

THE RESILIENCE TO DISASTERS AND EMERGENCIES INDEX (REDI)

A Unified Index of Resilience Capacity and Survivability
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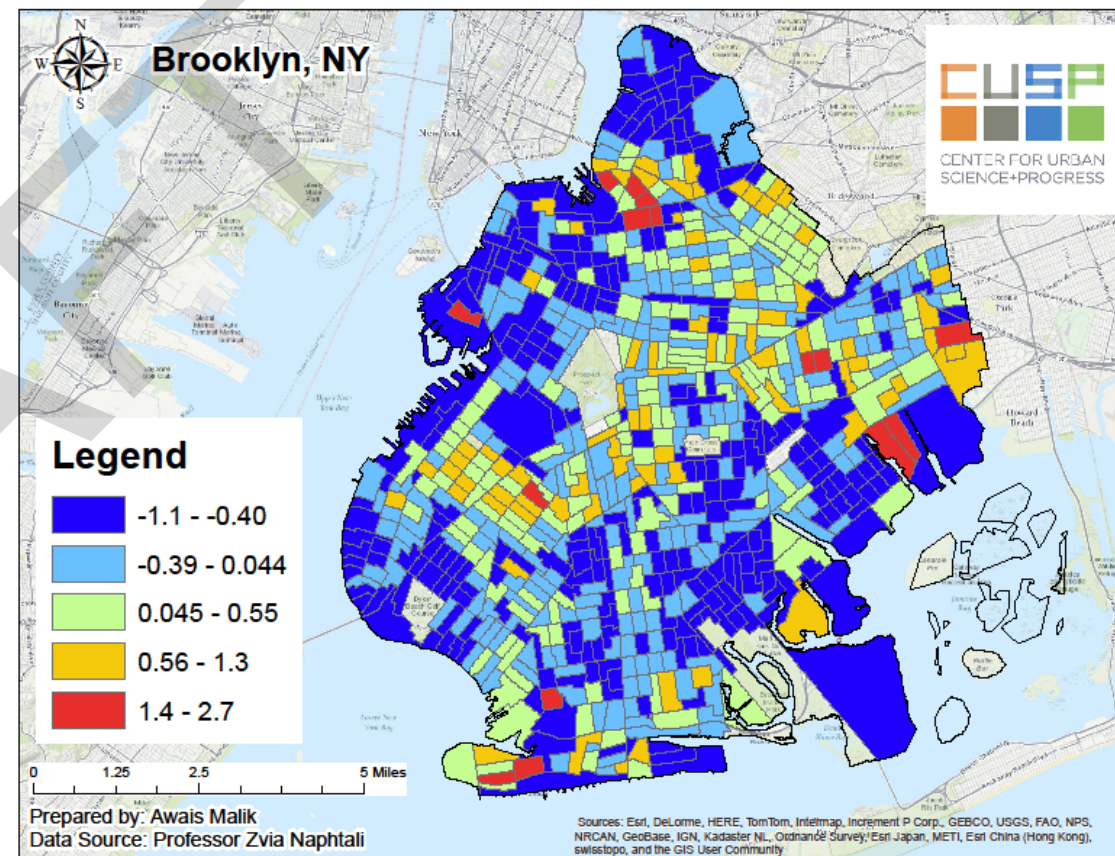


Project Objectives

Provide NYS with a unified, multi-factor index of local and regional resilience capacity and vulnerability. The intent is to create a single statistical measure of resilience and vulnerability – named here the Resilience for Emergencies and Disasters Index (**REDItm**) - that can be used to benchmark relative resilience capacity across municipalities and neighborhoods and prioritize investment and funding needs across multiple dimensions of physical, social, and economic conditions.

The **REDI Scoretm** combines measures of physical infrastructure, economic, and social vulnerability and resilience capacity to classify and rank the relative resilience capacity embedded in localized urban systems.

