Incorporating Medical and Social Vulnerability into an All-Hazards Assessment for the State of Florida

Final Report to the Florida Department of Health
created by the
Hazards and Vulnerability Research Institute
Department of Geography
University of South Carolina

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Planning Program, Bureau of Preparedness and Response
Division of Emergency Preparedness and Community Support
Florida Department of Health

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By

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Final Report

Introduction

There is an uneven distribution of risks and hazards across the landscape. Some places (e.g. coastal areas, or inland areas along rivers) have more exposure to hazards than others do by virtue of their natural setting and the natural processes. Equally significant is the distribution of human settlements that also are not evenly spaced across the landscape. It is the interaction between the natural risks and hazards on the one hand, and settlements and the people who live in them on the other, that produce the "hazards of place," and helps to explain why some places and some population groups are more vulnerable to hazards, such as those occurring in Florida.

The purpose of this project was to provide a series of maps and analytics depicting the existing social vulnerability of the population in the State of Florida, a series of maps/analytics illustrating all hazard vulnerability, and a series of maps/analytics representing medical vulnerability within the state of Florida. When examined together, these provide an assessment of the likely spatial impacts of hazard variability—past, present, future— at a sub-county level for emergency management planning, exercise design and resource allocation. The identification of such patterns provides a scientifically based mechanism that can assist Department of Health personnel in assessments of programmatic needs and opportunities within the state. It provides the evidentiary basis for developing targeted strategic initiatives for disaster risk reduction including preparedness for response and recovery, and longer-term adaptation in those most vulnerable and highly impacted areas. The project provides a new approach to regional assessments of potential hazard impacts by presenting an empirically based and geographically referenced assessment of social, hazard, and medical vulnerability for an entire state.

Task 1 – Social Vulnerability

Background

The concept of vulnerability, or the potential for harm, first introduced into the hazards and disasters literature in the 1970s, provided a means for understanding the interactions between social and ecological systems. It also provided understanding on how such interactions give rise to hazards and disasters (O'Keefe et al. 1976). Vulnerability explains the differential impacts of shocks or stressors to natural systems and the ability of those systems to absorb and withstand impacts (biophysical vulnerability). A companion construct, social vulnerability, provides the societal context within which such stressors operate and highlights the uneven capacity for preparedness, response, recovery, and adaptation to environmental threats in social systems. To fully understand and characterize the hazards of places, measures of the physical characteristics of hazards and the environment (hazard exposure) as well as those social, economic, demographic characteristics that influence a community's ability to

prepare for, respond to, cope with, recover from, and ultimately adapt to environmental hazards (social vulnerability) is required (Cutter et al. 2000). Vulnerability is widely used in the hazards, disasters, and human dimensions of global change literature to describe the differential impacts of environmental threats on people and the places where they live and work (Pelling 2003; Wisner et al. 2004; Adger 2006; Birkmann 2006; Eakin and Luers 2006; Fussell 2007; Polsky et al. 2007).

The Social Vulnerability Index (SoVI) is a quantitative measure of social vulnerability to environmental hazards. Originally developed in 2003 and applied to U.S. counties, SoVI provides a comparative metric that facilitates the geographic examination of differences in levels of social vulnerability across states and regions (Cutter et al. 2003). Based on extensive research literature focused on post-disaster response and recovery that now spans nearly a half century (National Research Council 2006), SoVI includes those population characteristics known to influence the ability of social groups and communities to prepare for, respond to, and recover from disasters, especially coastal disasters (Heinz Center 2002). The index synthesizes these socioeconomic variables into multiple dimensions, and sums the values to produce the overall score for the particular spatial unit (e.g. county, census tract) of interest. Conceptually, SoVI relates well to indices of social well-being, but its focus is on environmental hazards and the capacity of social groups to prepare for, respond to, and recover from disasters. For example, socioeconomic status (wealth or poverty) affects the ability of a community to absorb losses. Wealth enables communities to withstand the impact of losses more readily than those communities in poverty because of their access to capital, insurance and so forth. Age is another characteristic that influences vulnerability, and this is normally recognized at the two extremes of the age continuum—the very young (children) and the elderly. These age cohorts need special care, are often more susceptible to harm, and may have mobility constraints, all of which influence the ability to get out of harm's way. Special needs populations (nursing home residents, infirmed) are another example of a highly vulnerable population as they are often difficult to identify. Gender, race, and ethnicity often impose language and cultural barriers, affect access to post-disaster recovery funding, and often constrain employment opportunities and access to education. Finally, housing type and tenure (manufactured housing and renters) influence vulnerability. Manufactured housing is not as reliable as a sheltering option in high wind environments, for example. Renters are more vulnerable than homeowners are because they live in temporary quarters, often do not have renters insurance to cover the loss of their personal property, and lack strong social ties to the community.

The project represents an improvement in the Social Vulnerability Index (SoVI), which now only examines those specific social and demographic correlates of vulnerability, and is more reflective of social well-being. In the original formulation (Cutter et al. 2003), there were ten additional variables that measured aspects of the built environment (housing age) and county economic activity. We have now separated these into a companion Built Environment Index (BEVI), which is not included in this analysis. This new formulation of SoVI provides a more robust snapshot of those social group characteristics that are associated with vulnerability and known, based on the case study and empirical research literature, to either enhance or retard hazard preparedness, response, recovery, and mitigation/adaptation.

Methodology

The original SoVI formulation used 42 variables (derived from the US Census) for each county in the US. The original computation included social and demographic characteristics as well as some measures

of county economic productivity and growth. Because one could argue that economic productivity was more reflective of built environment indicators (e.g. the density of manufacturing establishments) rather than social indicators, these variables were deleted in this analysis. As a result, SoVI now reflects those characteristics of **social groups** that influence their differential capacity to prepare for and respond to environmental threats.

Twenty-eight variables were used in the SoVI-FL2010 computation (Table T1-1), based on the research literature described above. To facilitate comparisons across counties, all data were from the US Census Decennial product (2010) and US Census rolling 5-year American Community Survey (ACS) product (2006-2010). The Census 2010 data represent true counts of the population and their characteristics.

Table T1-11 Known Correlates of Social Vulnerability and Variables used to compute SoVI-FL2010 *

Population Characteristic and Specific Variables	Influence on Social Vulnerability
Race & ethnicity % African American % Native American % Asian or Pacific Islander % Hispanic	Impose language and cultural barriers for disaster preparedness and response; affects access to pre and post-disaster resources; minority group tendency to occupy high hazard areas; Non-white and non-Anglo populations are viewed as more vulnerable.
Socioeconomic Status Per capita income % households earning more than $200,000 % poverty	Affects community ability to absorb losses; wealth enables communities to recover more quickly using insurance, personal resources; poverty makes communities less able to respond and recover quickly
Gender % females in labor force % female population % female headed household, no spouse present	Women often have a more difficult time coping after disasters than men due to employment sector (personal services), lower wages, and family care responsibilities.
Age Age depended populations (% population under 5 years old and % population over 65) Median age	Age extremes (elderly and very young) increase vulnerability; parents must care for children when day care facilities are not available; elderly may have mobility or health problems
Rural/Urban % urban population Population density	Rural residents may be more vulnerable due to lower wealth and dependence on locally-based resource economy (farming); high density urban areas complicate evacuations and sheltering
Renters % renters Median Gross Rent	Renters are viewed as transient populations with limited ties to the community; they often lack shelter options when lodging becomes

	uninhabitable after disasters or too costly; lack insurance, often lack savings
Residential property Median value of owner occupied housing % housing units that are mobile homes	The value, quality, and density of residential construction affects disaster losses and recovery; expensive coastal homes are costly to replace; mobile homes are easily damaged
Occupation % employed in farming, fishing, forestry % employed in service occupations	Some occupations especially those involving resource extraction (fishing, farming) can be affected by disasters; service sector jobs suffer as disposable income declines; infrastructure employment (transportation, communications, utilities) is subject to temporary disruptions post-disaster
Family Structure Average number of people per household % families	Families with large numbers of dependents or single parent households may be more vulnerable because of the need to rely on paid care-givers
Employment % civilian labor force unemployed	Communities with high numbers of unemployed workers (pre disaster) are viewed as more vulnerable, because jobs are already difficult to obtain; this slows the recovery post disaster
Education % population over 25 with no high school diploma	Limited educational levels influence ability to understanding warning information, likely disaster impacts; access to post recovery resources
Population Growth % ESL (poorly or not at all)	New immigrant populations lack language skills and are unfamiliar with state and federal bureaucracies in how to obtain disaster relief; may not be permanent or legal residents; unfamiliar with range of hazards in area
Social Dependency and Special Needs Populations % collecting social security benefits Per capita residents in nursing homes % no automobile	Residents totally dependent on social services for survival are often economically marginalized and thus more vulnerable; special needs populations (infirmed) require more time for evacuation and recovery is often difficult

*Source: Heinz Center 2002; Cutter et al. 2003.

The 28 variables were standardized and input into a principal components analysis (PCA) to reduce the number of variables into a smaller set of multi-dimensional attributes or components. Adjustments to the component's directionality were made to insure that positive values were associated with increasing vulnerability, and negative values associated with decreasing vulnerability. If a factor included negative and positive values that both influenced vulnerability (such as the elderly and the

young), then the absolute value was used. Once the directionality was established, the components were added together to produce the final SoVI score for Florida (SoVI-FL2010).

Six distinct components explain 65.96% of the variance in the data for the SoVI-FL2010 (Table T1-2). These components include Class (percent living below poverty; percent with education less than 12th grade, % employed in service industry) and race (percent Black); Age (elderly); Wealth (per capita income, %rich, median house value); Urban/Female populations, Ethnicity (percent Hispanic, % English as a second language); and high occupancy households. These components and the level of explained variance are consistent with other SoVI studies for different regions and for the US as a whole. There is considerable sensitivity testing of the SoVI metric to monitor its robustness at different spatial scales and in different places (Schmidtlein et al. 2008), and in different application domains (see http://sovius.org).

Table T1-2 Social Vulnerability Index-Florida (SoVI-FL2010)

SoVI 2010 Component Read Me

28 Variables, Population > 0, Housing Units > 0

Florida Department of Health

Component	*Cardinality*	*Name*	*% Variance Explained*	*Dominant Variables*	*Component Loading*
1	**+**	Class (Poverty), Race (Black)	16.46	QBLACK	0.815
				QPOVTY	0.798
				QNOAUTO	0.706
				QFHH	0.683
				QED12LES	0.586
				QRENTER	0.577
				QSERV	0.534
				QFAM	-0.641
2	**+**	Age (Elderly)	12.88	QSSBEN	0.888
				QAGEDEP	0.841
				MEDAGE	0.770
				QCVLUN	0.629
				QASIAN	-0.596
3	**-**	Wealth	11.82	QRICH200K	0.888
				MDHSEVAL	0.875
				PERCAP	0.813
4	**+**	Urban, Females	8.70	QFEMALE	0.710
				QFEMLBR	0.564
				QURBAN	0.543
				QEXTRCT	-0.557
5	**+**	Ethnicity (Hispanic)	8.69	QHISP	0.846
				POPDENS	0.727
				QESL	0.582
6	**+**	High Occupancy Households	7.41	PPUNIT	0.850
				QFHH	0.436
			65.96		

The social vulnerability scores, ranging from 9.85 indicating the most vulnerable tract (in Miami-Dade County) to -17.01, the least vulnerable tract (in the Dry Tortugas), were mapped using a three-class standard deviation method. The standard deviations preserve the underlying distribution of the data (mean of zero and one-half standard deviation on either side) (Figure T1-1). The moderate category represents the mean; the elevated category is greater than one-half standard deviation above the mean; and the low category is more than one-half standard deviation below the mean. This method permits the best balance between interpretation (5 classes) and the identification and visualization of the extremes (high and low vulnerability that are of the most interest).

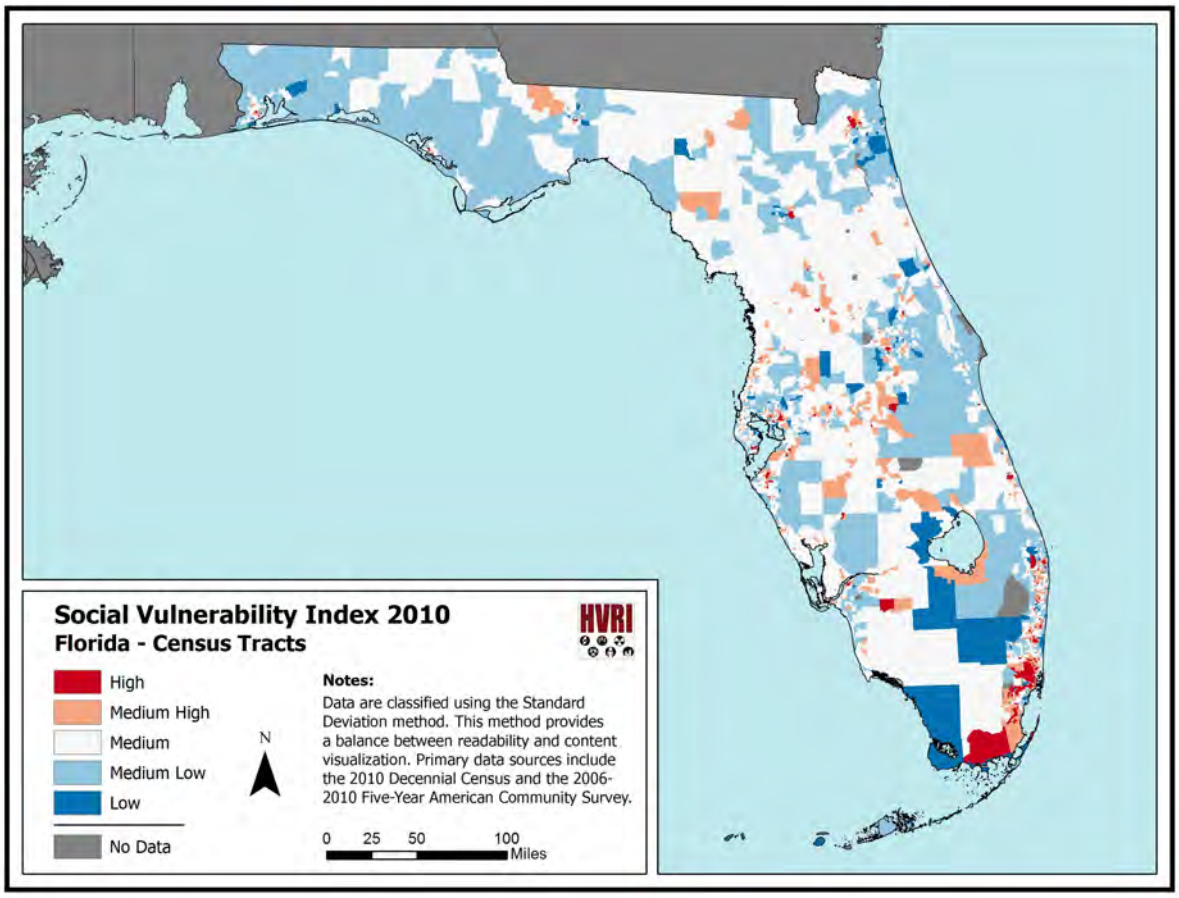

Figure T1-1: SoVI-FL2010 Tract level Social Vulnerability for the State of Florida

Overall social vulnerability at the tract level for the state is driven by the place specific combination of underlying socio-economic and demographic conditions present at the local level. These baseline conditions are teased out and merged into "components" through the factor analytic process. Mapping of each component provides a different view of the drivers of vulnerability across the state and may be useful for planning, exercise design, and the allocation of goods and services within the context of emergency management. SoVI-FL2010 tract is comprised of the six factor components outlined above and detailed in table T1-2. Table T1-3 shows the percentage of each county's total population in reference the SoVI classification of the composite census tracts. For instance, 17.86% of people in Alachua County population reside in census tracts with low vulnerability while nearly 55 reside in tracts with high social vulnerability. Table T1-4 provides an actual count of populations within these same zones for comparative purposes. Here, one can easily see that although nearly 54% of Gadsden County

populations reside in areas with elevated vulnerability the reality is that this percentage only represents 25,033 people, while Miami-Dade's 31% located in the medium high SoVI class represent more than 700,000 residents.

Using these tables in combination with the map above is the only accurate way to understand where clusters of vulnerability are occurring. Identification of and discussion about these areas of higher vulnerability can be found below in the discussion section.

Table T1-3: Percentage of county population by vulnerability class (SoVI-FL2010)

County Name	Social Vulnerability Rank				
	Low	Medium Low	Medium	Medium High	High
Alachua	17.86%	48.68%	25.61%	3.63%	4.21%
Baker	0.00%	19.85%	80.15%	0.00%	0.00%
Bay	1.30%	56.34%	37.12%	3.07%	2.17%
Bradford	0.00%	22.18%	77.82%	0.00%	0.00%
Brevard	0.00%	39.24%	56.93%	3.38%	0.46%
Broward	4.95%	21.09%	42.09%	23.32%	8.56%
Calhoun	0.00%	43.96%	56.04%	0.00%	0.00%
Charlotte	0.00%	3.75%	85.06%	11.19%	0.00%
Citrus	0.00%	0.00%	87.66%	12.34%	0.00%
Clay	0.00%	51.66%	45.55%	2.78%	0.00%
Collier	0.95%	19.70%	55.51%	22.01%	1.84%
Columbia	0.00%	34.37%	61.38%	4.25%	0.00%
De Soto	0.00%	34.75%	40.61%	18.03%	6.62%
Dixie	0.00%	30.39%	24.97%	44.64%	0.00%
Duval	8.47%	34.26%	40.15%	10.73%	6.39%
Escambia	3.42%	40.37%	42.80%	10.00%	3.41%
Flagler	0.00%	3.36%	80.04%	16.60%	0.00%
Franklin	0.00%	75.72%	24.28%	0.00%	0.00%
Gadsden	0.00%	0.00%	46.04%	53.96%	0.00%
Gilchrist	0.00%	30.42%	69.58%	0.00%	0.00%
Glades	29.09%	0.00%	70.91%	0.00%	0.00%
Gulf	0.00%	80.61%	19.39%	0.00%	0.00%
Hamilton	0.00%	0.00%	88.11%	11.89%	0.00%
Hardee	0.00%	0.00%	61.67%	38.33%	0.00%
Hendry	14.25%	0.00%	29.93%	55.82%	0.00%
Hernando	0.00%	5.92%	58.03%	34.17%	1.89%
Highlands	0.03%	1.05%	63.38%	35.55%	0.00%
Hillsborough	8.29%	28.32%	40.63%	18.00%	4.76%
Holmes	0.00%	0.00%	100.00%	0.00%	0.00%
Indian River	3.83%	8.58%	71.73%	15.86%	0.00%
Jackson	0.00%	39.70%	60.30%	0.00%	0.00%
Jefferson	0.00%	39.87%	60.13%	0.00%	0.00%
Lafayette	35.67%	0.00%	64.33%	0.00%	0.00%
Lake	0.00%	7.41%	78.85%	13.74%	0.00%
Lee	0.38%	20.01%	64.04%	13.78%	1.78%
Leon	4.47%	54.58%	34.45%	3.67%	2.82%
Levy	0.00%	3.44%	96.56%	0.00%	0.00%
Liberty	0.00%	100.00%	0.00%	0.00%	0.00%
Madison	0.00%	0.00%	100.00%	0.00%	0.00%
Manatee	1.12%	23.95%	49.85%	17.53%	7.55%
Marion	0.00%	7.04%	64.85%	27.59%	0.53%
Martin	0.00%	37.37%	59.83%	2.80%	0.00%
Miami-Dade	2.33%	6.60%	14.66%	31.01%	45.39%
Monroe	21.70%	54.86%	23.44%	0.00%	0.00%
Nassau	0.00%	55.76%	44.24%	0.00%	0.00%
Okaloosa	4.12%	75.65%	20.23%	0.00%	0.00%
Okeechobee	4.51%	14.43%	55.77%	25.29%	0.00%
Orange	7.81%	38.89%	31.72%	19.71%	1.87%
Osceola	0.15%	8.74%	55.04%	32.67%	3.40%
Palm Beach	3.29%	29.13%	37.23%	25.66%	4.68%
Pasco	0.00%	18.12%	63.73%	18.15%	0.00%
Pinellas	2.57%	29.12%	55.03%	10.33%	2.96%
Polk	0.45%	13.84%	50.21%	34.00%	1.50%
Putnam	0.00%	10.46%	75.45%	14.09%	0.00%
Santa Rosa	5.01%	78.91%	16.08%	0.00%	0.00%
Sarasota	0.68%	24.04%	64.47%	9.79%	1.01%
Seminole	6.15%	39.28%	48.43%	5.23%	0.90%
St Johns	7.32%	67.19%	23.30%	2.19%	0.00%
St Lucie	0.00%	4.34%	78.84%	10.98%	5.84%
Sumter	2.39%	0.00%	40.81%	55.48%	1.32%
Suwannee	0.00%	4.34%	78.78%	16.89%	0.00%
Taylor	0.00%	34.90%	65.10%	0.00%	0.00%
Union	0.00%	71.07%	28.93%	0.00%	0.00%
Volusia	1.95%	19.42%	61.80%	15.42%	1.41%
Wakulla	0.00%	55.88%	44.12%	0.00%	0.00%
Walton	0.00%	79.37%	20.63%	0.00%	0.00%
Washington	0.00%	59.08%	40.92%	0.00%	0.00%

Table T1-4: Total county population by vulnerability class (SoVI-FL2010)

County Name	Social Vulnerability Rank				
	Low	Medium Low	Medium	Medium High	High
Alachua	44,185	120,398	63,347	8,981	10,425
Baker		5,381	21,734		
Bay	2,190	95,130	62,686	5,186	3,660
Bradford		6,327	22,193		
Brevard		213,201	309,321	18,361	2,486
Broward	86,506	368,587	735,676	407,586	149,711
Calhoun		6,429	8,196		
Charlotte		5,994	136,079	17,905	
Citrus			123,812	17,424	
Clay		98,608	86,946	5,311	
Collier	3,041	63,336	178,461	70,762	5,920
Columbia		23,211	41,448	2,872	
De Soto		12,113	14,157	6,284	2,308
Dixie		4,990	4,101	7,331	
Duval	73,205	296,116	347,003	92,745	55,194
Escambia	10,184	120,144	127,368	29,771	10,152
Flagler		3,217	76,595	15,884	
Franklin		8,745	2,804		
Gadsden			21,356	25,033	
Gilchrist		5,152	11,787		
Glades	3,748		9,136		
Gulf		12,787	3,076		
Hamilton			13,039	1,760	
Hardee			17,101	10,630	
Hendry	5,578		11,716	21,846	
Hernando		10,220	100,257	59,044	3,257
Highlands	27	1,036	62,607	35,116	
Hillsborough	101,925	348,058	499,458	221,278	58,507
Holmes			19,927		
Indian River	5,291	11,840	99,009	21,888	
Jackson		19,748	29,998		
Jefferson		5,885	8,876		
Lafayette	3,164		5,706		
Lake		22,025	234,222	40,805	

County Name	Social Vulnerability Rank				
	Low	Medium Low	Medium	Medium High	High
Lee	2,382	123,799	396,255	85,286	11,032
Leon	12,325	150,370	94,894	10,122	7,776
Levy		1,402	39,399		
Liberty		8,365			
Madison			19,224		
Manatee	3,626	77,309	160,941	56,598	24,359
Marion		23,319	214,832	91,397	1,750
Martin		54,681	87,546	4,091	
Miami-Dade	58,145	164,510	365,609	773,240	1,131,623
Monroe	15,861	40,095	17,134		
Nassau		40,878	32,436		
Okaloosa	7,445	136,792	36,585		
Okeechobee	1,803	5,770	22,307	10,116	
Orange	89,498	445,656	363,495	225,904	21,403
Osceola	413	23,495	147,877	87,770	9,130
Palm Beach	43,446	384,407	491,191	338,632	61,786
Pasco		84,205	296,135	84,357	
Pinellas	23,529	266,920	504,344	94,649	27,100
Polk	2,726	83,319	302,342	204,694	9,014
Putnam		7,775	56,109	10,480	
Santa Rosa	7,585	119,446	24,341		
Sarasota	2,596	91,230	244,626	37,145	3,851
Seminole	26,017	166,059	204,741	22,117	3,784
St Johns	13,911	127,689	44,284	4,155	
St Lucie		12,064	219,015	30,499	16,211
Sumter	2,080		35,518	48,277	1,148
Suwannee		1,803	32,732	7,016	
Taylor		7,877	14,693		
Union		11,040	4,495		
Volusia	9,627	96,059	305,671	76,270	6,966
Wakulla		17,199	13,577		
Walton		43,686	11,357		
Washington		14,709	10,187		

A map for each of the components of SoVI can be seen in figures T1-2 – T1-7 (below). While not particularly useful at this small scale for visual comparison and identification purposes these component maps in conjunction with underlying data are vital for understanding the driving forces behind the SoVI index. Additionally, tables (T1-5 – T1-16) of percentages of population and total population for each county in relation to the SoVI components are provided.

