

**Corredor Ecologico Del Noreste, Luquillo**

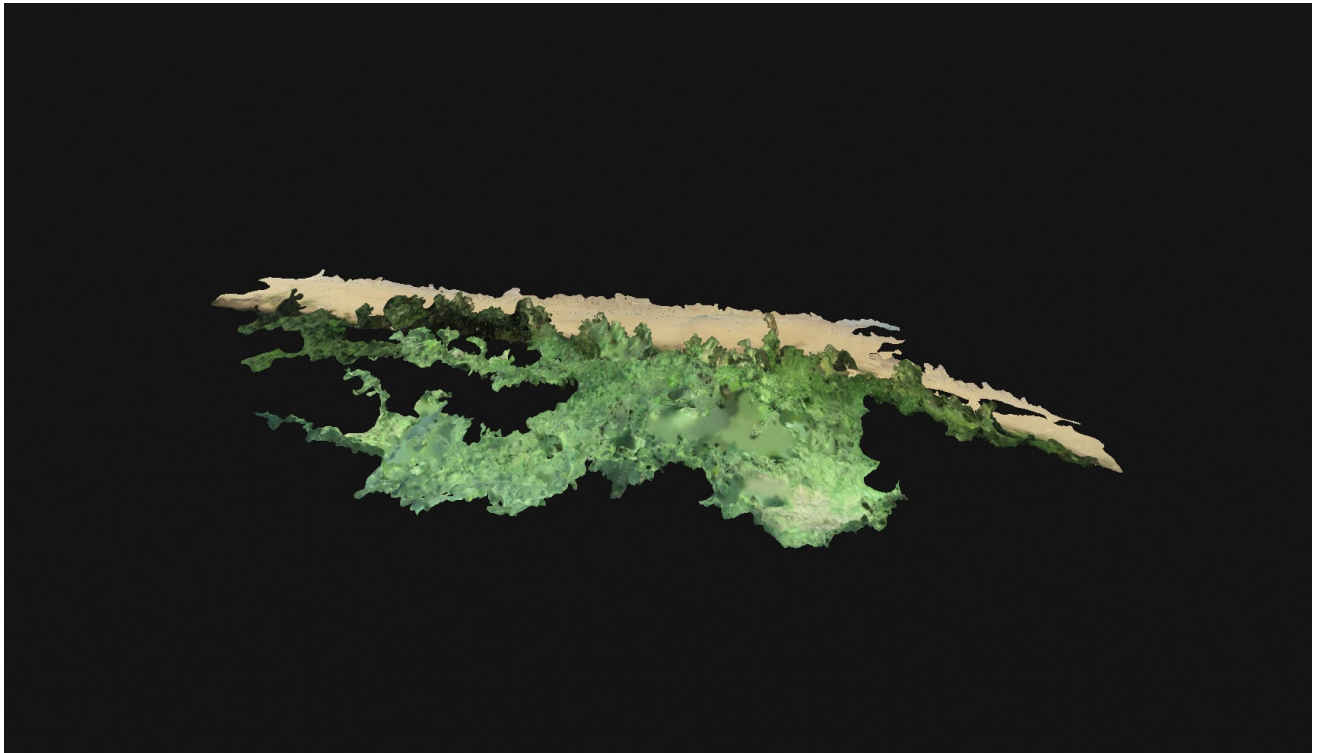
October 06, 2022



**Centroid coordinates : 18.36606° N 65.69261° W**

### 3D map

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### 2D map



Total area of site =3.36918 ha

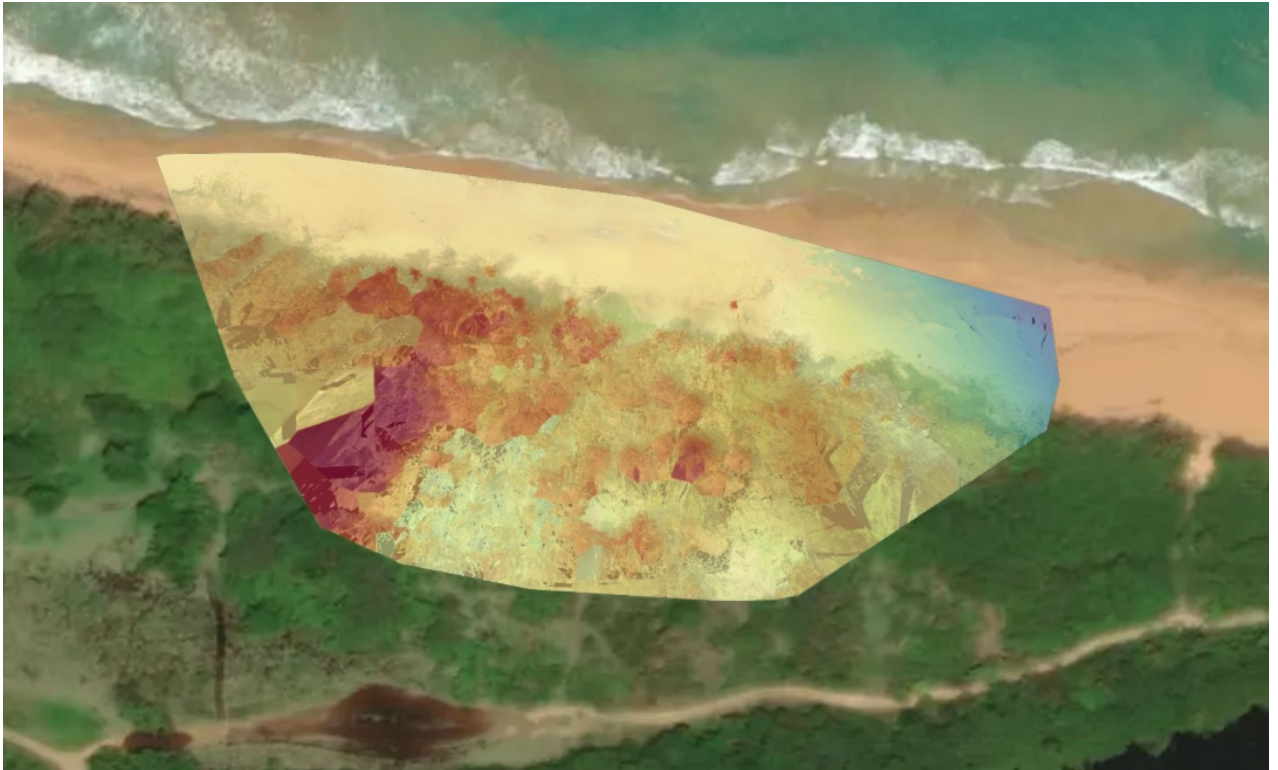
## Beach length (m)

