Suitability Analysis of a Proposed Park in the City of Kingston

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Introduction

Urban land use is vitally important for human development. Parks and recreation spaces play an important role in promoting healthy and active lifestyles. With childhood obesity emerging as a more prominent issue within contemporary culture, we considered it important to examine the placement of urban parks within the Urban Area for the City of Kingston (Figure 1).

The objective of our report is to find land suitable for a new park in the City of Kingston for children ages 0-14.

Data

For our analysis, the following layers were obtained:

- Roads
- Parks and Recreation
- Census Tract Data
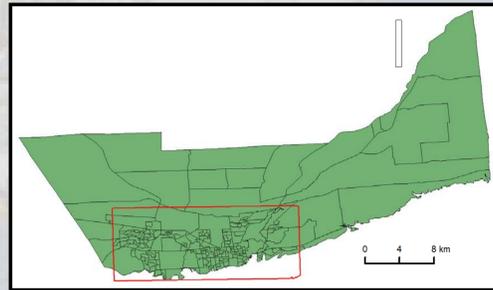- Marshland
- Waterbody
- Rivers
- Land Use

Figure 1: Study Area

The data was obtained through GeoPortal, the City of Kingston GIS department, and Queen's University's Department of Urban Planning. Figure 2 depicts this data.
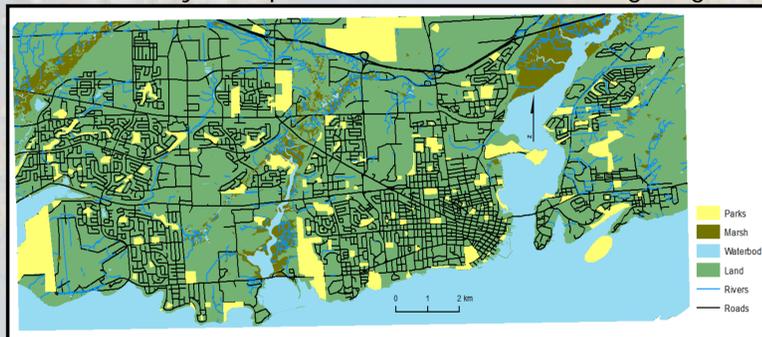

Figure 2: Initial Map

Methods

The flowchart of methods used is illustrated in Figure 3. The layers were manipulated then converted to raster and reclassified, as seen in Figure 4.
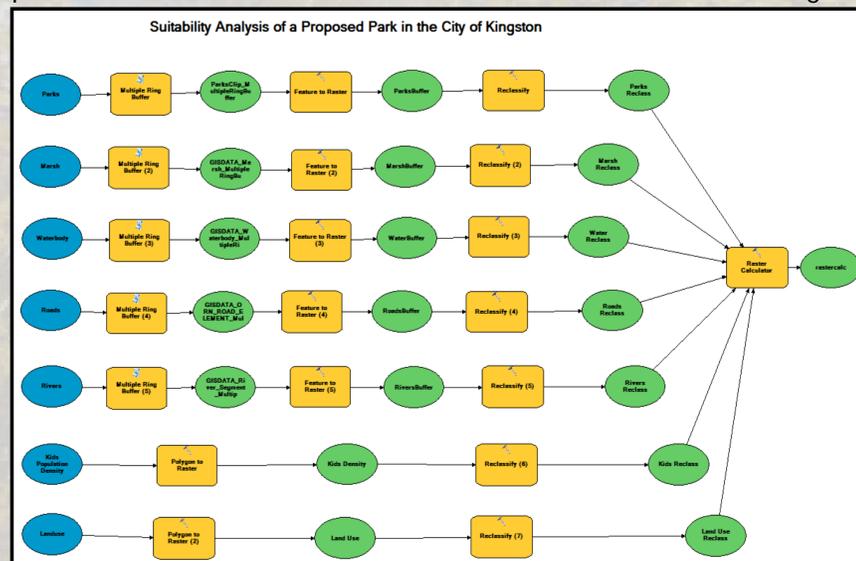
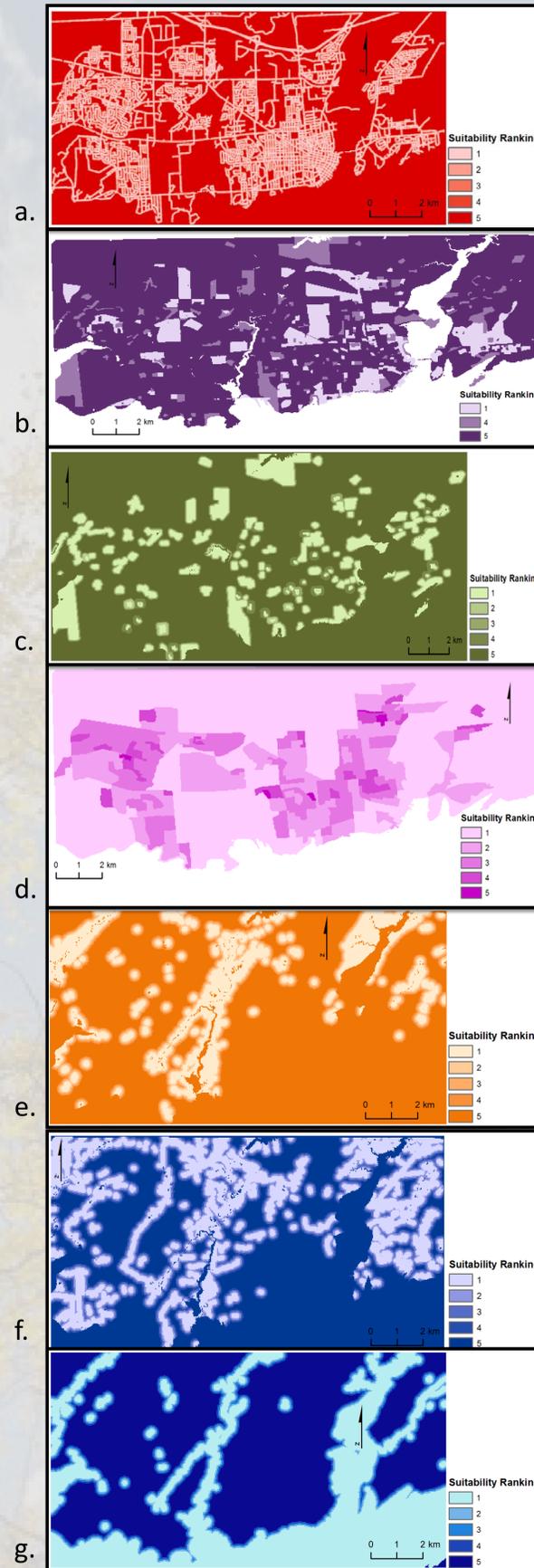

