

Bringing Back the Light

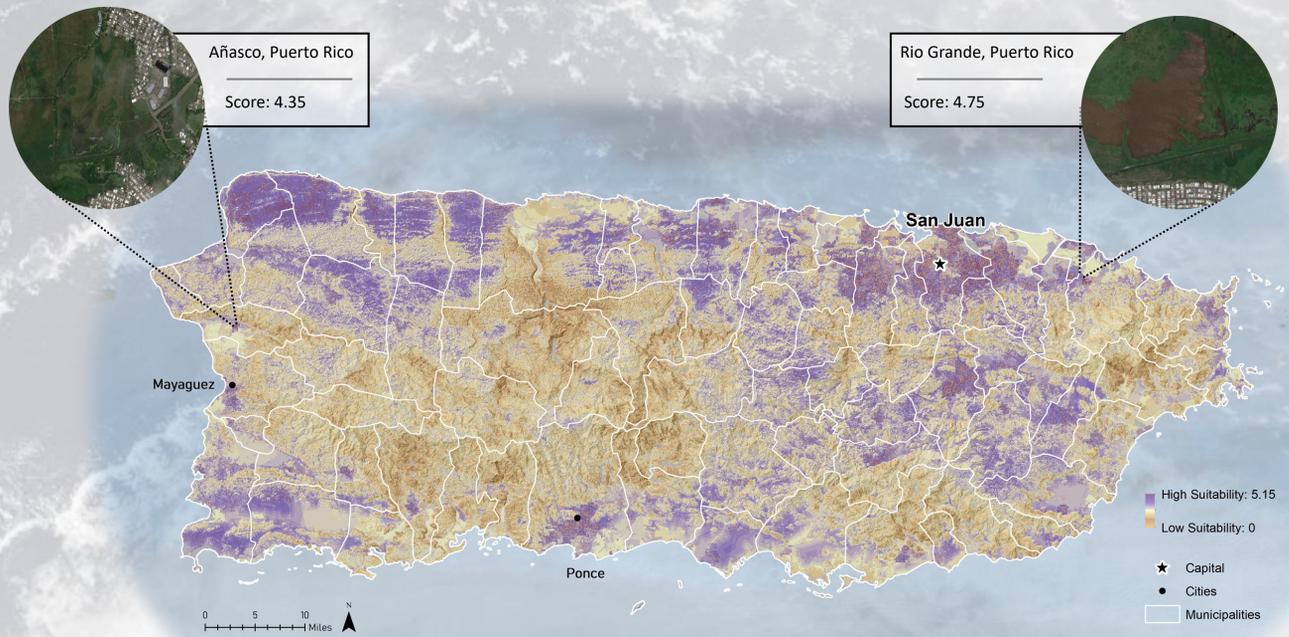
Identifying Suitable Areas for Solar Panels in Puerto Rico

Lights Out

In September of 2017 Puerto Rico was hit by two hurricanes of high magnitude mere weeks apart. Hurricane Irma, a category 5 and Hurricane Maria a category 4 storm. These consecutive and immensely destructive storms killed hundreds of people and laid waste to the already aged electrical grid of the island which left an estimated 1 million people without power, many for the months that followed. As the government struggles to rebuild the electrical infrastructure, this disaster could provide an opportunity for not only an improvement from the old system, but a change to a new more sustainable energy source. As the world attempts to move towards renewable energy sources this could be Puerto Rico's chance to make this step forward and be a leader in technology. This analysis takes into account multiple criteria that would affect placement of solar panels fields in Puerto Rico in order to convert most, if not all of the traditional power plants currently in place that were damaged from the storms. Solar panels could help bring back electrical power to the island and shine a light on the United States' worst blackout in history.



Final Suitability Assessment



How to Pick a Location

A weighted suitability analysis for the possible placement of municipality use solar panels was performed by taking into account various factors that are shown in the final map table. The factors were each scored on a scale from 1 to 6 with the most suitable elements for each factor being ranked 6, and the least suitable elements for each factor being ranked 1, with a gradient in-between. Existing building footprints were removed from the final analysis leaving only available open land. The highest scored land was 5.1 and the lowest score was 0, which is representing current development.

Final Map

The following weights were assigned to each factor:

25% Population Density	15% Flooding Risk
20% Slope	15% Land Cover
15% Distance to Power Plants	10% Solar Radiation

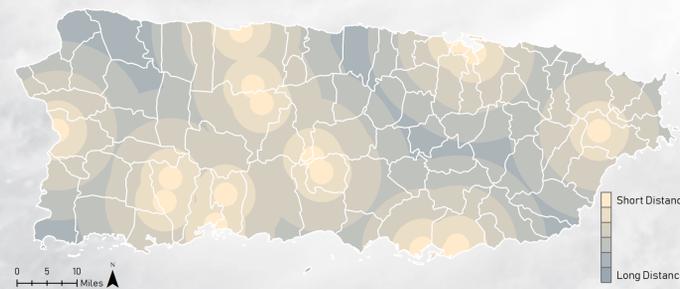
Solar Radiation

Placing the solar panels in appropriate locations to maximize solar radiation is important. Solar radiation special analysis was run on a digital elevation model then reclassified.



Distance to Power Plants

It would be both financially and logistically beneficial to place solar panel fields close to preexisting electrical power infrastructure. Euclidian distance was ran on the location of existing power plants then reclassified.



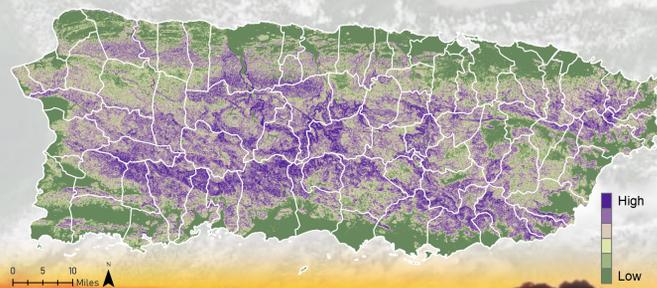
Flooding Risk

Puerto Rico is a mountainous island which can be prone to flooding, especially during natural disasters. It is important to keep the infrastructure out of flooding zones to provide the population power even during times of heavy rain. Euclidian distance was ran on flooding data, then reclassified.



Slope

Solar panels are ideally placed on flat terrain, limiting the areas they can be placed on a mountainous island. Slope was ran on a digital elevation model and reclassified based on suggested percent slopes for panel placement.



Land Cover

Different land uses and land cover were taken into consideration for available locations to place solar panels. The different land cover types were reclassified for suitability.



Population Density

Power requirements will vary depending on population density with the highest requirements needed closer to denser populations. For this analysis raster population data was reclassified.

