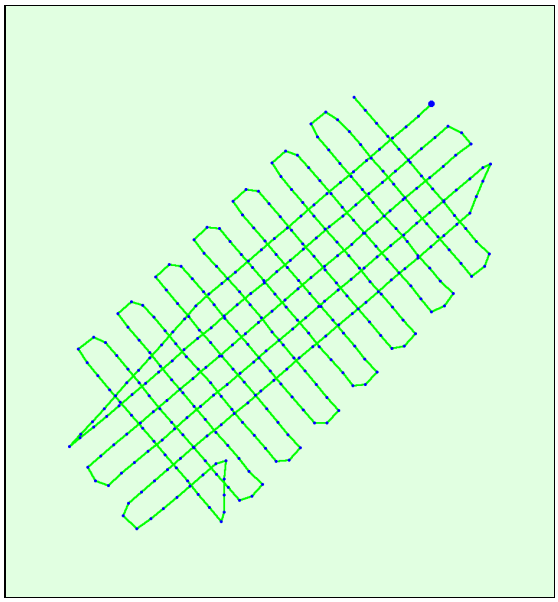
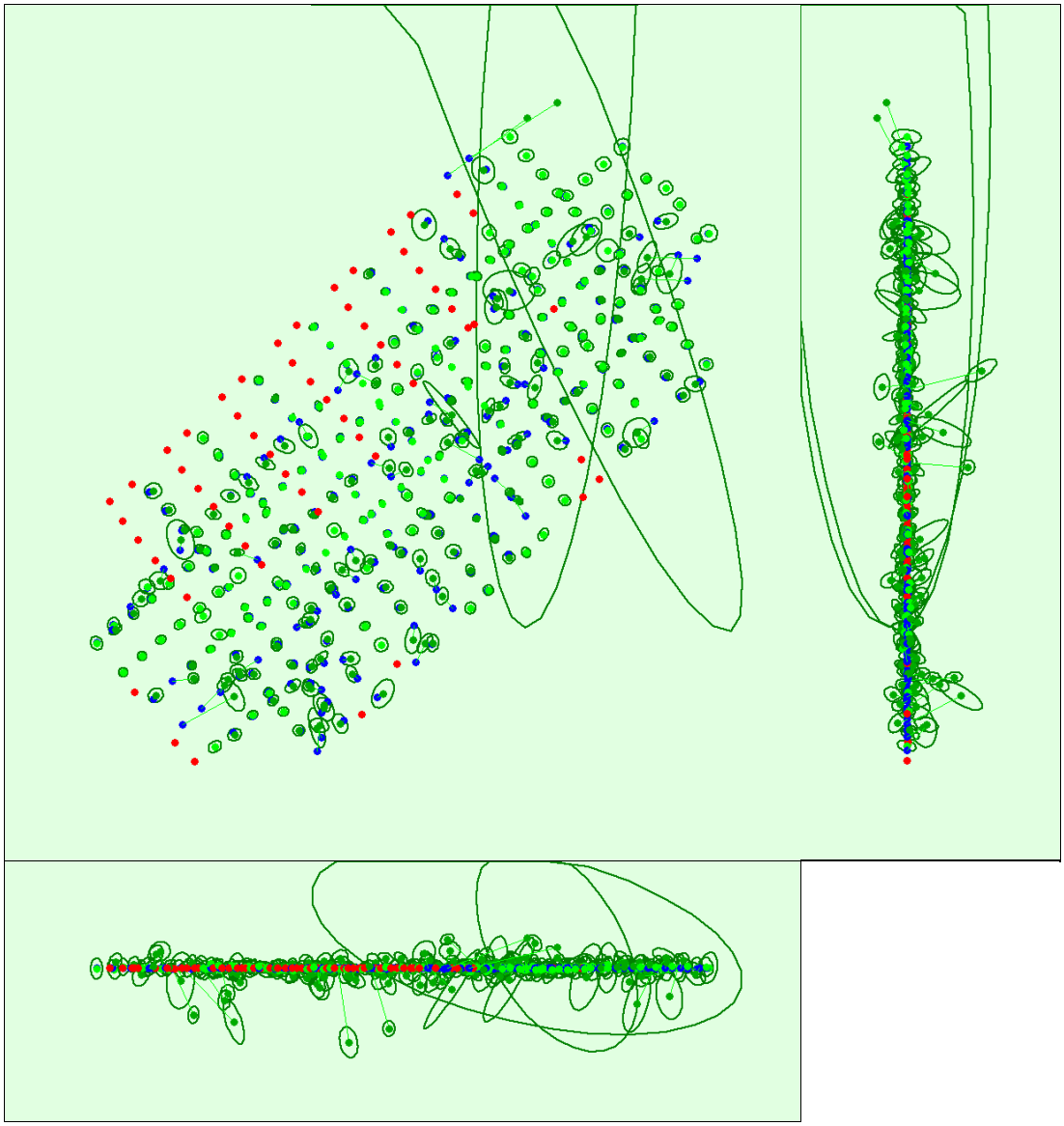