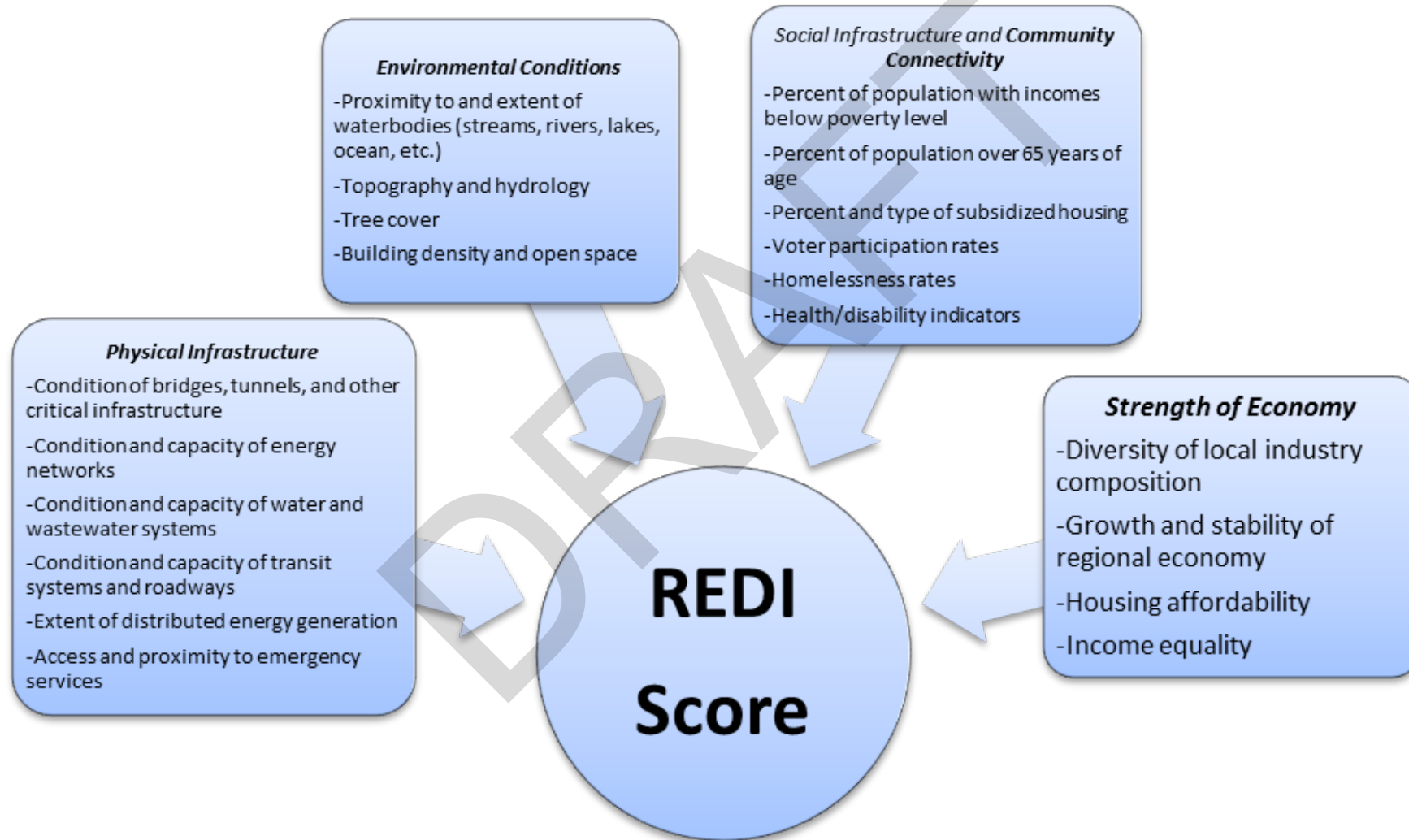
The **REDI Scoretm** recognizes the importance of community, socioeconomic, and demographic attributes of local neighborhoods and municipalities to their ability to withstand and recover from emergencies and disasters.



Data Sources

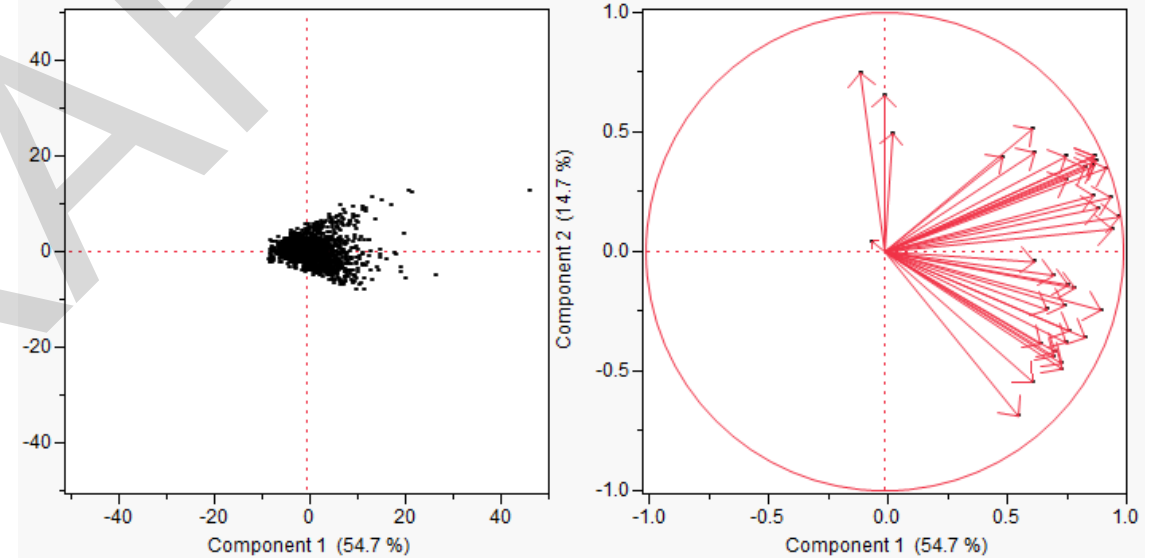
- The United States Census Bureau and American Community Survey
- The Federal Emergency Management Agency (FEMA)
- New York City Department of City Planning – BYTES of the Big Apple
- NYC Open Data
- U.S. Bureau of Labor Statistics
- NYC Department of Environmental Protection
- NYC Department of Housing Preservation and Development
- NYC Department of Buildings
- NYC Mayor's Office of Long-Term Planning and Sustainability
- Others...