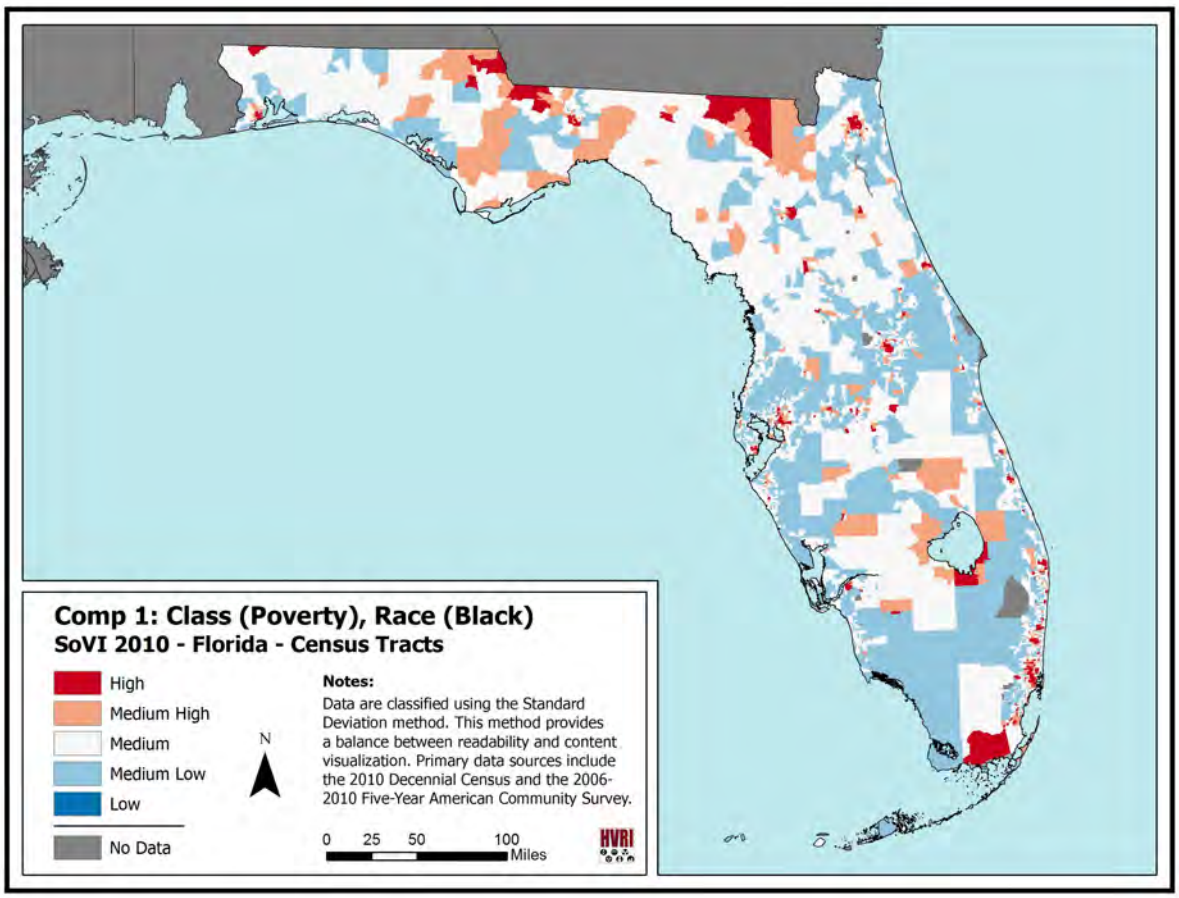

Figure T1-2: Component 1 of SoVI-FL2010 Tract level Social Vulnerability for the State of Florida

Table T1-5: Percentage of county population by vulnerability class for SoVI-FL2010 – Component 1

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Alachua	19.45%	38.48%	42.07%
Baker	19.85%	24.65%	55.50%
Bay	38.11%	47.80%	14.10%
Bradford	0.00%	48.96%	51.04%
Brevard	51.80%	38.85%	9.34%
Broward	35.61%	39.72%	24.68%
Calhoun	0.00%	43.96%	56.04%
Charlotte	43.12%	52.66%	4.22%
Citrus	15.15%	84.85%	0.00%
Clay	62.15%	35.06%	2.78%
Collier	36.70%	46.72%	16.58%
Columbia	14.92%	59.67%	25.40%
De Soto	34.76%	18.03%	47.21%
Dixie	0.00%	69.61%	30.39%
Duval	27.59%	42.34%	30.08%
Escambia	15.95%	51.07%	32.98%
Flagler	15.65%	84.35%	0.00%
Franklin	0.00%	41.38%	58.62%
Gadsden	0.00%	20.63%	79.37%
Gilchrist	44.10%	37.95%	17.95%
Glades	17.59%	53.32%	29.09%
Gulf	0.00%	47.44%	52.56%
Hamilton	0.00%	32.67%	67.33%
Hardee	17.26%	53.28%	29.46%
Hendry	0.00%	81.83%	18.17%
Hernando	44.68%	45.38%	9.93%
Highlands	50.27%	37.38%	12.34%
Hillsborough	35.85%	44.42%	19.73%
Holmes	0.00%	63.61%	36.39%
Indian River	40.15%	50.68%	9.17%
Jackson	8.69%	19.06%	72.25%
Jefferson	0.00%	30.46%	69.54%
Lafayette	0.00%	100.00%	0.00%
Lake	52.90%	39.04%	8.06%

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Lee	47.15%	43.22%	9.63%
Leon	26.78%	33.06%	40.16%
Levy	9.07%	70.89%	20.04%
Liberty	25.19%	0.00%	74.81%
Madison	0.00%	54.89%	45.11%
Manatee	47.05%	39.14%	13.82%
Marion	23.29%	64.86%	11.85%
Martin	60.13%	29.96%	9.92%
Miami-Dade	33.22%	34.46%	32.32%
Monroe	36.59%	52.26%	11.15%
Nassau	51.67%	48.33%	0.00%
Okaloosa	39.71%	56.43%	3.86%
Okeechobee	22.99%	53.22%	23.79%
Orange	40.79%	38.03%	21.18%
Osceola	33.42%	61.14%	5.44%
Palm Beach	37.14%	43.90%	18.96%
Pasco	56.40%	37.26%	6.34%
Pinellas	46.53%	39.65%	13.81%
Polk	37.70%	40.11%	22.19%
Putnam	4.84%	64.30%	30.86%
Santa Rosa	46.89%	49.07%	4.04%
Sarasota	51.26%	42.42%	6.32%
Seminole	53.58%	39.52%	6.90%
St Johns	54.78%	36.94%	8.29%
St Lucie	19.77%	66.71%	13.53%
Sumter	20.35%	68.07%	11.58%
Suwannee	41.16%	41.95%	16.89%
Taylor	0.00%	73.24%	26.76%
Union	0.00%	28.93%	71.07%
Volusia	39.24%	46.33%	14.43%
Wakulla	28.81%	44.12%	27.07%
Walton	23.47%	65.75%	10.78%
Washington	0.00%	60.46%	39.54%

Table T1-6: Total county population by vulnerability class for SoVI-FL2010 – Component 1

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Alachua	48,113	95,177	104,046
Baker	5,381	6,684	15,050
Bay	64,342	80,707	23,803
Bradford		13,962	14,558
Brevard	281,477	211,117	50,775
Broward	622,429	694,281	431,356
Calhoun		6,429	8,196
Charlotte	68,977	84,243	6,758
Citrus	21,396	119,840	
Clay	118,629	66,925	5,311
Collier	118,007	150,203	53,310
Columbia	10,077	40,298	17,156
De Soto	12,119	6,284	16,459
Dixie		11,432	4,990
Duval	238,407	365,892	259,964
Escambia	47,473	152,002	98,144
Flagler	14,976	80,720	
Franklin		4,779	6,770
Gadsden		9,571	36,818
Gilchrist	7,470	6,429	3,040
Glades	2,266	6,870	3,748
Gulf		7,526	8,337
Hamilton		4,835	9,964
Hardee	4,786	14,776	8,169
Hendry		32,028	7,112
Hernando	77,204	78,409	17,165
Highlands	49,661	36,931	12,194
Hillsborough	440,659	546,062	242,505
Holmes		12,676	7,251
Indian River	55,418	69,947	12,663
Jackson	4,325	9,482	35,939
Jefferson		4,496	10,265
Lafayette		8,870	
Lake	157,129	115,975	23,948

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Lee	291,748	267,450	59,556
Leon	73,778	91,083	110,626
Levy	3,701	28,924	8,176
Liberty	2,107		6,258
Madison		10,553	8,671
Manatee	151,881	126,341	44,611
Marion	77,155	214,896	39,247
Martin	87,976	43,830	14,512
Miami-Dade	828,313	859,015	805,799
Monroe	26,743	38,195	8,152
Nassau	37,879	35,435	
Okaloosa	71,810	102,031	6,981
Okeechobee	9,197	21,285	9,514
Orange	467,446	435,827	242,683
Osceola	89,796	164,268	14,621
Palm Beach	490,024	579,254	250,184
Pasco	262,099	173,150	29,448
Pinellas	426,496	363,452	126,594
Polk	226,984	241,480	133,631
Putnam	3,599	47,813	22,952
Santa Rosa	70,982	74,275	6,115
Sarasota	194,510	160,973	23,965
Seminole	226,488	167,047	29,183
St Johns	104,099	70,195	15,745
St Lucie	54,915	185,300	37,574
Sumter	17,708	59,240	10,075
Suwannee	17,103	17,432	7,016
Taylor		16,530	6,040
Union		4,495	11,040
Volusia	194,092	229,136	71,365
Wakulla	8,867	13,577	8,332
Walton	12,918	36,190	5,935
Washington		15,053	9,843

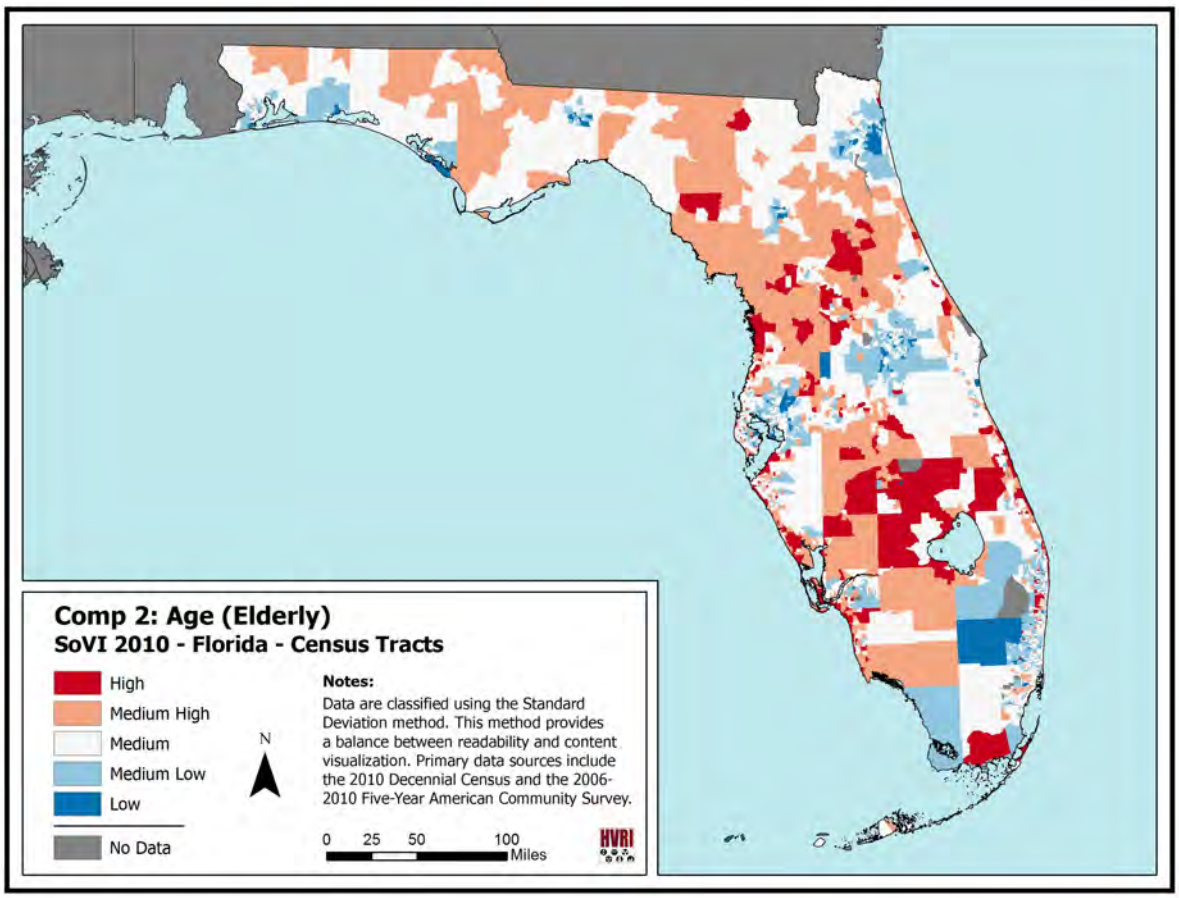

Figure T1-3: Component 2 of SoVI-FL2010 Tract level Social Vulnerability for the State of Florida

Table T1-7: Percentage of county population by vulnerability class for SoVI-FL 2010 – Component 2

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Alachua	63.31%	29.65%	7.04%
Baker	0.00%	72.23%	27.77%
Bay	41.57%	55.63%	2.80%
Bradford	0.00%	42.08%	57.92%
Brevard	16.23%	72.14%	11.64%
Broward	56.79%	33.41%	9.80%
Calhoun	0.00%	16.64%	83.36%
Charlotte	0.00%	31.14%	68.86%
Citrus	0.00%	0.00%	100.00%
Clay	52.43%	44.56%	3.02%
Collier	6.93%	45.63%	47.44%
Columbia	0.00%	85.35%	14.65%
De Soto	0.00%	15.23%	84.77%
Dixie	0.00%	30.39%	69.61%
Duval	64.61%	31.97%	3.42%
Escambia	37.77%	55.39%	6.84%
Flagler	0.00%	53.57%	46.43%
Franklin	0.00%	51.03%	48.97%
Gadsden	0.00%	8.70%	91.30%
Gilchrist	0.00%	49.80%	50.20%
Glades	0.00%	29.09%	70.91%
Gulf	0.00%	28.05%	71.95%
Hamilton	0.00%	0.00%	100.00%
Hardee	0.00%	0.00%	100.00%
Hendry	0.00%	28.40%	71.60%
Hernando	0.00%	53.65%	46.35%
Highlands	0.03%	3.72%	96.26%
Hillsborough	58.98%	35.17%	5.84%
Holmes	0.00%	0.00%	100.00%
Indian River	7.84%	51.38%	40.79%
Jackson	0.00%	46.32%	53.68%
Jefferson	0.00%	39.87%	60.13%
Lafayette	0.00%	35.67%	64.33%
Lake	25.10%	33.50%	41.40%

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Lee	21.94%	40.29%	37.77%
Leon	66.81%	33.19%	0.00%
Levy	0.00%	5.63%	94.37%
Liberty	0.00%	25.19%	74.81%
Madison	0.00%	63.83%	36.17%
Manatee	15.50%	48.72%	35.78%
Marion	2.32%	38.71%	58.97%
Martin	0.00%	61.59%	38.41%
Miami-Dade	19.07%	55.93%	25.00%
Monroe	32.18%	52.67%	15.16%
Nassau	0.00%	89.28%	10.72%
Okaloosa	59.16%	39.17%	1.67%
Okeechobee	0.00%	43.83%	56.17%
Orange	75.50%	22.91%	1.59%
Osceola	37.93%	62.01%	0.07%
Palm Beach	38.92%	38.34%	22.74%
Pasco	25.59%	40.54%	33.88%
Pinellas	27.56%	53.03%	19.40%
Polk	12.10%	54.09%	33.81%
Putnam	0.00%	31.21%	68.79%
Santa Rosa	38.32%	56.27%	5.41%
Sarasota	15.58%	33.40%	51.02%
Seminole	68.91%	31.09%	0.00%
St Johns	44.85%	46.42%	8.72%
St Lucie	19.60%	47.73%	32.67%
Sumter	2.39%	2.92%	94.69%
Suwannee	0.00%	0.00%	100.00%
Taylor	0.00%	100.00%	0.00%
Union	0.00%	100.00%	0.00%
Volusia	4.79%	75.94%	19.27%
Wakulla	0.00%	100.00%	0.00%
Walton	0.00%	94.65%	5.35%
Washington	0.00%	59.56%	40.44%

Table T1-8: Total county population by vulnerability class for SoVI-FL2010 – Component 2

County Name	Social Vulnerability		
	Low	Medium	High
Alachua	156,597	73,329	17,410
Baker		19,584	7,531
Bay	70,189	93,928	4,735
Bradford		12,002	16,518
Brevard	88,164	391,968	63,237
Broward	992,685	584,096	171,285
Calhoun		2,433	12,192
Charlotte		49,812	110,166
Citrus			141,236
Clay	100,062	85,040	5,763
Collier	22,269	146,714	152,537
Columbia		57,637	9,894
De Soto		5,308	29,554
Dixie		4,990	11,432
Duval	558,366	276,315	29,582
Escambia	112,425	164,842	20,352
Flagler		51,269	44,427
Franklin		5,893	5,656
Gadsden		4,036	42,353
Gilchrist		8,436	8,503
Glades		3,748	9,136
Gulf		4,450	11,413
Hamilton			14,799
Hardee			27,731
Hendry		11,116	28,024
Hernando		92,704	80,074
Highlands	27	3,671	95,088
Hillsborough	725,054	432,333	71,839
Holmes			19,927
Indian River	10,817	70,914	56,297
Jackson		23,040	26,706
Jefferson		5,885	8,876
Lafayette		3,164	5,706
Lake	74,558	99,508	122,986

County Name	Social Vulnerability		
	Low	Medium	High
Lee	135,761	249,304	233,689
Leon	184,050	91,437	
Levy		2,299	38,502
Liberty		2,107	6,258
Madison		12,270	6,954
Manatee	50,034	157,288	115,511
Marion	7,686	128,238	195,374
Martin		90,116	56,202
Miami-Dade	475,529	1,394,368	623,230
Monroe	23,517	38,495	11,078
Nassau		65,454	7,860
Okaloosa	106,975	70,836	3,011
Okeechobee		17,529	22,467
Orange	865,200	262,576	18,180
Osceola	101,910	166,599	176
Palm Beach	513,508	505,877	300,077
Pasco	118,911	188,366	157,420
Pinellas	252,604	486,085	177,853
Polk	72,850	325,690	203,555
Putnam		23,209	51,155
Santa Rosa	58,010	85,177	8,185
Sarasota	59,123	126,736	193,589
Seminole	291,312	131,406	
St Johns	85,235	88,224	16,580
St Lucie	54,454	132,582	90,753
Sumter	2,080	2,543	82,400
Suwannee			41,551
Taylor		22,570	
Union		15,535	
Volusia	23,695	375,581	95,317
Wakulla		30,776	
Walton		52,098	2,945
Washington		14,829	10,067

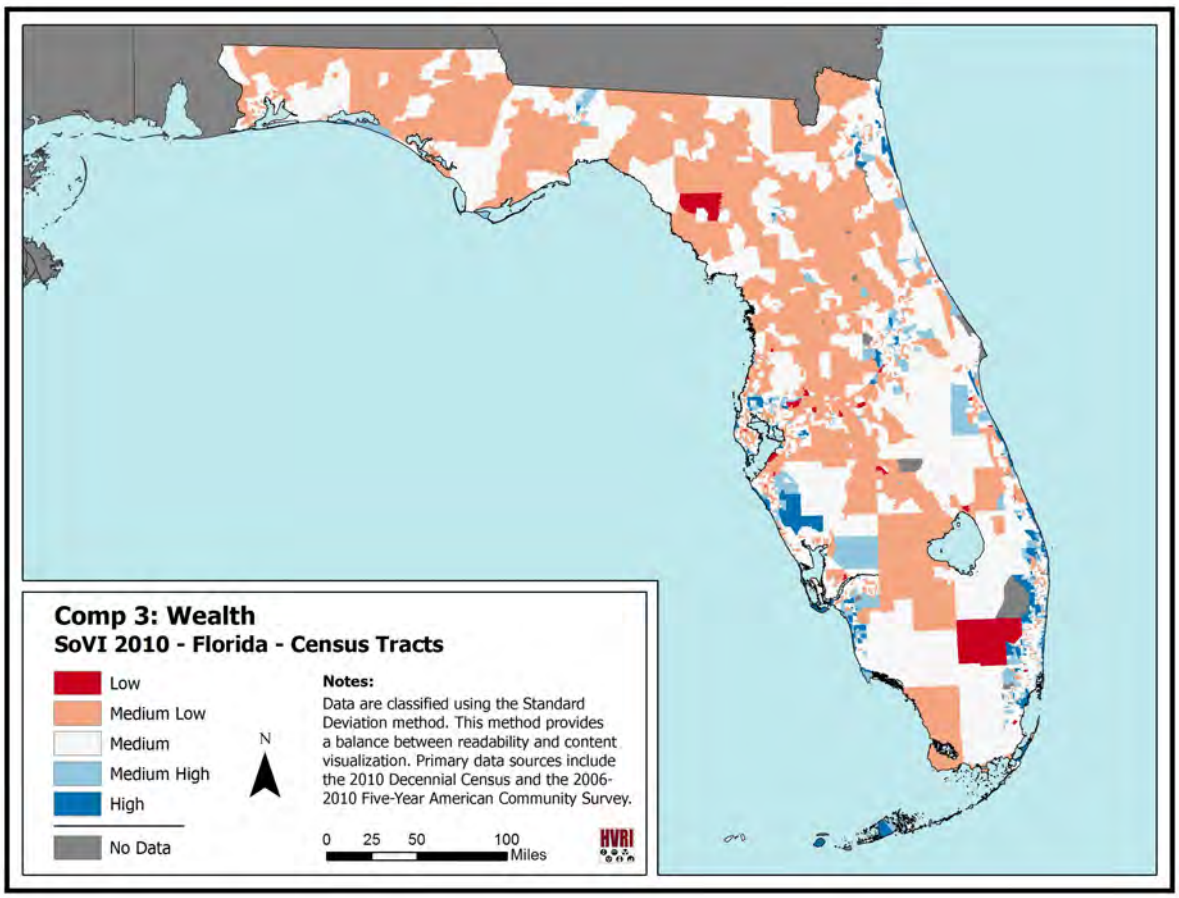

Figure T1-4: Component 3 of SoVI-FL2010 Tract level Social Vulnerability for the State of Florida

Table T1-9: Percentage of county population by vulnerability class for SoVI-FL 2010 – Component 3

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Alachua	14.08%	63.96%	21.95%
Baker	0.00%	24.65%	75.35%
Bay	3.37%	49.05%	47.57%
Bradford	0.00%	53.33%	46.67%
Brevard	10.42%	64.66%	24.92%
Broward	29.14%	59.77%	11.10%
Calhoun	0.00%	0.00%	100.00%
Charlotte	11.61%	49.62%	38.77%
Citrus	0.00%	23.33%	76.67%
Clay	6.14%	62.65%	31.21%
Collier	40.14%	50.75%	9.11%
Columbia	0.00%	29.64%	70.36%
De Soto	0.00%	49.88%	50.12%
Dixie	0.00%	30.39%	69.61%
Duval	9.98%	71.21%	18.81%
Escambia	4.26%	52.59%	43.15%
Flagler	10.85%	84.17%	4.98%
Franklin	14.63%	34.34%	51.03%
Gadsden	0.00%	66.17%	33.83%
Gilchrist	0.00%	17.95%	82.05%
Glades	0.00%	0.00%	100.00%
Gulf	0.00%	100.00%	0.00%
Hamilton	0.00%	55.44%	44.56%
Hardee	0.00%	67.79%	32.21%
Hendry	0.00%	18.17%	81.83%
Hernando	1.75%	39.68%	58.57%
Highlands	0.00%	13.20%	86.80%
Hillsborough	16.57%	55.16%	28.27%
Holmes	0.00%	36.39%	63.61%
Indian River	13.66%	52.76%	33.58%
Jackson	0.00%	46.67%	53.33%
Jefferson	0.00%	69.54%	30.46%
Lafayette	0.00%	35.67%	64.33%
Lake	0.99%	50.84%	48.17%
Lee	16.08%	57.93%	25.99%
Leon	16.79%	64.85%	18.36%
Levy	0.00%	17.92%	82.08%
Liberty	0.00%	74.81%	25.19%
Madison	0.00%	32.21%	67.79%
Manatee	18.04%	38.66%	43.29%
Marion	3.13%	34.19%	62.68%
Martin	25.86%	61.99%	12.15%
Miami-Dade	20.33%	71.39%	8.28%
Monroe	64.28%	35.69%	0.03%
Nassau	15.43%	34.79%	49.77%
Okaloosa	13.32%	64.27%	22.40%
Okeechobee	0.00%	37.99%	62.01%
Orange	17.52%	64.65%	17.83%
Osceola	3.47%	60.27%	36.26%
Palm Beach	31.54%	52.75%	15.72%
Pasco	2.80%	45.56%	51.64%
Pinellas	12.65%	50.69%	36.66%
Polk	3.26%	39.25%	57.49%
Putnam	0.00%	30.91%	69.09%
Santa Rosa	3.81%	64.39%	31.80%
Sarasota	21.27%	53.03%	25.70%
Seminole	28.29%	58.93%	12.79%
St Johns	33.40%	55.57%	11.03%
St Lucie	5.25%	72.53%	22.22%
Sumter	2.38%	51.75%	45.87%
Suwannee	0.00%	21.22%	78.78%
Taylor	0.00%	34.90%	65.10%
Union	0.00%	71.07%	28.93%
Volusia	7.59%	56.85%	35.56%
Wakulla	0.00%	27.07%	72.93%
Walton	33.52%	10.78%	55.69%
Washington	0.00%	33.20%	66.80%

Table T1-10: Total county population by vulnerability class for SoVI-FL 2010 – Component 3

County Name	Social Vulnerability		
	Low	Medium	High
Alachua	34,837	158,208	54,291
Baker		6,684	20,431
Bay	5,696	82,825	80,331
Bradford		15,210	13,310
Brevard	56,630	351,342	135,397
Broward	509,329	1,044,778	193,959
Calhoun			14,625
Charlotte	18,571	79,380	62,027
Citrus		32,948	108,288
Clay	11,714	119,578	59,573
Collier	129,046	163,176	29,298
Columbia		20,016	47,515
De Soto		17,389	17,473
Dixie		4,990	11,432
Duval	86,286	615,412	162,565
Escambia	12,680	156,524	128,415
Flagler	10,381	80,551	4,764
Franklin	1,690	3,966	5,893
Gadsden		30,697	15,692
Gilchrist		3,040	13,899
Glades			12,884
Gulf		15,863	
Hamilton		8,204	6,595
Hardee		18,799	8,932
Hendry		7,112	32,028
Hernando	3,027	68,557	101,194
Highlands	1	13,038	85,747
Hillsborough	203,696	678,009	347,521
Holmes		7,251	12,676
Indian River	18,854	72,822	46,352
Jackson		23,217	26,529
Jefferson		10,265	4,496
Lafayette		3,164	5,706
Lake	2,928	151,022	143,102

