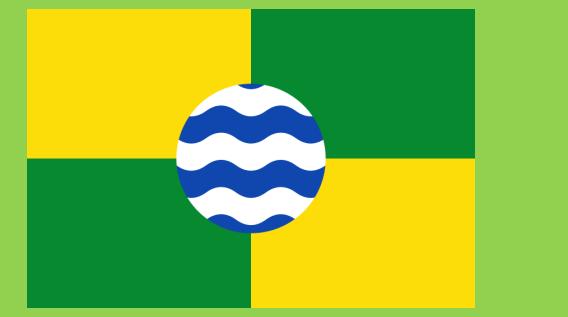


Slum Upgrading in Kibera, Nairobi

Identifying Optimal Spaces for the Construction of Decanting Sites for Temporary Dwelling



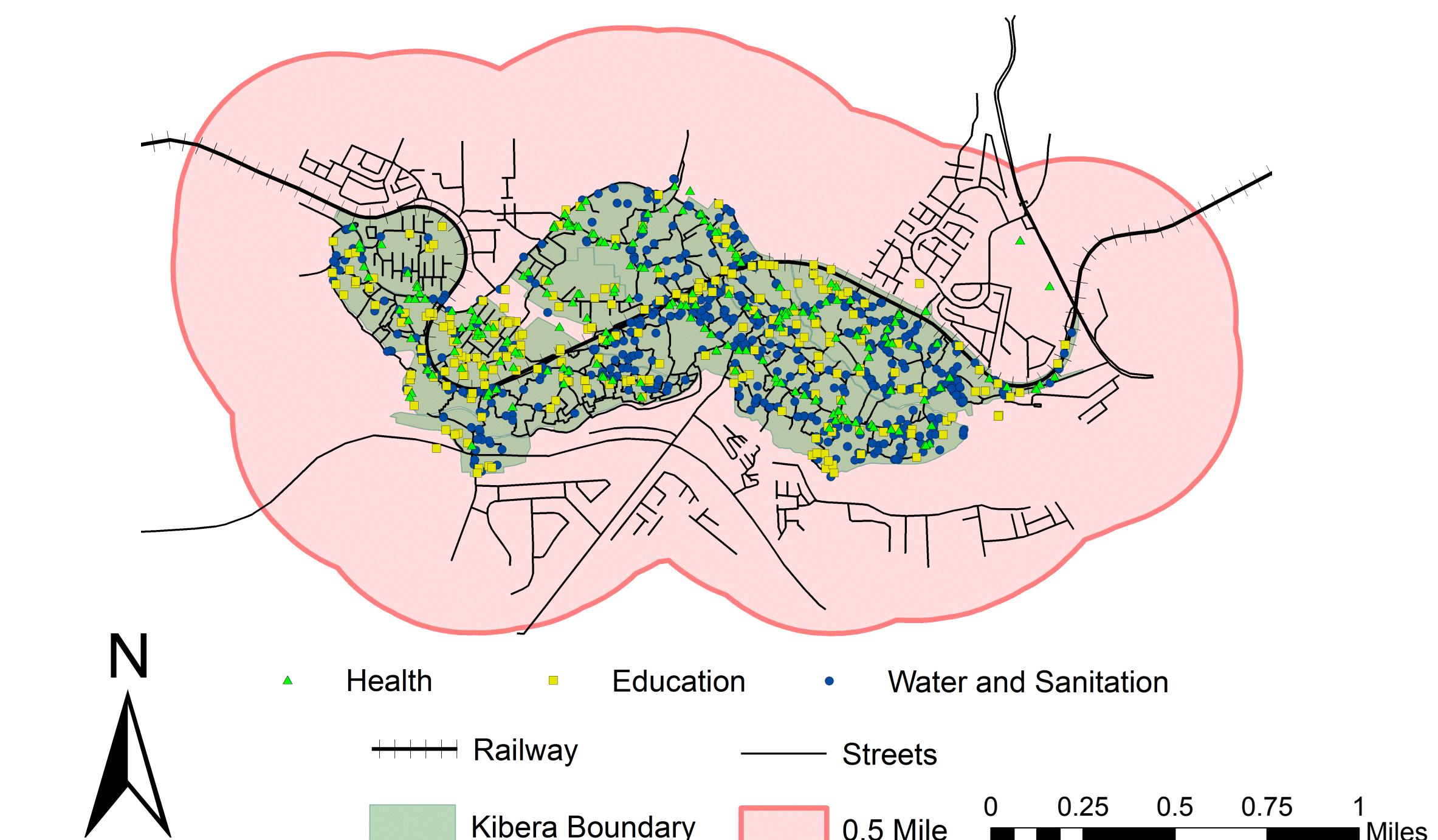
Project Description

Kenya's capital city Nairobi has some of the most dense, unsanitary and insecure slums in the world. Almost half of the city's population lives in over 100 slums and squatter settlements within the city, with little or inadequate access to safe water and sanitation. For many years Kenyan authorities have been trying to tackle this problem through slum upgrading projects, but while some have experienced modest success, most have failed. One of the former is a program jointly managed by Kenya's Ministry of Roads, Public Works and Housing and UN-HABITAT called Kensup (Kenya Slum Upgrading Project). Kensup is a nationwide project consisting of several phases, but in the particular case of Kibera, Nairobi's largest, poorest, and most populated slum, Kensup calls specifically for the temporary relocation of residents to adjacent "decanting sites," allowing the construction of permanent dwellings to proceed in the Kibera villages. Kensup, however, has had its share of criticisms.

As of September 2009, the first decanting site was under construction, and by early 2010 the first families moved. These temporary apartments, however, while providing "Kiberaans" with some comfort such as electricity and lower rents, were considered to be problematic due to lack of intermittent supply of piped water and relative great distance from many essential services residents find within Kibera, such as nursing homes, schools, health clinics, pharmacies, water sources and access to transportation, according to reports found on Voice of Kibera (<http://voiceofkibera.org/>). Having these issues as a motivation, and knowing that more upgrading projects in Kibera are underway—World Bank's Kisip (Kenya Informal Settlements Improvement Project) being one of them—this project used GIS to perform a spatial analysis of a surrounding area of Kibera of 0.5 miles in order to identify open space locations where future decanting sites can be built, while at the same time offering enough proximity to services existent within Kibera.