Methodology: Index Composition



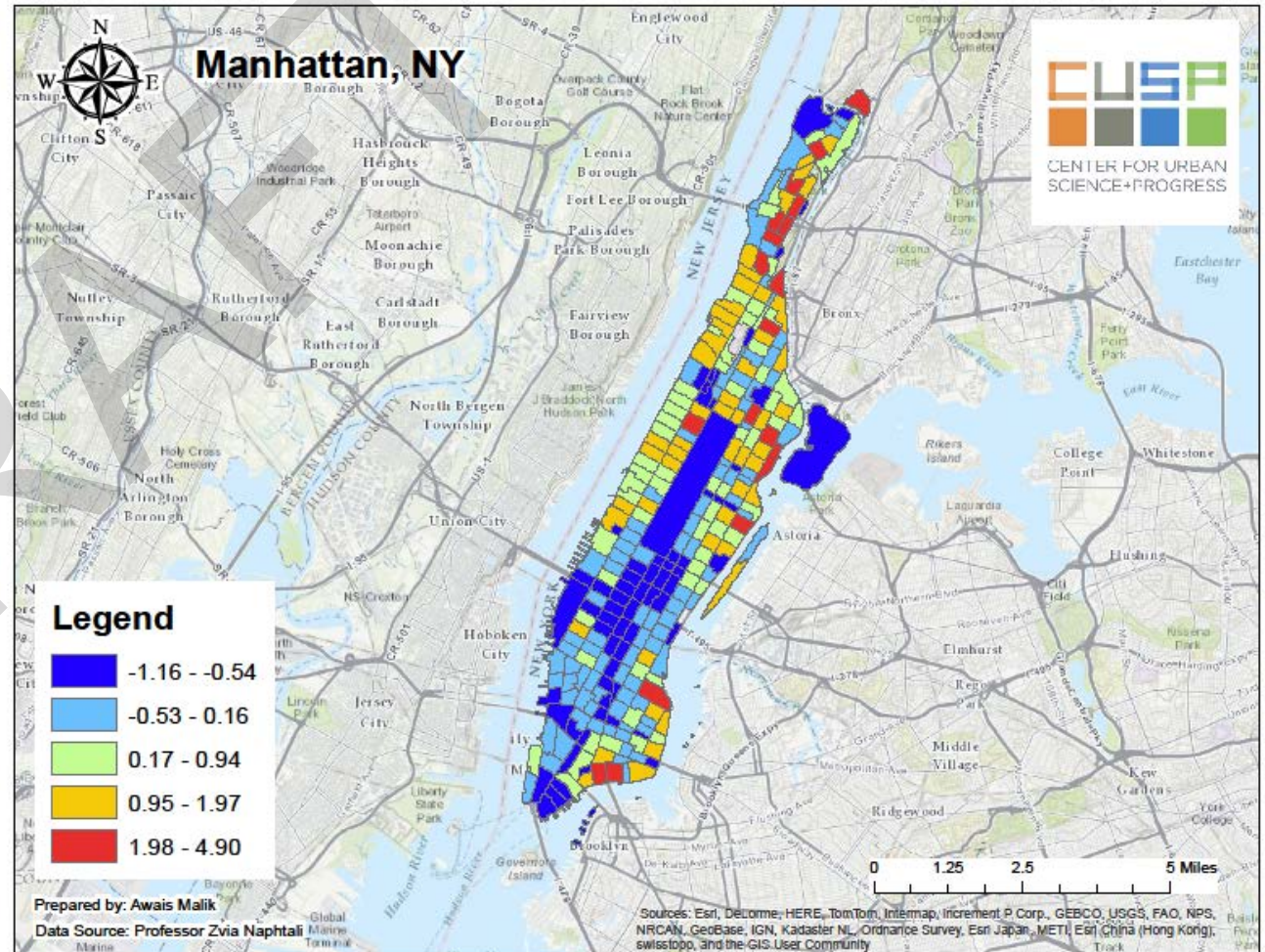
Methodology: REDI Score Tabulation

- Data cleaning and integration
- Variable identification and prioritization
- Z-score calculation
- Factor analysis
- Predictive regression model
- Final REDI Score calculation and normalization



Mapping Vulnerability

- ArcGIS: Interactive mapping tool for visualizing data
- Risk assessment by census tract and borough
- Vulnerability heat map as a basis for evaluation
- Social and economic attributes overlaid with critical facilities and infrastructure