County Name	Social Vulnerability		
	Low	Medium	High
Lee	99,469	358,458	160,827
Leon	46,259	178,654	50,574
Levy		7,312	33,489
Liberty		6,258	2,107
Madison		6,192	13,032
Manatee	58,248	124,818	139,767
Marion	10,367	113,261	207,670
Martin	37,838	90,701	17,779
Miami-Dade	506,968	1,779,764	206,395
Monroe	46,983	26,083	24
Nassau	11,316	25,506	36,492
Okaloosa	24,093	116,216	40,513
Okeechobee		15,195	24,801
Orange	200,793	740,887	204,276
Osceola	9,317	161,939	97,429
Palm Beach	416,112	695,967	207,383
Pasco	13,005	211,717	239,975
Pinellas	115,916	464,590	336,036
Polk	19,654	236,309	346,132
Putnam		22,988	51,376
Santa Rosa	5,763	97,474	48,135
Sarasota	80,711	201,206	97,531
Seminole	119,578	249,092	54,048
St Johns	63,473	105,602	20,964
St Lucie	14,572	201,486	61,731
Sumter	2,070	45,037	39,916
Suwannee		8,819	32,732
Taylor		7,877	14,693
Union		11,040	4,495
Volusia	37,524	281,180	175,889
Wakulla		8,332	22,444
Walton	18,452	5,935	30,656
Washington		8,266	16,630

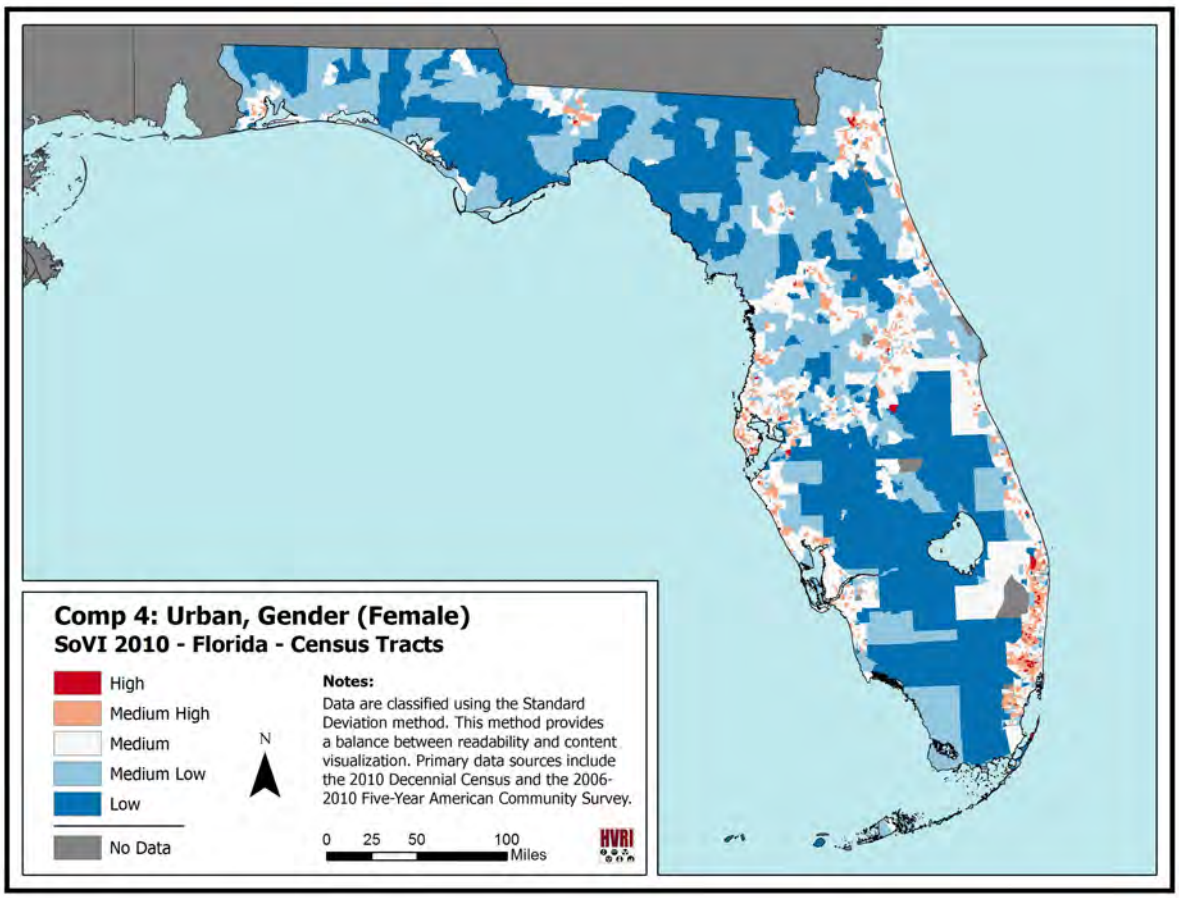

Figure T1-5: Component 4 of SoVI-FL2010 Tract level Social Vulnerability for the State of Florida

Table T1-11: Percentage of county population by vulnerability class for SoVI-FL 2010 – Component 4

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Alachua	31.78%	51.74%	16.47%
Baker	75.35%	24.65%	0.00%
Bay	30.18%	58.50%	11.32%
Bradford	80.10%	19.90%	0.00%
Brevard	9.09%	74.20%	16.72%
Broward	8.98%	36.58%	54.44%
Calhoun	100.00%	0.00%	0.00%
Charlotte	9.94%	49.37%	40.69%
Citrus	32.17%	59.74%	8.09%
Clay	25.37%	53.76%	20.88%
Collier	42.70%	43.03%	14.27%
Columbia	84.92%	10.83%	4.25%
De Soto	93.38%	6.62%	0.00%
Dixie	100.00%	0.00%	0.00%
Duval	8.08%	54.89%	37.03%
Escambia	18.00%	61.35%	20.65%
Flagler	11.27%	43.61%	45.12%
Franklin	100.00%	0.00%	0.00%
Gadsden	40.29%	59.71%	0.00%
Gilchrist	100.00%	0.00%	0.00%
Glades	100.00%	0.00%	0.00%
Gulf	80.61%	19.39%	0.00%
Hamilton	100.00%	0.00%	0.00%
Hardee	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%
Hernando	27.01%	37.04%	35.94%
Highlands	38.98%	61.02%	0.00%
Hillsborough	17.85%	56.70%	25.46%
Holmes	100.00%	0.00%	0.00%
Indian River	18.30%	52.39%	29.30%
Jackson	89.98%	10.02%	0.00%
Jefferson	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%
Lake	32.74%	54.71%	12.56%

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Lee	16.46%	69.40%	14.15%
Leon	20.65%	31.21%	48.14%
Levy	100.00%	0.00%	0.00%
Liberty	100.00%	0.00%	0.00%
Madison	100.00%	0.00%	0.00%
Manatee	21.37%	53.99%	24.65%
Marion	33.37%	39.33%	27.30%
Martin	21.38%	62.64%	15.98%
Miami-Dade	13.79%	41.84%	44.37%
Monroe	74.07%	25.93%	0.00%
Nassau	72.10%	27.90%	0.00%
Okaloosa	25.64%	73.31%	1.05%
Okeechobee	100.00%	0.00%	0.00%
Orange	13.88%	62.11%	24.01%
Osceola	11.91%	74.23%	13.86%
Palm Beach	14.95%	41.71%	43.34%
Pasco	18.20%	56.11%	25.70%
Pinellas	7.99%	55.09%	36.92%
Polk	31.65%	59.01%	9.34%
Putnam	81.91%	12.67%	5.42%
Santa Rosa	36.20%	63.80%	0.00%
Sarasota	4.06%	62.32%	33.62%
Seminole	1.52%	69.26%	29.22%
St Johns	14.37%	73.57%	12.06%
St Lucie	16.26%	58.49%	25.25%
Sumter	36.67%	7.85%	55.48%
Suwannee	100.00%	0.00%	0.00%
Taylor	73.24%	26.76%	0.00%
Union	100.00%	0.00%	0.00%
Volusia	14.22%	56.27%	29.51%
Wakulla	100.00%	0.00%	0.00%
Walton	86.62%	13.38%	0.00%
Washington	100.00%	0.00%	0.00%

Table T1-12: Total county population by vulnerability class for SoVI-FL 2010 – Component 4

County Name	Social Vulnerability		
	Low	Medium	High
Alachua	78,611	127,977	40,748
Baker	20,431	6,684	
Bay	50,963	98,774	19,115
Bradford	22,845	5,675	
Brevard	49,381	403,162	90,826
Broward	156,976	639,396	951,694
Calhoun	14,625		
Charlotte	15,901	78,979	65,098
Citrus	45,433	84,379	11,424
Clay	48,415	102,603	39,847
Collier	137,295	138,336	45,889
Columbia	57,348	7,311	2,872
De Soto	32,554	2,308	
Dixie	16,422		
Duval	69,861	474,383	320,019
Escambia	53,584	182,580	61,455
Flagler	10,785	41,735	43,176
Franklin	11,549		
Gadsden	18,692	27,697	
Gilchrist	16,939		
Glades	12,884		
Gulf	12,787	3,076	
Hamilton	14,799		
Hardee	27,731		
Hendry	39,140		
Hernando	46,671	64,005	62,102
Highlands	38,504	60,282	
Hillsborough	219,391	696,913	312,922
Holmes	19,927		
Indian River	25,266	72,319	40,443
Jackson	44,761	4,985	
Jefferson	14,761		
Lafayette	8,870		
Lake	97,246	162,511	37,295

County Name	Social Vulnerability		
	Low	Medium	High
Lee	101,822	429,401	87,531
Leon	56,884	85,988	132,615
Levy	40,801		
Liberty	8,365		
Madison	19,224		
Manatee	68,982	174,283	79,568
Marion	110,557	130,286	90,455
Martin	31,283	91,647	23,388
Miami-Dade	343,881	1,043,043	1,106,203
Monroe	54,141	18,949	
Nassau	52,862	20,452	
Okaloosa	46,367	132,562	1,893
Okeechobee	39,996		
Orange	159,083	711,736	275,137
Osceola	31,994	199,439	37,252
Palm Beach	197,231	550,388	571,843
Pasco	84,572	260,719	119,406
Pinellas	73,250	504,879	338,413
Polk	190,564	355,300	56,231
Putnam	60,912	9,421	4,031
Santa Rosa	54,802	96,570	
Sarasota	15,412	236,461	127,575
Seminole	6,418	292,774	123,526
St Johns	27,305	139,809	22,925
St Lucie	45,165	162,485	70,139
Sumter	31,912	6,834	48,277
Suwannee	41,551		
Taylor	16,530	6,040	
Union	15,535		
Volusia	70,332	278,312	145,949
Wakulla	30,776		
Walton	47,676	7,367	
Washington	24,896		

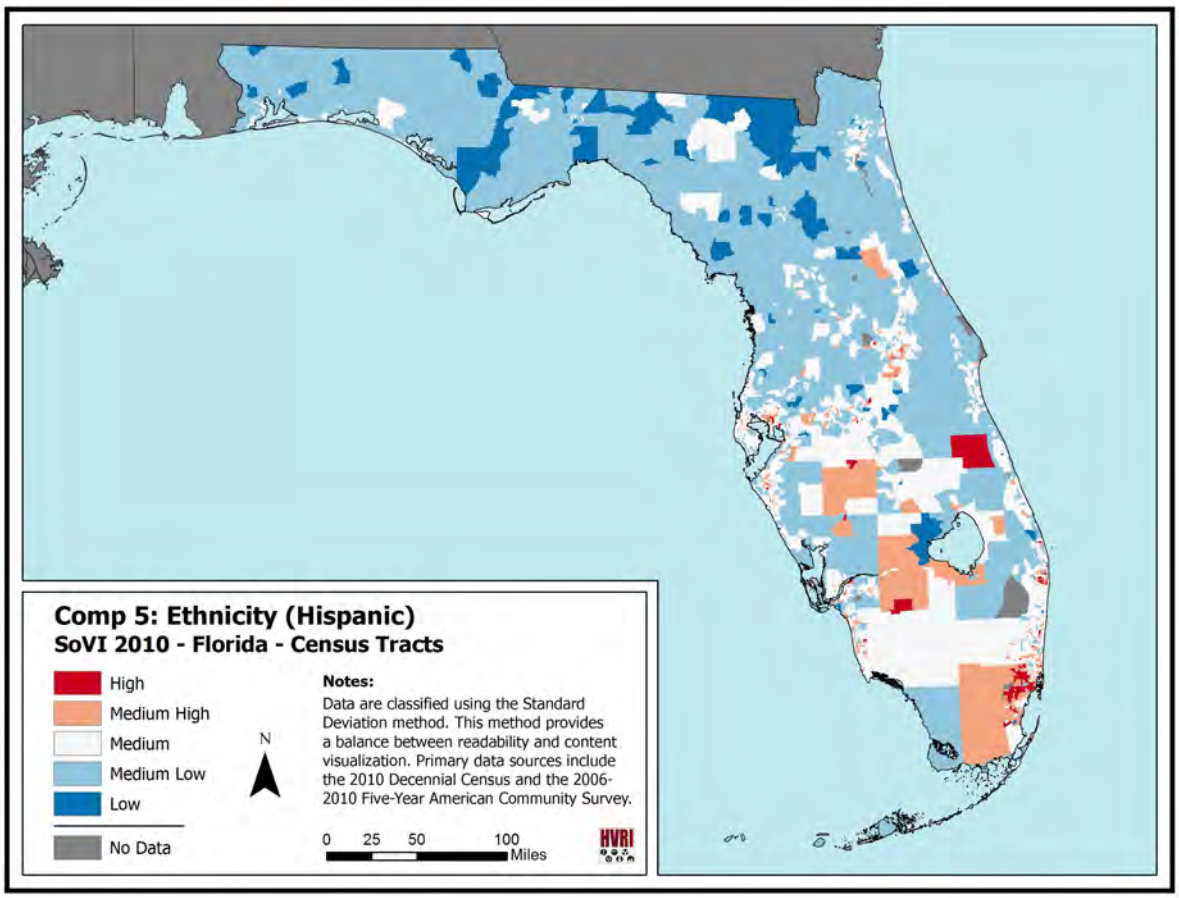

Figure T1-6: Component 5 of SoVI-FL2010 Tract level Social Vulnerability for the State of Florida

Table T1-13: Percentage of county population by vulnerability class for SoVI-FL 2010 – Component 5

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Alachua	72.20%	27.80%	0.00%
Baker	100.00%	0.00%	0.00%
Bay	64.62%	35.38%	0.00%
Bradford	100.00%	0.00%	0.00%
Brevard	37.13%	62.26%	0.61%
Broward	6.04%	70.61%	23.35%
Calhoun	100.00%	0.00%	0.00%
Charlotte	43.81%	56.19%	0.00%
Citrus	88.95%	11.05%	0.00%
Clay	65.72%	34.28%	0.00%
Collier	6.39%	61.48%	32.13%
Columbia	100.00%	0.00%	0.00%
De Soto	32.08%	13.38%	54.55%
Dixie	55.36%	44.64%	0.00%
Duval	58.97%	39.04%	1.99%
Escambia	72.77%	27.23%	0.00%
Flagler	46.69%	53.31%	0.00%
Franklin	85.37%	14.63%	0.00%
Gadsden	89.72%	10.28%	0.00%
Gilchrist	100.00%	0.00%	0.00%
Glades	46.68%	0.00%	53.32%
Gulf	100.00%	0.00%	0.00%
Hamilton	88.11%	11.89%	0.00%
Hardee	0.00%	3.46%	96.54%
Hendry	0.00%	33.49%	66.51%
Hernando	45.40%	54.60%	0.00%
Highlands	23.33%	64.93%	11.74%
Hillsborough	19.07%	62.08%	18.85%
Holmes	100.00%	0.00%	0.00%
Indian River	23.02%	71.75%	5.23%
Jackson	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%
Lake	56.16%	42.07%	1.76%

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Lee	20.24%	63.88%	15.88%
Leon	81.48%	18.52%	0.00%
Levy	100.00%	0.00%	0.00%
Liberty	100.00%	0.00%	0.00%
Madison	83.17%	16.83%	0.00%
Manatee	23.29%	57.86%	18.85%
Marion	57.29%	42.71%	0.00%
Martin	24.45%	59.25%	16.30%
Miami-Dade	2.86%	16.43%	80.72%
Monroe	24.01%	45.85%	30.14%
Nassau	91.31%	8.69%	0.00%
Okaloosa	62.60%	34.51%	2.89%
Okeechobee	18.93%	52.40%	28.66%
Orange	22.06%	54.57%	23.37%
Osceola	13.00%	54.78%	32.21%
Palm Beach	12.18%	67.77%	20.05%
Pasco	34.32%	61.25%	4.43%
Pinellas	18.96%	73.90%	7.15%
Polk	27.91%	61.42%	10.67%
Putnam	90.22%	9.78%	0.00%
Santa Rosa	81.65%	18.35%	0.00%
Sarasota	26.75%	65.43%	7.82%
Seminole	24.94%	72.00%	3.06%
St Johns	68.37%	31.63%	0.00%
St Lucie	13.35%	80.76%	5.90%
Sumter	78.35%	21.65%	0.00%
Suwannee	20.85%	79.15%	0.00%
Taylor	100.00%	0.00%	0.00%
Union	71.07%	28.93%	0.00%
Volusia	42.53%	55.54%	1.93%
Wakulla	100.00%	0.00%	0.00%
Walton	79.86%	20.14%	0.00%
Washington	100.00%	0.00%	0.00%

Table T1-14: Total county population by vulnerability class for SoVI-FL 2010 – Component 5

County Name	Social Vulnerability		
	Low	Medium	High
Alachua	178,572	68,764	
Baker	27,115		
Bay	109,104	59,748	
Bradford	28,520		
Brevard	201,767	338,314	3,288
Broward	105,591	1,234,243	408,232
Calhoun	14,625		
Charlotte	70,089	89,889	
Citrus	125,629	15,607	
Clay	125,440	65,425	
Collier	20,560	197,662	103,298
Columbia	67,531		
De Soto	11,182	4,663	19,017
Dixie	9,091	7,331	
Duval	509,647	337,443	17,173
Escambia	216,580	81,039	
Flagler	44,683	51,013	
Franklin	9,859	1,690	
Gadsden	41,620	4,769	
Gilchrist	16,939		
Glades	6,014		6,870
Gulf	15,863		
Hamilton	13,039	1,760	
Hardee		959	26,772
Hendry		13,108	26,032
Hernando	78,449	94,329	
Highlands	23,045	64,145	11,596
Hillsborough	234,409	763,051	231,766
Holmes	19,927		
Indian River	31,771	99,039	7,218
Jackson	49,746		
Jefferson	14,761		
Lafayette	8,870		
Lake	166,838	124,980	5,234

County Name	Social Vulnerability		
	Low	Medium	High
Lee	125,230	395,269	98,255
Leon	224,456	51,031	
Levy	40,801		
Liberty	8,365		
Madison	15,989	3,235	
Manatee	75,191	186,780	60,862
Marion	189,798	141,500	
Martin	35,770	86,692	23,856
Miami-Dade	71,212	409,549	2,012,366
Monroe	17,547	33,513	22,030
Nassau	66,943	6,371	
Okaloosa	113,193	62,402	5,227
Okeechobee	7,573	20,959	11,464
Orange	252,741	625,351	267,864
Osceola	34,941	147,196	86,548
Palm Beach	160,736	894,225	264,501
Pasco	159,486	284,605	20,606
Pinellas	173,756	677,292	65,494
Polk	168,074	369,787	64,234
Putnam	67,094	7,270	
Santa Rosa	123,591	27,781	
Sarasota	101,503	248,255	29,690
Seminole	105,406	304,366	12,946
St Johns	129,939	60,100	
St Lucie	37,074	224,336	16,379
Sumter	68,182	18,841	
Suwannee	8,662	32,889	
Taylor	22,570		
Union	11,040	4,495	
Volusia	210,344	274,700	9,549
Wakulla	30,776		
Walton	43,958	11,085	
Washington	24,896		

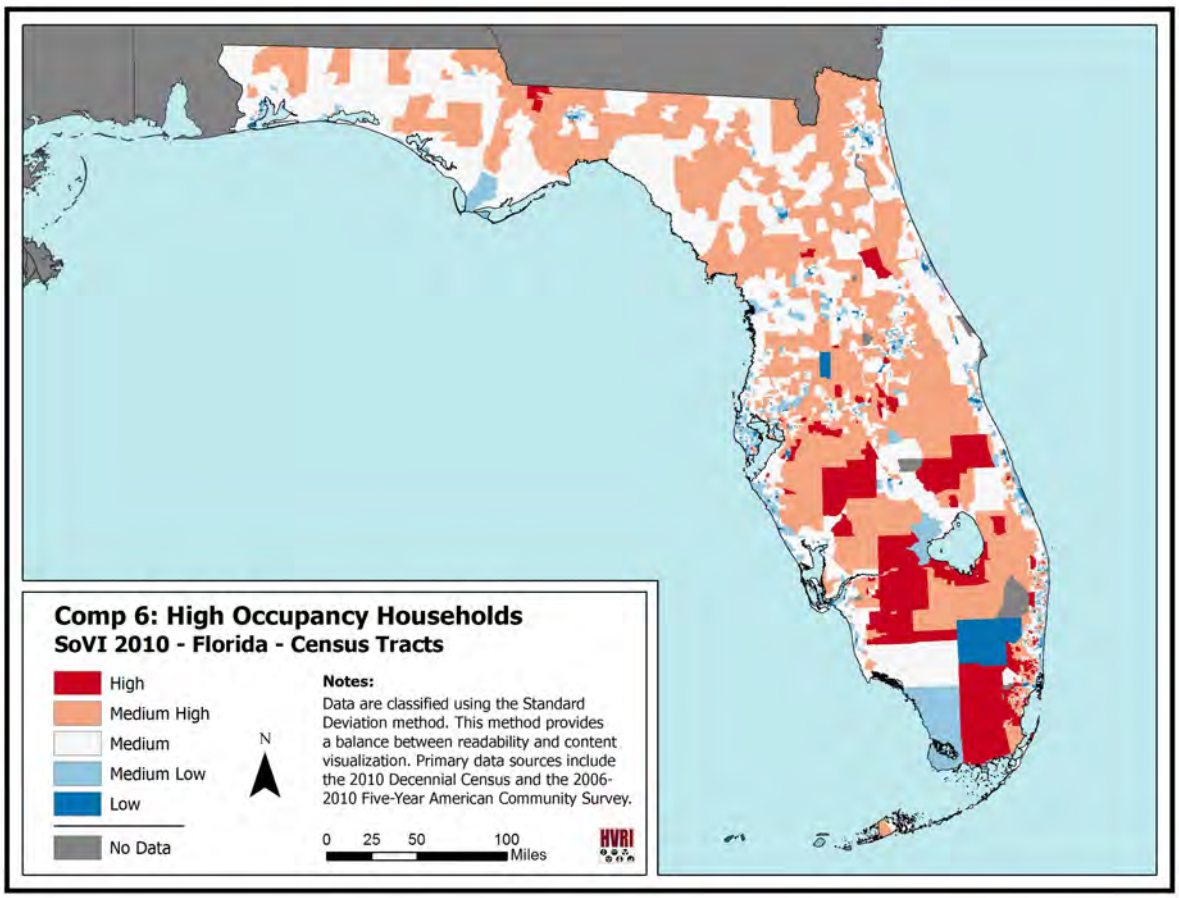

Figure T1-7: Component 6 of SoVI-FL2010 Tract level Social Vulnerability for the State of Florida

Table T1-15: Percentage of county population by vulnerability class for SoVI-FL 2010 – Component 6

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Alachua	48.28%	33.89%	17.83%
Baker	0.00%	27.77%	72.23%
Bay	28.74%	63.68%	7.57%
Bradford	0.00%	46.67%	53.33%
Brevard	28.56%	58.35%	13.09%
Broward	21.53%	31.86%	46.62%
Calhoun	0.00%	72.68%	27.32%
Charlotte	24.79%	72.81%	2.40%
Citrus	23.08%	68.47%	8.45%
Clay	5.27%	44.79%	49.95%
Collier	21.98%	45.72%	32.29%
Columbia	6.93%	51.00%	42.07%
De Soto	0.00%	27.23%	72.77%
Dixie	0.00%	55.36%	44.64%
Duval	26.79%	49.87%	23.34%
Escambia	28.36%	64.11%	7.53%
Flagler	8.09%	66.87%	25.03%
Franklin	14.63%	85.37%	0.00%
Gadsden	0.00%	0.00%	100.00%
Gilchrist	0.00%	81.43%	18.57%
Glades	29.09%	17.59%	53.32%
Gulf	28.05%	71.95%	0.00%
Hamilton	0.00%	55.44%	44.56%
Hardee	0.00%	0.00%	100.00%
Hendry	0.00%	0.00%	100.00%
Hernando	9.13%	64.90%	25.96%
Highlands	8.53%	68.13%	23.34%
Hillsborough	23.64%	37.87%	38.49%
Holmes	0.00%	72.18%	27.82%
Indian River	27.12%	50.76%	22.13%
Jackson	7.01%	58.69%	34.30%
Jefferson	0.00%	70.33%	29.67%
Lafayette	0.00%	35.67%	64.33%
Lake	9.41%	55.91%	34.68%

