



Site Suitability: Interpolation and Map Suitability

Rhythm osan | ENVE 555 | 02/14/2024

Table of contents

01

Water Data

02

Road Data

03

Land cover Data

04

Railroad Data

05

Powerline Data

06

Elevation Data

07

Geography Data

01

Water Data

Site :

1. can not exist on
water

Water Data

Geoprocessing

Reclassify

Parameters Environments

Input raster
Water_Band_1

Reclass field
Description

Reclassification

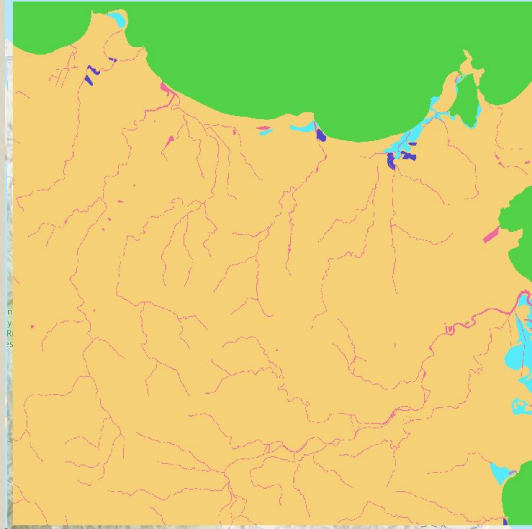
Reverse New Values

Value	New
00 = Dry Land	1
01 = Wetland	NODATA
02 = Mangroves	NODATA
03 = Inland Water	NODATA
04 = Ocean	NODATA
NODATA	NODATA

Classify Unique

Output raster
Reclass_Wate2

☐ Change missing values to NoData



Green = Areas that are dry
land → site suitable



02

Road Data

Site :

1. can not exist on a road
2. must be close to a road for easy transportation

Road Data Criteria 1

Geoprocessing ▾ 🔍 ✕

⬅️ Reclassify ➕

Parameters Environments ?

Input raster
Roads_Band_1 📁

Reclass field
Description ⚙️

Reclassification

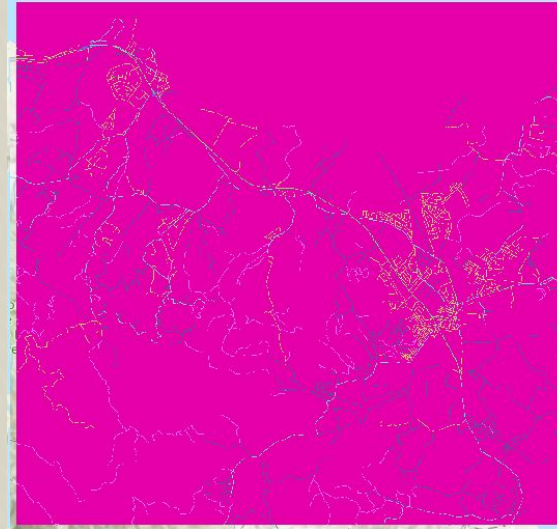
Reverse New Values

Value	New
00 = Non-road	1
02 = State Highway: 2-lane	NODATA
03 = Highway Access Ramp	NODATA
06 = Regional Road: 2-lane	NODATA
08 = Local Road: Primary	NODATA
09 = Local Road: Secondary	NODATA
10 = Local Road: Tertiary	NODATA
13 = Cul de Sac	NODATA
NODATA	NODATA

Classify Unique 📁 💾 🗑️

Output raster
Reclass_Road3 📁

☐ Change missing values to NoData



Pink = Roads do not exist so
site suitable



Road Data Criteria 2

Geoprocessing

Reclassify

Parameters Environments

Input raster
Roads_Band_1

Reclass field
Description

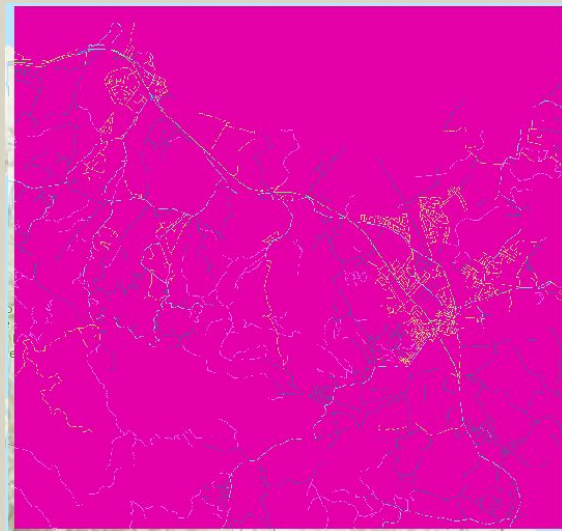
Reclassification

Value	New
00 = Non-road	NODATA
02 = State Highway: 2-lane	1
03 = Highway Access Ramp	1
06 = Regional Road: 2-lane	1
08 = Local Road: Primary	1
09 = Local Road: Secondary	1
10 = Local Road: Tertiary	1
13 = Cul de Sac	8
NODATA	NODATA