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Beach length =334.687 m

**Density surface model**  
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## Area of the beach

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Area of the beach = 9,228.5 m<sup>2</sup>

# Beach volume

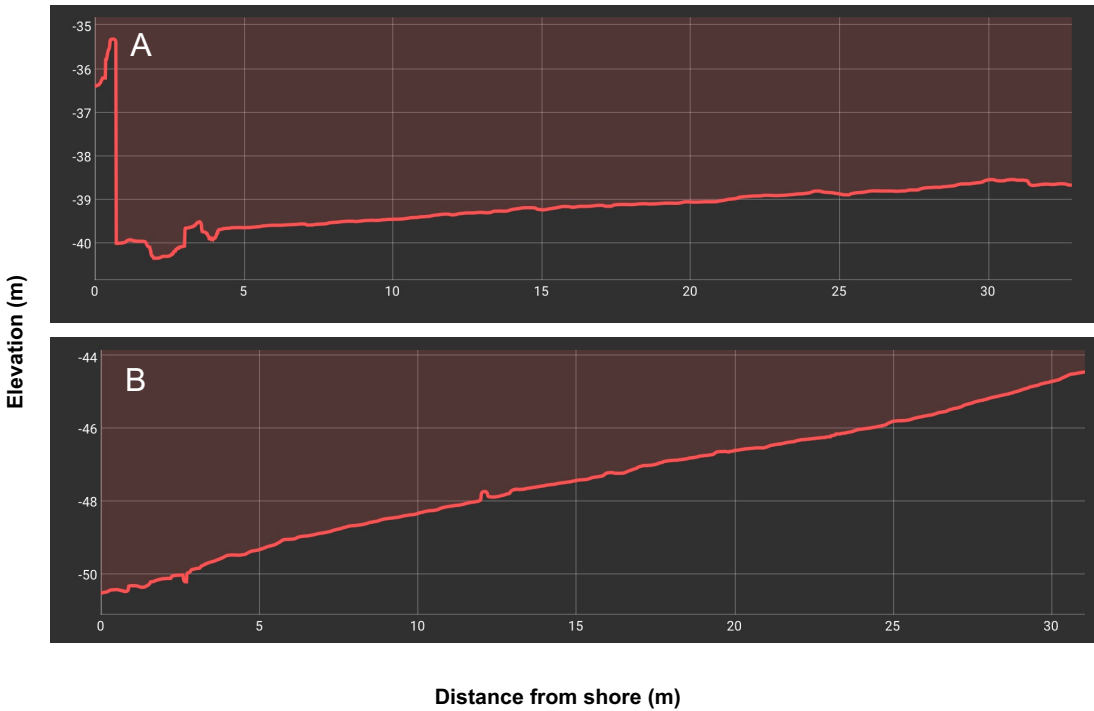
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**Cut = 0.00 m<sup>3</sup>**  
**Fill = -402,319 m<sup>3</sup>**  
**Volume Dif. = -402,319 m<sup>3</sup>**