County Name	Social Vulnerability Component 1 Rank		
	Low	Medium	High
Lee	47.15%	43.22%	9.63%
Leon	26.78%	33.06%	40.16%
Levy	9.07%	70.89%	20.04%
Liberty	25.19%	0.00%	74.81%
Madison	0.00%	54.89%	45.11%
Manatee	47.05%	39.14%	13.82%
Marion	23.29%	64.86%	11.85%
Martin	60.13%	29.96%	9.92%
Miami-Dade	33.22%	34.46%	32.32%
Monroe	36.59%	52.26%	11.15%
Nassau	51.67%	48.33%	0.00%
Okaloosa	39.71%	56.43%	3.86%
Okeechobee	22.99%	53.22%	23.79%
Orange	40.79%	38.03%	21.18%
Osceola	33.42%	61.14%	5.44%
Palm Beach	37.14%	43.90%	18.96%
Pasco	56.40%	37.26%	6.34%
Pinellas	46.53%	39.65%	13.81%
Polk	37.70%	40.11%	22.19%
Putnam	4.84%	64.30%	30.86%
Santa Rosa	46.89%	49.07%	4.04%
Sarasota	51.26%	42.42%	6.32%
Seminole	53.58%	39.52%	6.90%
St Johns	54.78%	36.94%	8.29%
St Lucie	19.77%	66.71%	13.53%
Sumter	20.35%	68.07%	11.58%
Suwannee	41.16%	41.95%	16.89%
Taylor	0.00%	73.24%	26.76%
Union	0.00%	28.93%	71.07%
Volusia	39.24%	46.33%	14.43%
Wakulla	28.81%	44.12%	27.07%
Walton	23.47%	65.75%	10.78%
Washington	0.00%	60.46%	39.54%

Table T1-16: Total county population by vulnerability class for SoVI-FL 2010 – Component 6

County Name	Social Vulnerability		
	Low	Medium	High
Alachua	119,413	83,812	44,111
Baker		7,531	19,584
Bay	48,536	107,526	12,790
Bradford		13,310	15,210
Brevard	155,194	317,046	71,129
Broward	376,279	556,869	814,918
Calhoun		10,629	3,996
Charlotte	39,656	116,485	3,837
Citrus	32,602	96,700	11,934
Clay	10,051	85,479	95,335
Collier	70,674	147,014	103,832
Columbia	4,678	34,441	28,412
De Soto		9,494	25,368
Dixie		9,091	7,331
Duval	231,496	431,021	201,746
Escambia	84,416	190,789	22,414
Flagler	7,745	63,996	23,955
Franklin	1,690	9,859	
Gadsden			46,389
Gilchrist		13,794	3,145
Glades	3,748	2,266	6,870
Gulf	4,450	11,413	
Hamilton		8,204	6,595
Hardee			27,731
Hendry			39,140
Hernando	15,781	112,136	44,861
Highlands	8,426	67,302	23,058
Hillsborough	290,618	465,515	473,093
Holmes		14,383	5,544
Indian River	37,427	70,062	30,539
Jackson	3,488	29,194	17,064
Jefferson		10,381	4,380
Lafayette		3,164	5,706
Lake	27,955	166,094	103,003

County Name	Social Vulnerability		
	Low	Medium	High
Lee	139,358	318,310	161,086
Leon	114,056	80,097	81,334
Levy		7,277	33,524
Liberty		2,107	6,258
Madison		8,671	10,553
Manatee	71,062	192,123	59,648
Marion	52,856	156,145	122,297
Martin	50,743	66,568	29,007
Miami-Dade	396,585	464,314	1,632,228
Monroe	24,418	41,814	6,858
Nassau	6,371	20,912	46,031
Okaloosa	45,000	120,367	15,455
Okeechobee		19,646	20,350
Orange	232,636	416,144	497,176
Osceola	9,161	89,858	169,666
Palm Beach	346,884	479,849	492,729
Pasco	94,968	249,400	120,329
Pinellas	522,695	346,406	47,441
Polk	61,450	242,606	298,039
Putnam		40,760	33,604
Santa Rosa	9,228	126,374	15,770
Sarasota	193,562	169,802	16,084
Seminole	85,819	221,476	115,423
St Johns	36,446	75,915	77,678
St Lucie	29,084	118,856	129,849
Sumter	43,881	20,121	23,021
Suwannee		12,394	29,157
Taylor		22,570	
Union		11,040	4,495
Volusia	144,394	243,424	106,775
Wakulla			30,776
Walton		55,043	
Washington		15,053	9,843

Discussion

The pattern of elevated social vulnerability within the state of Florida (Figures T1-1) is concentrated in four main areas across the state. The first is within the urban areas in the Southeast part of the state, north from Miami-Dade, through Broward, and into Palm Beach Counties where 86%, 32%, and 30% of the respective populations live in areas with high vulnerability (Table T1-3). Here, social vulnerability is a product of a diverse set of drivers particular to each enumeration unit. For example, the most vulnerable tracts (medium high and high SoVI) within these counties - while primarily driven by components 4 and 6 in both cases is not solely an urban vs. rural phenomenon (Table T1-17). Of particular interest is the difference in overall vulnerability and its constituent parts between these areas of extreme vulnerability.

Table T1-17: Driving forces of the most vulnerable tracts in Southwest Florida.

County	Tract	Total Population	Comp 1- Class (Poverty), Race (Black)	Comp 2 - Age (Elderly)	Comp 3 - Wealth	Comp 4 Urban, Females	Comp5 - Ethnicity (Hispanic)	Comp 6 - High Occupancy Households	SoVI
Miami-Dade	12086009040	120	3.33	5.71	1.13	-1.58	1.54	-0.27	9.85
Palm Beach	12099980100	5	0.53	-0.78	1.37	3.82	-1.29	5.54	9.18
Miami-Dade	12086980800	3	0.90	-0.66	1.75	3.46	1.09	2.52	9.07
Miami-Dade	12086980700	964	4.60	0.44	1.51	0.25	-1.87	3.01	7.94
Miami-Dade	12086980100	18	0.64	-1.30	0.90	1.86	0.87	4.63	7.61
Miami-Dade	12086001501	3479	5.02	0.23	-0.41	2.02	-0.59	1.08	7.35
Palm Beach	12099005939	1162	1.17	4.21	0.77	2.44	-0.41	-1.34	6.85
Miami-Dade	12086001801	3778	3.72	0.62	-0.10	1.22	-0.10	1.46	6.81
Broward	12011110335	7569	-0.32	3.46	0.78	1.85	1.83	-1.04	6.56
Miami-Dade	12086009315	3066	0.45	1.38	0.39	0.76	4.61	-1.07	6.53
Palm Beach	12099007747	2792	1.07	4.33	0.08	2.52	0.22	-1.80	6.43
Miami-Dade	12086010001	6465	1.64	0.49	0.10	1.37	0.21	2.61	6.42
Miami-Dade	12086009017	6202	-0.35	0.97	1.38	-0.17	3.15	1.45	6.42
Miami-Dade	12086009022	2118	-0.64	0.39	0.76	1.04	2.88	1.98	6.40
Miami-Dade	12086009021	4729	0.44	0.65	0.49	0.10	3.62	1.06	6.36
Miami-Dade	12086008304	7577	1.77	0.78	0.26	1.82	-0.06	1.79	6.36
Miami-Dade	12086011003	4448	0.91	0.58	0.32	0.20	1.94	2.39	6.33
Palm Beach	12099007746	1052	0.78	3.45	1.07	3.08	-0.34	-1.86	6.18
Miami-Dade	12086009314	3942	0.64	0.88	0.58	0.20	4.16	-0.30	6.16
Miami-Dade	12086003100	4416	4.30	0.34	-0.12	1.43	0.22	-0.04	6.14
Miami-Dade	12086010016	4919	-0.44	0.35	0.31	1.12	2.21	2.52	6.07
Miami-Dade	12086000410	4231	1.47	0.30	0.21	1.01	0.36	2.72	6.05
Palm Beach	12099005933	2934	0.25	3.84	0.83	2.85	-0.30	-1.42	6.05
Miami-Dade	12086000901	8227	0.06	0.75	0.53	-0.03	2.79	1.91	6.02
Broward	12011030401	3017	2.17	0.82	-0.11	1.05	-0.21	2.23	5.96
Palm Beach	12099001403	2863	3.69	0.23	0.09	1.84	-1.19	1.28	5.94
Miami-Dade	12086000706	7688	-0.05	0.89	0.47	0.31	4.07	0.19	5.89
Miami-Dade	12086000601	5412	-0.83	1.06	0.36	0.28	3.06	1.95	5.88
Miami-Dade	12086001502	3926	4.25	0.28	-0.52	1.29	-0.56	1.11	5.85
Palm Beach	12099006802	3069	2.40	0.65	-0.06	0.44	0.30	2.11	5.84

Vulnerability Driver | Vulnerability Detractor

The second area of elevated SoVI is comprised of tracts located on the I-4 corridor from Hillsborough County to Orange County and throughout the periphery of Orlando, FL in south-central Florida. Here, between 22% - 36% of the population resides in areas with the most extreme vulnerability scores in the state (Table T1-3). In Hillsborough County, nearly 280.000 individuals are situated within seventy-three census tracts characterized with medium high or high SoVI. Thirteen tracts in Osceola County containing nearly 97,000 people are characterized by high vulnerability. Nearly 250,000 people (more than 20%) reside within the most vulnerable tracts (49) in Orange County, while in Polk County more than 35% (213,000) people live in the most socially vulnerable tracts. Overall, the I-4 corridor contains 186 tracts within 837,000 people characterized by high vulnerability. Again, the drivers of social vulnerability are diverse both within each county and between constituent tracts (Table T1-18). Interestingly, component six (High Occupancy Households) serves to increase vulnerability in each of the thirty most vulnerable tracts within this zone while neither component 2 (Age-Elderly) nor component 2 (Wealth) serve as major contributors. However, components four and five attenuate vulnerability in some of the most vulnerable places.

Table T1-18: Driving forces of the most vulnerable tracts in Central Florida.

County	Tract	Total Population	Comp 1- Class (Poverty), Race (Black)	Comp 2 - Age (Elderly)	Comp 3 - Wealth	Comp 4 Urban, Females	Comp5 - Ethnicity (Hispanic)	Comp 6 - High Occupancy Households	SoVI
Polk	12105980000	3	1.76	-0.45	0.25	1.78	-2.23	3.03	4.14
Hillsborough	12057013914	4531	0.34	0.78	0.88	-3.58	0.84	2.98	2.24
Hillsborough	12057013912	3471	-0.27	0.81	0.96	-1.69	0.02	2.00	1.82
Polk	12105012602	5778	0.61	0.32	0.35	-2.03	1.55	1.94	2.74
Hillsborough	12057013913	5195	0.11	0.40	0.43	-1.84	0.94	1.93	1.97
Polk	12105014902	7268	-0.53	0.37	0.85	-2.32	1.09	1.90	1.36
Osceola	12097042601	3074	0.12	0.37	0.35	0.56	1.67	1.87	4.93
Polk	12105014103	8341	0.03	-0.50	0.46	-0.23	-0.31	1.84	1.29
Osceola	12097041300	13009	0.30	-0.06	0.34	0.34	0.03	1.80	2.75
Polk	12105014502	3651	0.71	0.91	0.73	-2.51	1.77	1.76	3.38
Orange	12095017001	2889	1.42	0.02	0.50	1.07	-1.30	1.73	3.44
Orange	12095014605	4305	2.31	0.81	0.26	1.71	-0.63	1.71	6.17
Hillsborough	12057013505	3251	0.77	-0.20	0.31	0.40	0.03	1.64	2.96
Hillsborough	12057003600	4333	2.15	-0.08	0.26	1.13	-0.91	1.64	4.19
Hillsborough	12057003400	3009	3.66	0.70	0.16	1.82	-0.31	1.64	7.66
Osceola	12097041100	16827	0.05	-0.33	0.49	0.51	0.37	1.63	2.71
Hillsborough	12057001900	2831	2.72	0.19	0.15	1.59	-1.09	1.60	5.17
Orange	12095012306	3193	0.39	-0.78	0.27	1.30	-0.73	1.53	1.99
Orange	12095017701	5186	-0.58	-0.54	0.11	0.24	0.53	1.49	1.26
Polk	12105014501	8295	0.11	0.59	0.97	-1.30	-0.06	1.49	1.79
Orange	12095012303	6429	0.17	-0.95	0.21	1.22	-0.76	1.47	1.36
Hillsborough	12057012900	2942	2.06	0.72	0.01	-0.09	0.62	1.47	4.79
Orange	12095016807	17017	-0.67	-1.09	0.42	0.71	0.65	1.42	1.44
Orange	12095012304	6295	1.35	-0.69	0.09	1.08	-0.14	1.42	3.11
Orange	12095014601	7597	2.67	-0.61	0.14	1.31	-0.55	1.40	4.36
Orange	12095014908	5979	0.53	-0.08	0.64	1.21	-0.31	1.37	3.35
Hillsborough	12057001800	4129	2.92	0.20	-0.07	0.91	-0.74	1.35	4.56
Orange	12095016806	12476	0.01	-0.65	0.26	0.57	0.67	1.32	2.18
Polk	12105015401	2526	0.12	0.69	0.75	-0.51	-0.69	1.32	1.68
Orange	12095012202	4539	1.58	-0.52	0.40	0.96	-0.19	1.31	3.55

Vulnerability Driver | Vulnerability Detractor

The third cluster of extreme social vulnerability exists in Southwest Florida, specifically in Lee and Collier Counties. Here forty-six census tracts containing 173,000 people 24% and 15% of the respective county populations are characterized by either medium high or high vulnerability (Table T1-3). Again, one of the main drivers of vulnerability in these tracts is component 6 (2.72 people per house compared to mean of 2.47) and a mixture of components one, two and five. Table T1-19 provides a breakdown of populations for the most vulnerable tracts within each county in respect to overall social vulnerability score.

Table T1-19: Driving forces of the most vulnerable tracts in Southwest Florida.

County	Tract	Total Population	Comp 1 - Class (Poverty), Race (Black)	Comp 2 - Age (Elderly)	Comp 3 - Wealth	Comp 4 Urban, Females	Comp5 - Ethnicity (Hispanic)	Comp 6 - High Occupancy Households	SoVI
Collier	12021011302	5920	1.22	1.02	0.72	-2.31	1.47	3.24	5.36
Collier	12021011400	4657	0.89	0.91	0.03	-4.20	2.11	2.82	2.57
Collier	12021011301	6369	0.67	0.34	0.74	-2.24	1.80	2.12	3.42
Collier	12021011205	2664	2.59	1.07	-0.03	-4.64	1.86	2.10	2.95
Lee	12071000503	3832	1.51	-0.01	0.35	-0.02	0.55	1.95	4.33
Lee	12071040314	1913	0.22	0.22	0.45	-0.64	-0.03	1.88	2.10
Lee	12071040208	1319	0.22	0.14	0.45	-0.79	-0.02	1.82	1.82
Lee	12071040303	4540	0.08	-0.47	0.14	0.02	0.34	1.60	1.71
Lee	12071000600	3783	3.63	0.69	-0.07	1.01	-0.75	1.47	5.97
Collier	12021011204	4807	2.33	0.87	-0.03	-4.61	2.73	1.44	2.74
Lee	12071040301	6000	0.36	-0.64	0.69	0.25	0.38	1.42	2.47
Lee	12071040210	2087	0.23	0.00	0.55	-0.43	-0.18	1.29	1.46
Lee	12071000502	3417	3.75	0.92	0.20	0.98	0.35	1.28	7.47
Lee	12071040122	4897	1.55	-0.57	-0.13	-0.62	1.20	1.22	2.66
Collier	12021010420	6012	0.58	-0.40	0.34	-0.78	2.22	1.14	3.11
Collier	12021010802	10208	0.75	0.42	-0.61	-0.73	0.93	1.13	1.88
Lee	12071040313	1338	-0.39	-0.67	0.90	0.84	-0.11	1.02	1.60
Collier	12021010410	8157	0.53	-0.56	0.05	-2.02	2.46	0.93	1.39
Collier	12021010419	3160	-0.17	-0.72	0.28	-0.68	1.71	0.90	1.32
Collier	12021010411	6632	-0.34	-0.20	0.12	-0.28	1.14	0.84	1.27
Lee	12071040305	2953	-0.19	0.57	0.70	0.47	0.77	0.77	3.09
Lee	12071040109	4674	0.77	-0.19	0.08	0.66	0.19	0.75	2.26
Lee	12071040125	1965	0.05	0.01	0.33	-0.31	0.49	0.68	1.25
Lee	12071010501	3540	-0.83	0.32	0.34	0.48	0.51	0.42	1.23
Collier	12021011103	2225	-0.08	2.23	1.28	-0.90	0.75	0.37	3.65
Lee	12071040311	3038	0.04	0.72	0.71	-0.22	1.14	0.09	2.48
Collier	12021010505	6784	-0.07	-0.06	0.46	0.79	0.22	0.07	1.41
Lee	12071001101	3244	1.62	-0.41	0.35	-0.03	0.36	-0.04	1.85
Lee	12071020101	3906	-0.88	2.98	0.65	0.71	-1.00	-0.12	2.34
Lee	12071000700	2207	2.18	-0.19	0.36	-0.26	0.23	-0.19	2.11

Vulnerability Driver **Vulnerability Detractor**

The final area of elevated SoVI extends from western Pasco County through Hernando and into Citrus, Marion, Sumter, and Lake Counties. Here, seventy-three tracts containing more than 347,000 people exhibit medium high and high social vulnerability. Component 2 (Age-Elderly) is considerably more influential in this area than many of the other SoVI components. Additionally, components 4 and 5 generally decrease vulnerability in this area and component six is less influential here than in the other areas of increased SoVI across the state.

Table T1-20: Driving forces of the most vulnerable tracts in west central Florida.

County	Tract	Total Population	Comp 1- Class (Poverty), Race (Black)	Comp 2 - Age (Elderly)	Comp 3 - Wealth	Comp 4 Urban, Females	Comp5 - Ethnicity (Hispanic)	Comp 6 - High Occupancy Households	SoVI
Pasco	12101032402	3409	0.53	0.70	0.89	-1.91	-0.14	1.40	1.47
Sumter	12119911302	1148	3.51	0.96	0.27	0.22	-1.87	1.24	4.33
Pasco	12101032500	5289	0.12	0.44	0.68	-1.60	0.82	1.21	1.66
Marion	12083001204	5957	0.81	-0.08	0.49	0.80	-0.15	1.20	3.08
Marion	12083001004	12236	0.14	0.65	0.52	-0.13	-0.07	1.07	2.18
Lake	12069030503	1492	1.08	-0.38	0.46	-0.58	-0.24	0.98	1.33
Pasco	12101033101	2437	-0.61	2.86	1.26	-1.81	-0.69	0.80	1.79
Marion	12083001005	6004	0.05	1.10	0.44	0.26	-0.90	0.76	1.70
Marion	12083001207	11209	-0.14	-0.26	0.62	0.70	-0.14	0.74	1.52
Marion	12083001500	3534	1.66	0.46	0.62	-0.17	-1.29	0.57	1.84
Lake	12069030206	4024	0.71	0.17	0.81	0.14	-0.19	0.52	2.16
Marion	12083001401	5006	1.33	-0.16	0.64	0.57	-0.77	0.43	2.04
Marion	12083001800	1750	3.36	0.54	0.23	1.84	-1.37	0.43	5.04
Hernando	12053041006	6310	-0.24	0.19	0.67	0.59	-0.01	0.42	1.62
Hernando	12053041004	6378	-0.50	0.09	0.75	0.82	-0.06	0.36	1.46
Pasco	12101031807	3069	0.46	1.58	1.19	-0.26	-0.64	0.31	2.65
Pasco	12101032700	2768	0.01	2.05	1.43	-0.65	-0.39	0.29	2.74
Hernando	12053041401	5779	-0.19	0.12	0.75	0.50	-0.07	0.29	1.40
Marion	12083001700	4977	2.21	-0.16	0.45	0.95	-0.34	0.29	3.40
Hernando	12053041103	3959	-0.44	0.30	0.80	0.94	-0.25	0.18	1.53
Pasco	12101031205	3946	-0.30	1.50	0.94	-0.58	-0.13	0.18	1.62
Pasco	12101032601	3466	1.65	0.49	0.21	-0.46	0.76	0.17	2.82
Lake	12069030504	7145	0.95	1.41	0.56	0.62	-0.03	0.05	3.56
Hernando	12053041402	5269	-0.34	0.62	0.72	0.94	-0.47	0.05	1.52
Hernando	12053041203	4029	-0.08	0.93	0.18	0.41	-0.08	-0.01	1.35
Hernando	12053040905	6141	-0.75	1.43	0.32	0.68	-0.37	-0.09	1.23
Lake	12069030307	4441	-0.85	1.19	1.09	0.64	-0.25	-0.09	1.74
Hernando	12053041204	3147	-0.11	1.21	0.98	-0.07	0.30	-0.13	2.17
Pasco	12101031007	4915	0.39	0.30	0.50	0.36	-0.05	-0.14	1.36
Pasco	12101031012	4581	-0.44	1.13	0.83	0.80	0.23	-0.16	2.39

Vulnerability Driver Vulnerability Detractor

References and Further Readings

Adger, W. N. 2006. "Vulnerability," *Global Environmental Change* 16: 268-281.

Birkmann, J. (ed.), 2006. *Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies.* Tokyo: United Nations University Press.

Cutter, S. L., J. T. Mitchell, and M. S. Scott, 2000. "Revealing the Vulnerability of People and Places: A Case Study of Georgetown, South Carolina," *Annals of the Association of American Geographers* 90 (4): 713-737.

Cutter, S.L., B. J. Boruff, and W. L. Shirley, 2003. "Social Vulnerability to Environmental Hazards," *Social Science Quarterly* 84 (1):242-261.

Eakin, H. and A.L. Luers, 2006. "Assessing the Vulnerability of Social-Environmental Systems," *Annual Review of Environment and Resources* 31: 365-394.

Fussell, H-M, 2007. "Vulnerability: A Generally Applicable Conceptual Framework for Climate Change Research," *Global Environmental Change* 17 (2): 155-167.

Heinz Center, 2002. *Human Links to Coastal Disasters*. Washington D.C.: The H. John Heinz III Center for Science, Economics and the Environment.

National Research Council, 2006. *Facing Hazards and Disasters: Understanding Human Dimensions.* Washington D. C.: National Academies Press.

O'Keefe, P., K. Westgate, and B. Wisner, 1976. "Taking the Naturalness out of Natural Disasters," *Nature* 260: 566-567.

Pelling, M. 2003. *The Vulnerability of Cities: Natural Disasters and Social Resilience.* London: Earthscan.

Polsky, C., R. Neff, and B. Yarnal, 2007. "Building Comparable Global Change Vulnerability Assessments: The Vulnerability Scoping Diagram," *Global Environmental Change* 17 (3-4): 472-485.

Schmidtlein, M. C., R. Deutsch, W. W. Piegorsch, and S. L. Cutter, 2008. "A Sensitivity Analysis of the Social Vulnerability Index," *Risk Analysis* 28 (4):1099-1114.

Wisner, B., P. Blaikie, T. Cannon, and I. Davis, 2004. *At Risk: Natural hazards, People's Vulnerability and Disasters (2nd edition)*. New York: Routledge.

Task 1 - Appendix 1 – Technical Appendix

The methods described here summarize all steps taken in the construction of the Social Vulnerability Index for the Florida Department of Health at the tract level for Florida. This report, divided into 5 sections, outlines each major component of these methods, including:

1. Sources of Data
2. Preprocessing of Raw Data
3. Calculation of SoVI Variables
4. Principal Component Analysis
5. Calculation of SoVI Score

Sources of Data

Data used in the construction of SoVI for the State of Florida are collected from several sources as per the data type and information needed to complete each task. **Table T1-A1** below provides the description and source for all spatial and tabular data acquired during the construction process.

Table T1-A1: Sources and descriptions of data

Name (type)	Description	Source
U.S. Census Tracts (spatial)	Boundaries for U.S. Census Tracts	U.S. Census TIGER/Line
U.S. Water Boundaries (spatial)	Water boundaries for the entire U.S.	U.S. Census TIGER/Line
U.S. Census Demographics (tabular)	Raw demographic data used to calculate SoVI variables	U.S. Census Bureau ACS 2006-2010 and Decennial Census (2010) Products

Preprocessing of Raw Data

U.S. census tract boundary and water boundary shapefiles were imported into ArcMap v10 for preprocessing. To represent the truest areal extent of the of the census tracts' land boundary, we performed a spatial erase, removing any interior/coastal water boundaries, using the erase tool in ArcToolbox. This step becomes particularly important in subsequent calculations that are land-area dependent.

For this version of SoVI, our geographic study area was the state of Florida (**Figure T1-A1**).

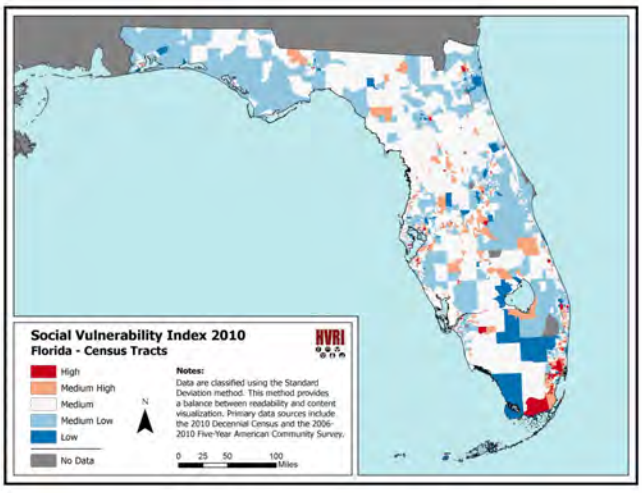

Figure T1-A1: Florida Study Area

To calculate the area for each census tract we first created a new column in the attribute table of the Florida tracts shapefile to hold the area values. Using the 'calculate geometry' function built in to ArcMap, the area automatically calculates for each census tract in square miles. This area value was needed to calculate several SoVI variables, as discussed below.

Tabular data representing hospital locations were converted to a point level shapefile in ArcMap using latitude and longitude values provided. Next, to get a count of hospitals in each tract, we performed a spatial join of the point level hospital data and census tracts. In doing this, ArcMap calculates a summary of combined data, with one attribute being a count of points within each tract.

Calculation of SoVI Variables

Raw demographic data at the U.S tract level were obtained using the 2010 American Fact Finder Website and related documentations. The resultant dataset is comprised of data from both Summary File 1 (SF1) (i.e. 100 percent data) and ACS 2006-2010 (5 year estimates) (i.e. estimates derived from sample data). While SF1 data is more accurate and desirable, several vulnerability indicators, such as income, education, cost of housing, and occupation are not available at the 100% count level. Therefore, we drew this information from the American Community Survey.

