Land Suitability Analysis for Parks Building in NYC

Tufts UNIVERSITY
Graduate School of Arts and Sciences

Yijie Zhi
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Introduction

Park is one of the most important infrastructures for entertainment in our society. It has some landscapes and facilities to provide an open space for people to relax and have fun. Nowadays, there are hundreds of parks scattered all over New York City. They help New York City become a viably thriving urban space and attract more and more visitors.

However, in the meanwhile, these parks receive large amounts of visitors, tourists, and residents, which cause burden for the management of parks. In this case, we need to make further plan about parks building in NYC and try to find the suitable place of parks building.

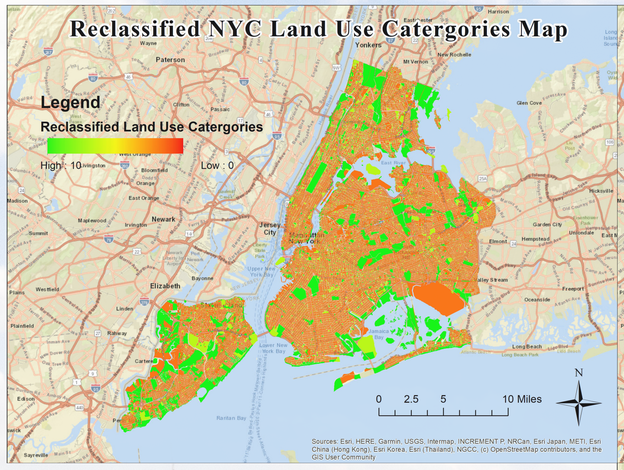
Methods

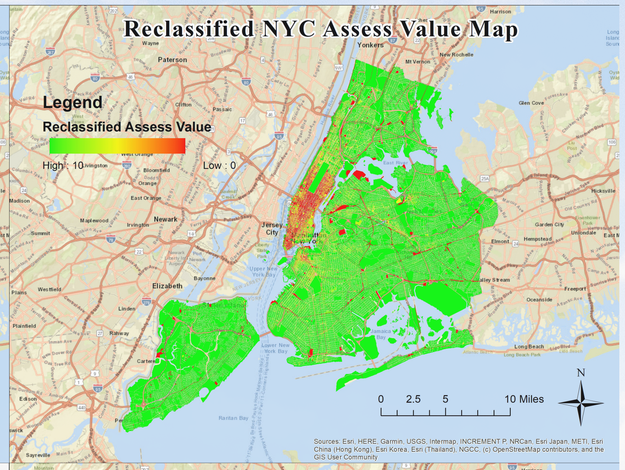
In the project, I mainly use **Suitability Analysis** method to find the best place for parks building in NYC. I consider 5 factors which may affect choosing the most suitable place for park building. Here are the descriptions:

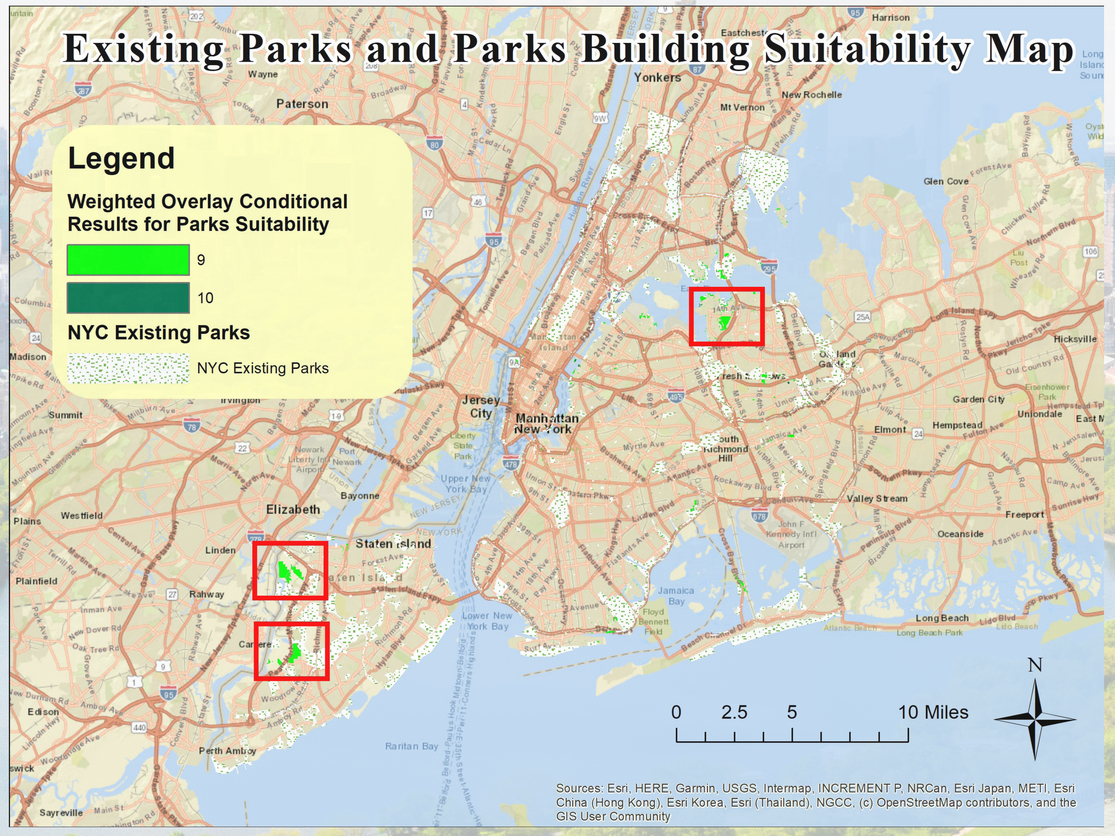
- **Land Use Catergories** - Place which is vacant or relatively easy to transform is suitable for parks building;
- **Assess Value** - We should minimize the cost of buying land. So, the higher the value, the worse the suitability;
- **Service Area** - New parks should be away from existing parks to avoid running against each other. So, the further, the better;
- **Visit Flow from CBG** - This variable presents the demand of going to parks from the residents in CBG (census block groups). So, the higher the visit flow, the stronger the will that need more parks building;
- **Vist Flow to Parks** - This variable presents the existing visit flow of parks. So, the higher the visit flow, the heavier the burden for parks, thus need more parks building.

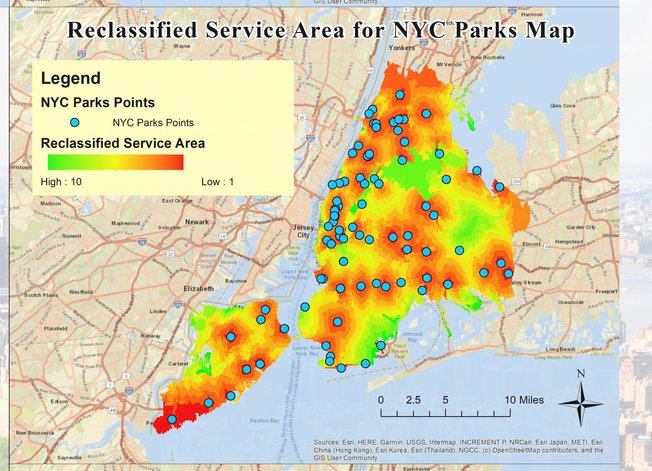
And the table following is about the weight in model and meaning and value for each suitability score in each factor.