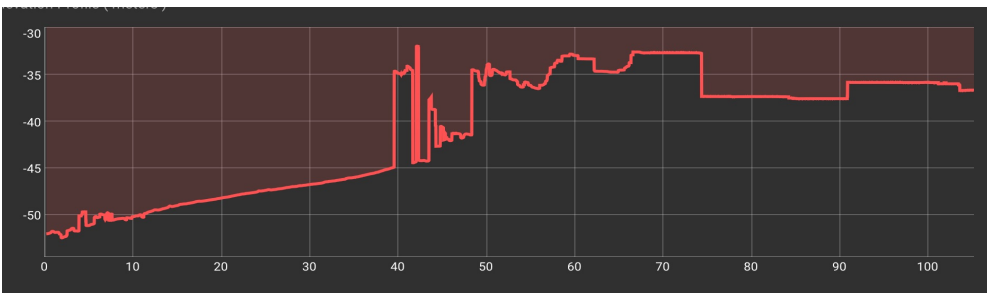
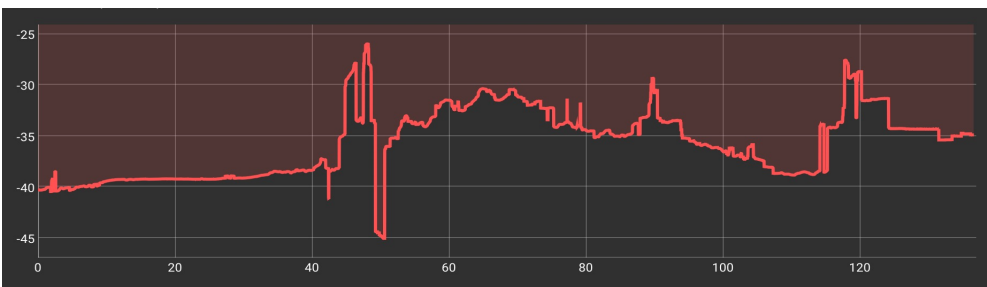
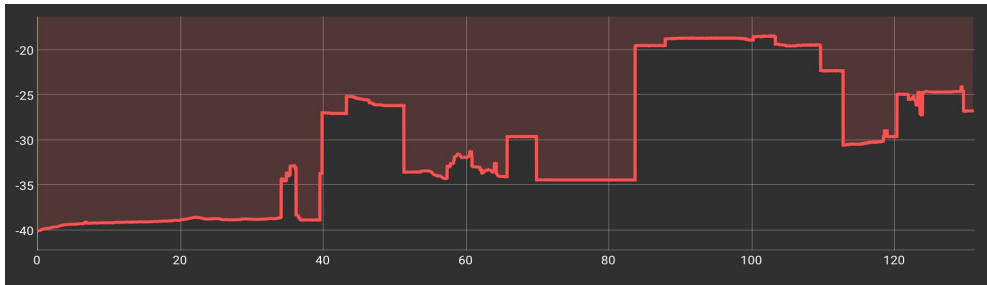
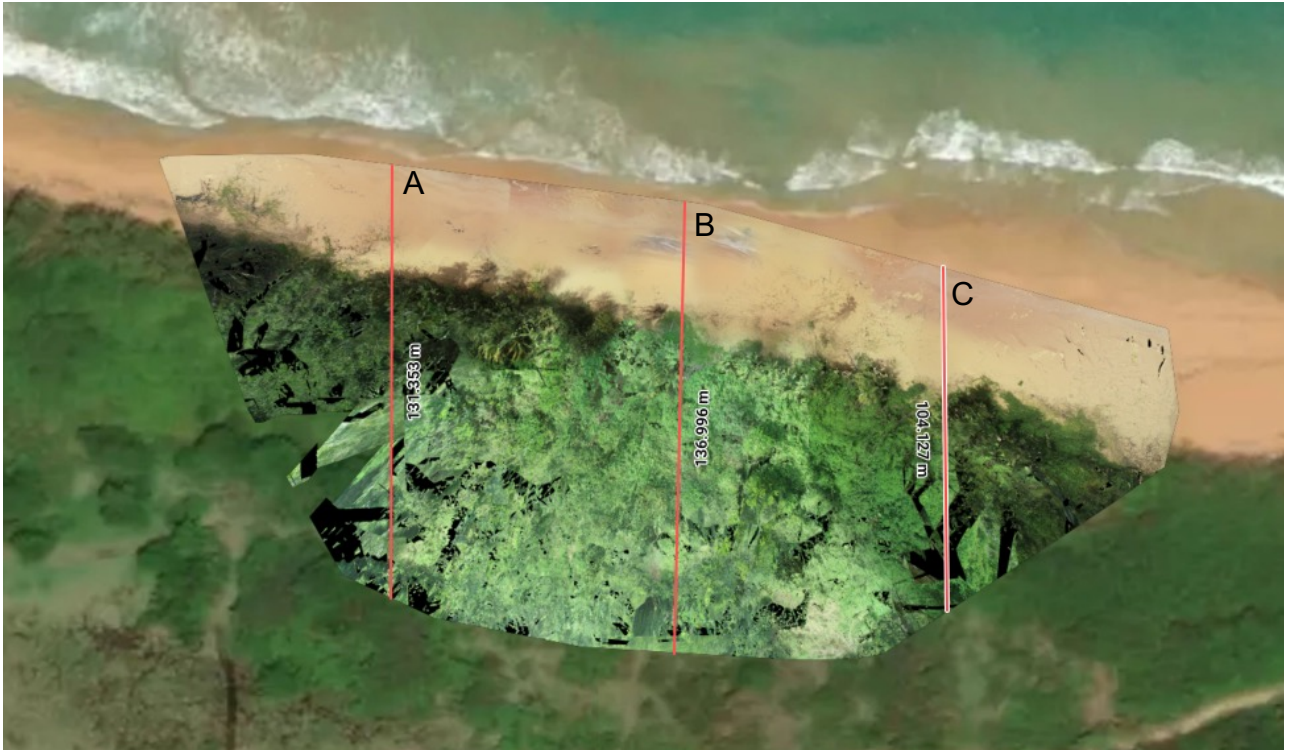
# Beach elevation

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# Site elevation (m)

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Distance from shore (m)



**Shoreface extension (m)**

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Shoreface extension A = 22.529 m  
Shoreface extension B = 27.962 m

## Shoreline

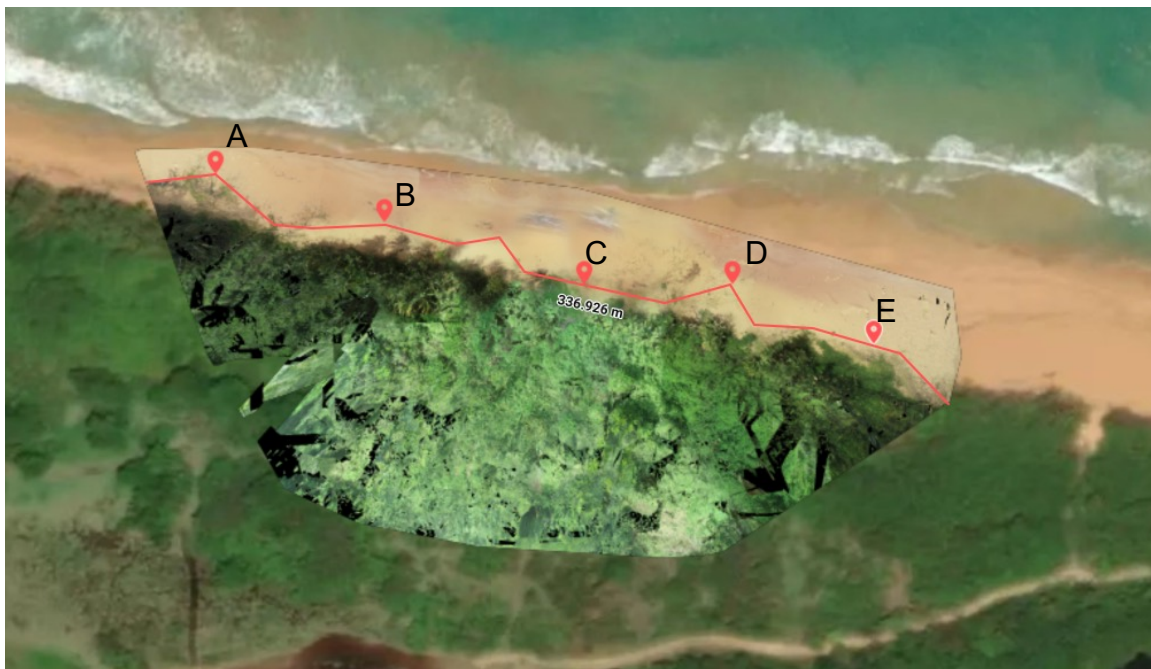
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Shoreline length= 336.926 m