The tabular data were imported into Microsoft Excel for processing. Each SoVI variable was calculated manually using the Excel's formula builder. For this project, we calculated 32 variables using equations derived from previous versions of the SoVI metric. **Table T1-A2** below provides a brief description for each variable.

Table T1-A2: Descriptions for the 28 SoVI Variables used to create SoVI-FL2010 Tract

SoVI Metadata
SoVI Tract Level 2010: 28 Variables
Florida Department of Health

Name	Description	Source (Geographic Summary Level)	Caveats
MEDAGE	Median Age 2010	Census 2010 (Tract)	
QBLACK	Percent of population who are African American 2010	Census 2010 (Tract)	Omitted people of two or more races
QNATAM	Percent of population who are Native American 2010	Census 2010 (Tract)	Omitted people of two or more races
QASIAN	Percent of population who are Asian or Hawaiian Islanders 2010	Census 2010 (Tract)	Omitted people of two or more races
QHISP	Percent of population who are Hispanic 2010	Census 2010 (Tract)	
QAGEDEP	Percent of population either under 5 yrs of age 65 or over 2010 (i.e., elderly and young children as a percent of the total population)	Census 2010 (Tract)	
PPUNIT	Average number of people per occupied household 2010	Census 2010 (Tract)	
QRENTER	Percent of housing units that are renter occupied 2010	Census 2010 (Tract)	
QNRRES	Percent of population who are 65 and over in nursing facilities 2010	Census 2010 (Tract)	
QFEMALE	Percent of the population who are female 2010	Census 2010 (Tract)	
QFHH	Percent of households that are female headed, with no spouse present 2010	Census 2010 (Tract)	
PERCAP	Per capita income (in dolllars) 2006-2010	ACS 2006-2010 (Tract)	
MDHSEVAL	Median value (in dollars) of owner occupied housing units 2006-10	ACS 2006-2010 (Tract)	
MDGRENT	Median gross rent (in dollars) for renter occupied housing units paying cash rent 2006-10	ACS 2006-2010 (Tract)	
QESL	Percent of persons 18 and older speaking English as a second language with limited English proficiency (i.e., those who speak English not very well or not at all) 2006-10	ACS 2006-2010 (Tract)	
QCVLUN	Percent of population of workforce age (16-64 years) who did not work the in past 12 months 2006-10	ACS 2006-2010 (Tract)	
QPOVTY	Percent of the civilian noninstitutionalized population living below poverty level 2006-10	ACS 2006-2010 (Tract)	
QMOHO	Percent of housing units that are mobile homes 2006-10	ACS 2006-2010 (Tract)	
QED12LES	Percent of the population 25 years or older with no high school diploma 2006-10	ACS 2006-2010 (Tract)	
QFEMLBR	Percent of the total civilian employed population 16 and older who are female 2006-10	ACS 2006-2010 (Tract)	
QEXTRCT	Percent of the civilian employed population 16 and older employed in farming, fishing, mining, and forestry occupations 2006-10	ACS 2006-2010 (Tract)	
QSERV	Percent of the civilian employed population 16 and older employed in service occupations 2006-10	ACS 2006-2010 (Tract)	
QURBAN	Percent of the population living in urban block groups	Census 2010 (Block Group & Tract)	
QSSBEN	Percent of households collecting social security benefits 2006-10	ACS 2006-2010 (Tract)	
QNOAUTO	Percent of occupied housing units with no automobile	ACS 2006-2010 (Tract)	
QFAM	Percent of own children under 18 living in married couple families	ACS 2006-2010 (Tract)	
POPDENS	Number of people per square mile land area 2006-10	Census 2010 (Tract)	
QRICH200K	Percent of households earning $200,000 or more 2006-10	ACS 2006-2010 (Tract)	

Principal Component Analysis

The Excel table containing calculated SoVI variables was first imported into ArcMap then spatially joined with the South Atlantic Division Census Tracts. In this process, we noticed a number of tracts with a population value of zero. These tracts (N= 23) were excluded from our analysis because the SoVI Index is fundamentally connected to human occupancy of the enumeration unit. Selecting those tracts with a population greater than zero (N=4,176), we exported the data in .dbf format for processing in SPSS.

Upon importing the table, descriptive statistics were calculated for the entire dataset to verify the robustness of previous calculations. Data were standardized by calculating z-scores for each variable. Next, those z-scores were reduced to a smaller set of multi-dimensional components using principal components analysis. We applied a varimax rotation and set the maximum number of iterations for convergence to 100. Our threshold for extraction of factors was determined by examining a scree plot for major significant drops in Eigenvalues as the number of components increase. While some disjoints in the scree are anticipated (such as those that occur between the first few components) subsequent decreases in Eigenvalue indicate appropriate thresholds for factor extraction. In **Figure T1-A3** below, we observe a fall in Eigenvalue between component 6 and 7. Upon further examination, we found that the Eigenvalue dropped from 1.4528 to .987. As a result, we chose to extract only the first 6 factors (or those factors with Eigenvalues greater than 1).

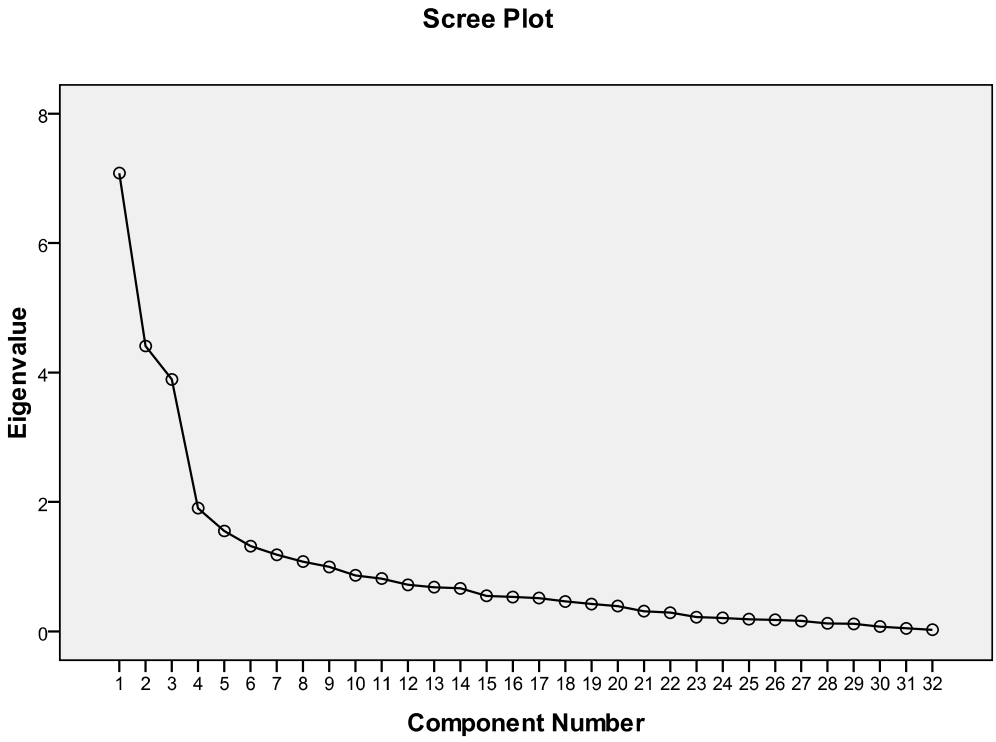

Figure T1-A3: Scree Plot for FLDOH SoVI Factor Analysis

In analyzing our results, we first examined the total variance explained. In this version, 73.2% of the variance was explained in nine principal components. **Table T1-A3** depicts percent variance explained for each of the extracted principal components before, and after applying the varimax rotation.

Table T1-A3: Percent variance explained (SPSS)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Eigen-value	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.875	24.554	24.554	4.608	16.458	16.458
2	3.917	13.988	38.541	3.607	12.883	29.341
3	2.717	9.704	48.245	3.310	11.822	41.163
4	1.995	7.125	55.370	2.435	8.698	49.861
5	1.512	5.401	60.771	2.434	8.692	58.553
6	1.452	5.187	65.958	2.074	7.406	65.958

In the next step of our analysis, we inspect the factor loadings in each individual principal component. Highlighting significant values (i.e. < -0.5 and > 0.5), we isolate the most influential SoVI variables in each component (**Table T1-A4**). These significant factor loadings are used characterize each component for purposes of naming and assigning cardinality.

Table T1-A4: PCA Component Matrix for SoVI Florida 2010

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
Zscore(medage)	-.382	.770	.178	.148	-.120	-.347
Zscore(qblack)	.815	-.155	-.094	.188	-.134	.231
Zscore(qnatam)	.066	-.101	-.179	-.448	.016	-.046
Zscore(qasian)	-.226	-.596	.052	.160	-.083	-.116
Zscore(qhisp)	-.003	-.120	-.042	-.044	.846	.291
Zscore(qagedep)	-.169	.841	.061	.215	-.053	-.352
Zscore(ppunit)	.124	-.294	-.083	-.065	.191	.850
Zscore(qrenter)	.577	-.448	-.146	-.062	.368	-.315
Zscore(qnrres)	.148	.032	-.055	.035	.015	-.331
Zscore(qfemale)	-.035	.227	-.062	.710	.032	.029
Zscore(qfhh)	.683	-.219	-.261	.214	.158	.436
Zscore(percap)	-.350	.144	.813	.072	-.149	-.174
Zscore(qesl)	.276	.068	-.232	-.274	.582	.161
Zscore(qcvlun)	.416	.629	.052	-.171	-.112	.099
Zscore(qpovty)	.798	.007	-.216	-.198	.148	-.045
Zscore(qmoho)	-.096	.386	-.421	-.434	-.245	.099
Zscore(qed12les)	.586	.198	-.347	-.333	.383	.270
Zscore(qfemlbr)	.191	.009	-.255	.564	-.187	.055
Zscore(qextrct)	.069	.197	-.101	-.557	.015	.247
Zscore(qserv)	.534	.035	-.375	-.054	.116	-.041
Zscore(qnoauto)	.706	.092	-.055	-.020	.294	-.342
Zscore(qfam)	-.641	-.017	.236	-.103	-.005	.196
Zscore(qrich200k)	-.189	.066	.888	-.023	-.102	.033
Zscore(qssben)	-.139	.888	-.030	.128	-.121	-.230
Zscore(qurban)	.093	-.206	.158	.543	.392	-.245
Zscore(popdens)	.127	-.118	.076	.194	.727	-.166
Zscore(mdgrent)	-.382	-.095	.453	.320	.177	.199
Zscore(mdhseval)	-.230	-.009	.875	.044	.060	.041

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 11 iterations.

Cardinality describes how the component affects a census tract's social vulnerability. While indicators such as race and poverty might increase vulnerability, others such as wealth decrease vulnerability. In yet another case, it may be necessary to take the absolute value of the factor loadings. While the principal components may exhibit significant positive AND negative factor loadings, such factors might have a similar effect on vulnerability which is why the absolute value is occasionally used. Using these methods, the six principal components are:

- **Principal component 1:** Class (Poverty), Race (+)
- **Principal component 2:** Age (Elderly) (+)
- **Principal component 3:** Wealth (-)
- **Principal component 4:** Urban, Females (+)
- **Principal component 5:** Ethnicity (Hispanic) (+)
- **Principal component 6:** High Occupancy Households (+)

Calculating the SoVI Score

Applying these cardinalities, we used a simple mathematical algorithm to derive our equation for the SoVI-FL2010 Tract Score:

SoVI-FL2010 Tract =
(Principal component 1) + (Principal component 2) - (Principal component 3) + (Principal component 4) + (Principal component 5) + (Principal component 6)

This calculation performed in SPSS using the 'compute variable' function to execute column math. SoVI scores for each tract were joined to the South Atlantic census tracts shapefile in ArcMap so that they could be visualized. **Figure T1-A4** shows the distribution of social vulnerability using standard deviation classification.

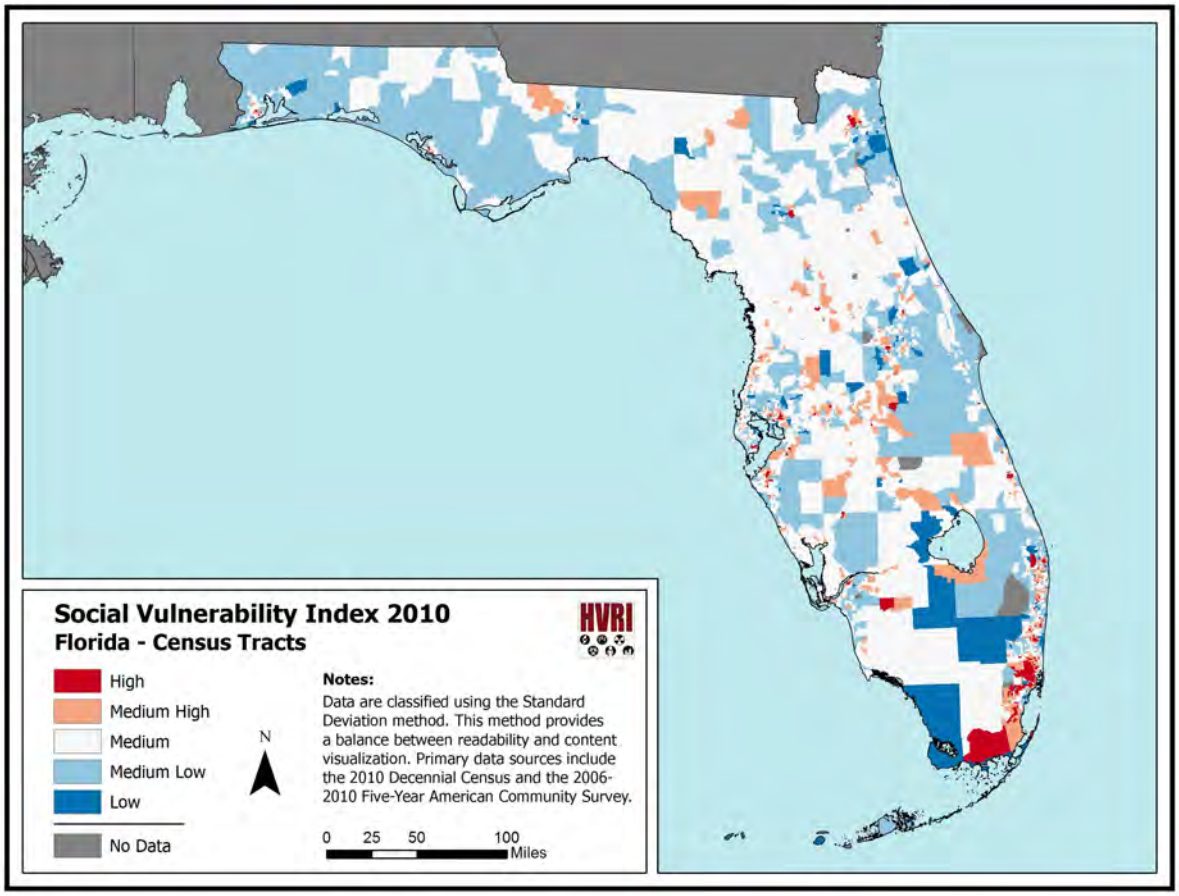

Figure T1-A1: Social Vulnerability in Florida using 2010 census

SoVI 2010: Tract-level
28 Variables, Pop > 0, HUnits > 0
Florida Department of Health
May 3, 2012

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
medage	4176	10.500000	81.400000	42.67485632	10.416880588	108.511
qblack	4176	.000000	100.000000	15.66865142	20.964368226	439.505
qnatam	4176	.000000	23.943662	.38193409	.588719236	.347
qasian	4176	.000000	23.602970	2.18133200	2.220601220	4.931
qhisp	4176	.000000	100.000000	20.42148021	22.343382255	499.227
qagedep	4176	.000000	89.532221	24.55451450	12.517879389	156.697
ppunit	4176	1.000000	6.000000	2.47737645	.485599658	.236
qrenter	4176	.000000	100.000000	27.88398574	17.701249795	313.334
qnrres	4176	.000000	55.000000	.42689129	1.543974202	2.384
qfemale	4176	.000000	100.000000	51.15530930	4.082148582	16.664
qfhh	4176	.000000	100.000000	13.83171349	8.068650291	65.103
percap	4176	378.155601	293830.197269	27058.22559259	15727.653869740	2.474E8
qesl	4176	.000000	100.000000	21.05970589	17.909384406	320.746
qcvlun	4176	.000000	100.000000	24.99827331	9.412031815	88.586
qpovty	4176	.000000	94.527363	14.15360902	10.783870320	116.292
qmoho	4176	.000000	100.000000	9.95976069	16.977642091	288.240
qed12les	4176	.000000	79.112123	14.81639081	10.649001975	113.401
qfemlbr	4176	.000000	100.000000	47.54167533	7.503072352	56.296
qextrct	4176	.000000	54.024011	1.24106352	3.624561849	13.137
qserv	4176	.000000	100.000000	19.23283462	8.685043756	75.430
qnoauto	4176	.000000	100.000000	6.86694953	7.669904933	58.827
qfam	4176	.000000	100.000000	65.13181385	22.224209839	493.916
qrich200k	4176	.000000	100.000000	3.77592880	6.222600715	38.721
qssben	4176	.000000	100.000000	33.18427017	16.139371807	260.479
qurban	4176	.000000	100.000000	84.45336833	33.461973525	1119.704
popdens	4176	.025059	77214.819936	3759.08181103	4671.526565883	21823160.456
mdgrent	4176	.000000	2000.000000	1034.72820881	353.565810563	125008.782
mdhseval	4176	.000000	1000000.000000	231576.26915709	146467.674763016	2.145E10
Valid N (listwise)	4176					

Task 2 – Medical Vulnerability

Background

Research over the past two decades from epidemiology and public health has investigated the link between health and social vulnerability drawing ties from the social science literature to identify the social characteristics of populations at highest health risk based on access to medical resources (Aday 1994, 2001). These commonly-cited social characteristics that correlate with health care access include social status, social capital, and human capital; showing unmistakable parity with those social indicators introduced by the social vulnerability literature in the previous section. Several researchers, however, make a clear distinction between health risk and health need (Aday 1994, 2001; Morath 2010). While the social indicators of health risk help to identify sensitive populations, the indicators of health need identify individuals and communities with inherent medical vulnerability independent of ancillary factors.

While the concept of medical vulnerability is relatively new in the field of hazards research, it is tenured in a long standing tradition combining concepts of public and environmental health, quality of life, health equity, medical surge and other place-based models of community and family health. Based in the epidemiology and disaster surveillance literature Morath's (2010) investigation of medical vulnerability to disasters identifies three dimensions that contribute to a potential for harm: individual medical needs, community healthcare access, and health system capability. These dimensions, described in Table T2-1 below are derived not only from direct disaster impacts on the exposed population, but also impacts on the healthcare system that include the interruption of key medical services.

Table T2-1: Medical Vulnerability Concepts and Description

Concept	Description	Increases (+), or Decreases (-) Vulnerability
Physical health needs	Individuals dependent on the public healthcare system for medication, medical treatments, equipment, or supervision from skilled medical professionals to maintain quality of health and life. Examples include chronic illness, communicable diseases, physical disability or immobility.	Extensive physical health needs of the individuals within a community (+)
Psychological health needs	Individuals with psychological or psychosomatic disorders, or having mental limitations that often require medical consideration including medication, therapy, supervision, and in some acute cases institutionalization. Conditions include, but are not limited to depression and mental illness, dementia, and mental retardation.	Extensive psychological health needs of the individuals within a community (+)
Healthcare access	Individuals or communities with limited access to healthcare resources, either through direct local scarcity of healthcare providers, or through financial proxies such as insurance status.	Increased access (-), decreased access (+)
Health System Capability	Resources maintained by the local healthcare system that prepare for emergencies and help to build medical surge capacity during disasters. Proxies include emergency medical vehicles and personnel, a diverse set of medical professionals, CERT capacity, and Home Health Agencies	Increased capability (-), decreased capability (+)

Methodology

Characteristics of Medical Vulnerability

Despite a well-developed understanding of public health and wellbeing indicators, quantification of community health remains a major challenge, due in part to the insufficiency and confidentiality of health incidence data. In 2010, Morath developed the Medical Vulnerability Index (MedVI), borrowing the algorithmic approach finalized by Cutter et al. 2003 for the construction of SoVI. Morath's (2010) MedVI used principal components analysis to derive a multidimensional construct of social vulnerability, comprised by the concepts reviewed in the table above. Identifying appropriate data for quantifying medical vulnerability across that state was the first step necessary to create a spatial representation of medical vulnerability. For this project we relied heavily on previous work undertaken by Morath (2010) as a basis from which to build the current MedVI dataset. Included in Morath's work were 36 variables identified through a detailed literature review and expert identification provided by the Florida Department of Health as indicators or representations of medically vulnerable populations across the state (FLDOH Key Indicators; FLDOH 2012). These indicators provided a solid starting point for the data collection described in this work.

In the progression of this research design, our variant of the MedVI includes a number of key modifications to Morath's original work, including:

1. An expanded set of indicators, including 61 discrete variables that capture medical vulnerability at multiple scales to comprehensively capture
2. Utilization of a tenured subject matter expert on the project team to guide us in sometime unfamiliar territory
3. Departure from the principle components analysis utilized by Morath in favor of a method that is more easily dissectible and readily applicable to planning and decision analytics

The variables, selection criteria, processing steps, and analytic procedures used in this section are outlined in a detailed technical appendix following the results. Generally, however, variables were chosen for inclusion in this project if they met one or more of the following criteria.

- Previous identification of a variable characteristic of medically vulnerable populations by the Florida Department of Health.
- Variables utilized in the previous work by Morath in the first iteration of MedVI for Florida.
- Variables related to high risk health concerns (heart disease, low birth rate).
- Crime information related to possible delays in medical response following a disaster.
- Perceptions of health quality, health care access, and indicators of areas that have historically been medically underserved or have shortages of practitioners
- Locations with higher than average numbers of persons who will require special attention or special medical assistance during disaster.
- Characteristics of communities that lead to higher levels of capacity to respond to disasters
- Indicators of decreased access to health care resources

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Results and Findings

The pattern of medical vulnerability across the state is varied with the highest medical vulnerability scores generally located in rural areas (Figure T2-1) and more rural counties (figure T2-2). However, this image can be a bit misleading because there are many urbanized areas within the state which also have high medical vulnerability but are such small census tracts that they are not easily identifiable on the maps below. Table T2-2 shows the number of census tracts in each MedVI standard deviation class. Here one can gain a more robust understanding of the pattern of medical vulnerability within and between counties than is comprehendible by simply looking at the maps (figures T2-1 and T2-2). The table helps us to identify many instances where there are significant numbers of tracks with high MedVI classification that may be too small to identify on a map. For example, Brevard County has 27 tracts with high MedVI scores that are not identifiable on the map (Figure T2-1) and Hillsborough County has eighty0five tracts with high MedVI scores that are not immediately recognizable on the map outs of medical vulnerability

