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Discerning relationships between urban ecosystem connectivity and social vulnerability in a major US city

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As the body of research surrounding the benefits of Urban Green Infrastructure (UGI) grows, questions regarding how and where UGI is implemented in regards to vulnerable populations require more investigation. Although US cities and municipalities have begun to examine the environmental justice implications of UGI placement, the spatial aggregation and connectivity characteristics of urban ecosystems in vulnerable areas aren't always considered when making these decisions. Evidence suggests that connectivity of UGI can influence the ecosystem services UGI provides, but currently research into the differences in UGI connectivity between vulnerable and non-vulnerable populations is sparse. Understanding this relationship can help to better inform decisionmakers on how to effectively address discrepancies in UGI implementation while minimizing the expenditure of municipal resources.

In this case study of Washington, DC, we explore relationships between metrics of ecosystem connectivity derived from high spatial resolution (1m) land cover maps and components of the US Center for Disease Control's Social Vulnerability Index. These relationships are analyzed using PCA to uncover correlations between commonly used indicators of social vulnerability and the spatial patterns of land cover in a major US city.