## Shoreline geolocation

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### Shoreline markers

A = 18.36668° N 65.69373° W  
B = 18.36652° N 65.69313° W  
C = 18.36631° N 65.69242° W  
D = 18.36631° N 65.69189° W  
E = 18.36610° N 65.69138° W

## Shoreline extension

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### Shoreline extension

A= 22.795 m

B = 24.349 m

## Shoreline position

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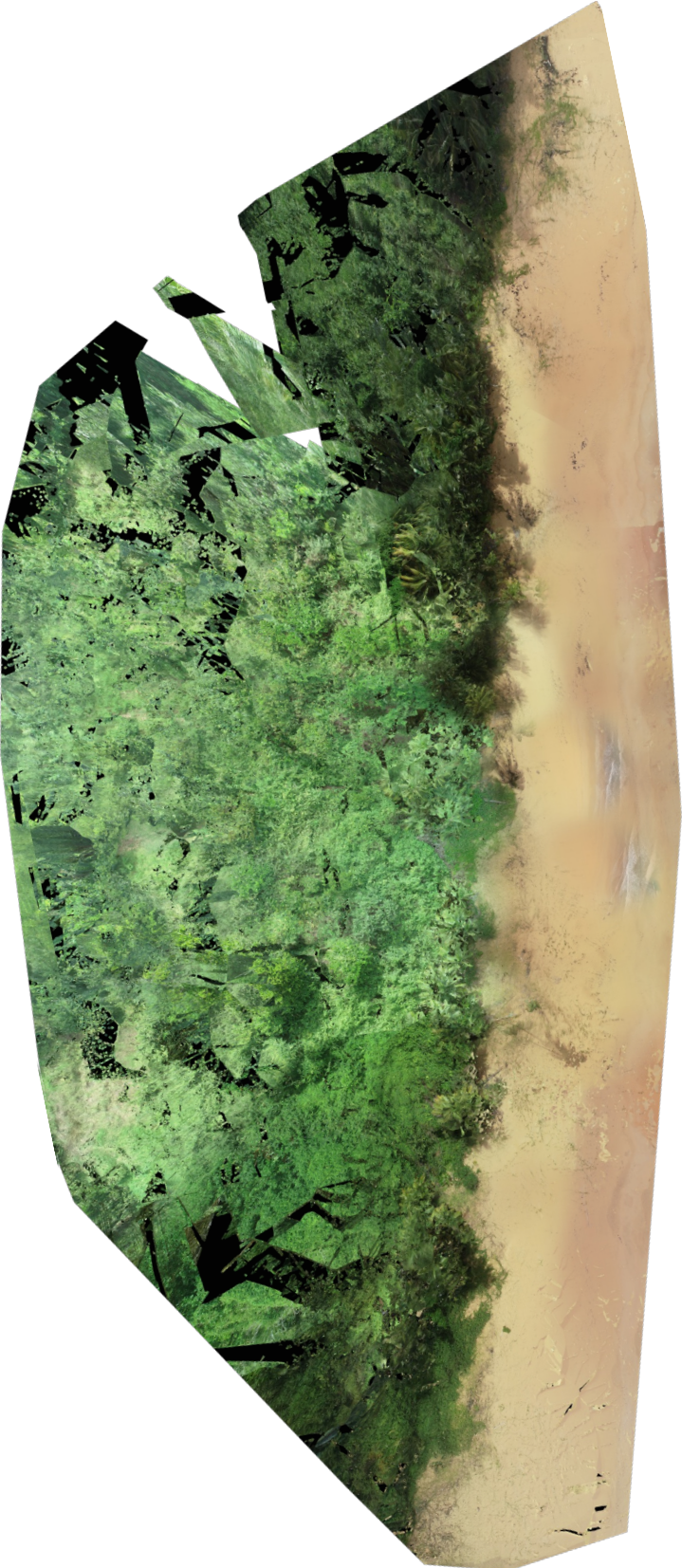
### Shoreline position

A = 10.765 m

B = 13.17 m

C = 11.693 m

**High Resolution Orthomosaic  
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# 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	182801-Project-2022-10-11T15:31:02.070Z
Processed	2022-10-11 16:00:12
Camera Model Name(s)	FC6310R_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.48 cm / 0.58 in
Area Covered	0.033 km <sup>2</sup> / 3.2693 ha / 0.01 sq. mi. / 8.0829 acres
Time for Initial Processing (without report)	18m:57s

## Quality Check



<b>Images</b>	median of 34054 keypoints per image	
<b>Dataset</b>	218 out of 291 images calibrated (74%), all images enabled, 6 blocks	
<b>Camera Optimization</b>	1.29% relative difference between initial and optimized internal camera parameters	
<b>Matching</b>	median of 5777.69 matches per calibrated image	
<b>Georeferencing</b>	yes, no 3D GCP	