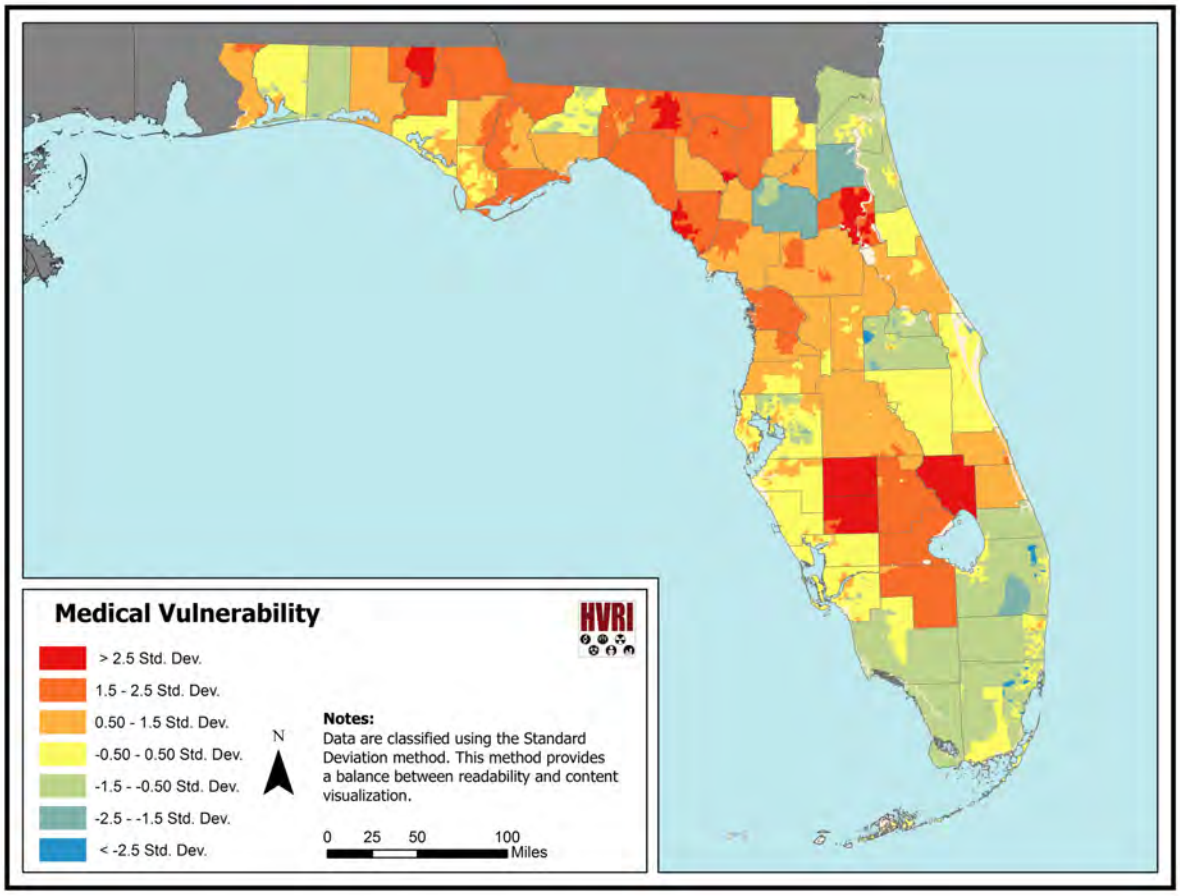

Figure T2-1: Medical Vulnerability Index for the State of Florida

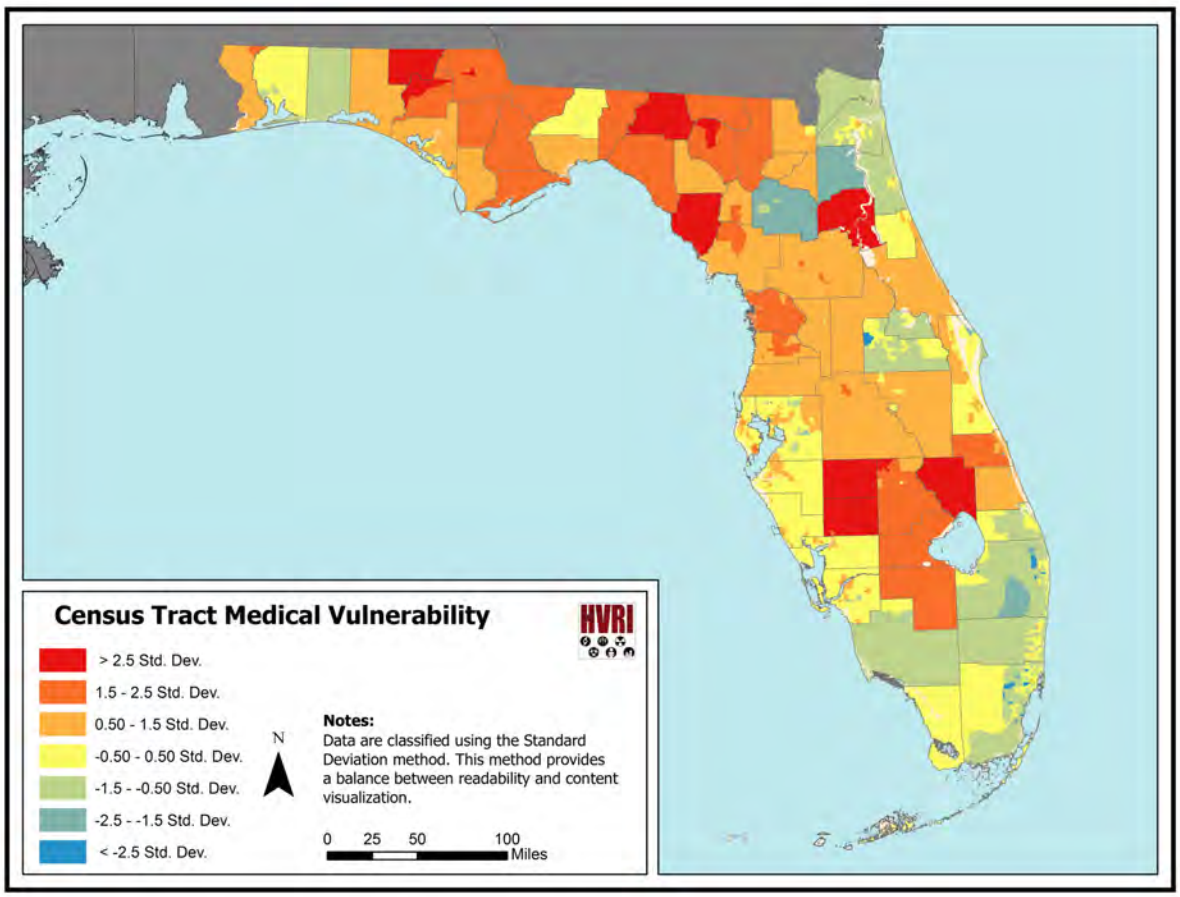

Figure T2-2: Medical Hazard Vulnerability for census tracts within the State of Florida

Table T2-2: Number of census tracts within each MedVI standard deviation classification by County

County Name	Medical Vulnerability		
	Low	Medium	High
Alachua	56	0	0
Baker	0	1	3
Bay	0	11	32
Bradford	0	0	4
Brevard	2	84	27
Broward	255	102	4
Calhoun	0	0	3
Charlotte	0	31	7
Citrus	1	0	27
Clay	30	0	0
Collier	68	5	0
Columbia	0	0	12
De Soto	0	0	9
Dixie	0	0	3
Duval	103	60	10
Escambia	0	1	70
Flagler	0	14	6
Franklin	0	0	4
Gadsden	0	0	9
Gilchrist	0	0	5
Glades	0	0	3
Gulf	0	0	3
Hamilton	0	0	3
Hardee	0	0	6
Hendry	0	0	6
Hernando	0	0	44
Highlands	0	1	26
Hillsborough	27	207	85
Holmes	0	0	4
Indian River	1	0	29
Jackson	0	0	11
Jefferson	0	0	3
Lafayette	0	0	2
Lake	0	0	56

County Name	Medical Vulnerability		
	Low	Medium	High
Lee	3	131	32
Leon	3	65	0
Levy	0	0	9
Liberty	0	0	2
Madison	0	0	5
Manatee	0	61	17
Marion	1	0	62
Martin	22	12	0
Miami-Dade	339	175	4
Monroe	1	29	0
Nassau	12	0	0
Okaloosa	41	0	0
Okeechobee	0	0	11
Orange	142	65	0
Osceola	0	2	39
Palm Beach	279	57	0
Pasco	0	2	131
Pinellas	1	175	68
Polk	0	1	153
Putnam	0	0	17
Santa Rosa	12	12	0
Sarasota	0	78	16
Seminole	74	12	0
St Johns	32	5	2
St Lucie	1	1	43
Sumter	0	1	18
Suwannee	0	0	7
Taylor	0	0	4
Union	0	0	3
Volusia	0	0	113
Wakulla	0	0	4
Walton	0	0	11
Washington	0	0	7

Table T2-3: Total population within each MedVI standard deviation classification by County

County Name	Medical Vulnerability		
	Low	Medium	High
Alachua	247,336	0	0
Baker	0	6,684	20,431
Bay	0	41,056	127,796
Bradford	0	0	28,520
Brevard	0	385,131	158,238
Broward	1,190,932	530,018	27,116
Calhoun	0	0	14,625
Charlotte	0	127,744	32,234
Citrus	0	0	141,236
Clay	190,865	0	0
Collier	297,103	24,417	0
Columbia	0	0	67,531
De Soto	0	0	34,862
Dixie	0	0	16,422
Duval	565,268	264,174	34,821
Escambia	0	3,223	294,396
Flagler	0	71,175	24,521
Franklin	0	0	11,549
Gadsden	0	0	46,389
Gilchrist	0	0	16,939
Glades	0	0	12,884
Gulf	0	0	15,863
Hamilton	0	0	14,799
Hardee	0	0	27,731
Hendry	0	0	39,140
Hernando	0	0	172,778
Highlands	0	1	98,785
Hillsborough	71,311	849,989	307,926
Holmes	0	0	19,927
Indian River	0	0	138,028
Jackson	0	0	49,746
Jefferson	0	0	14,761
Lafayette	0	0	8,870
Lake	0	0	297,052

County Name	Medical Vulnerability		
	Low	Medium	High
Lee	3,941	478,225	136,588
Leon	9,798	265,689	0
Levy	0	0	40,801
Liberty	0	0	8,365
Madison	0	0	19,224
Manatee	0	249,308	73,525
Marion	0	0	331,298
Martin	90,263	56,055	0
Miami-Dade	1,543,269	937,344	12,514
Monroe	20	73,070	0
Nassau	73,314	0	0
Okaloosa	180,822	0	0
Okeechobee	0	0	39,996
Orange	774,517	371,439	0
Osceola	0	4,108	264,577
Palm Beach	1,088,242	231,220	0
Pasco	0	5,987	458,710
Pinellas	1,669	641,881	272,992
Polk	0	3	602,092
Putnam	0	0	74,364
Santa Rosa	77,376	70,792	0
Sarasota	0	315,852	63,596
Seminole	389,242	33,476	0
St Johns	164,184	18,182	7,673
St Lucie	0	3,204	277,789
Sumter	0	0	87,023
Suwannee	0	0	41,551
Taylor	0	0	22,570
Union	0	0	15,535
Volusia	0	0	494,593
Wakulla	0	0	30,776
Walton	0	0	55,043
Washington	0	0	24,896

Overall medical vulnerability is comprised by a multitude of factors which can be categorized into three broad categories,

1. Health Care Access
2. Health Care System Capability
3. Medical Need

Each of these broad categories was developed based upon how the component parts (variables) are seen in relation to the concept of social vulnerability described above. Every variable was appraised based on how it either added to or diminished overall medical vulnerability and how it characterized the populations or capacities within the state. Each of these broad categories are discussed in greater detail below.

Health Care Access

The first of the three categories utilized in the creation of this MedVI index centers on the identification of locations and populations within the state of Florida with less than adequate access to medical care. Lack of access or inadequate access to medical treatment facilities, physicians, emergency medical care, and primary medical treatment increases medical vulnerability. Understanding where people are located and identifying service area gaps and medical treatment shortages linked to those locations provides a useful "picture" of areas where planning, decision making and resource allocation may help not only during but also in non-disaster times. To that end we identified, normalized, standardized, and mapped the following component pieces:

- County level medically underserved areas (figure T2-3)
- Tract level medically underserved areas (figure T2-4)
- County level medically underserved populations (figure T2-5)
- Tract level medically underserved populations (figure T2-6)
- County level mental health practitioner shortage areas (figure T2-7)
- Zip code level mental health practitioner shortage areas (figure T2-8)
- Tract level mental health practitioner shortage areas (figure T2-9)
- County level primary health practitioner shortage areas (figure T2-10)
- Tract level primary health practitioner shortage areas (figure T2-11)
- Zip code level non emergency access to geriatric medical specialists (figure T2-12)
- Zip code level non emergency access to emergency medical specialists (figure T2-13)
- Zip code level non emergency access to obstetric medical specialists (figure T2-14)
- Zip code level non emergency access to pediatric medical specialists (figure T2-15)
- Zip code level non emergency access to primary medical specialists (figure T2-16)
- Tract level non emergency access to federally qualified health centers (figure T2-17)
- Tract level non emergency access to Hill Burton facilities (figure T2-18)
- Tract level non emergency access to rural health centers (figure T2-19)
- Tract level access to emergency medical transport services (figure T2-20)
- Tract level non emergency access to county health clinics (figure T2-21)
- Tract level non emergency access to free health clinic (figure T2-22)

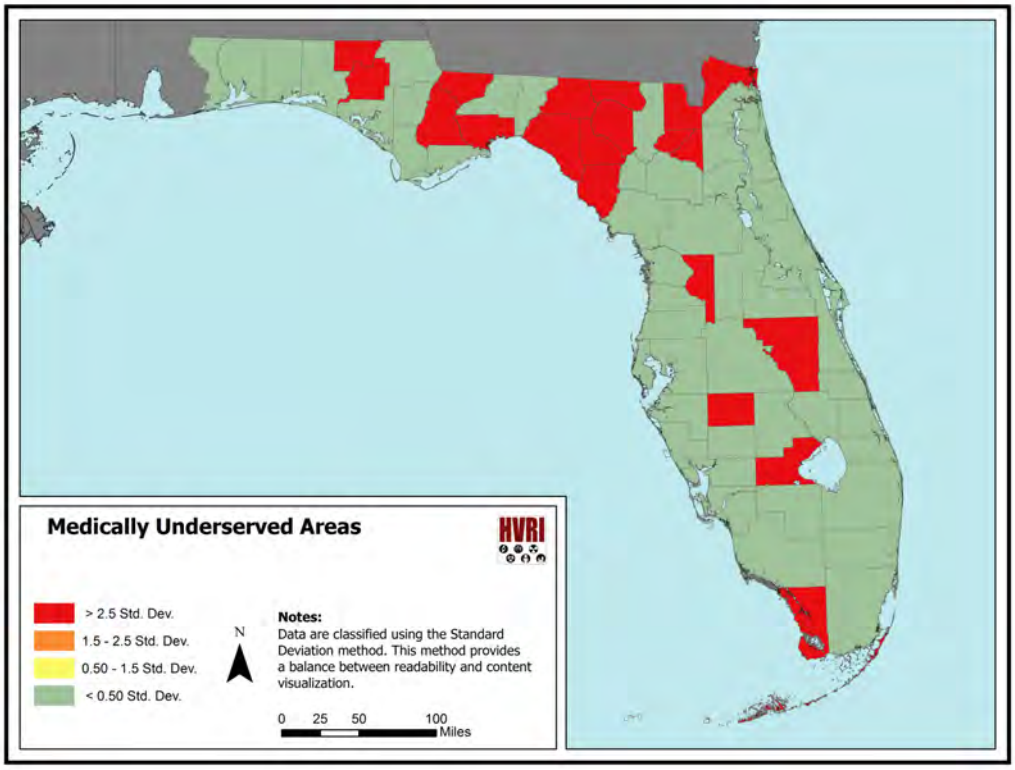

Figure T2-3: Medically underserved counties within the State of Florida

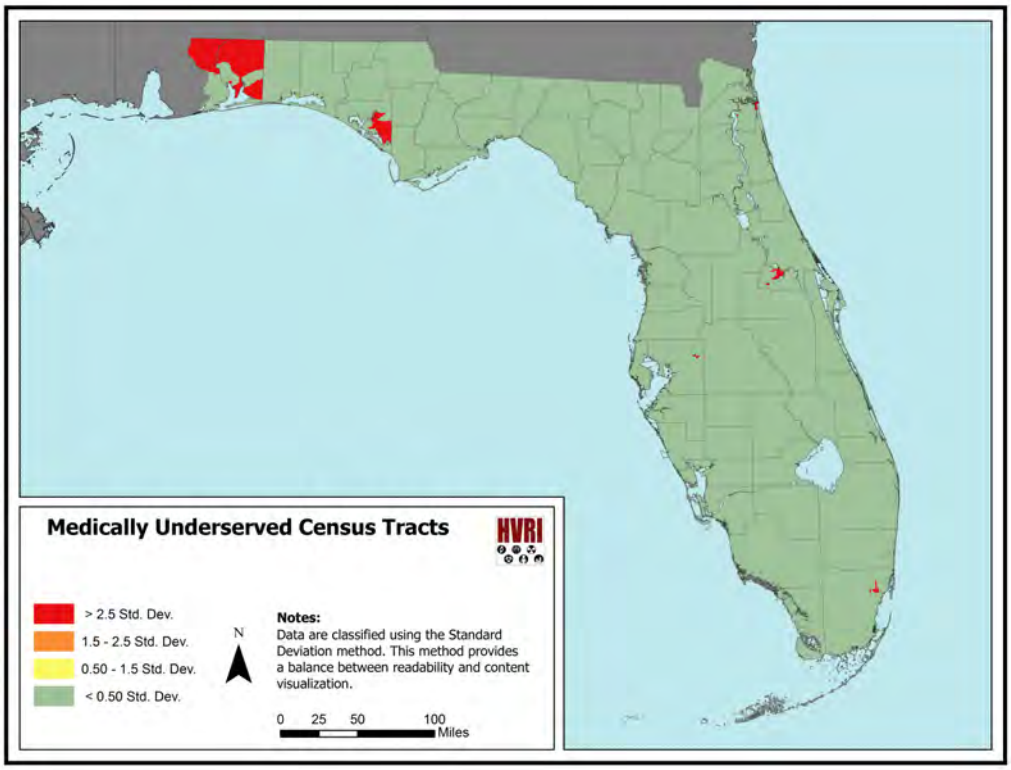

Figure T2-4: Medically underserved census tracts within the State of Florida

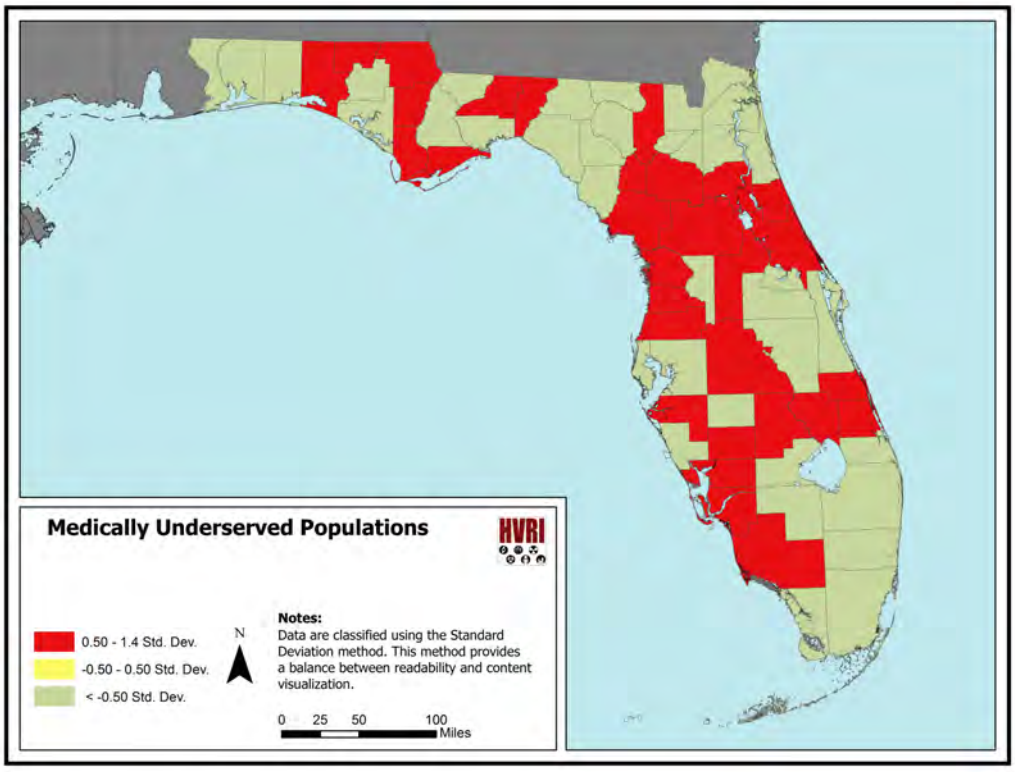

Figure T2-5: Medically underserved populations within the State of Florida

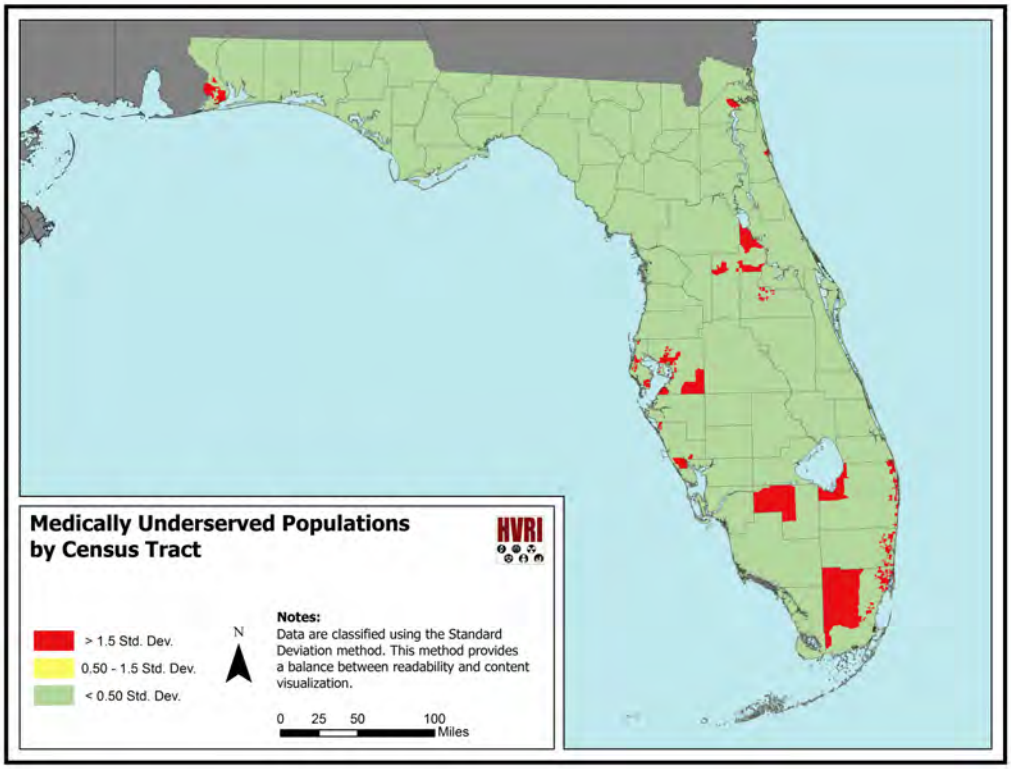

Figure T2-6: Medically underserved populations by census tracts within the State of Florida

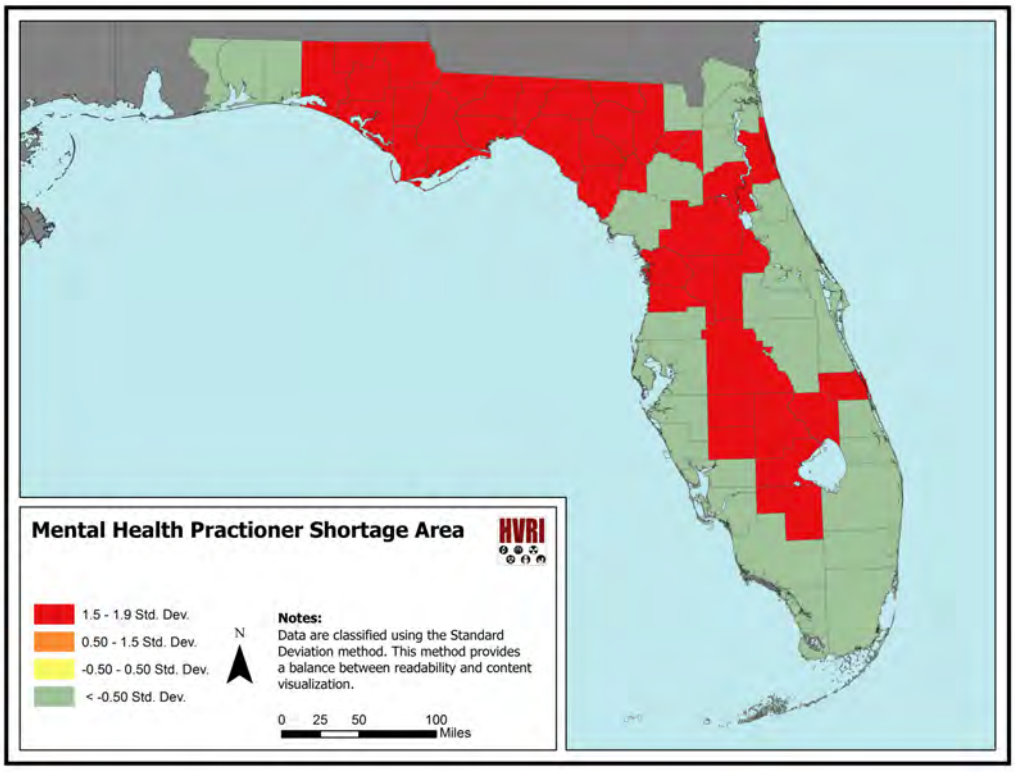

Figure T2-7: Mental health practitioner shortage areas within the State of Florida

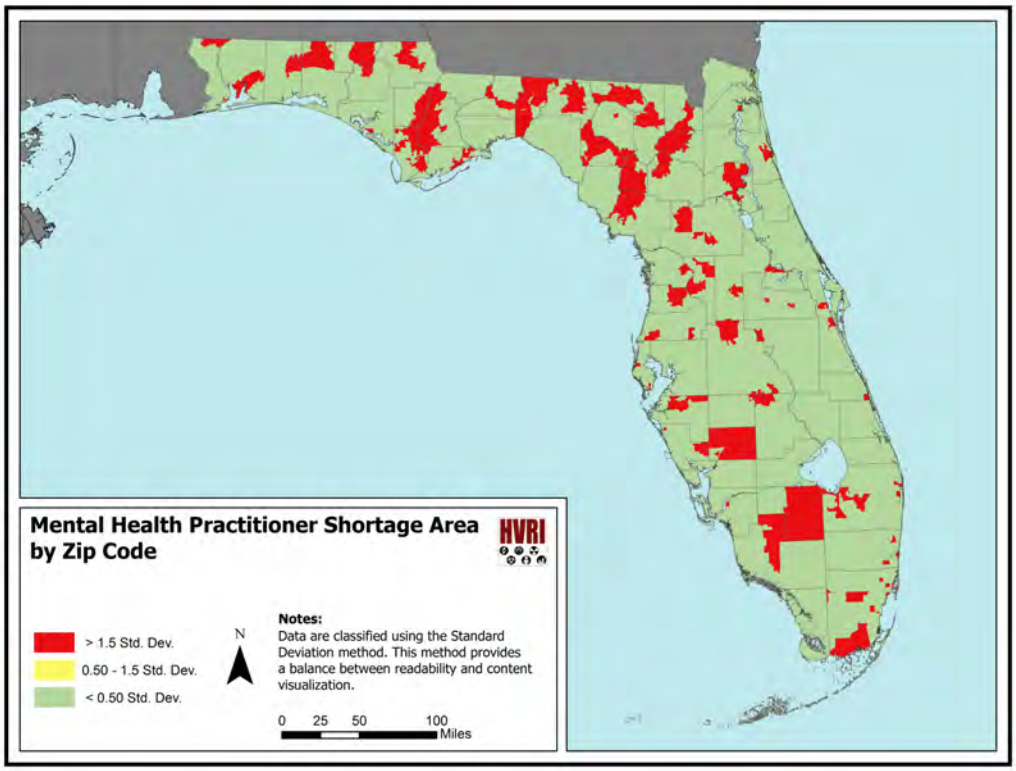

Figure T2-8: Mental health practitioner shortage areas by zip code within the State of Florida