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

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 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	0.016	0.022	0.019	0.048	0.047	0.032
Sigma	0.029	0.093	0.020	0.085	0.151	0.050

Overlap

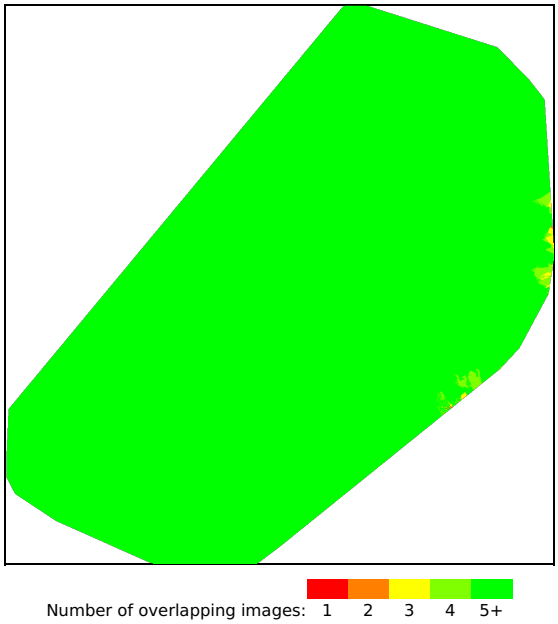


**Figure 4: Number of overlapping images computed for each pixel of the orthomosaic.
Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint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

Bundle Block Adjustment Details

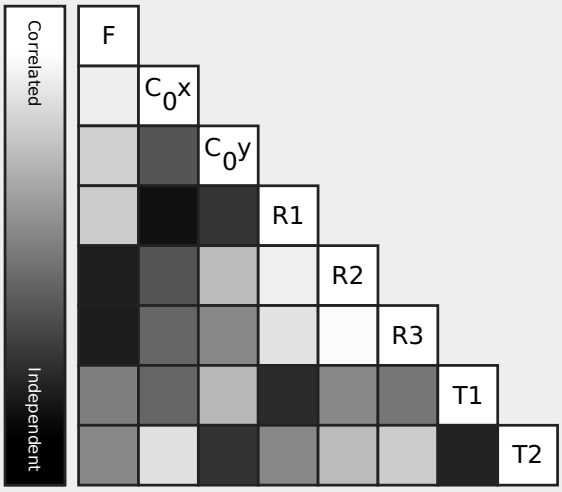
Number of 2D Keypoint Observations for Bundle Block Adjustment	2268194
Number of 3D Points for Bundle Block Adjustment	912771
Mean Reprojection Error [pixels]	0.347

Internal Camera Parameters

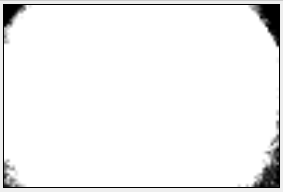
FC6310R_8.8_5472x3648 (RGB). Sensor Dimensions: 12.833 [mm] x 8.556 [mm]

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	3404.547 [pixel] 7.985 [mm]	2681.595 [pixel] 6.289 [mm]	1942.470 [pixel] 4.556 [mm]	-0.034	-0.015	0.010	0.007	-0.004
Uncertainties (Sigma)	0.829 [pixel] 0.002 [mm]	0.499 [pixel] 0.001 [mm]	0.840 [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	59330	6209
Min	35844	77
Max	78524	28919
Mean	57937	7044

