Online Resource

Social Vulnerability and Compound Heat-Flood Exposure in Houston, Miami, and Norfolk: A Census-Tract-Level Analysis

Md Jubier Ahammed , M Shahriar Sonet

Fig. S1

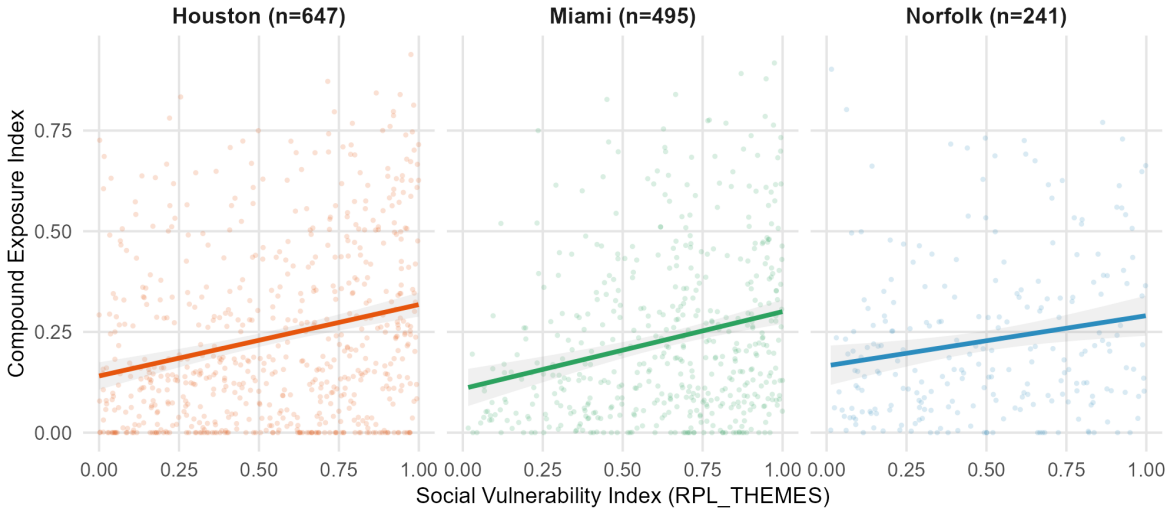

Fig. S1 Scatter plots of Compound Exposure Index against social vulnerability (RPL_THEMES) for Houston, Miami, and Norfolk cluster. Lines show ordinary least squares fit with 95% confidence interval shading.

Fig. S2

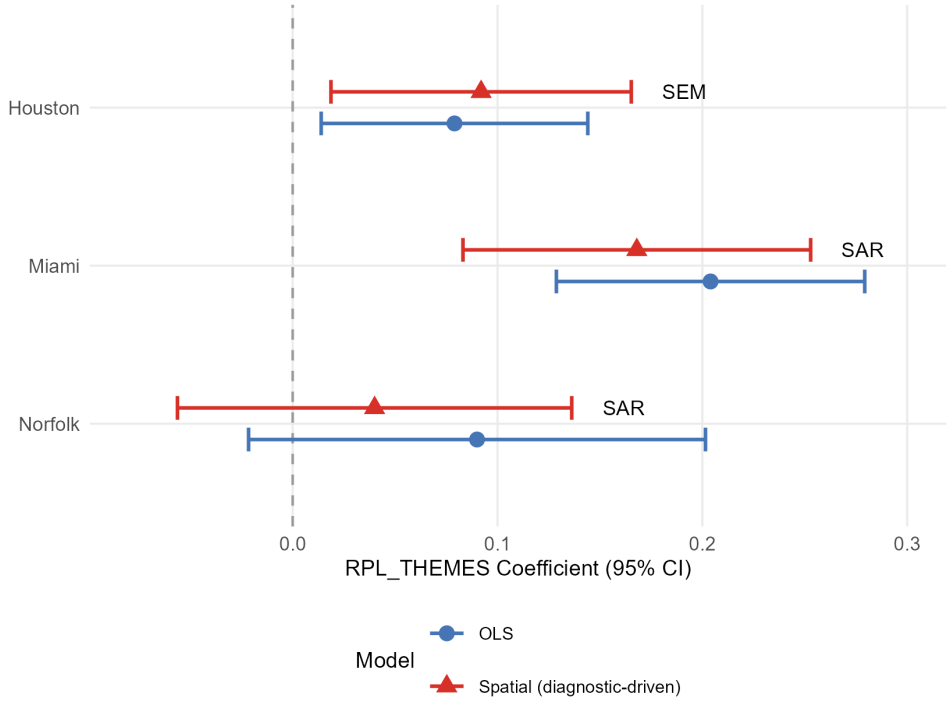

Fig. S2 City-specific ordinary least squares (OLS) and diagnostic-driven spatial model coefficients for social vulnerability (RPL_THEMES) predicting the Compound Exposure Index. Spatial model type selected per city by Anselin's robust Lagrange Multiplier diagnostics (SEM for Houston; SAR for Miami and Norfolk cluster). Error bars indicate 95% confidence intervals.

Table S1

Quartile-based compound exposure classification by city. Compound-high defined as tracts in the top quartile of both daytime land surface temperature and NFIP claim density within each city.

City	n (total)	Compound-high (quartile-based)	Compound-high (percent)
Houston	647	39	6.0%
Miami	495	26	5.3%
Norfolk cluster	241	12	5.0%

Table S2

Comparison of the social vulnerability (RPL_THEMES) coefficient across the primary median-split classification and the quartile-based robustness check. HC3 standard errors used throughout.

Model	Outcome	RPL_THEMES estimate	Significance
M1 (primary, OLS)	Compound Exposure Index (continuous)	0.135	$p < 0.001$
M2 (primary, logistic)	Compound-high (median-split, binary)	OR = 4.100	$p < 0.001$
Quartile-based (robustness check, logistic)	Compound-high (quartile-based, binary)	OR = 3.775	$p = 0.021$

The quartile-based classification produced a smaller but consistent set of compound-high tracts (77 of 1,383 tracts, 5.6%) relative to the primary median-split classification (320 of 1,383 tracts, 23.1%). Despite this difference in classification threshold, the social vulnerability association remained positive and statistically significant, confirming that the reported relationship between social vulnerability and compound exposure is not an artifact of the median-split threshold chosen for the primary analysis (main text Table 2 and Table 3).