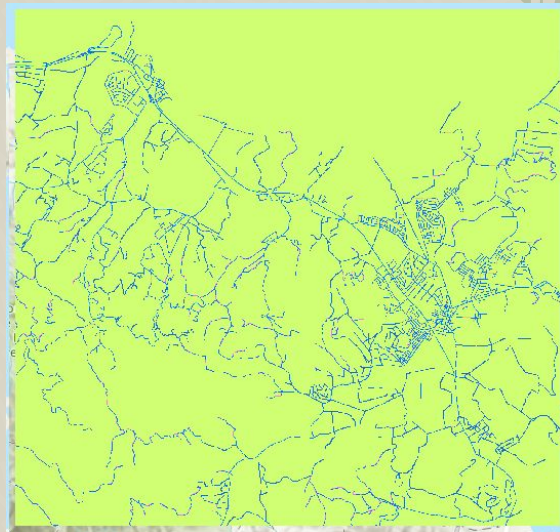
Classify Unique

Output raster
Reclass_Road3

☐ Change missing values to NoData



Blue = Roads exist



Road Data Criteria 2

Geoprocessing

Euclidean Distance

This tool is deprecated and will be removed in a future release.
The Distance Accumulation tool provides enhanced functionality or performance.

Parameters Environments

Input raster or feature source data
Roads

Output distance raster
EucDist_Recl2

Input raster or feature barrier data

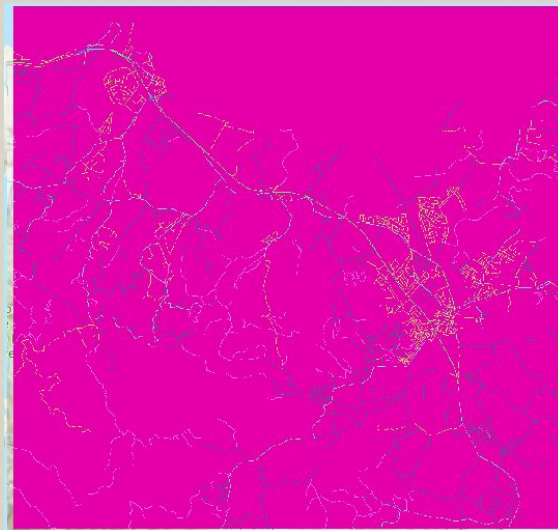
Maximum distance

Output cell size
10

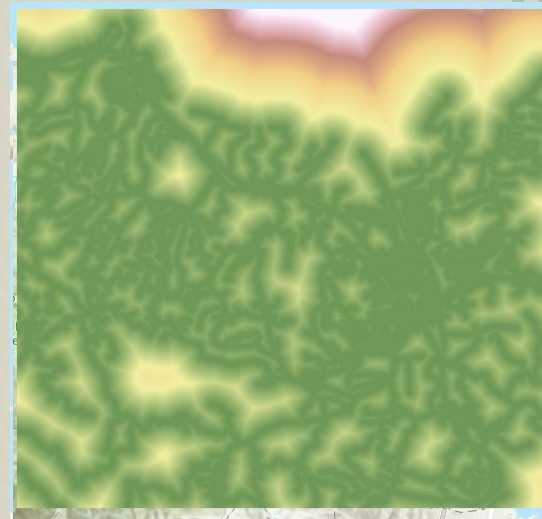
Distance Method
Planar

Output direction raster

Out back direction raster



Green = Areas close to roads so preferably more site suitable



Road Data Criteria 2

Geoprocessing

← Slice →

Parameters Environments ?