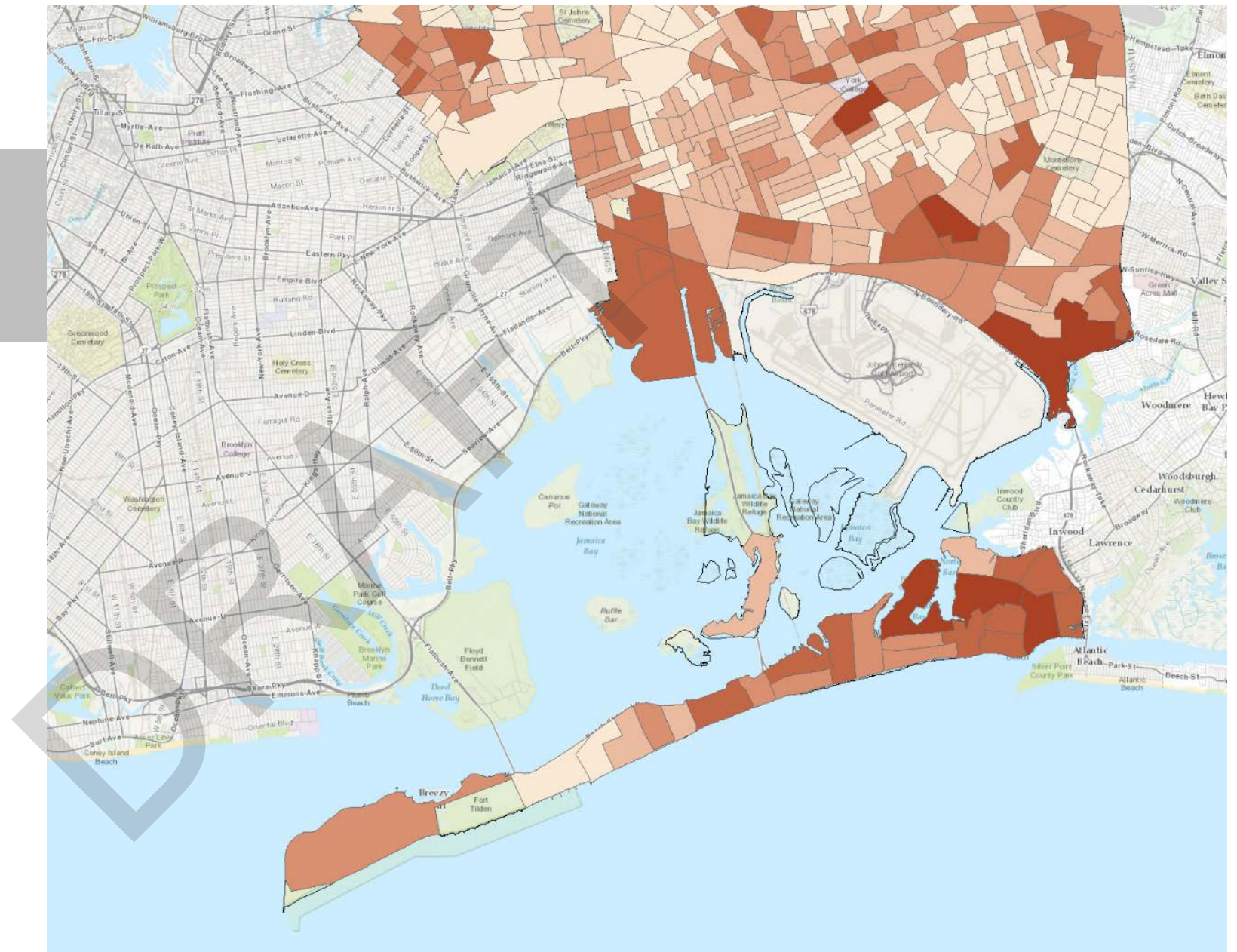
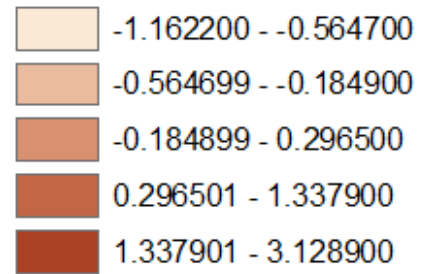
Identifying Vulnerable Populations

- Department of City Planning (DCP)
 - Resilient Neighborhoods Initiative – to better manage the risk in costal areas
- A method of evaluation/comparison
- For high vulnerability census tracts, investigate:
 - PLUTO Land Use Data
 - Population Density
 - Median Household Income
 - Sandy and FEMA Predicted Surge Areas
 - Proximity to critical infrastructure

REDI Raw Index Values - Queens, NY

Legend

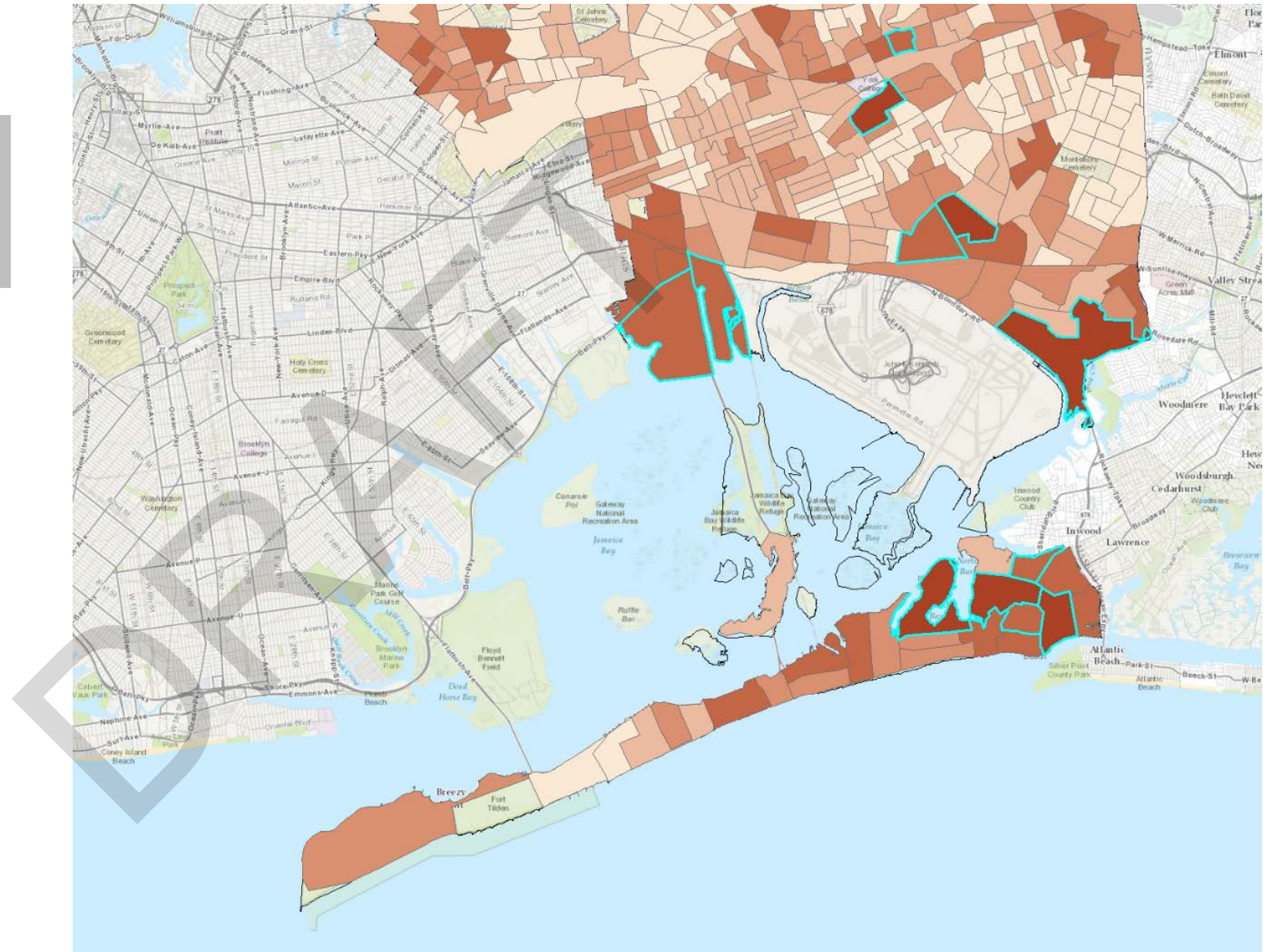
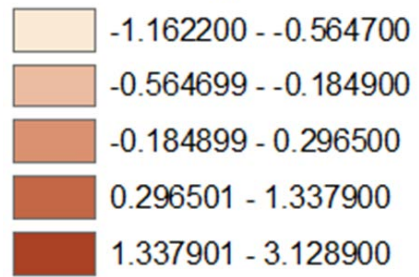
Vulnerability Index