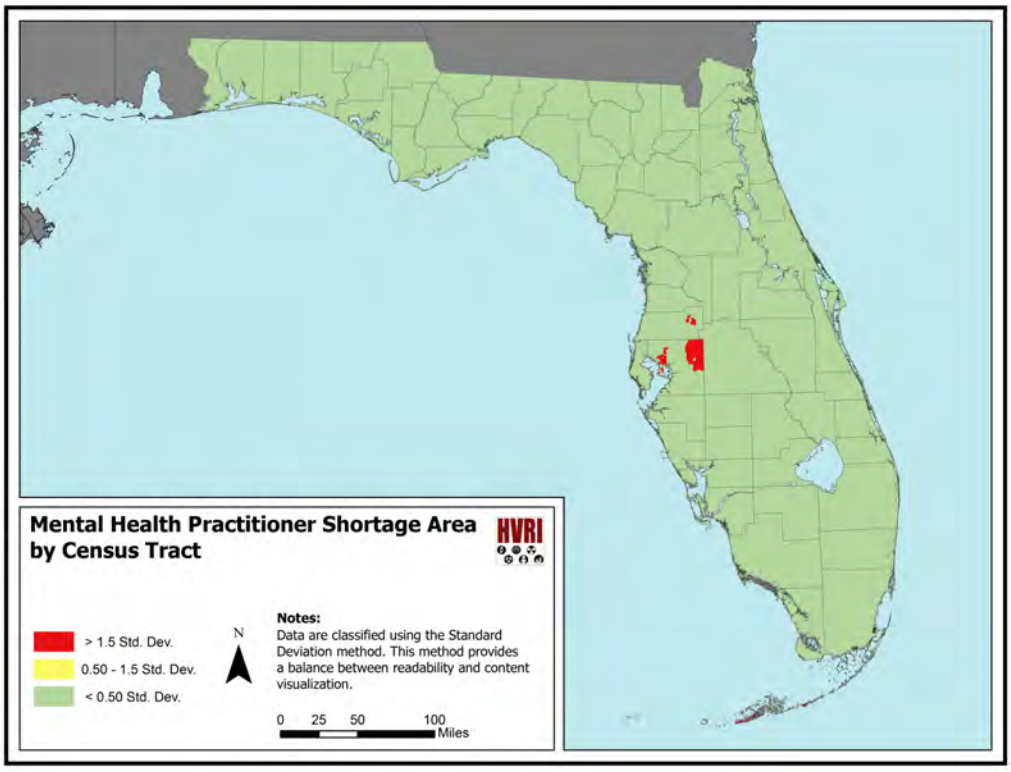

Figure T2-9: Mental health practitioner shortage areas by census tracts within the State of Florida

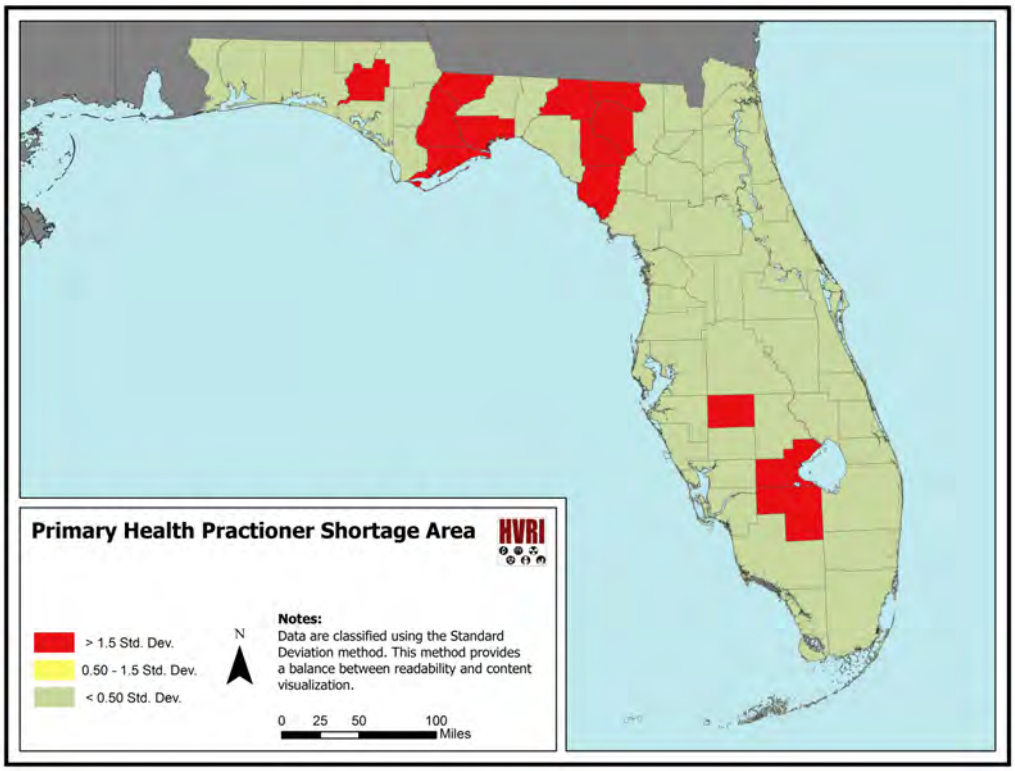

Figure T2-10: Primary health practitioner shortage areas within the State of Florida

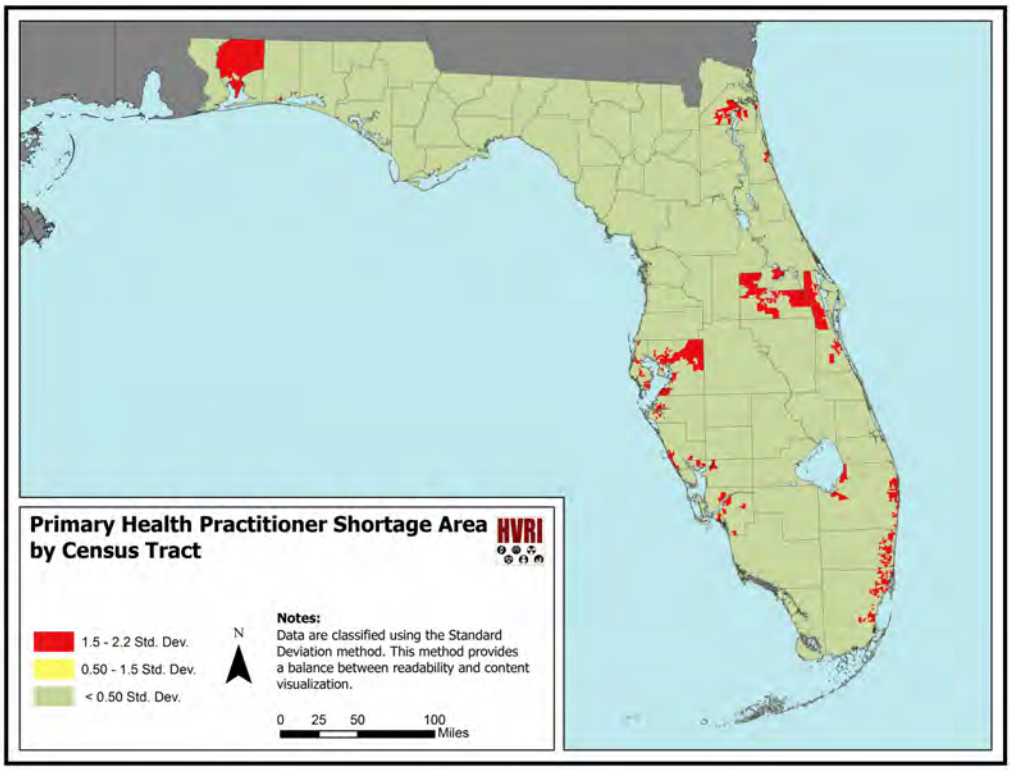

Figure T2-11: Primary health practitioner shortage areas by census tract within the State of Florida

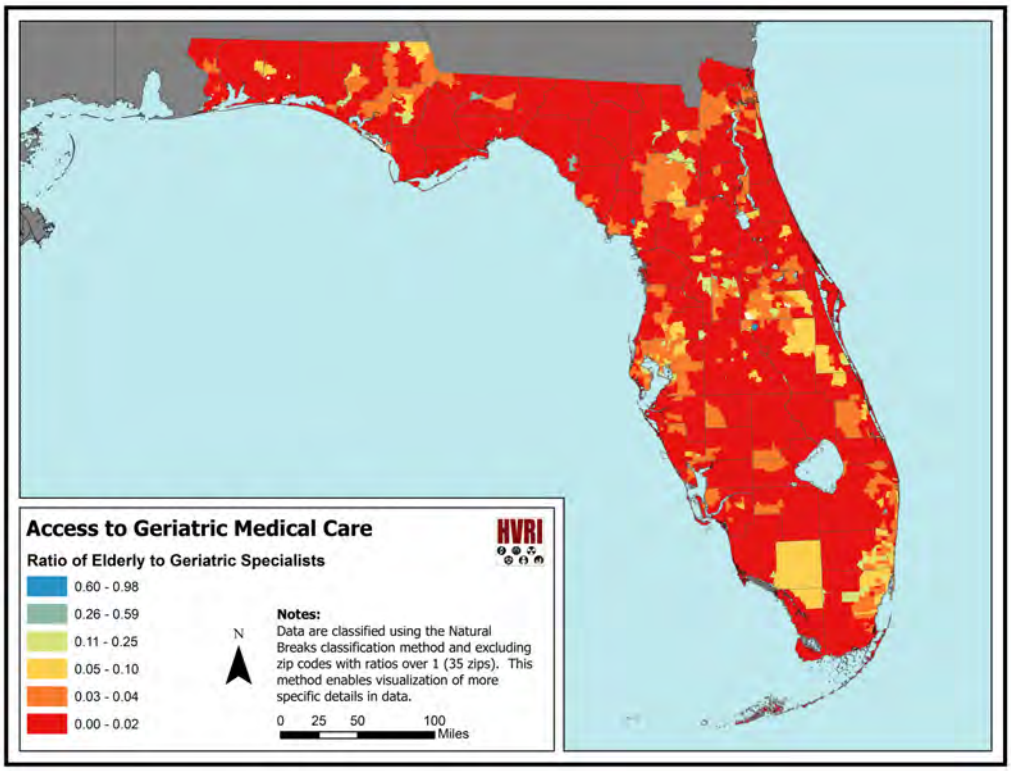

Figure T2-12: Non-emergency access to geriatric medical care within the State of Florida

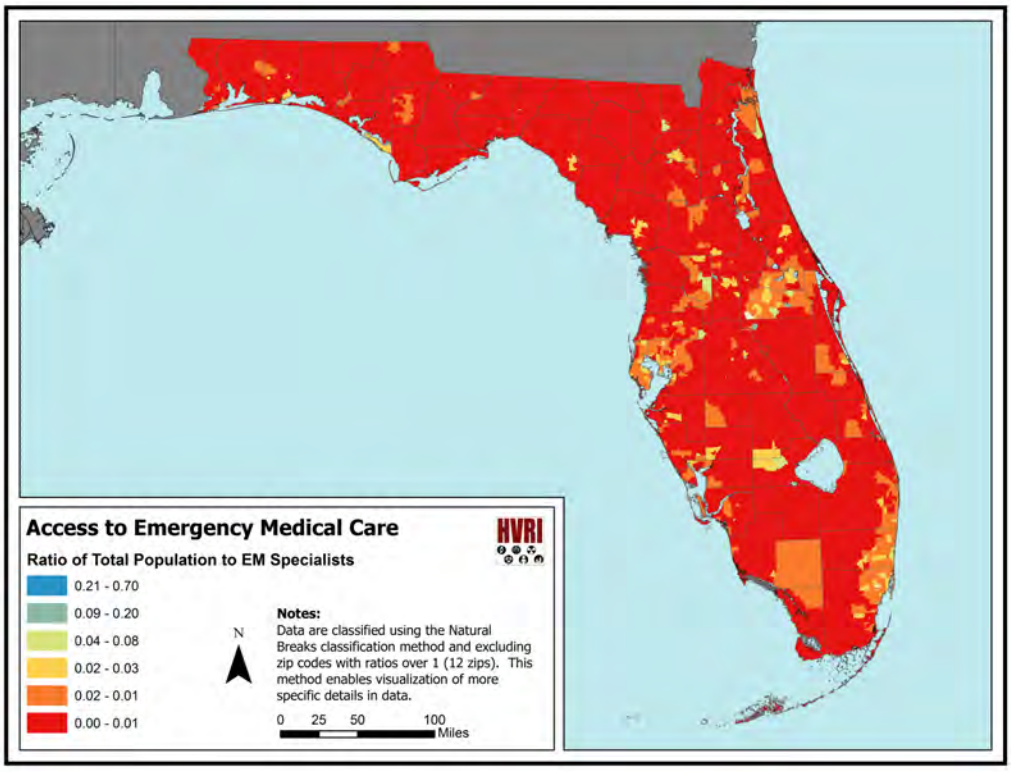

Figure T2-13: Non-emergency access to emergency medical care within the State of Florida

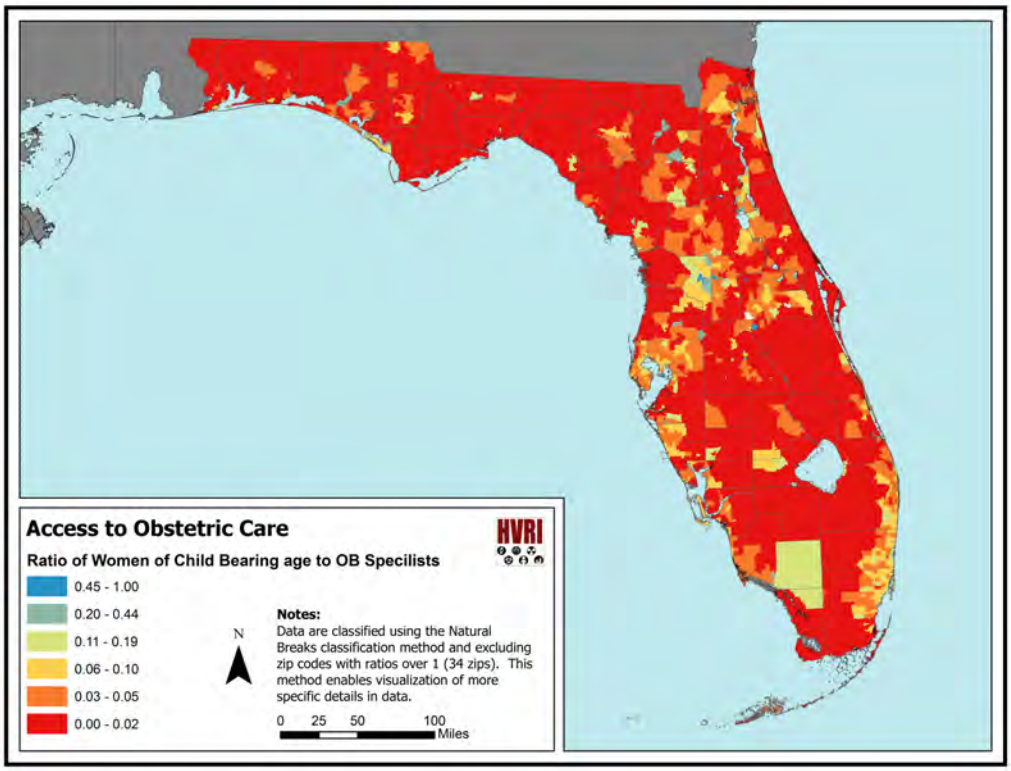

Figure T2-14: Non-emergency access to obstetric care within the State of Florida

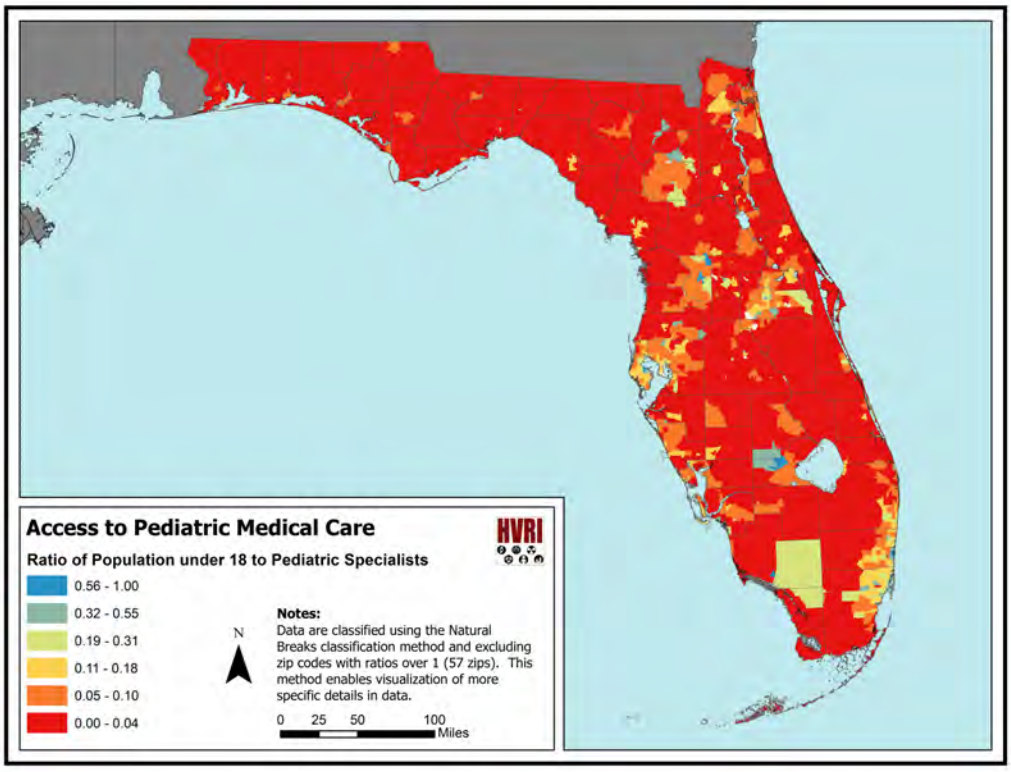

Figure T2-15: Non-emergency access to pediatric medical care within the State of Florida

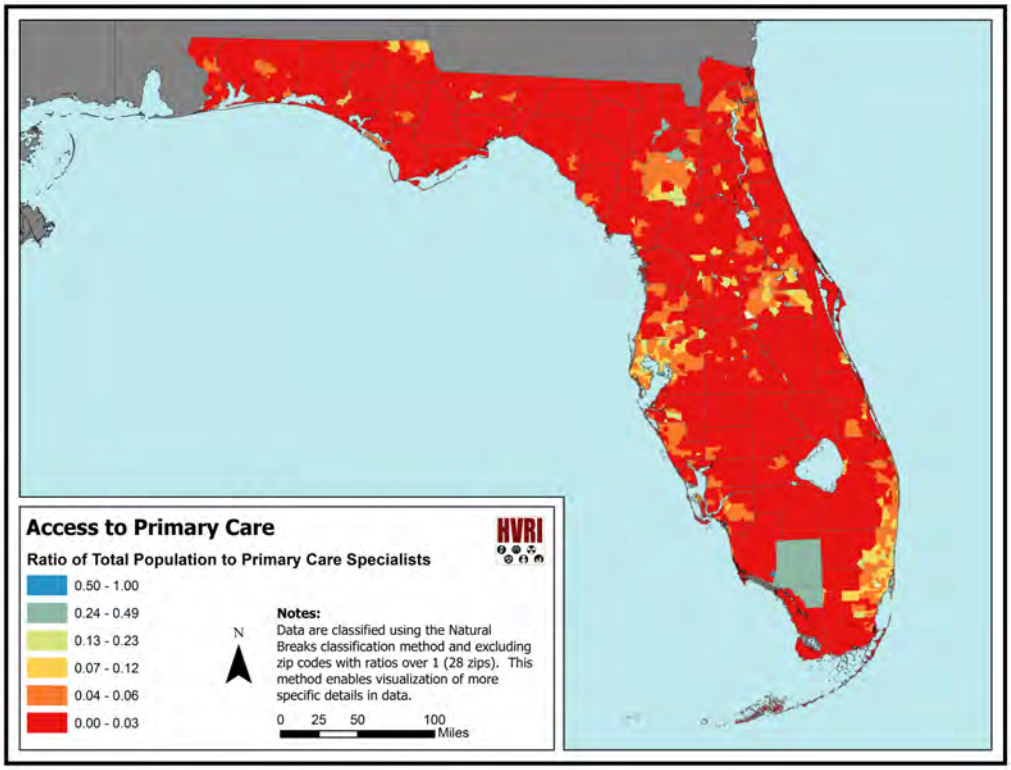

Figure T2-16: Non-emergency access primary care within the State of Florida

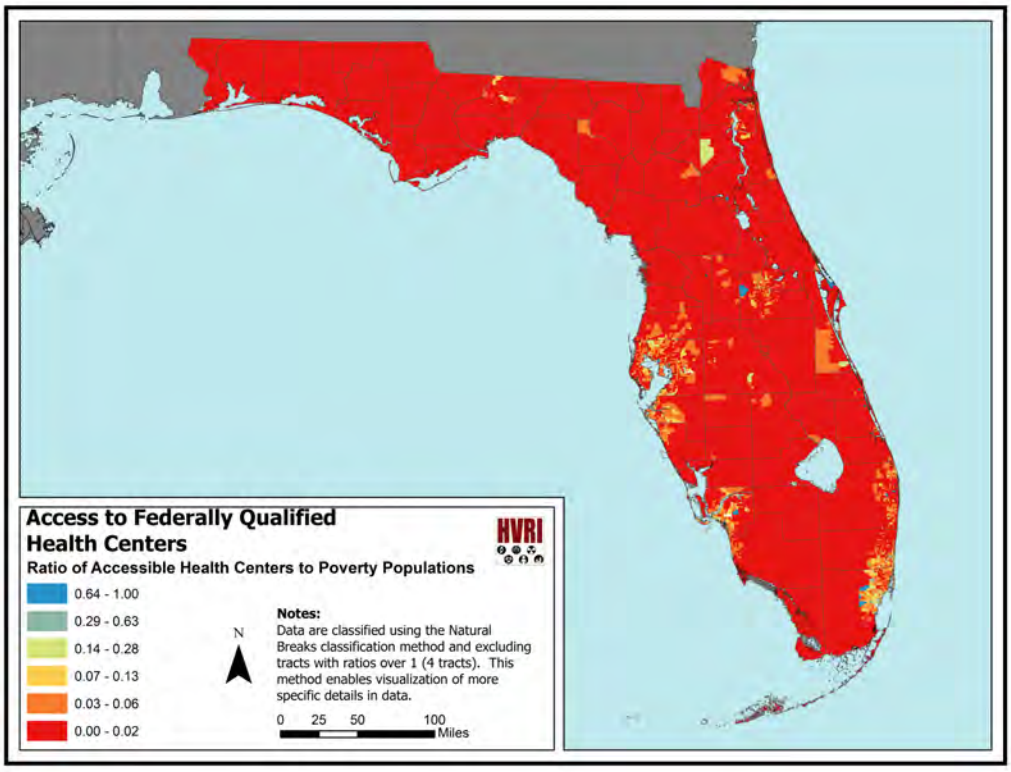

Figure T2-17: Access to federally qualified health centers within the State of Florida