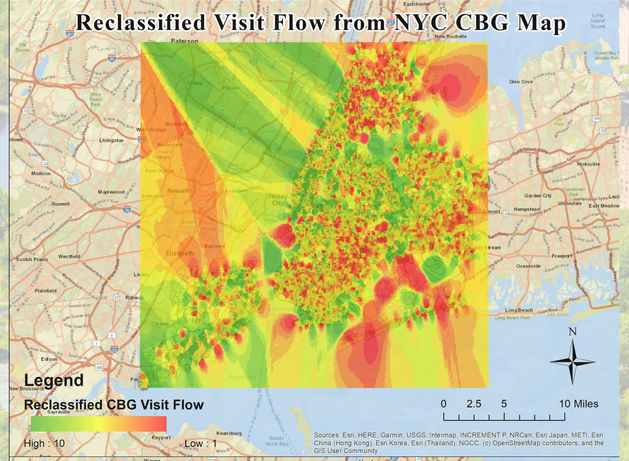
Suitability Factor	Weight (%)	Suitability Score 1 (Least Suitable)	Suitability Score 2	Suitability Score 3	Suitability Score 4	Suitability Score 5	Suitability Score 6	Suitability Score 7	Suitability Score 8	Suitability Score 9	Suitability Score 10 (Most Suitable)
Land Use Categories	30	01-07	N/A	N/A	08,10	N/A	N/A	09	N/A	N/A	11
Assess Value ($/ft²)	30	10th decile (28975.8735)	9th decile (2602.3909)	8th decile (1696.8636)	7th decile (1244.1000)	6th decile (904.52720)	5th decile (678.14547)	4th decile (451.76364)	3rd decile (338.57273)	2nd decile (225.38182)	1st decile (112.190910)
Service Area (minutes)	20	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
Visit Flow from CBG	10	1st decile (481.663208)	2nd decile (746.10510)	3rd decile (972.15930)	4th decile (1121.4761)	5th decile (1436.4468)	6th decile (1786.1684)	7th decile (2290.4128)	8th decile (2928.5000)	9th decile (4358.8359)	10th decile (64259.2343)
Visit Flow to Parks	10	1st decile (66945.4403)	2nd decile (84686.952)	3rd decile (93557.709)	4th decile (111299.22)	5th decile (155653.00)	6th decile (200006.78)	7th decile (226619.05)	8th decile (253231.32)	9th decile (279843.59)	10th decile (2275763.75)

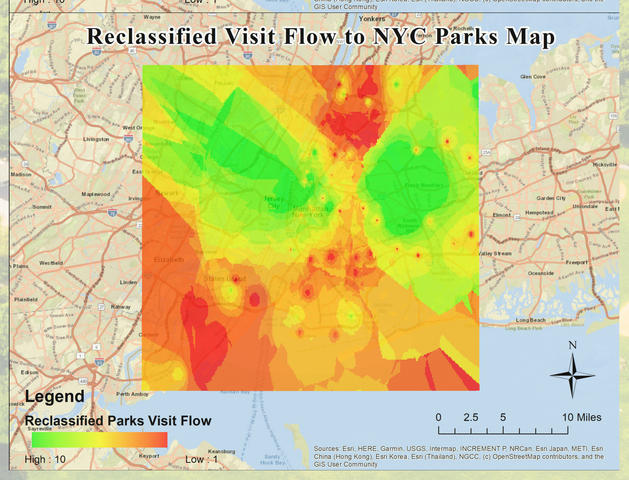












Results & Future Plan

As the maps show above, we can find that after using weighted overlay to analyze the 5 reclassified factors maps in the right side of the poster, we can finally obtain the best place for future parks building in NYC (the red frame): one in the east of NYC and the other two in the southwest of NYC.

In the future, I will concern to add more factors that may contribute to affect visit flow from CBG to parks in NYC into the suitability analysis model. And I will try to learn more analysis methods. Hope I can provide a more detailed and reliable conslusions from my research.

Data Source: NYC Open Data | AirSage | Tufts GIS Data Server | NYC Department of City Planning
Projection: Lambert Conformal Conic Coordinate System: GCS North American 1983

Reference: (1) Chandio, Imtiaz Ahmed, Abdul-Nasir Matori, Dano Umar Lawal, and Soheil Sabri. "GIS-based land suitability analysis using AHP for public parks planning in Larkana City." Modern applied science 5, no. 4 (2011): 177.
(2) Yigitcanlar, Tan, Nell Sipe, Rick Evans, and Matt Pitot. "A GIS-based land use and public transport accessibility indexing model." Australian planner 44, no. 3 (2007): 30-37.