Input raster
dist_from_roads

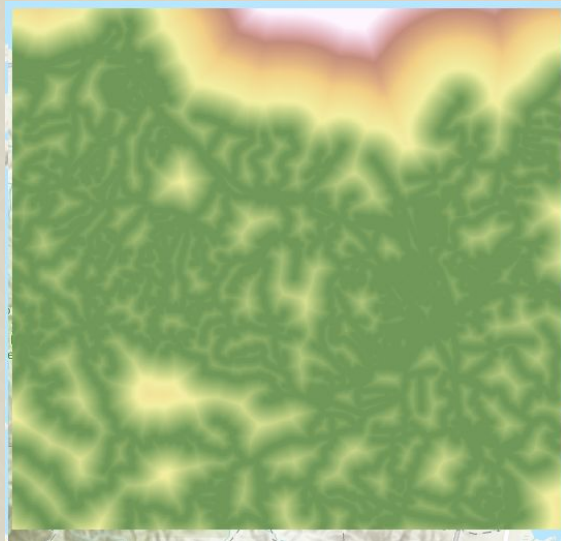
Output raster
Slice_Slice_1

Slice method
Equal interval

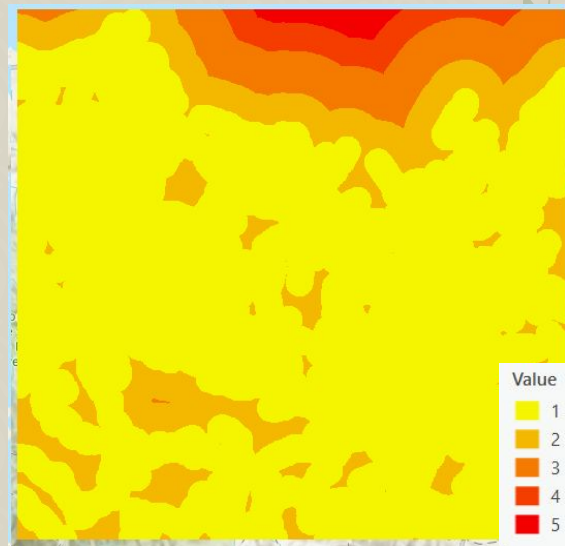
Number of output zones 5

Starting value for output 1

Change NoData to value for output

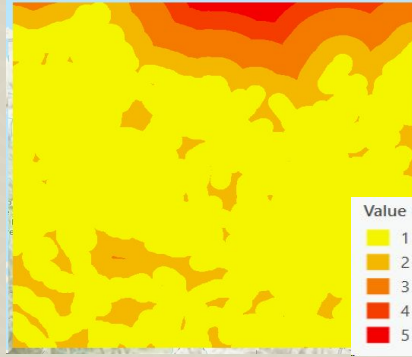
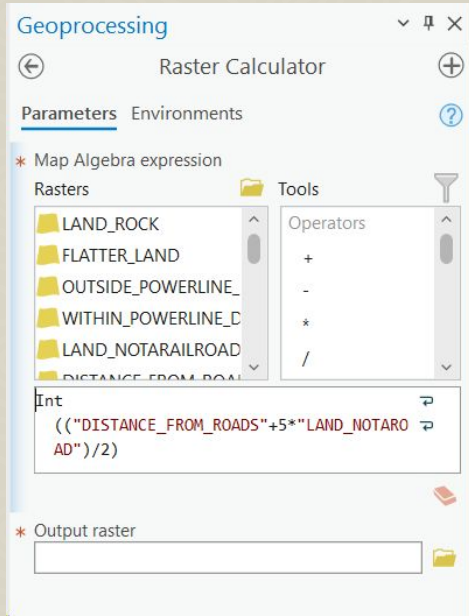


Yellow= Area with close access to a road → site suitable



Road Overlay

Road Overlay



+



=



Road overlay

Geoprocessing

Reclassify

Parameters Environments

Input raster
distan_raste

Reclass field
Value

Reclassification

Reverse New Values

Value	New
3	1
4	NODATA
5	NODATA
NODATA	NODATA

Classify Unique

Output raster
Reclass_dist1

☐ Change missing values to NoData



Yellow= Areas that aren't on top of a road but close enough for easy transportation



03

Land Cover Data

Site :

1. can not exist on water
2. can not exist on sand or rock
3. must exist on relatively dry ground

