# Analysis of Flood Risk and Demographics in the South Bronx

## Summary of Findings

This document summarizes the analysis of flood risk (measured by the Flood Social Hazard Risk Index, FSHRI) and its relationship with racial demographics in the South Bronx and New York City.

## 1. OLS Regression Results

The regression analysis examines the relationship between different racial demographic groups and FSHRI. Key findings include:

- R-squared = 0.298: Approximately 29.8% of the variation in FSHRI is explained by the model.

- Significant Variables:

- White alone (coef = -1.0644, p = 0.003): Associated with lower flood risk.

- Asian alone (coef = 3.0629, p < 0.001): Strongly associated with higher flood risk.

- Some Other Race alone (coef = 2.6895, p < 0.001): Positively associated with higher flood risk.

- Black or African American alone (coef = 0.2583, p = 0.478): Included in the model but not statistically significant, suggesting a weaker or inconsistent relationship with FSHRI.

Note: Severe multicollinearity among racial variables may affect the reliability of individual coefficients.

## 2. Neighborhood-Specific Risk

The South Bronx neighborhoods exhibit varying levels of flood risk, with the most at-risk neighborhoods having an average flood risk score above 4.0. Key findings include:

- The most at-risk neighborhoods are BX0202 and BX1104, with average flood risk scores of 4.5.

- Across the South Bronx, the overall average flood risk is 3.27.

## 3. Correlations Between FSHRI and Demographics

The correlation analysis highlighted the strength of relationships between FSHRI and racial group proportions:

- Positive Correlations: Asian and Some Other Race proportions are strongly correlated with higher FSHRI values. Black or African American populations show a weaker positive correlation.

- Negative Correlations: White populations are negatively correlated with FSHRI, indicating lower risk.

## 4. Policy Implications

The analysis highlights systemic inequalities in flood risk, with key takeaways:

- Black Populations: While not statistically significant in the regression, areas with higher Black populations show notable, albeit weaker, flood risk correlations, warranting further investigation.

- Asian and Other Race Groups: These groups face higher flood risks, possibly due to residing in underserved or high-exposure areas.

- White Populations: The negative relationship indicates lower vulnerability, reflecting historical advantages in urban planning and resource allocation.

- South Bronx Vulnerability: Targeted interventions are essential for high-risk neighborhoods like BX0202 and BX1104.

## Recommendations

To address flood risk and demographic vulnerabilities, the following steps are recommended:

- Further Data Collection: Incorporate additional socioeconomic variables (e.g., income, housing type) to clarify racial disparities in flood risk.

- Policy Focus: Invest in flood defenses for high-risk neighborhoods and ensure equitable infrastructure development.

- Community Engagement: Engage at-risk communities, especially those with higher proportions of Black and Asian residents, in resilience planning.

- Mapping and Visualization: Use GIS tools to better understand spatial patterns of risk.