3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	691089
In 3 Images	126719
In 4 Images	46809
In 5 Images	21459
In 6 Images	10807
In 7 Images	5678
In 8 Images	3305
In 9 Images	2008
In 10 Images	1326
In 11 Images	924
In 12 Images	687
In 13 Images	527
In 14 Images	396
In 15 Images	275
In 16 Images	227
In 17 Images	155
In 18 Images	109
In 19 Images	88
In 20 Images	61
In 21 Images	35
In 22 Images	22
In 23 Images	13

In 24 Images	10
In 25 Images	13
In 26 Images	9
In 27 Images	4
In 28 Images	4
In 29 Images	1
In 30 Images	1
In 31 Images	5
In 33 Images	2
In 34 Images	3

2D Keypoint Matches

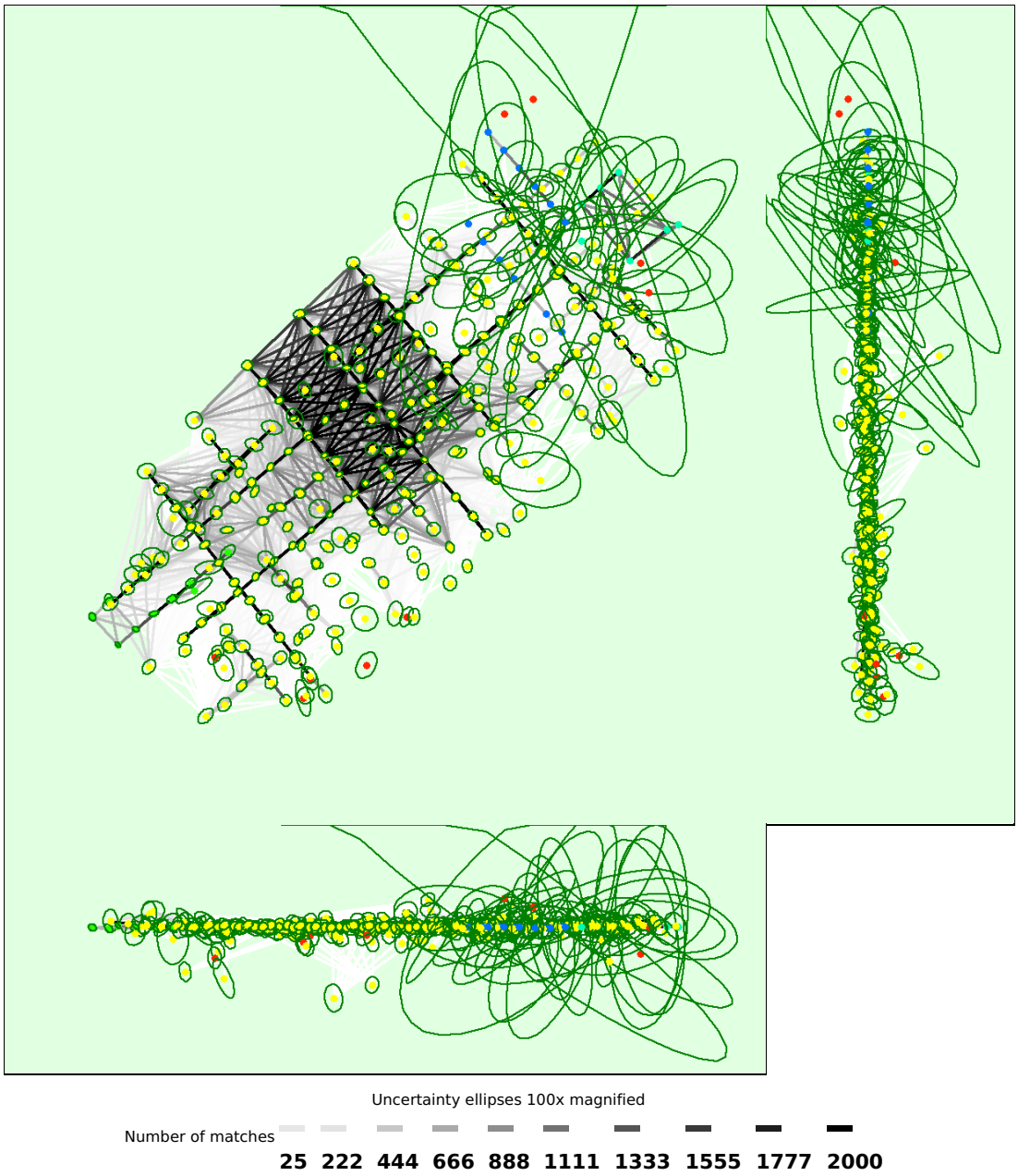


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty 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	0.028	0.030	0.030	0.080	0.062	0.062
Sigma	0.046	0.068	0.044	0.139	0.124	0.128

Geolocation Details

Absolute Geolocation Variance

Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-0.13	5.20	7.51	26.01
-0.13	-0.11	1.73	1.73	5.20
-0.11	-0.08	5.20	4.62	4.05
-0.08	-0.05	6.94	5.78	5.20
-0.05	-0.03	14.45	13.29	1.73
-0.03	0.00	17.92	17.34	6.94
0.00	0.03	16.76	13.87	4.62
0.03	0.05	12.72	10.40	5.20
0.05	0.08	8.67	7.51	4.62
0.08	0.11	6.36	8.09	3.47
0.11	0.13	0.58	5.20	5.20
0.13	-	3.47	4.62	27.75
Mean [m]		-0.003571	0.002509	-0.014005
Sigma [m]		0.072591	0.088111	0.278963
RMS Error [m]		0.072678	0.088147	0.279315

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]	19.08	18.50	12.72
[-2.00, 2.00]	35.84	31.21	20.81
[-3.00, 3.00]	52.02	43.35	32.37
Mean of Geolocation Accuracy [m]	0.014011	0.014011	0.031639
Sigma of Geolocation Accuracy [m]	0.003724	0.003724	0.013876

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

Geolocation Orientational Variance	RMS [degree]
Omega	2.762
Phi	3.090
Kappa	2.368

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 5.13.0-1031-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	11m:16s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	07m:10s

Results

Number of Generated Tiles	1
Number of 3D Densified Points	13240293
Average Density (per m^3)	1452.58