Land Cover Data

Geoprocessing

Reclassify

Parameters Environments

Input raster
LandCover_Band_1

Reclass field
Description

Reclassification

Reverse New Values

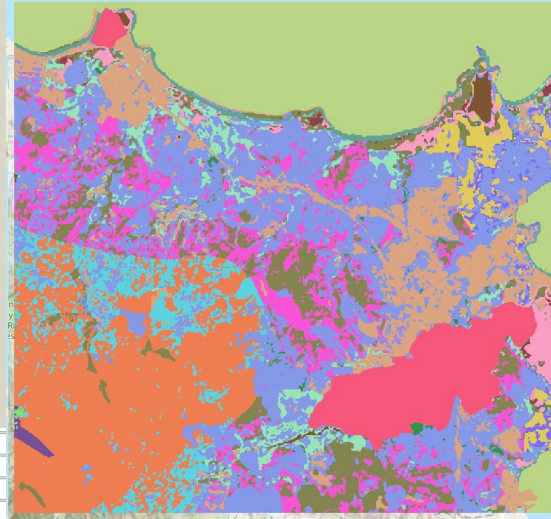
Value		New
01 = Montane	Wet	NODATA
02 = Montane	Wet	NODATA
03 = Submontane	Wet	NODATA
04 = Submontane	Wet	NODATA
05 = Lowland	Moist	1
09 = Lowland	Moist	1
10 = Lowland	Moist	1
11 = Lowland	Dry	1
12 = Lowland	Dry	1
13 = Tidal		NODATA
15 = Seasonally Flooded R.		NODATA
16 = Wetlands (or seasona		NODATA

18 = Pasture	1
19 = Agriculture	1
20 = Agriculture (or hay fie	1
21 = Urban (or barren)	1
22 = Sand or Rock	NODATA
23 = Inland Water Body	NODATA
24 = Ocean	19
NODATA	NODATA

Classify Unique

Output raster
Reclass_Land2

☐ Change missing values to NoData



Green= Suitable land regions



04

Railroad Data

Site :

1. can not exist on
or too close to
any railroad

Railroad Data

Geoprocessing

Reclassify

Parameters Environments

Input raster
Railroads_Band_1

Reclass field
Description

Reclassification

Value	New
00 = Non-railroad	1
01 = Railroad	0
NODATA	NODATA

Classify Unique

Output raster
Reclass_Rail3

☐ Change missing values to NoData

Geoprocessing

Focal Statistics

Parameters Environments

Input raster
Reclass_Rail3

Output raster
FocalSt_Recl3

Neighborhood
Circle

Radius
100

Units type
Map

Statistics type
Minimum

☒ Ignore NoData in calculations

Geoprocessing

Reclassify

Parameters Environments

Input raster
FocalSt_Recl3

Reclass field
Value

Reclassification

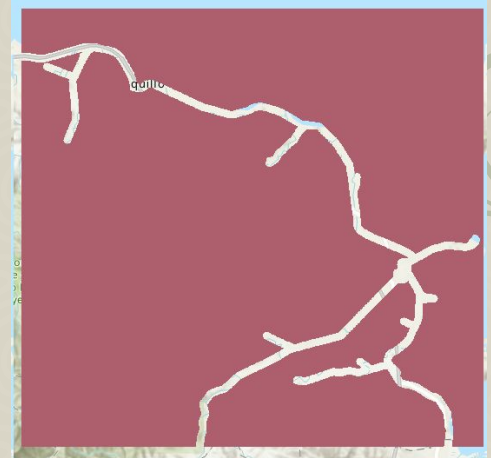
Value	New
0	NODATA
1	2
NODATA	NODATA

Classify Unique

Output raster
Reclass_Foca1

☐ Change missing values to NoData

Red= Not on top of or directly next to a railroad



05

Power Data

Site :

1. can not exist going through a powerline or too close to a powerline
2. can not exist too far from powerline (access to utilities like electricity)