## Preview

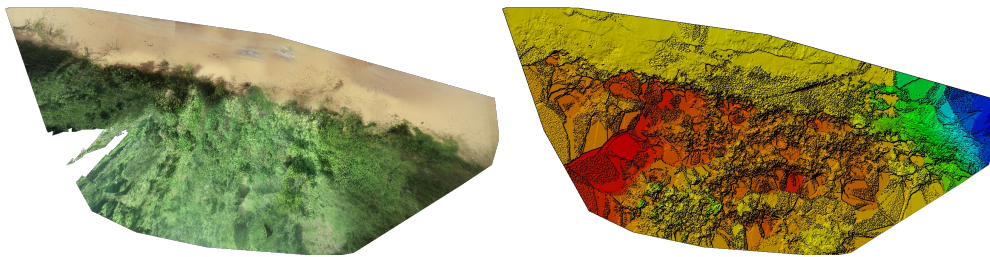


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

## Calibration Details



Number of Calibrated Images	218 out of 291
Number of Geolocated Images	291 out of 291

## Initial Image Positions



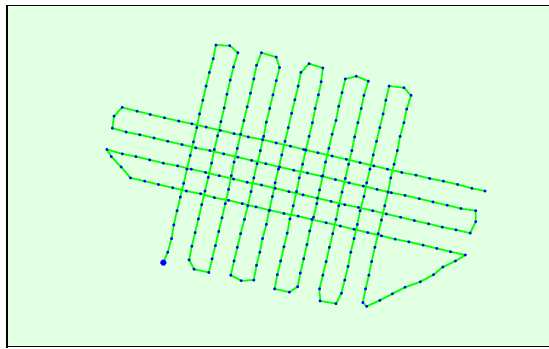
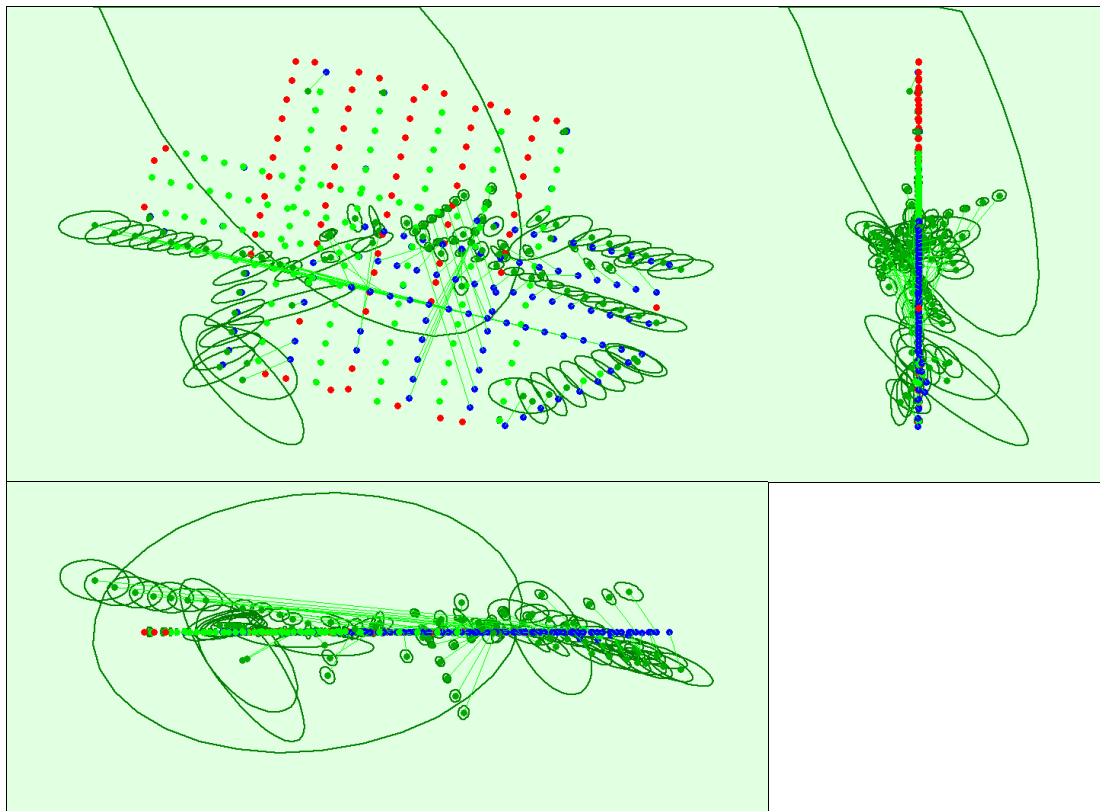


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

### Computed Image/GCPs/Manual Tie Points Positions



Uncertainty ellipses 100x magnified

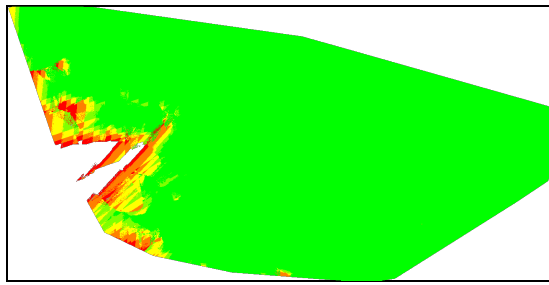
Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Red dots indicate disabled or uncalibrated 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	0.026	0.018	0.019	0.041	0.038	0.050
Sigma	0.053	0.051	0.034	0.046	0.044	0.094

