Geographic Inequalities: Exploring Green Space Access in New York City

In the 2023 Fall semester, our GEO242 instructor, Dr. Shenyue Jia, tasked us with examining green space in New York City: what it is and why it's significant in NYC. Green space is defined by the New York City Department of Parks and Recreation as "a citywide system of engineered landscapes that transform unused impervious areas into vibrant and pervious green space". In our initial research, we explored three topics: the general availability of green space in NYC, how access to green space is affected by means of transportation, and what patterns exist between green space and racial demographics. The existence and availability of green space is essential, especially in larger cities, as it has been linked to positive mental and physical health benefits.

Following the completion of our project, Dr. Jia expressed that our preliminary work had the potential for further analysis and recommended that we focus and expand on one topic to submit for the LAURE award. Our original project was not meant to be a deep dive into our topic, and instead centered around data visualization and analysis.

When considering how to direct our research, we decided that racial demographics and their relationship to green space access already contained identifiable patterns. We wanted to understand whether there was a relationship between the racial makeup of a community and its access to green space. The specific data that we focused our analysis on was Tree Equity Score (TES), a measure of access to trees in census tracts. Our original maps showed that in areas such as Bronx, Kings, and Queens Counties, there were glaring inequalities between TES in predominantly non-white areas versus predominantly white areas. While many areas

showed a high population of people of color with a high TES, the number of areas consisting almost entirely of people of color with lower TES was far greater than the number of white neighborhoods with low TES. Our research showed approximately no areas with a predominantly white population having a TES lower than ~70 (on a progressive scale of zero to 100).

From the start of our GEO242 project to the end stages of our LAURE research, library resources were essential. At the beginning of GEO242, geography and information analytics librarians Kristen Adams and Roger Justus visited our class to share resources relevant to conducting efficient research, such as proper use of the Miami library databases for Geography and Geographic Information Systems, as well as utilizing OneSearch. Through OneSearch, we were able to find NYC Open Data and Open Data NY, two of our most utilized sources in the preliminary and final stages of our research. OneSearch was also useful for locating peer-reviewed research on the current effects of redlining. We met with Roger and Kristen to discuss how the library could additionally be used moving forward in our research. Roger and Kristen recommended platforms such as Engineering Village, an online database where we were able to access papers that played into the more “traditional” aspect of our research - simply understanding what redlining is and if our initial hypothesis, that redlining trends relate to the current inequalities people of color experience in accessing nature, could be supported. The library also served as the perfect location for meeting and to begin studying and fine-tuning our work.

Following gathering resources from Roger and Kristen and advising from Dr Jia, we decided to present our data in the form of an ArcGIS StoryMap: a narrative

application that allows users to present multimedia research stories. We met frequently in the library to have a dedicated study space and to have resources easily available when we needed them. We compiled our data in our StoryMap, beginning with a brief overview of greenspace, an examination of TES based on the racial makeup of communities, an overview of redlining, and ending with our final conclusions regarding how redlining can be used as a lens to view the present day inequalities of access to nature in NYC.

Anyone with experience in mapping will tell you that creating maps from public data can sometimes be a walk in the park, or can be extremely frustrating. We had our fair share of troubles with formatting or finding public databases that were compatible with our mapping software: QGIS and ArcGIS Pro. Databases have to be formatted in specific ways, often as Shapefiles or Geopackages. While many sites offer datasets in the format of Excel spreadsheets, most sites do not have dedicated downloads for data visualization. Therefore, sources such as NYC Open Data, which offered several downloading formats, were essential to our research.

This project provided us the opportunity to conduct formal geographical research and utilize historical data to analyze and explain present-day data. Additionally, we expanded our abilities as GIS practitioners by creating visual representations of data that convey useful and important information, in the form of our final maps and our StoryMap, which we submitted for the research portion of the LAURE award. None of this would’ve been possible without advising from Roger and Kristen and the invaluable resources they provided to us made available through the library, as well as our sponsor and professor Dr. Shenyue Jia. We believe our work is reflective of systemic and

persisting injustices faced by people of color, not only in New York but throughout the country. Further expansion on how these injustices manifest themselves will allow current and future generations to work toward making an equal and equitable future.