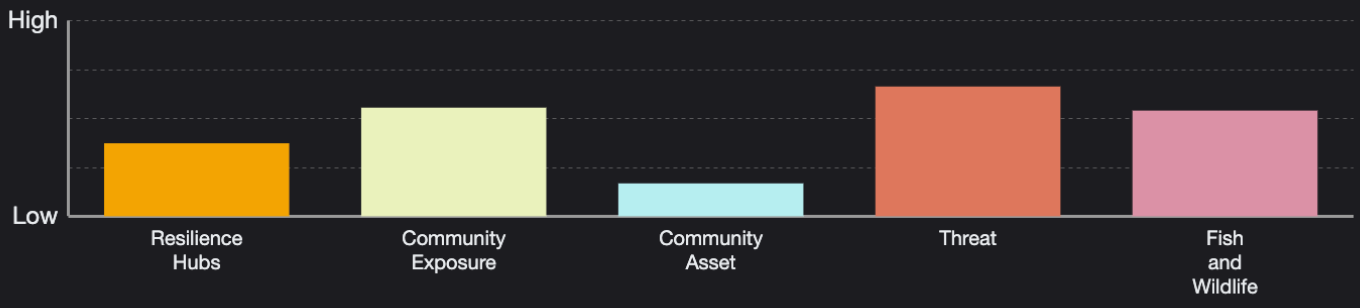
DSM, Orthomosaic and Index Details

Processing Options

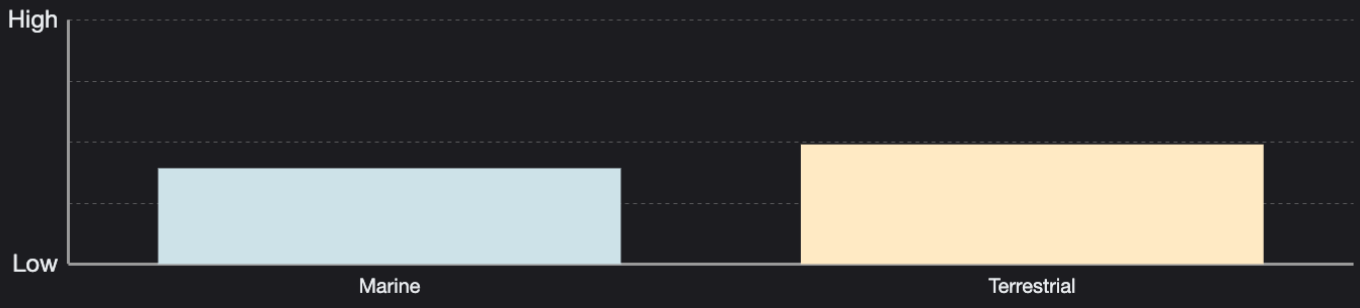
DSM and Orthomosaic Resolution	1 x GSD (1.08 [cm/pixel])

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	21m:16s
Time for DTM Generation	00s
Time for Contour Lines Generation	00s
Time for Reflectance Map Generation	00s
Time for Index Map Generation	00s