Above Median Vulnerability

Legend

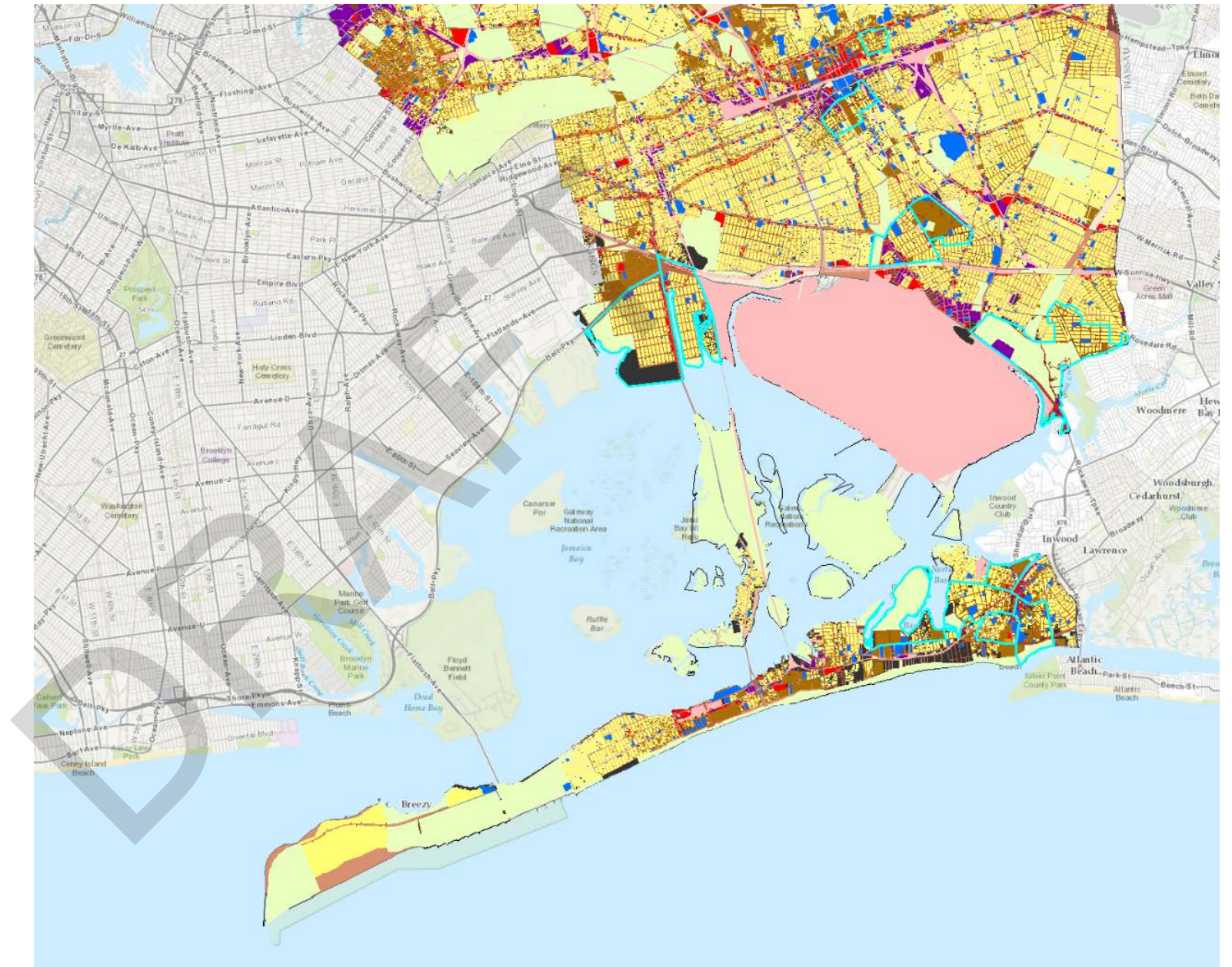
Vulnerability Index



PLUTO Land Use

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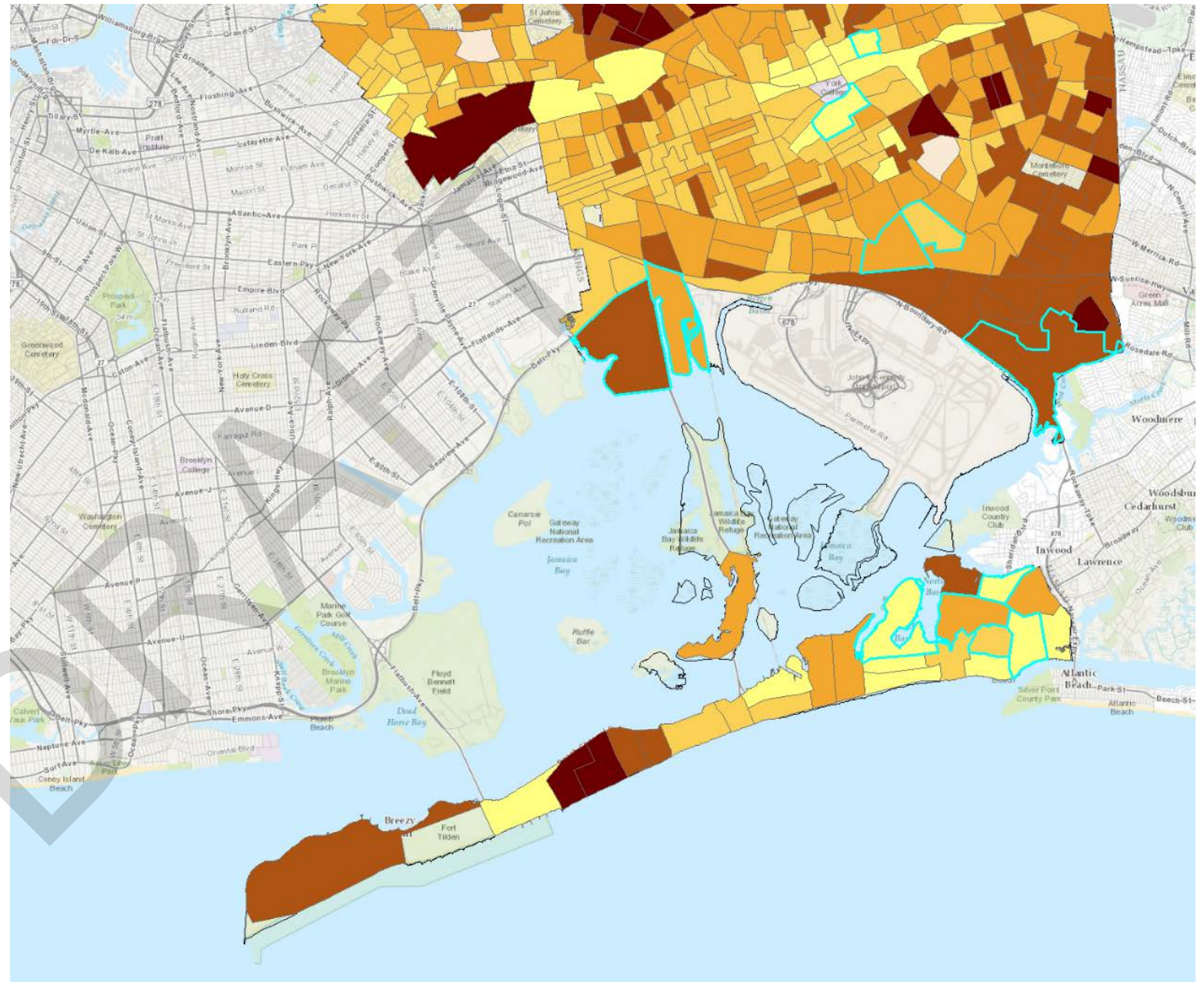
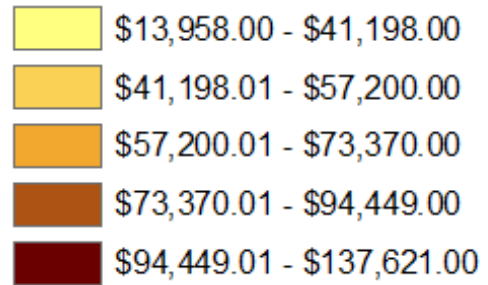
- No Data
- One and Two Families
- Multi-families
- Mixed Residential and Commercial
- Commercial and Offices
- Industry and Manufacturing
- Transportation and Utility
- Public Facilities and Institutions
- Open Space and Outdoor Recreation
- Parking Facilities
- Vacant Land