### 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

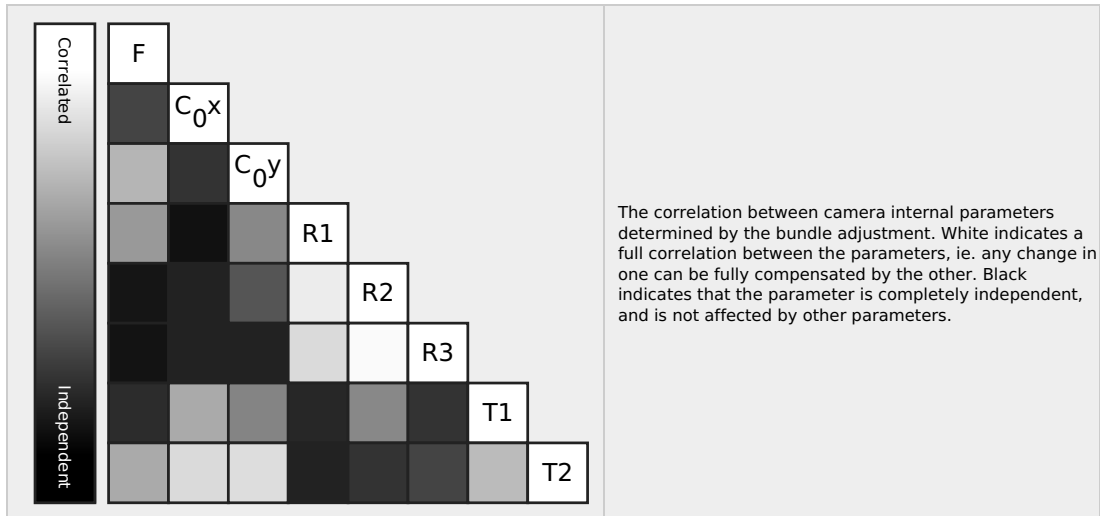
Number of 2D Keypoint Observations for Bundle Block Adjustment	1233321
Number of 3D Points for Bundle Block Adjustment	507615
Mean Reprojection Error [pixels]	0.191

### 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	3705.837 [pixel] 8.691 [mm]	2736.499 [pixel] 6.418 [mm]	1754.907 [pixel] 4.116 [mm]	-0.001	-0.016	0.017	-0.000	-0.000
Uncertainties (Sigma)	1.019 [pixel] 0.002 [mm]	0.757 [pixel] 0.002 [mm]	1.427 [pixel] 0.003 [mm]	0.000	0.001	0.001	0.000	0.000





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 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	34054	5778
Min	20365	50
Max	79965	18125
Mean	41269	5657

## 3D Points from 2D Keypoint Matches



	Number of 3D Points Observed
In 2 Images	389054
In 3 Images	71341
In 4 Images	24467
In 5 Images	10843
In 6 Images	5269
In 7 Images	2757
In 8 Images	1452
In 9 Images	909
In 10 Images	538
In 11 Images	348
In 12 Images	170
In 13 Images	133
In 14 Images	92
In 15 Images	67
In 16 Images	52
In 17 Images	49
In 18 Images	21
In 19 Images	17
In 20 Images	14
In 21 Images	9
In 22 Images	7
In 23 Images	6

## 2D Keypoint Matches





1.83	2.75	0.00	0.00	0.00
2.75	3.67	0.00	0.00	0.00
3.67	4.59	0.00	0.00	0.00
4.59	-	0.00	0.00	0.00
<b>Mean [m]</b>		-0.016177	-0.043753	-0.024530
<b>Sigma [m]</b>		0.126903	0.341043	0.244122
<b>RMS Error [m]</b>		0.127930	0.343838	0.245352

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]	75.20	78.40	65.60
[-2.00, 2.00]	98.40	98.40	76.00
[-3.00, 3.00]	100.00	100.00	86.40
<b>Mean of Geolocation Accuracy [m]</b>	0.032550	0.032550	0.083327
<b>Sigma of Geolocation Accuracy [m]</b>	0.139579	0.139579	0.378003

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

Geolocation Orientational Variance	RMS [degree]
Omega	2.122
Phi	3.656
Kappa	5.389

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 5.15.0-1021-aws x86_64

### Coordinate Systems

Image Coordinate System	WGS 84
Output Coordinate System	WGS 84 / UTM zone 20N

### 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	07m:10s
Time for Point Cloud Classification	NA
Time for 3D Textured Mesh Generation	06m:33s

### Results



Number of Generated Tiles	1
Number of 3D Densified Points	13119753
Average Density (per m <sup>3</sup> )	776.33