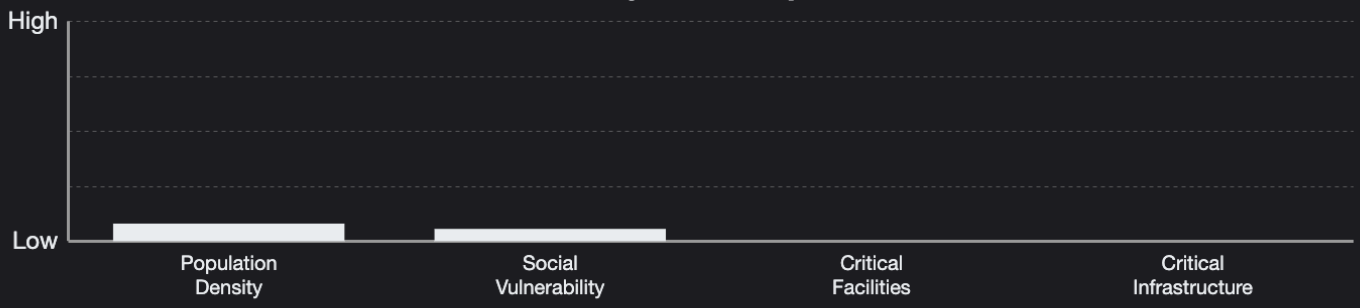
Summary Chart



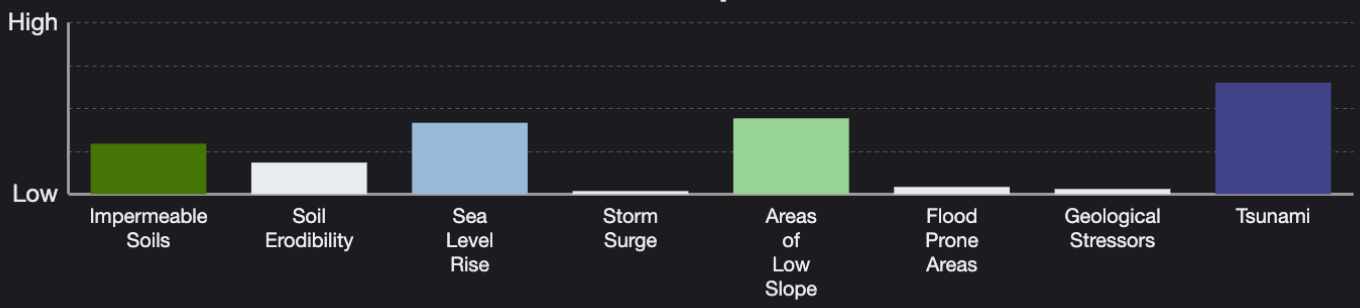
Fish And Wildlife Inputs



Comunity Assets Inputs



Threats Inputs

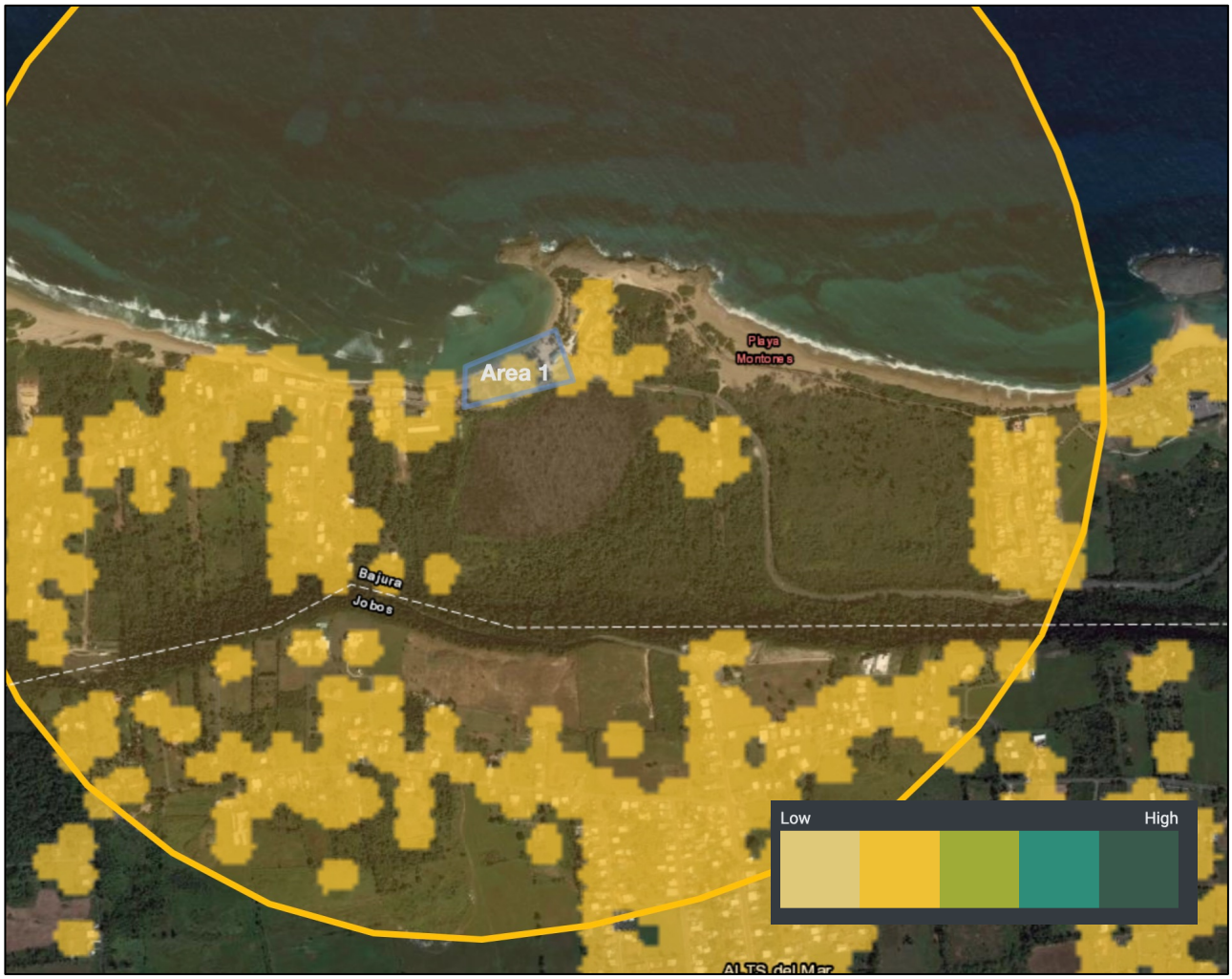


Jobos, Isabela

Flood-Prone Areas

Areas considered by FEMA to be in the 100- and 500-year flood zones, as well as the floodway. Frequently and occasionally flooded soil designations are used to identify areas outside of FEMA coverage. Highest values suggest areas directly in the floodway, whereas low values suggest occasionally flooded soils outside of the floodplain.