Power Line Data Criteria 1

Geoprocessing

Reclassify

Parameters Environments

Input raster
Powerlines_Band_1

Reclass field
Description

Reclassification

Reverse New Values

Value	New
00 = Non-powerline	1
01 = Powerline	0
NODATA	NODATA

Classify Unique

Output raster
Reclass_Powe1

☐ Change missing values to NoData

Geoprocessing

Focal Statistics

Parameters Environments

Input raster
Reclass_Powe2

Output raster
FocalSt_Recl5

Neighborhood
Circle

Radius
15

Units type
Map

Statistics type
Minimum

☒ Ignore NoData in calculations

Geoprocessing

Reclassify

Parameters Environments

Input raster
FocalSt_Recl5

Reclass field
Value

Reclassification

Reverse New Values

Value	New
0	NODATA
1	1
NODATA	NODATA

Classify Unique

Output raster
Reclass_Foca3

☐ Change missing values to NoData

Green = Regions
not on top of a
Powerline



Power Line Data Criteria 2

Geoprocessing

Reclassify

Parameters Environments

Input raster
Powerlines_Band_1

Reclass field
Description

Reclassification

Reverse New Values

Value	New
00 = Non-powerline	1
01 = Powerline	0
NODATA	NODATA

Classify Unique

Output raster
Reclass_Powe1

☐ Change missing values to NoData

Geoprocessing

Focal Statistics

Parameters Environments

Input raster
Reclass_Powe1

Output raster
FocalSt_Recl4

Neighborhood
Circle

Radius
2000

Units type
Map

Statistics type
Minimum

☒ Ignore NoData in calculations

Geoprocessing

Reclassify

Parameters Environments

Input raster
FocalSt_Recl5

Reclass field
Value

Reclassification

Reverse New Values

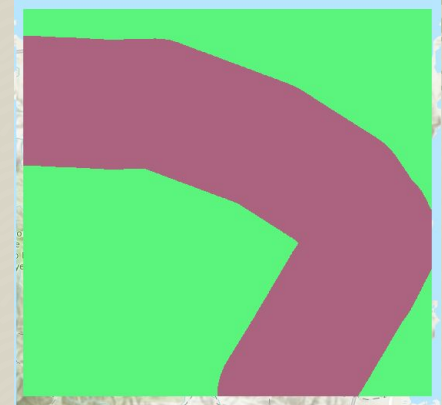
Value	New
0	NODATA
1	1
NODATA	NODATA

Classify Unique

Output raster
Reclass_Foca3

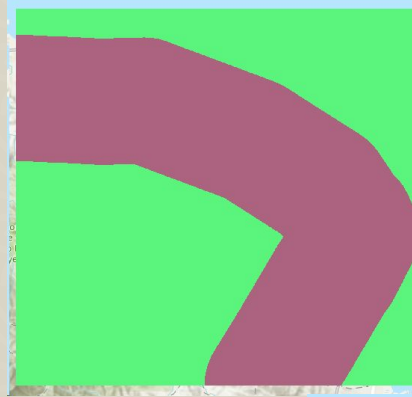
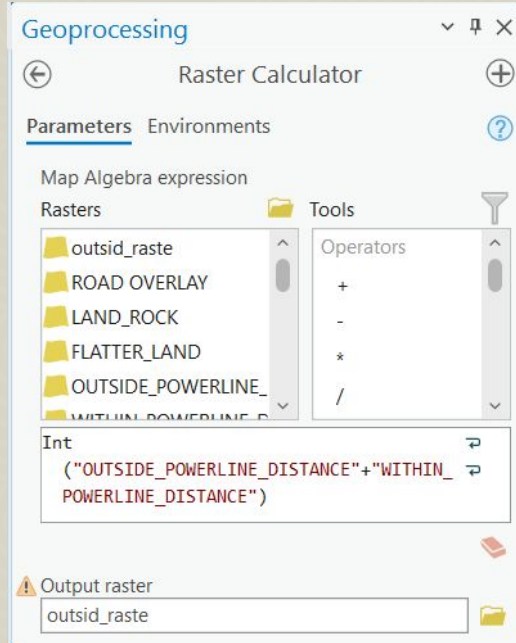
☐ Change missing values to NoData

Red= Within the region for accessible electricity/utilities

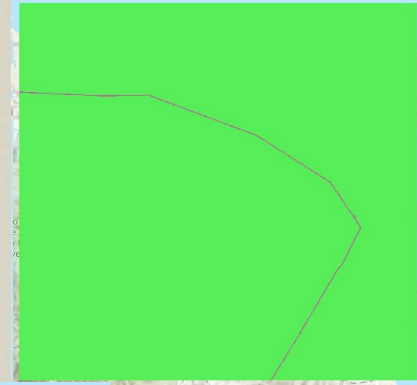


Power Data Overlay

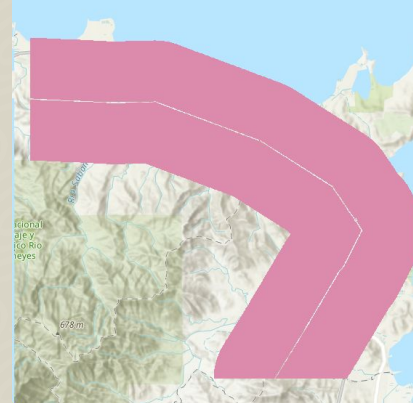
Power Data Overlay



-



=



Pink = Close enough to the powerline but not directly on top of it

06

Elevation Data

Site :

1. can not exist on an area that slopes too much (for structural reasons)

Elevation Data

Geoprocessing

Slope

The Surface Parameters tool provides enhanced functionality or performance.