## DSM, Orthomosaic and Index Details



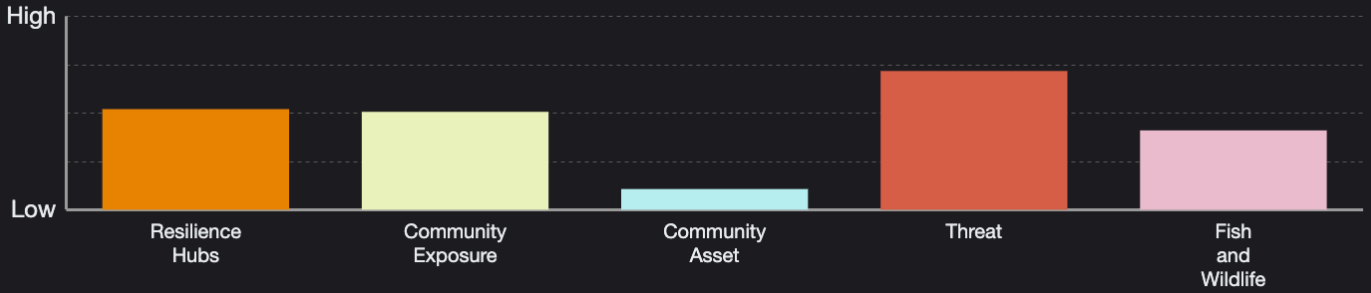
### Processing Options



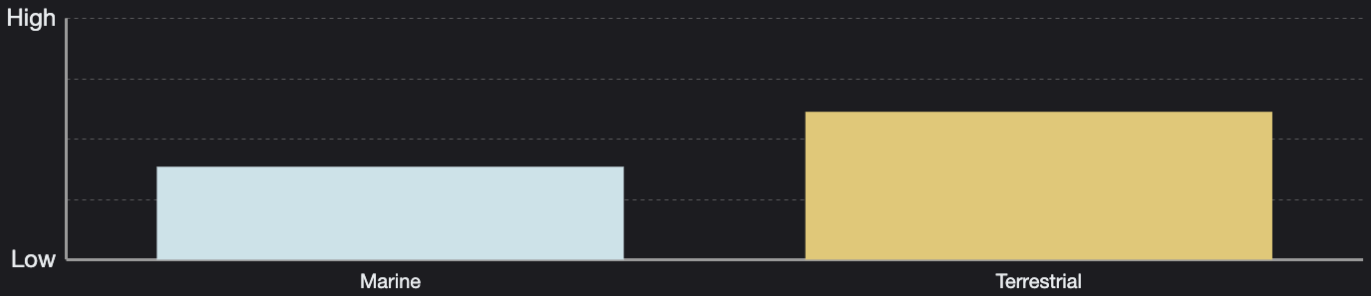
DSM and Orthomosaic Resolution	1 x GSD (1.48 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Raster DSM	Generated: yes Method: Inverse Distance Weighting Merge Tiles: yes
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no
Time for DSM Generation	05m:02s
Time for Orthomosaic Generation	12m:29s
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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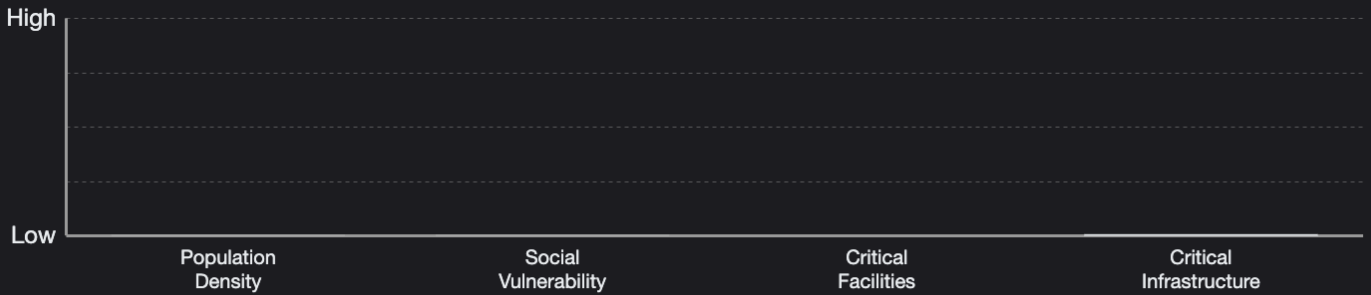
## Summary Chart



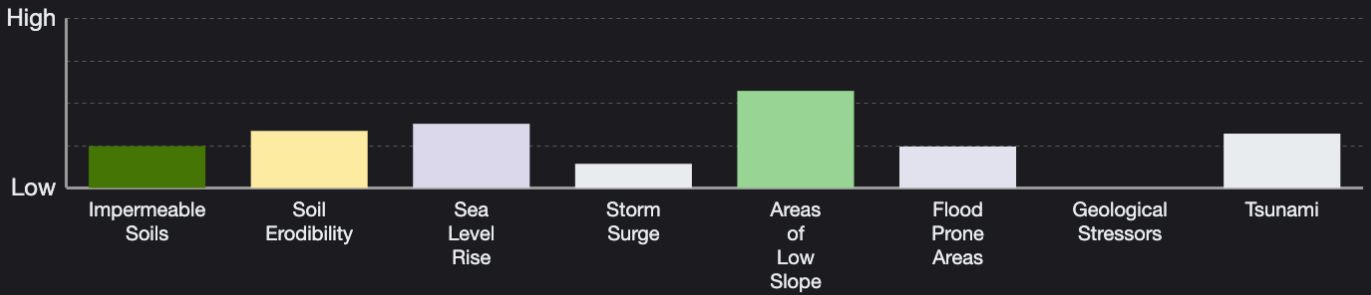
## Fish And Wildlife Inputs



## Comunity Assets Inputs



## Threats Inputs



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### 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.

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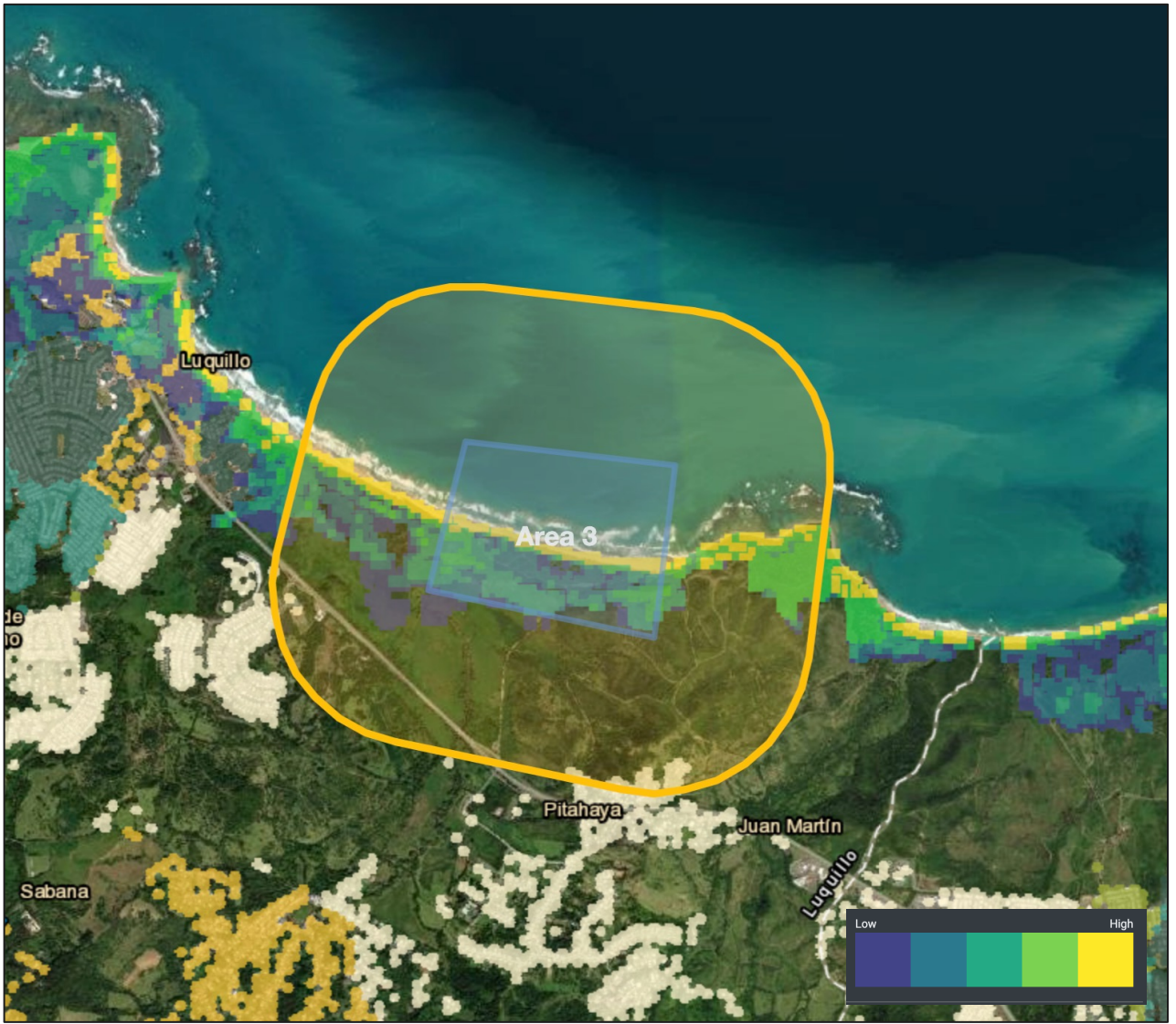