Source: Google Images



Methodology and Results

"Kibera in Nairobi, Kenya, was a blank spot on the map until November 2009, when young Kiberaans created the first free and open digital map of their own community. Map Kibera has now grown into a complete interactive community information project."

Map Kibera

The analysis I performed consisted in creating "accessibility maps" for four different types of services — health, education, water and sanitation, and streets — within an area of 0.5 mile, which could be judged to be an area immediately adjacent to Kibera boundaries.

All the points in the maps (and street lines) representing individual service providers in Kibera were mapped by Map Kibera (for a complete visualization of what each one of the points represent, visit <http://mapkibera.org/>). With that data in hands I used the proximity analysis tool for each of the categories (maps 1 to 4) and defined a gradient that represents higher and lower distances from the service locations indicated in each of the maps. Then, I overlaid these four maps into the fifth one, assigning different weights for each of the categories (health, education and proximity to roads weigh 0.3 each; water and sanitation 0.1) to create an accessibility gradient. In that same map I included polygons representing open space areas around Kibera. Lastly, in the final map I overlaid the accessibility gradient with the open spaces polygons to find out that accessibility to services is greater in the immediate vicinity of the west and southwest regions of Kibera, which are actually very close to Kensup's decanting site. Also, some other existent optimal areas are close to the central section and north of Kibera.