Median Household Income

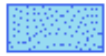
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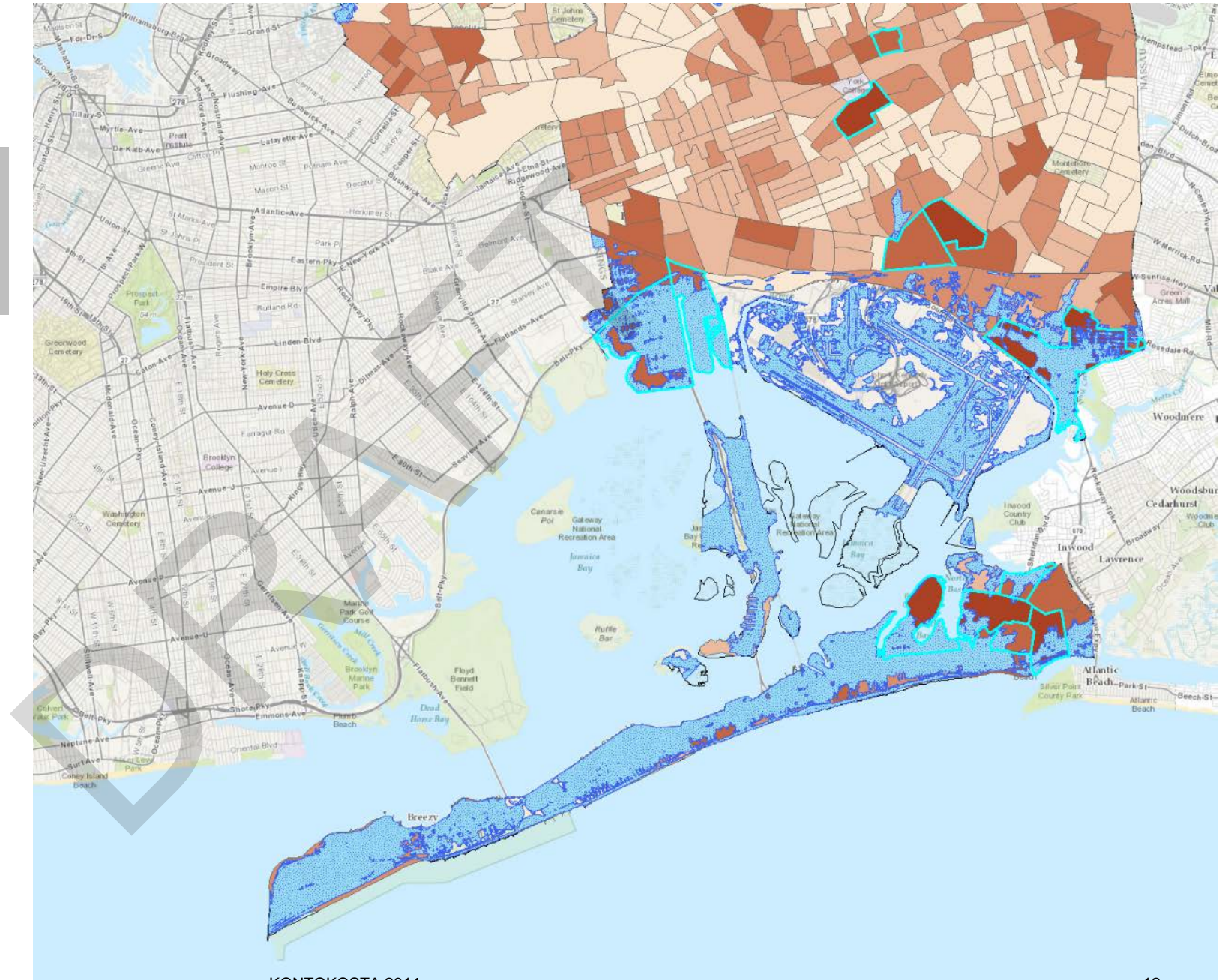
Median Household Income