Parameters Environments

Input raster
Elevation_Band_1

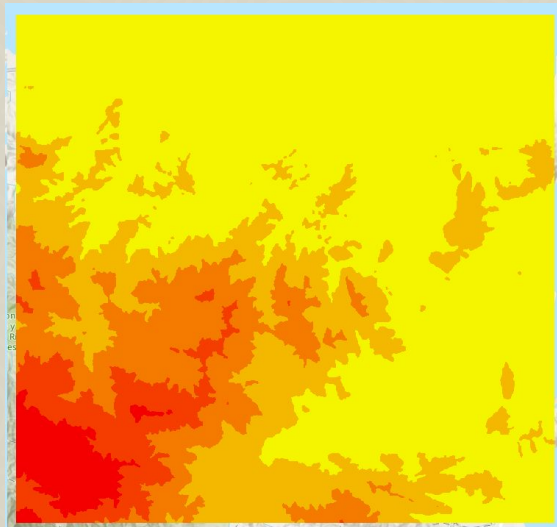
Output raster
Slope_Elevat1

Output measurement
Degree

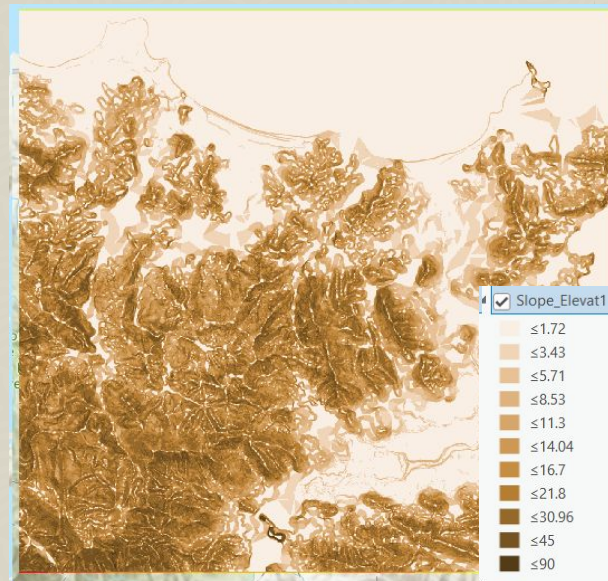
Method
Planar

Z factor
1

Target device for analysis
GPU then CPU



Slope of Elevation



Elevation Data

Geoprocessing

Reclassify

Parameters Environments

Input raster
Slope_Elevat1

Reclass field
VALUE

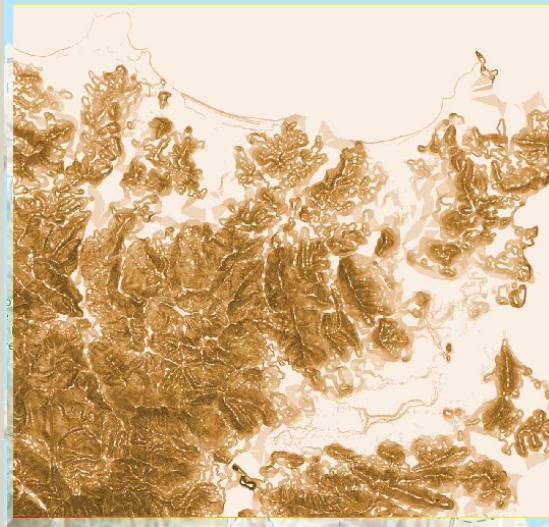
Reclassification

Reverse New Values

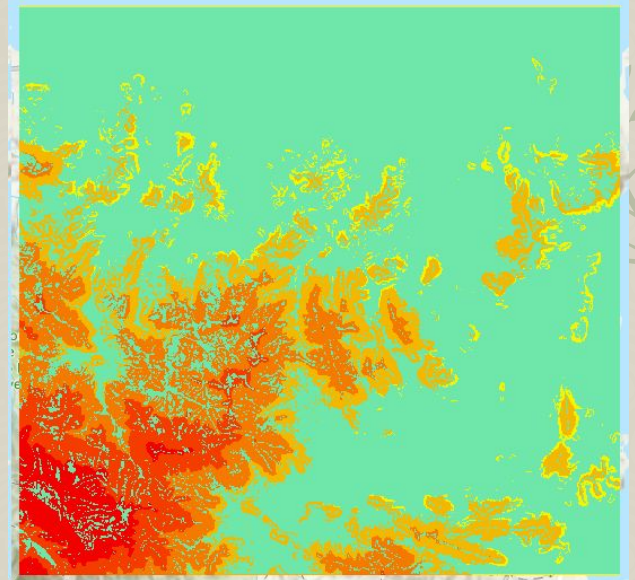
Start	End	New
0	1.72	1
1.72	3.43	1
3.43	5.71	1
5.71	8.53	1
8.53	11.3	1
11.3	14.04	1
14.04	16.7	NODATA
16.7	21.8	NODATA
21.8	30.96	NODATA
30.96	45	NODATA
45	90	NODATA
NODATA	NODATA	NODATA