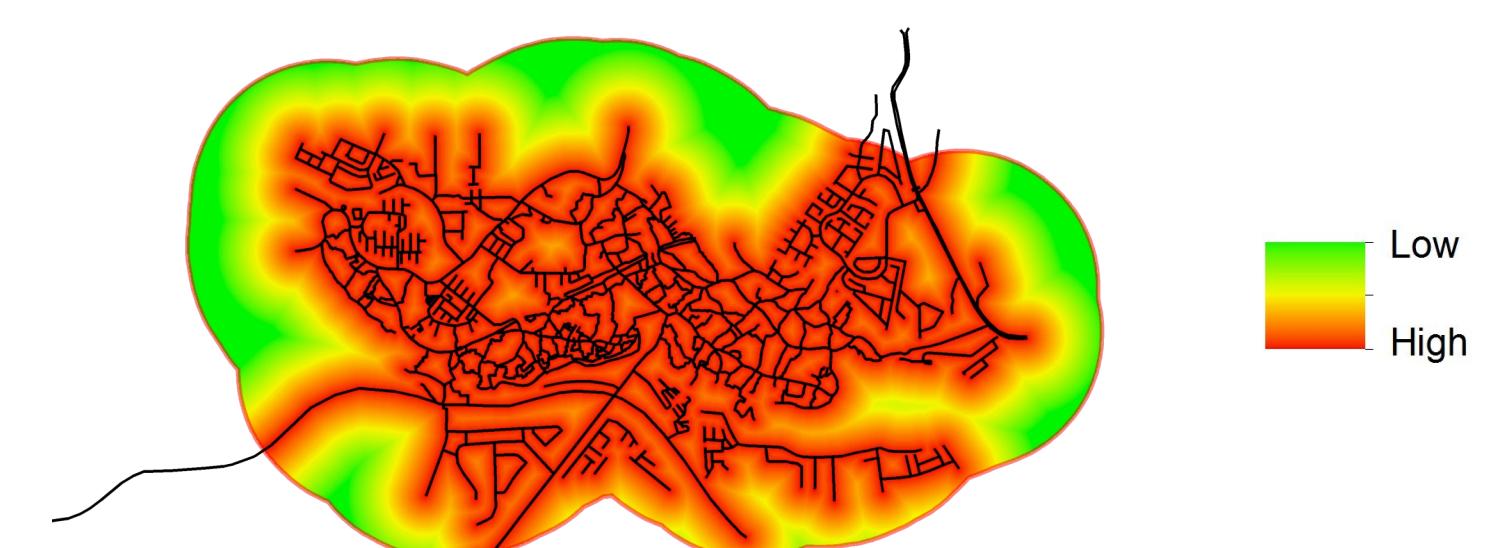
Challenges

Even though this analysis provides us a good visualization of the most suitable areas for the construction of decanting sites, I believe it could be more comprehensive if information about land ownership, real state prices and land characteristics were available.

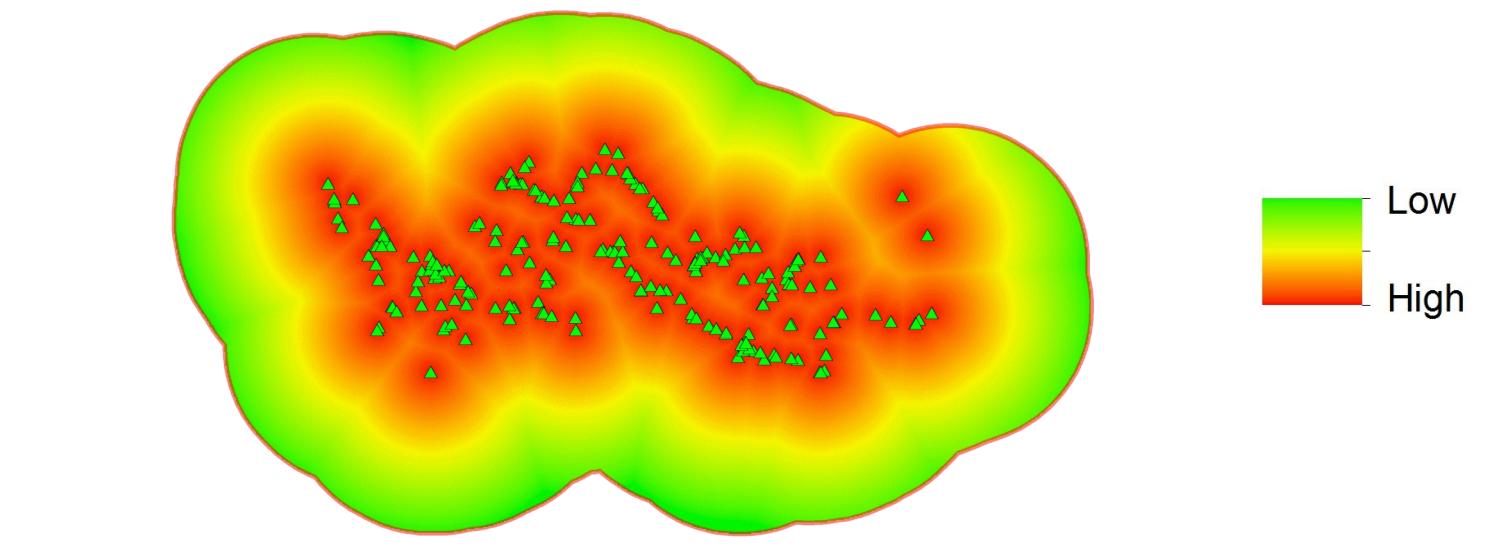
Created by Luiz Guilherme C. Vieira
The Fletcher School of Law & Diplomacy | Tufts University
DHP P207: GIS for International Applications
Prof. Parmenter and Florance
05 May 2012

Sources: Map Kibera (<http://mapkibera.org/>); Center for Sustainable Urban Development | Columbia University (<http://csud.ei.columbia.edu>)