Sandy Surge Areas and Vulnerable Neighborhoods

Legend

 Sandy Surge Areas in Queens

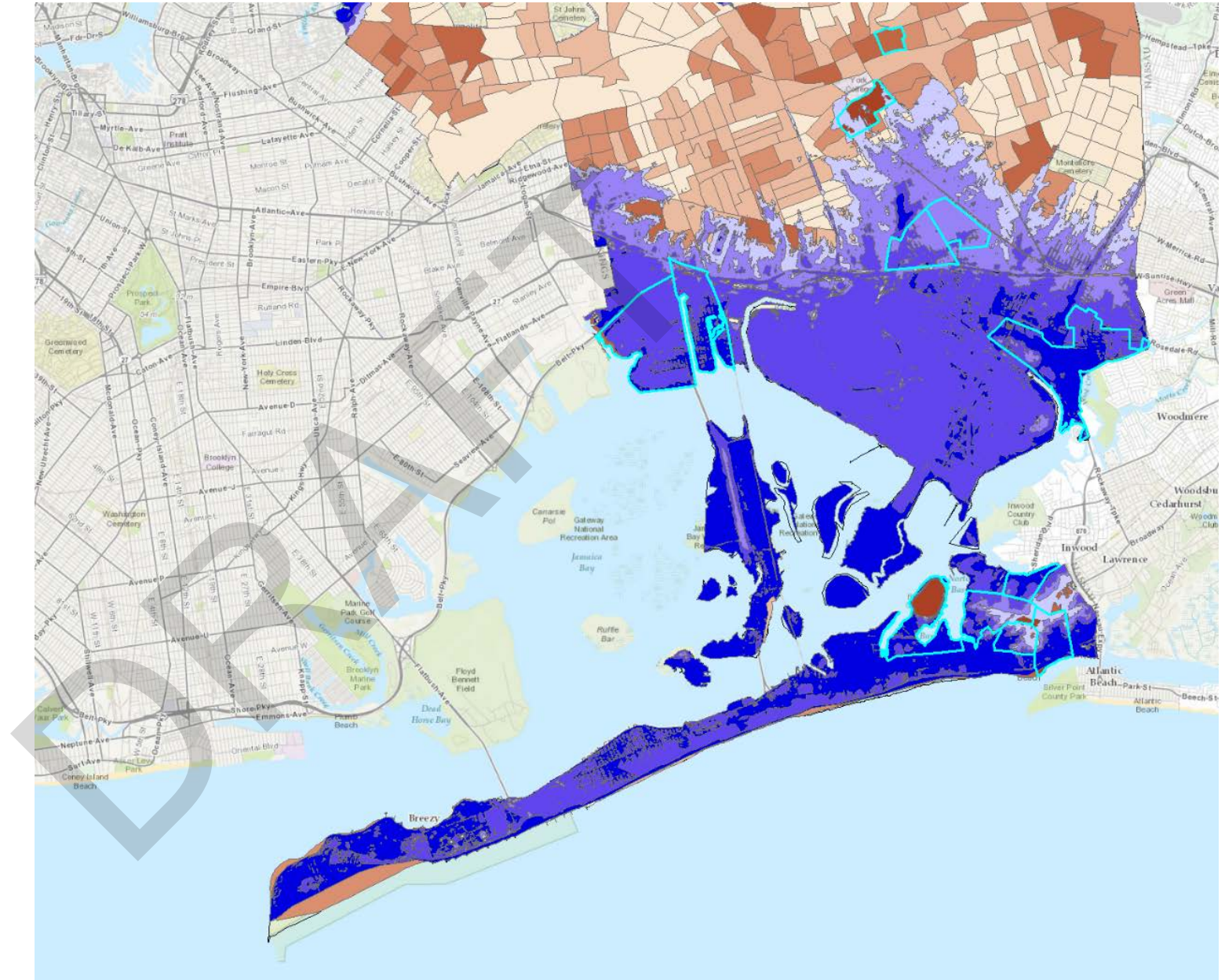


FEMA Flood Zones and Vulnerable Neighborhoods

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FEMA Surge Areas

Zone

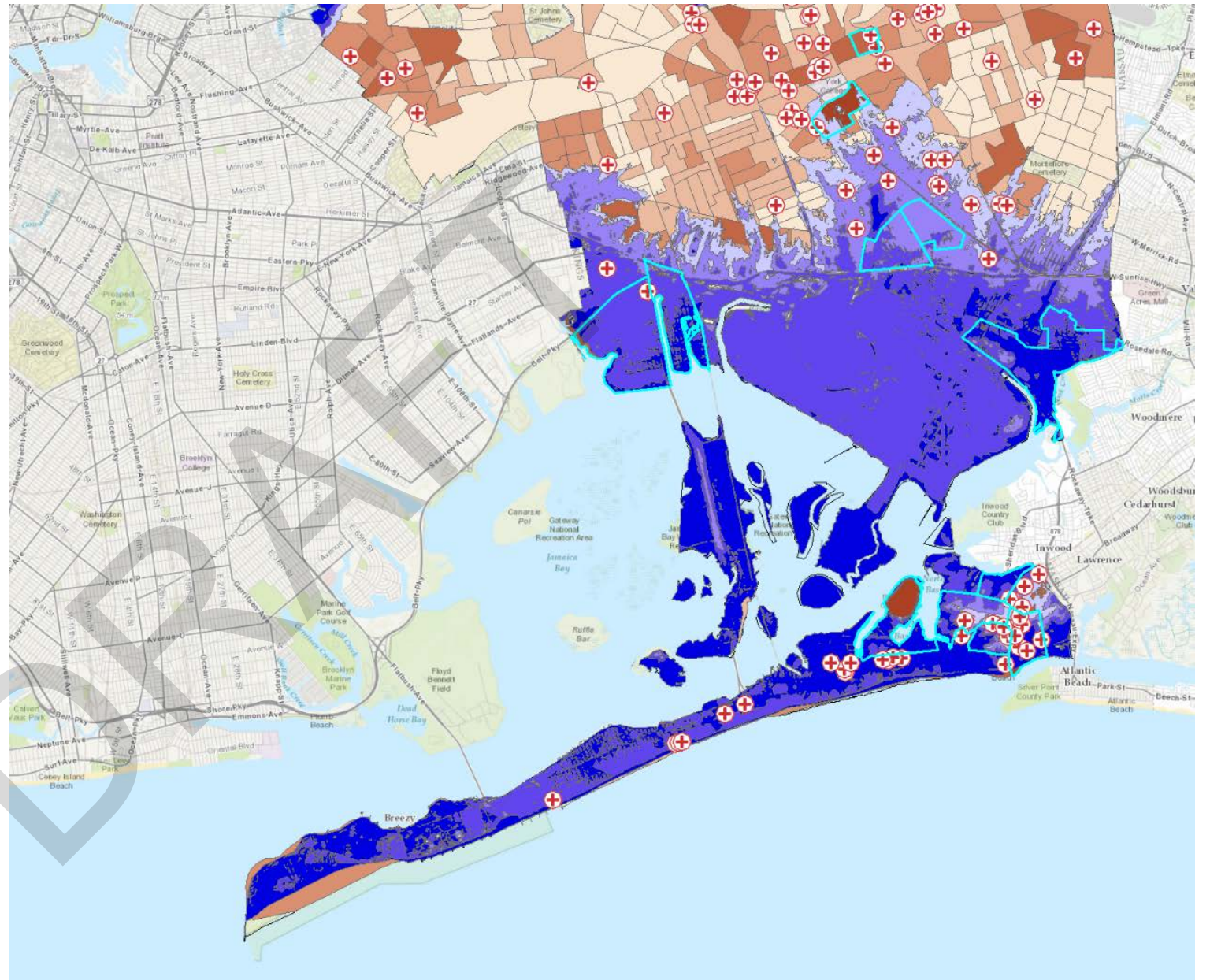


Healthcare Facilities

Legend

FEMA Surge Areas

Zone



Next Steps

- Calculate final RED Index scores and complete data analysis
- Present case studies
- Deliver interim report
- Deliver final report
- Launch interactive visualization tool