Figure 3: Flowchart of Methods

Figure 4: Reclassified Roads (a), Land Use (b), Parks (c), Density of Children (d), Marsh (e), Rivers (f), and Water body (g) layers.

For the final calculations, the reclassified layers were put into raster calculator to create a weighted suitability layer. Table 1 shows the weights applied to each layer and the rationale behind each choice.

Table 1: Criteria Weighting

Layer	Weighting	Reasoning
Rivers	0.15	A park cannot be built on water, and locations near water may be unsafe for young children
Waterbody	0.15	We cannot build a park on water, and proximity to water can pose safety risks to children
Marsh	0.15	This land is not suitable for building a park
Roads	0.15	A park cannot be too close to roads
Parks	0.05	We would like to build a park that is not located too close to an already existing park
Age Group Density	0.20	It is most important to us that our park be located near our target age group of 0-14 yrs. Old.
Land Use	0.10	We do not want to build on commercial or government land that is already in use

Discussion

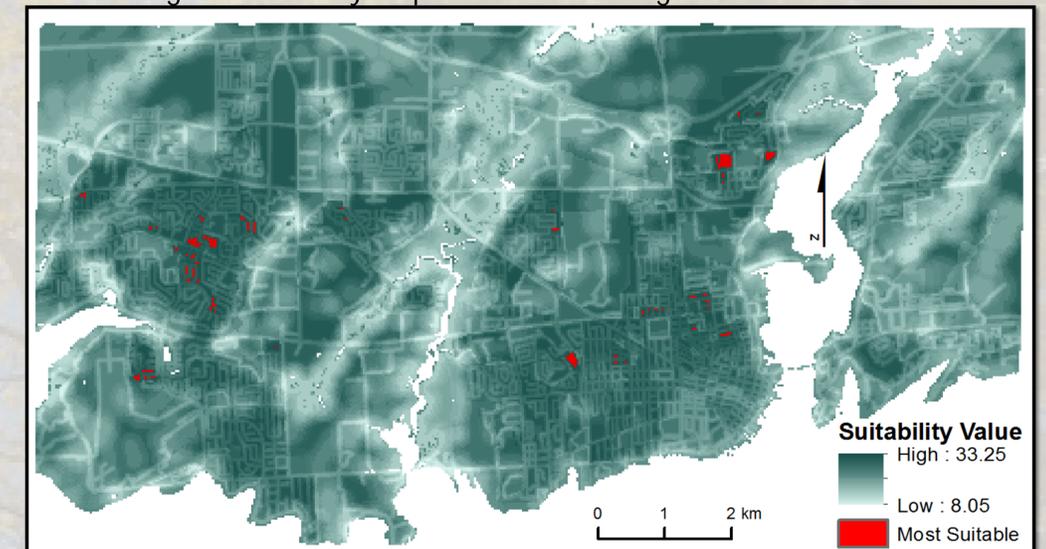The final weighted suitability map can be seen in Figure 5.

Figure 5: Final Weighted Suitability Map

The most suitable areas for the location of a new park in the City of Kingston are symbolized by the areas of red on the map. The total area of suitable land for this study is approximately 0.24% of the Total Land Area (79% of the Study Area which water is not present). The locations are relatively spread out over the entire area, with no large trends being discernable. This output was created using the population density of our target age group as the most heavily weighted criteria. It was desired that the new location of a park be as close to the most densely populated areas of young children. It is also important to note that our analysis does not take into account land ownership. This is something that could be examined further by GIS analysts. Our analysis has allowed us to determine the suitable areas for the placement of a new park in the City of Kingston, information which will be useful in the future planning for The City of Kingston.

Acknowledgements

References

Chandio, I. A., Matori, A., Lawal, D. U., & Sabri, S. (2011). GIS- based land suitability analysis using AHP for public parks planning in larkana city. *Modern Applied Science, 5*(4), 177-189.