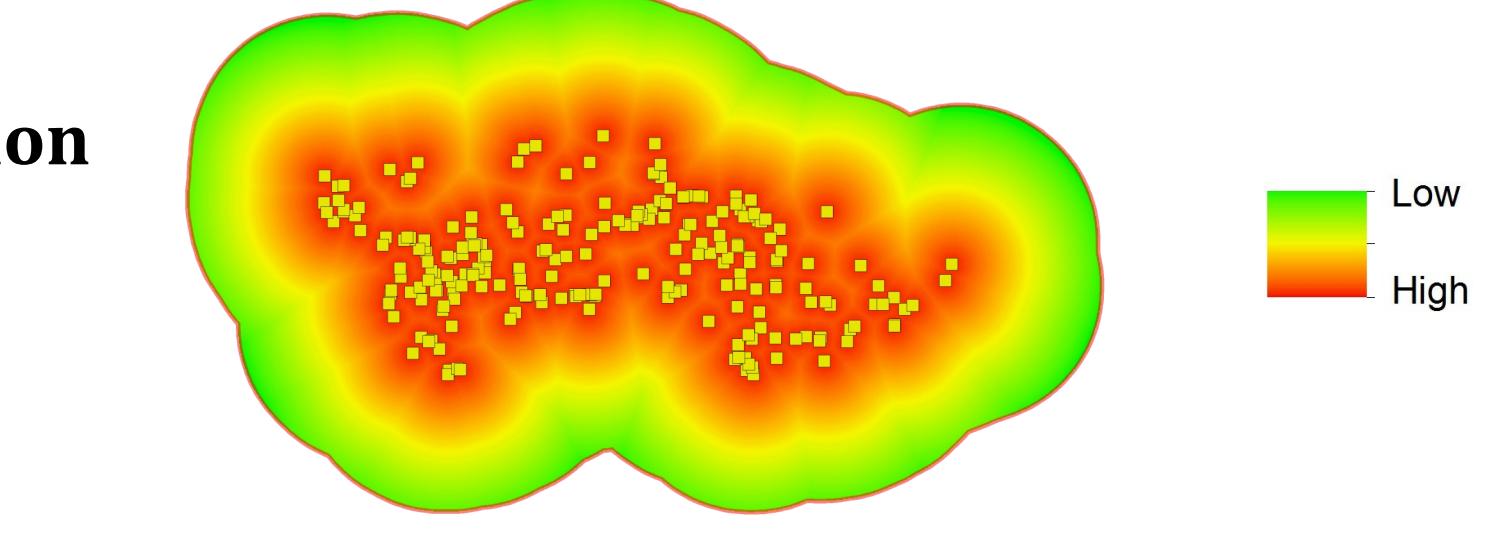
1. Streets access



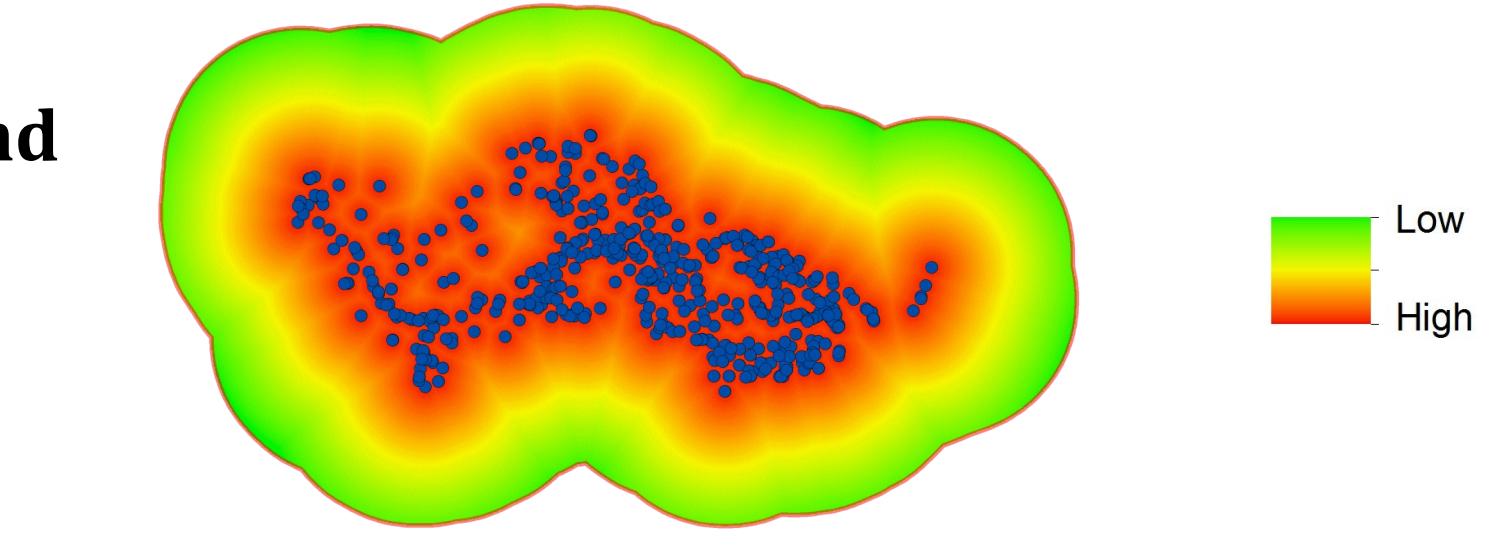
2. Health access



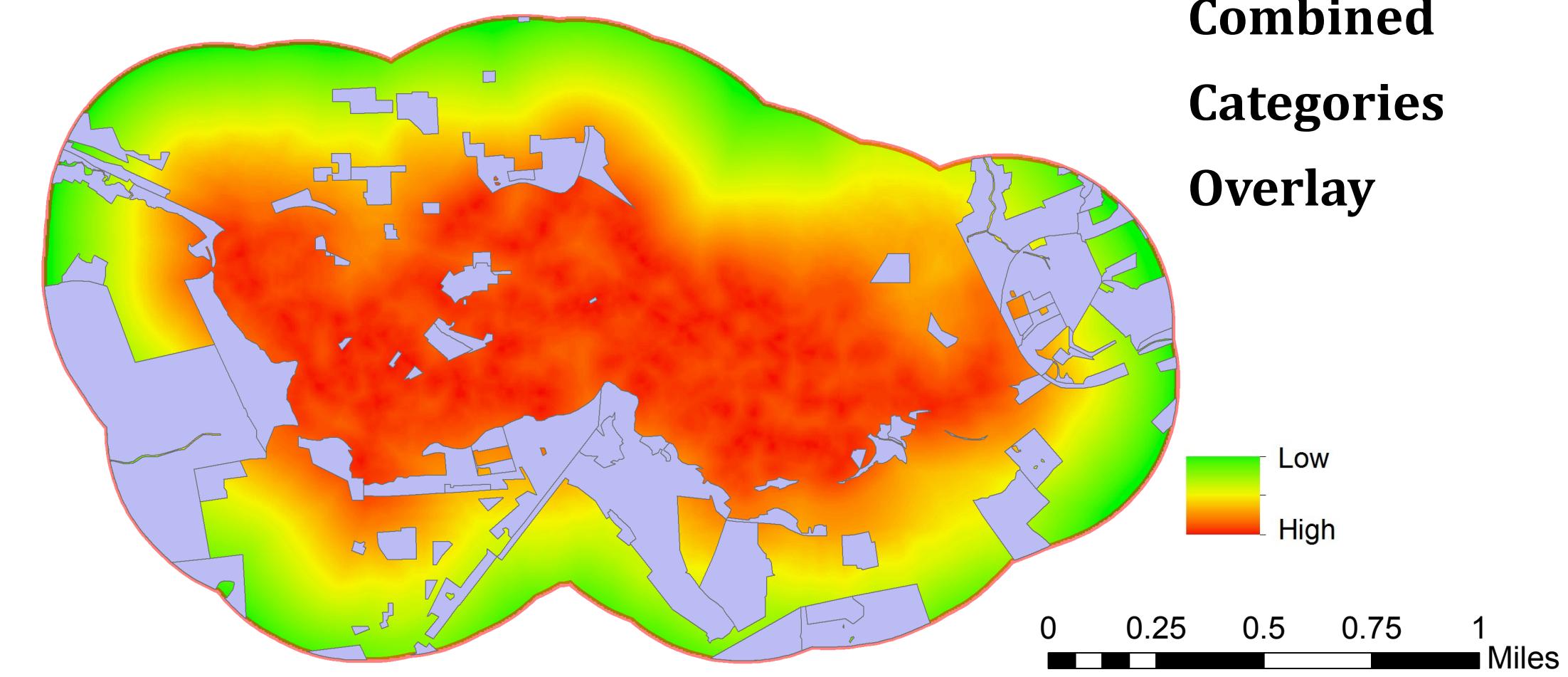
3. Education access



4. Water and sanitation access



Combined Categories Overlay



Open Space Site Suitability for the Construction of "Decanting Sites"