### Population Density

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.



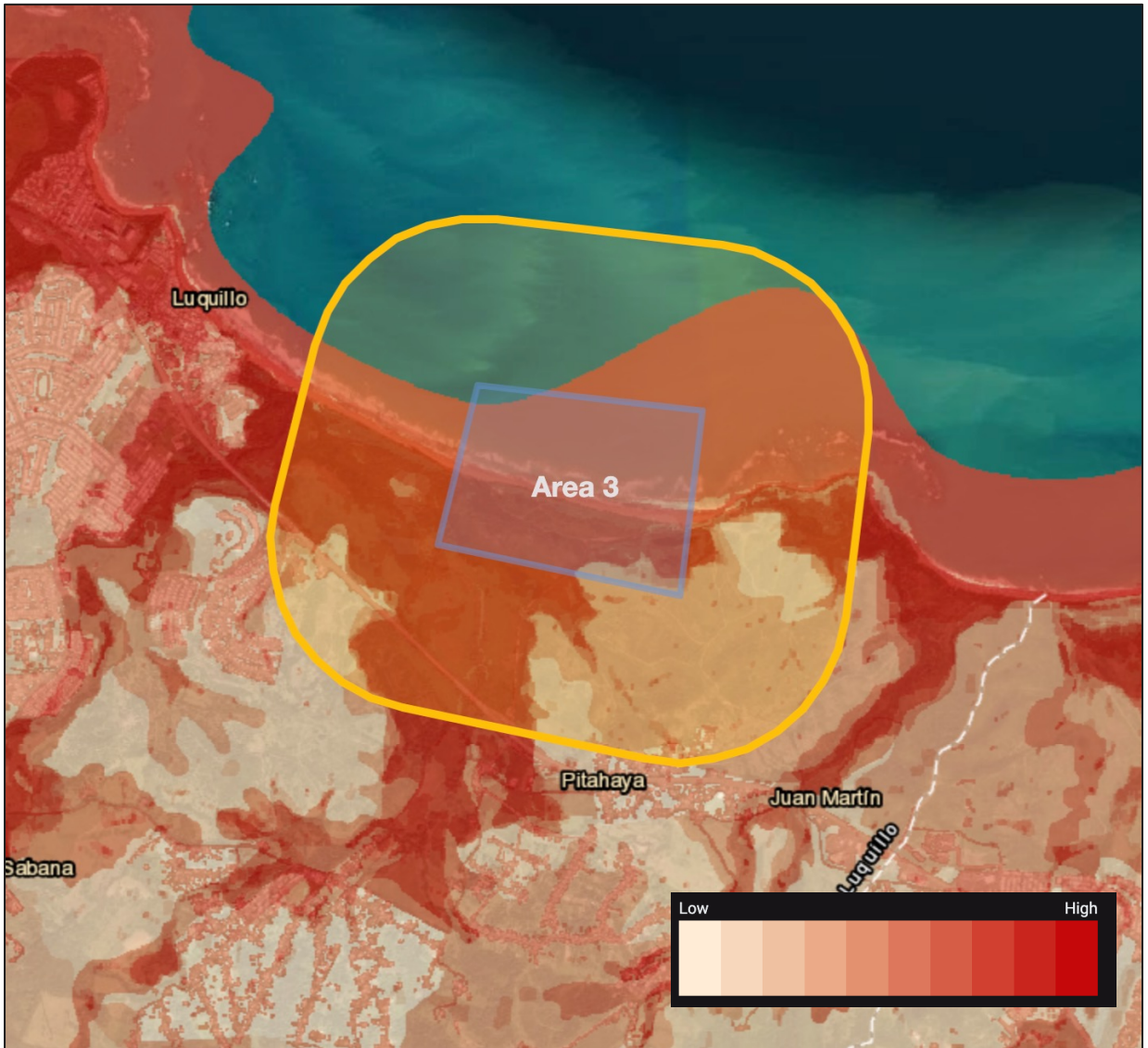
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**Tsunami**

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

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### 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.