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Climate-Enhanced Social Vulnerability Assessment: Evidence from New York State

Social vulnerability encompasses pre-existing conditions that influence a community's ability to prepare for, respond to, and recover from disasters. Traditional Social Vulnerability Indices (SVIs) effectively capture socio-economic factors but often neglect climate-specific risks, which significantly affect disaster outcomes. This study presents a modified SVI incorporating climate-related indicators-heat index, wind chill, and precipitation-measured across 127 NYS Mesonet stations. The enhanced index combines 70% of the original CDC SVI theme scores with 30% climate vulnerability, ensuring balanced adjustment without penalizing high original scores. Standardization was performed using percentile ranking to normalize values (0-1 scale), and spatial analysis employed kriging to assess geographic patterns.

Results showed that the modified SVI exhibited stronger correlations with Expected Annual Loss (EAL) (Pearson: 0.259, Spearman: 0.383) compared to the original SVI (Pearson: 0.206, Spearman: 0.322), with Theme 3 (Minority Status/Language) emerging as a key determinant (Pearson: 0.626, Spearman: 0.696). Hospitalization data further validated the approach, revealing stronger associations with total and elderly (75+)

hospitalizations. These findings highlight the importance of integrating climate-specific variables into SVIs for more accurate assessments of community risk and resilience.

Presentation Theme: Enhancing Social Vulnerability Indices by Integrating Climate-Specific Indicators for Improved Disaster Risk Assessment in New York State.

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