Classify Unique

Output raster
Reclass_Slop1



Teal= Regions with a less steep slope (more flatter) and thus easier to build



07

Geography Data

Site :

1. can not exist on
ocean or alluvium

Geography Data

Geoprocessing

Reclassify

Parameters Environments

Input raster
Geology_Band_1

Reclass field
Description

Reclassification

Value	New
00 = Ocean	NODATA
01 = Alluvium	NODATA
02 = Extrusive Igneous Rock	1
03 = Intrusive Igneous Rock	1
NODATA	NODATA

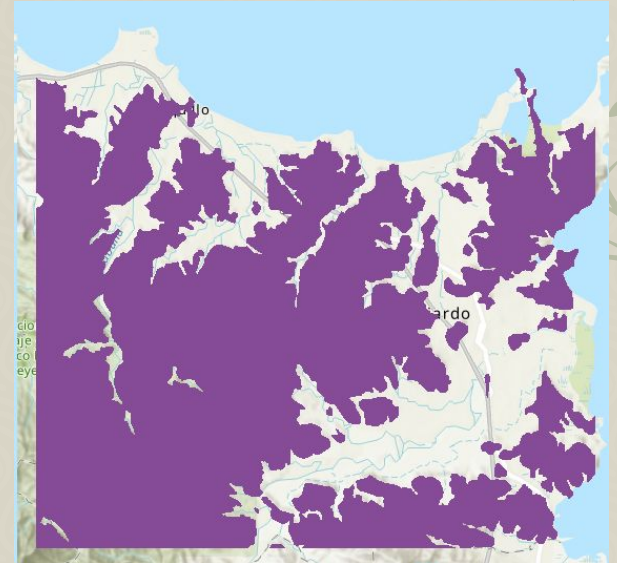
Classify Unique

Output raster
Reclass_Geol1

☐ Change missing values to NoData

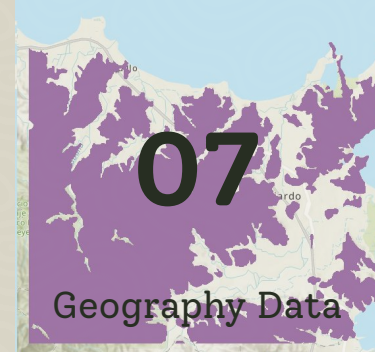
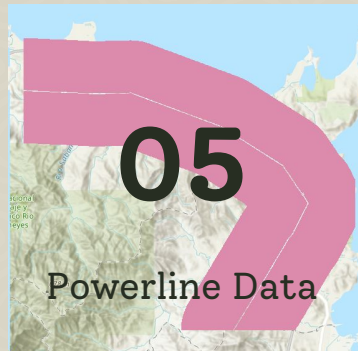
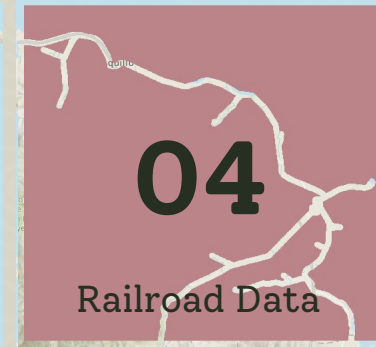
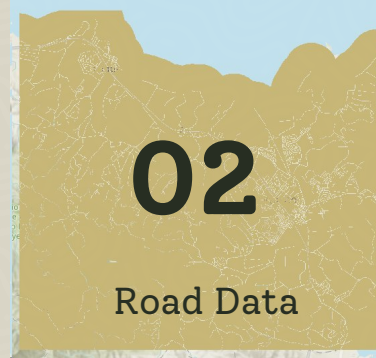