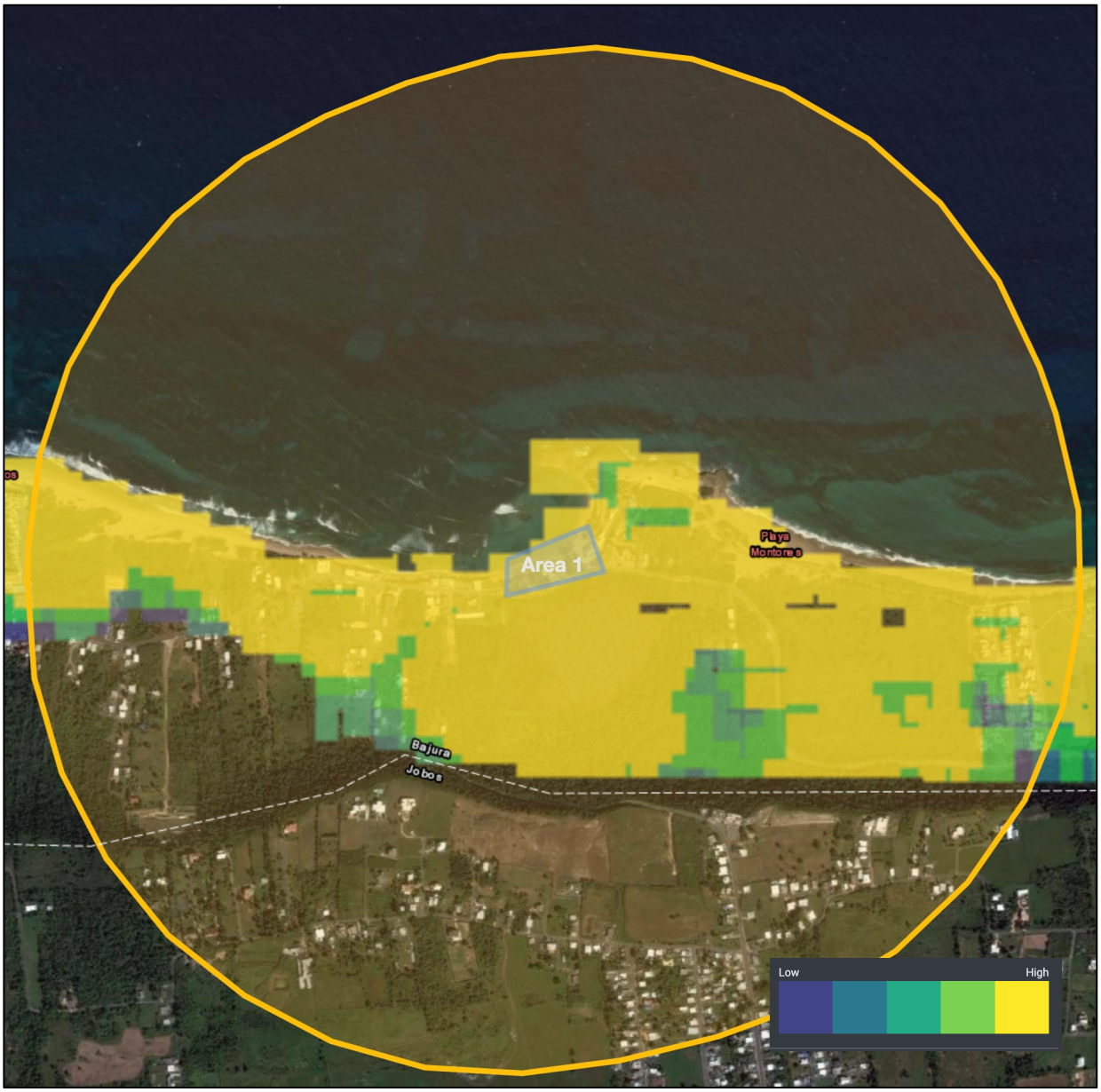
Jobos, Isabela



Population Density

A ranking of population density by census block groups based on the 2016 American Community Survey. Areas are ranked from low to high using the ratio of people per square kilometer.

