Social Vulnerability Index

Data used, all data at the census tract level:

Variable	Description	Year, Source
Income	Per capita income	2010, ACS
Black	Percent of population that is Black or African American	2010, Census
Hispanic	Percent of population that is Hispanic	2010, Census
Native	Percent of population that is Native American	2010, Census
Over 65	Percent of population that is over 65 years of age	2010, Census
Unemployed	Percent of civilian labor force 16 and over that is unemployed	2010, Census
Poverty	Percent of population for whom poverty status is established that is living in poverty	2006-2010, ACS
No High School	Percent of population 25 and older with no high school degree or equivalent	2006-2010, ACS
Nursing Homes	Percent of population in nursing homes	2010, Census
Female Labor Force	Percent of females 16 and over in civilian labor force	2006-2010, ACS
Female Households	Percent of households with female head, no spouse	2010, Census
Social Security	Percent of households with social security income	2010, Census

Method of analysis:

We conducted a principal component analysis (PCA) using the "pca" command in the Stata software program. All of the variables listed above were standardized to z-scores with zero means and unit variances to avoid any confounding effects that might arise from using variables of different magnitudes in the analysis. After conducting the PCA, we retained all of the principal components with an eigenvalue of 1.0 or greater. To facilitate the interpretation of the components, we conducted a Varimax rotation of the six components with a Kaiser normalization. We then determine the directionality of each retained component, that is whether higher values of the component increase the level of social vulnerability (positive directionality) or decrease the level of social vulnerability (negative directionality). Where the directionality of the component was clearly negative, we scaled the component by a factor of -1 before including it in the composite index so that higher values of the scaled component would increase the overall vulnerability index. As is common in the literature, in instances when the effect of the component on vulnerability is ambiguous (as is the case when the different variables that make up the component work in opposite ways), we assume a positive directionality. Each component is then multiplied by the variance it captures from the total input matrix and the weighted components are added together to form the index. To ensure that the index can be compared to other indices, the resulting aggregated values to z-scores with zero means and unit variances. After computing the six component measures for each census tract, we then standardized each variable to z-scores with zero means and unit variances. Each component was then multiplied by the variance it captures from the total input matrix and the weighted components were added together to form the index. To ensure that the index can be compared to other indices, the resulting aggregated values to z-scores with zero means and unit variances.