Purple= Not ocean or
alluvium → Stable ground

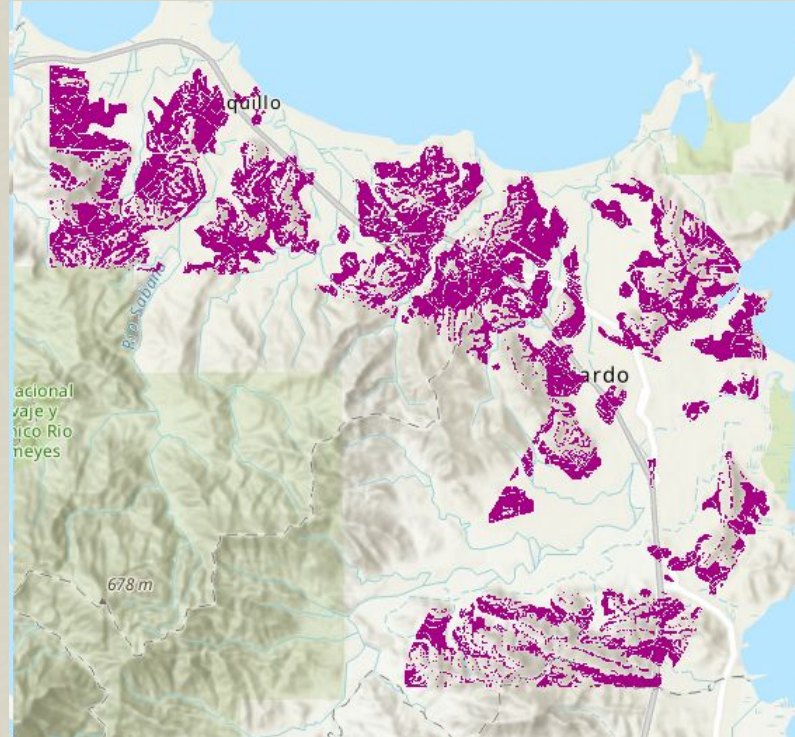
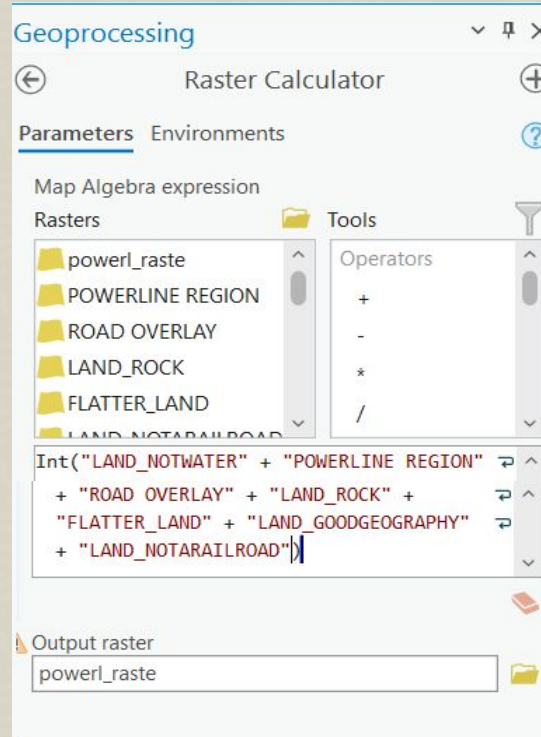


Final Overlay

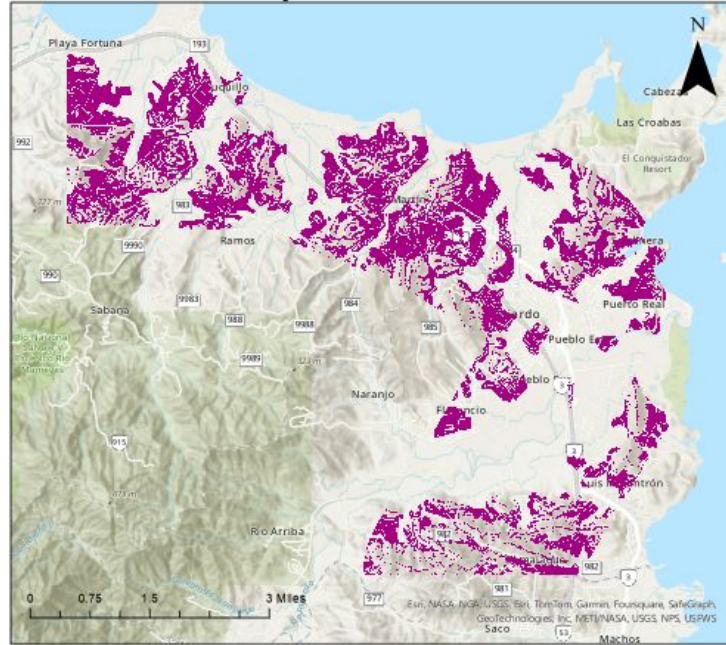
Final Overlay



Final Overlay



Site Suitability in Puerto Rico



Puerto Rico was analyzed on a variety of factors including elevation, geography, railroad locations, powerline locations, road locations, landcover, and water data. After overlaying all "suitable zones", this map displays acceptable regions to build a structure