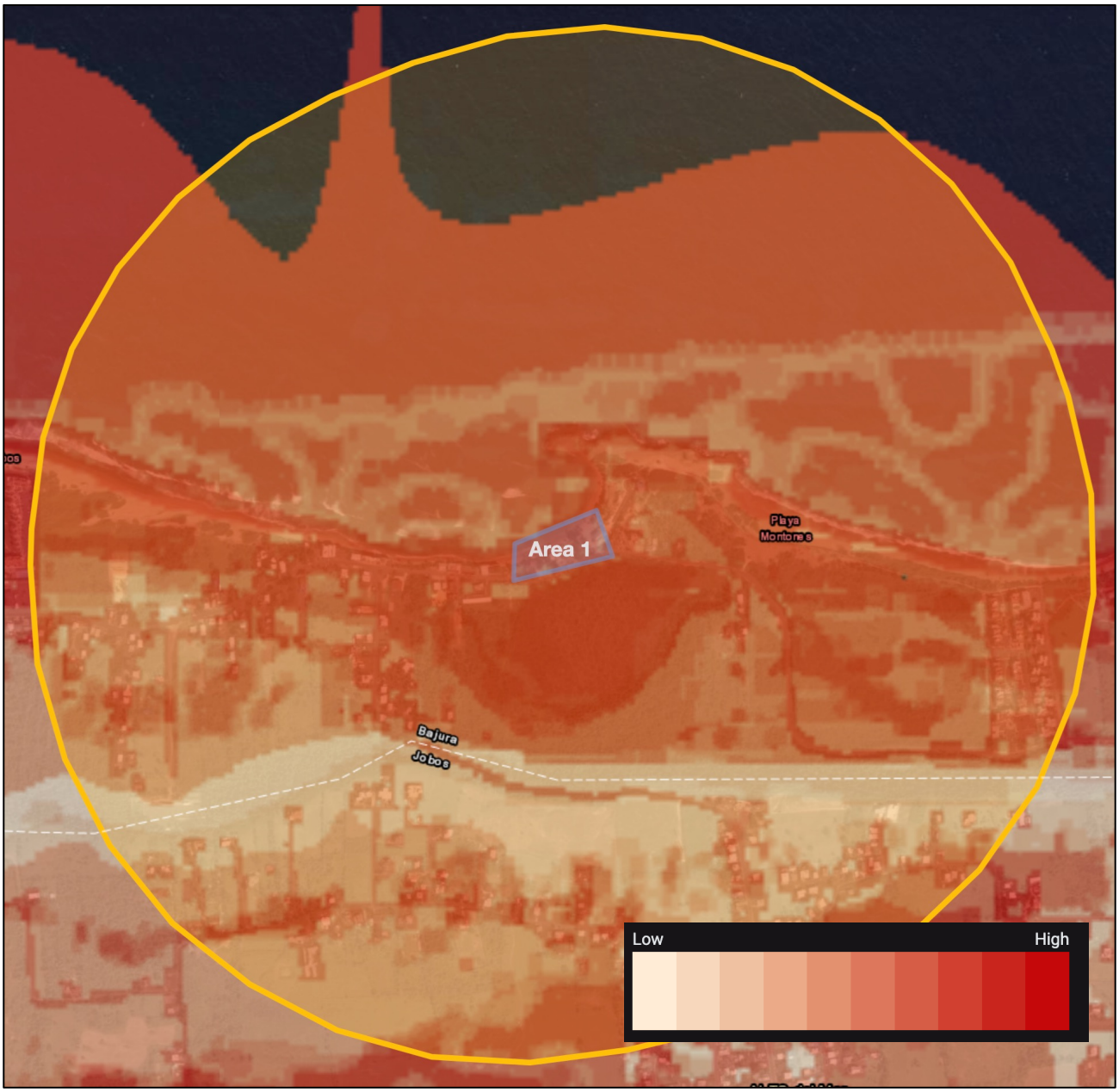
Guajataca, Isabela



Tsunami

Represents the potential inundation height above the ground from a tsunami in Puerto Rico. A higher rank indicates a higher inundation depth.

Guajataca, Isabela



Threat Index

Index of flood-related datasets, including storm surge scenarios and landscape characteristics that exacerbate flood potential. High values in the Index represent those areas on the landscape where there are multiple high values of individual inputs.