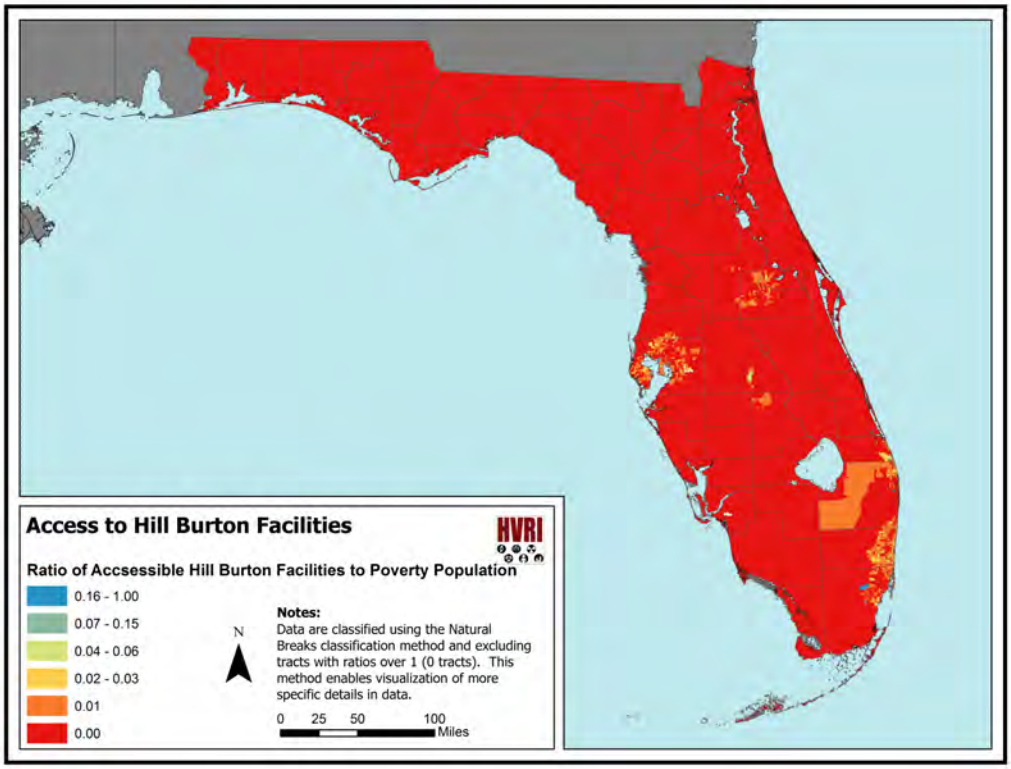

Figure T2-18: Access to Hill Burton facilities within the State of Florida

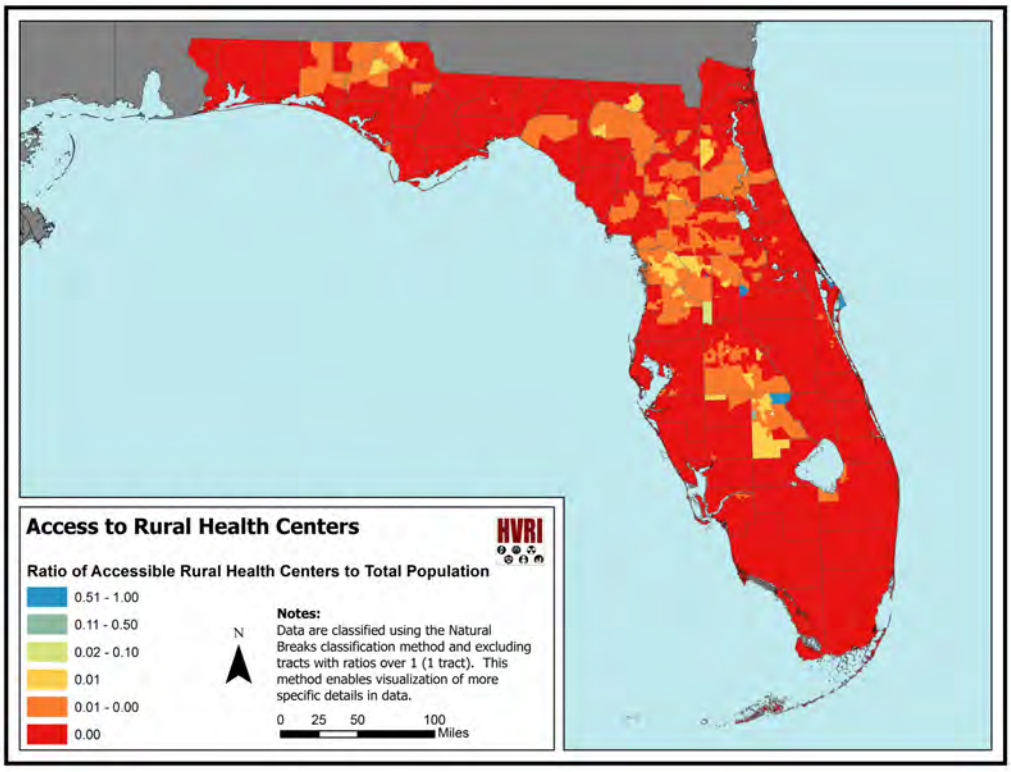

Figure T2-19: Access to rural health centers within the State of Florida

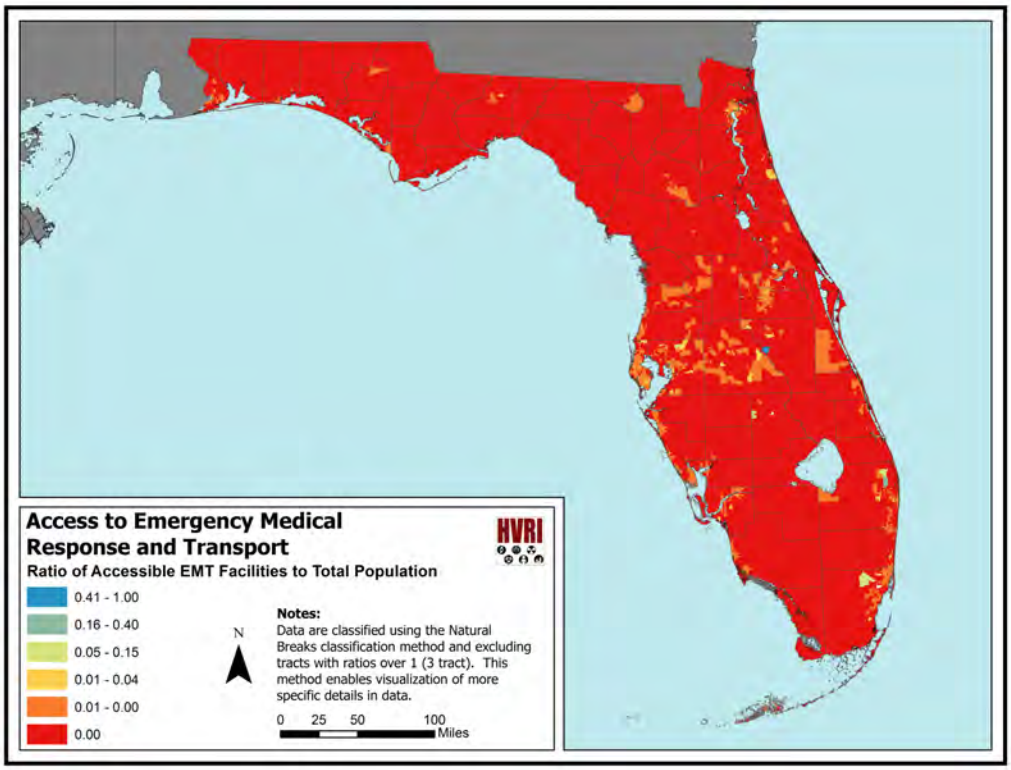

Figure T2-20: Access to emergency medical treatment and transport within the State of Florida

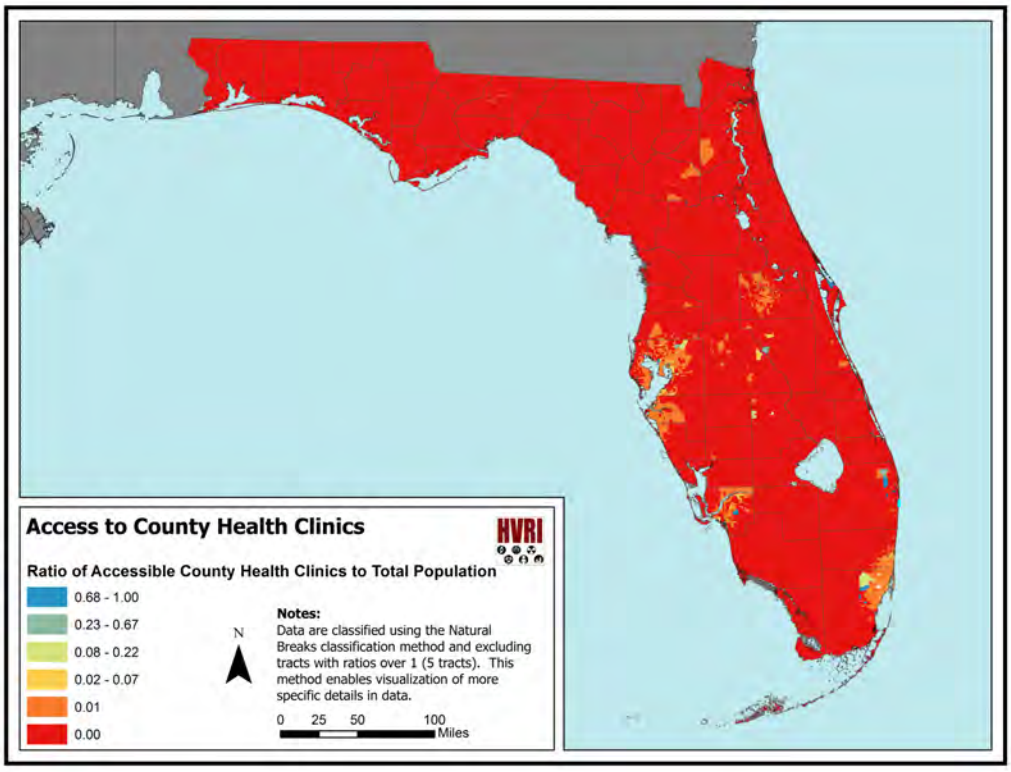

Figure T2-21: Access to county health clinics within the State of Florida

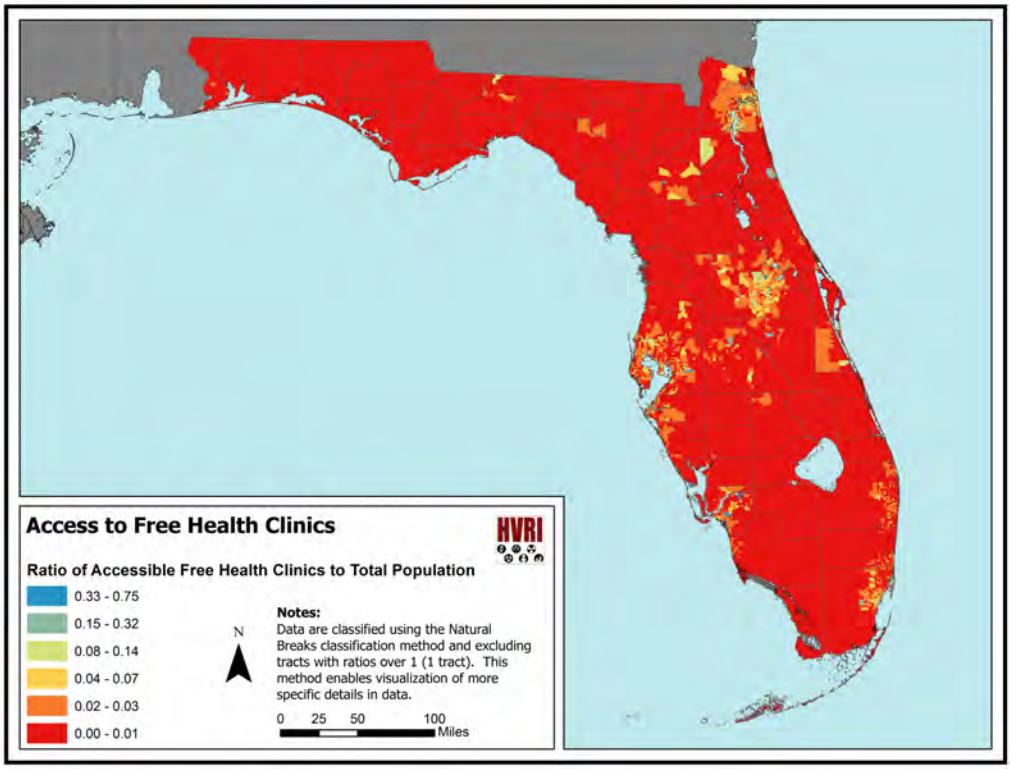

Figure T2-22: Access to free health clinics within the State of Florida

Health Care System Capability

The second major component of medical vulnerability that is a requisite part for understanding how a place or population may be differentially impacted by disasters is the functional capabilities present within the health care system. Here, we aim to identify and spatially display differences in county and community ability to assist populations residing within their respective jurisdictions. This portion of the assessment focuses on a host of medical vulnerability variables directly connected to fostering efficient and effective response to disasters and medical events. Included here are:

- County level community emergency response team (CERT) capacity (figure T2-23)
- Zip code level community emergency response team (CERT) capacity (figure T2-24)
- County level funding of 501c(3) health care organizations (figure T2-25)
- County level home health facility capacity (figure T2-26)
- County level homemaker and companion service facilities (figure T2-27)
- Tract level interventional cardiac capability (figure T2-28)
- Tract level stroke care capability (figure T2-29)
- Tract level pediatric trauma capability (figure T2-30)
- Tract level emergency maternity capability (figure T2-31)
- Tract level trauma level 1 or level 2 capability (figure T2-32)
- Tract level emergency mental health capability (figure T2-33)
- Tract level emergency hospital capability (figure T2-34)
- Tract level emergency burn service capability (figure T2-35)

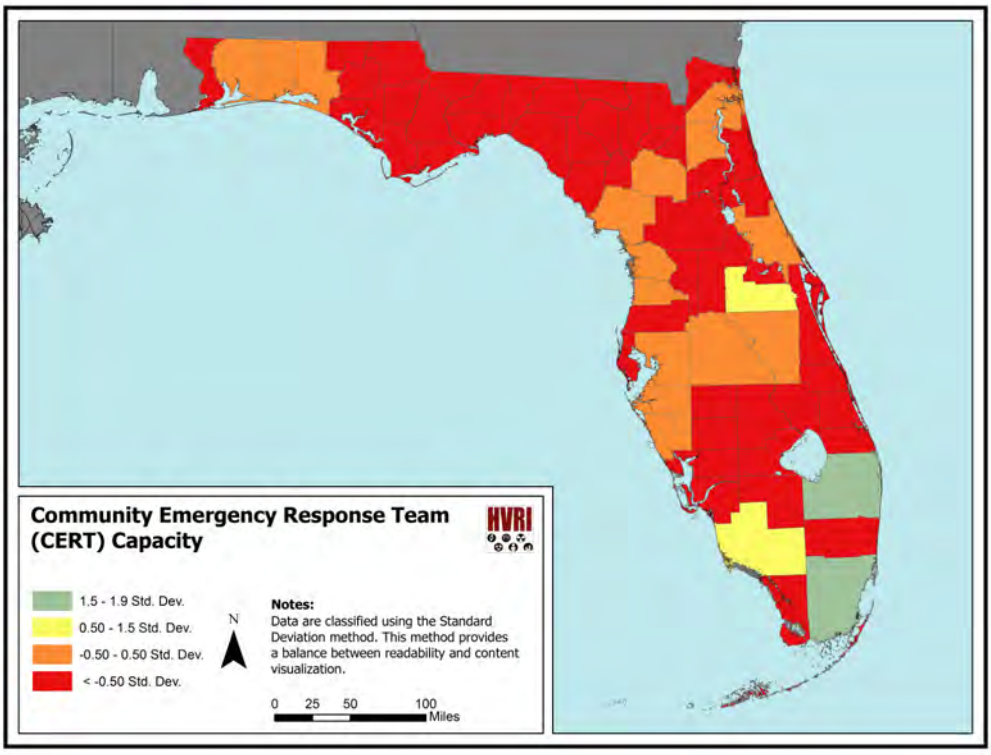

Figure T2-23: CERT capacity at the county level within the State of Florida

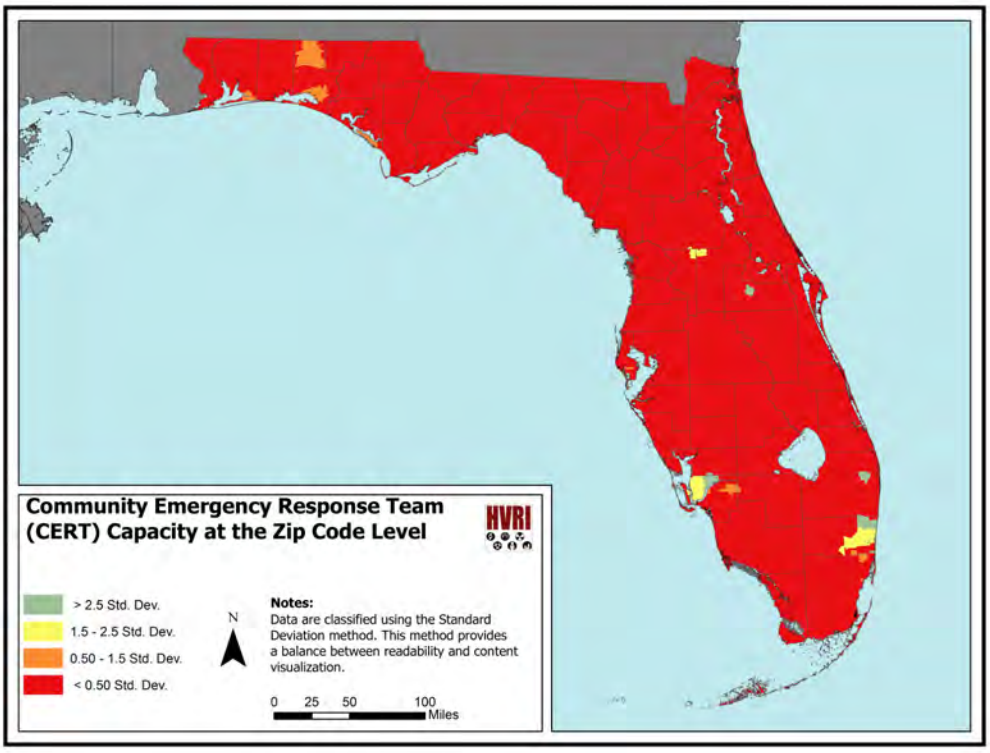

Figure T2-24: CERT capacity at the zip code level within the State of Florida

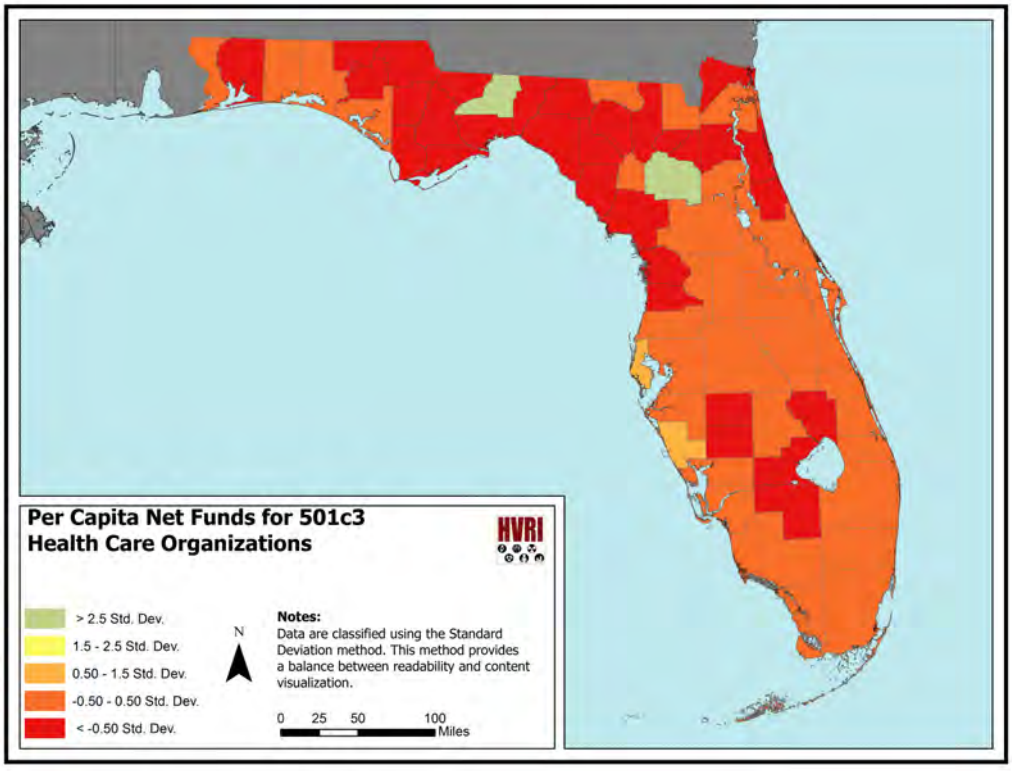

Figure T2-25: Medical Vulnerability based on per capita funding for 501c3 health care organizations within the State of Florida

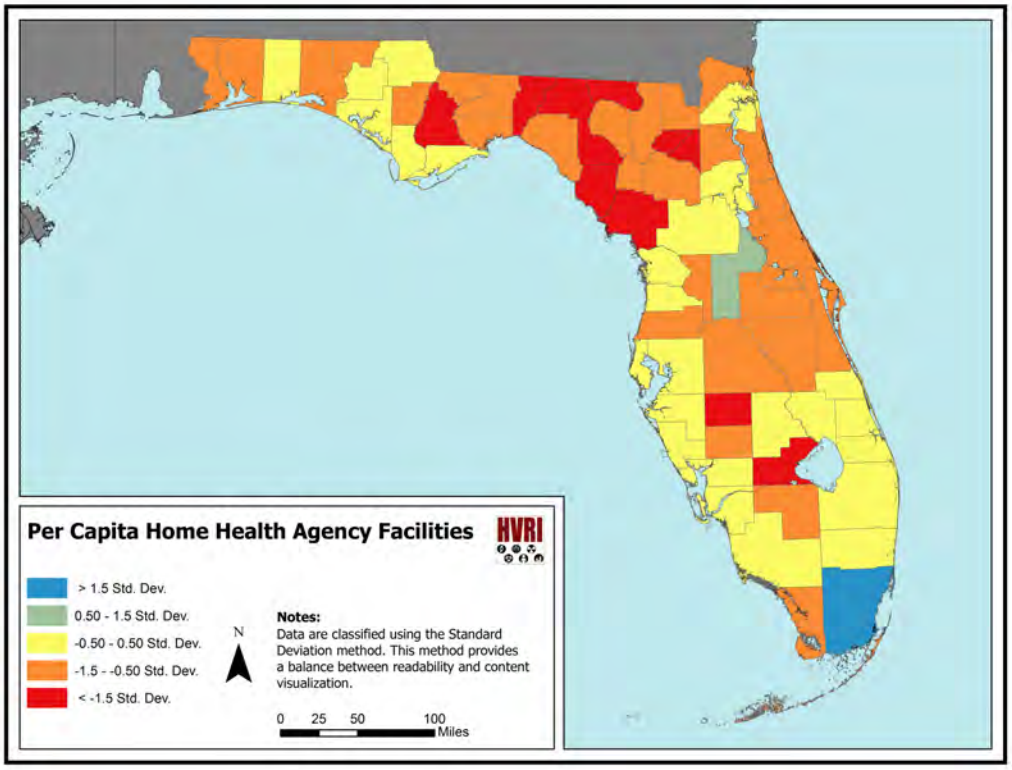

Figure T2-26: Medical Vulnerability based on per capita number of home health facilities within the State of Florida

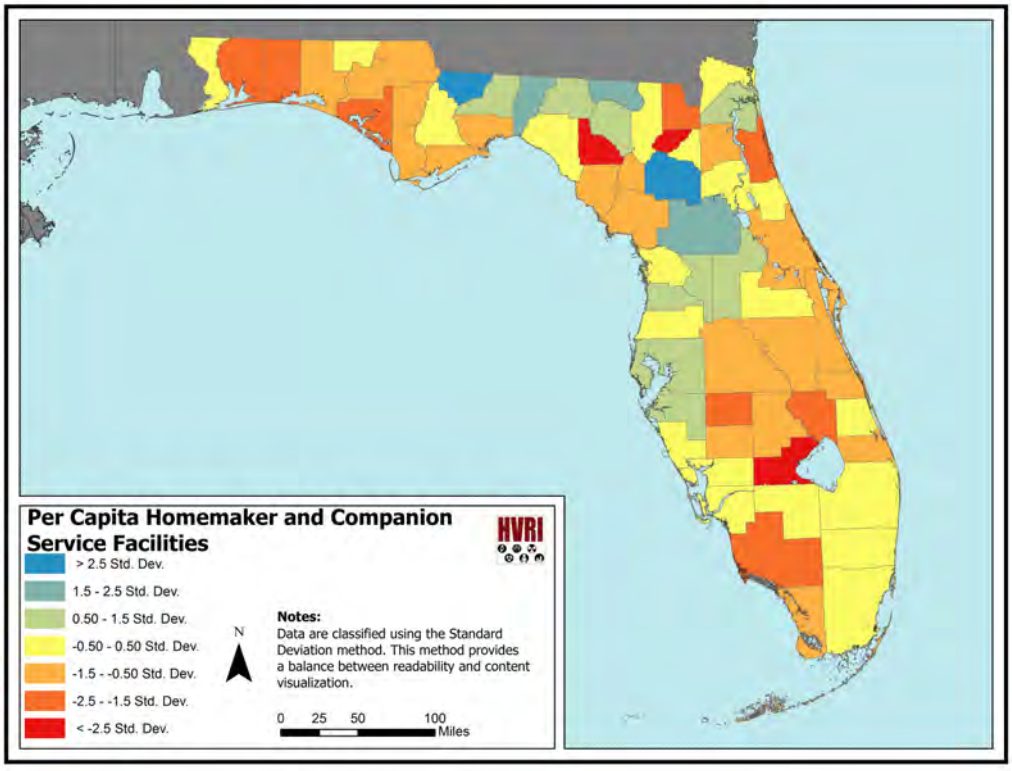

Figure T2-27: Medical Vulnerability based on per capita number of homemaker and companion services facilities within the State of Florida

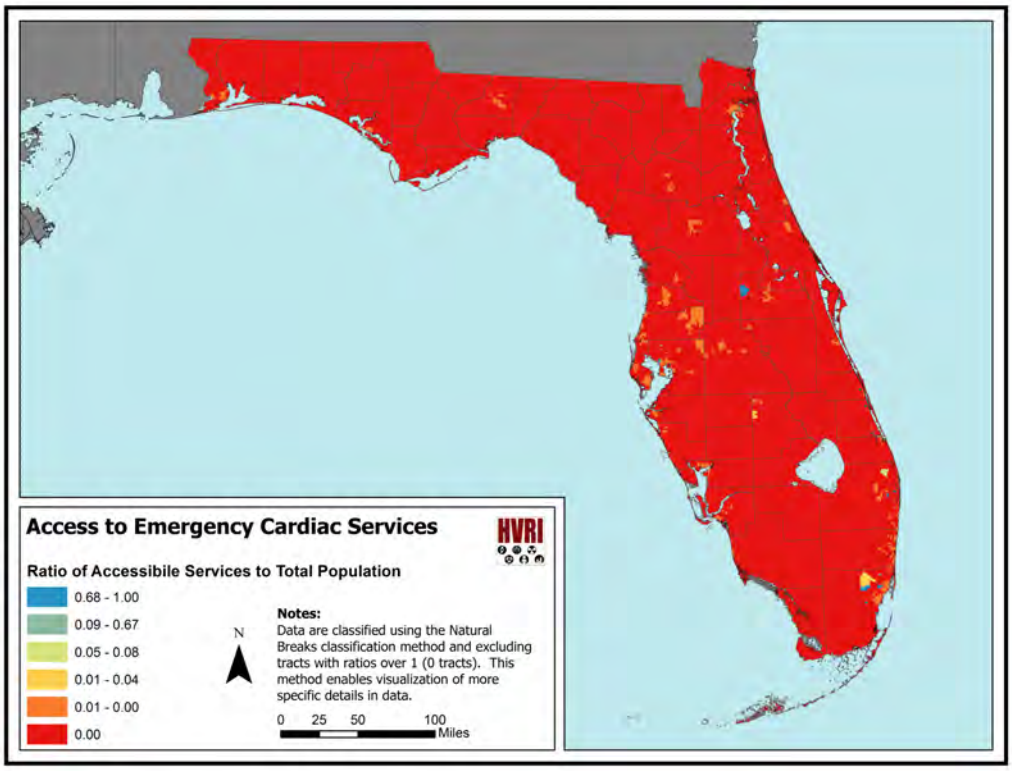

Figure T2-28: Medical Vulnerability based on access to emergency cardiac services within the State of Florida

Figure T2-29: Medical Vulnerability based on access to emergency stroke services within the State of Florida

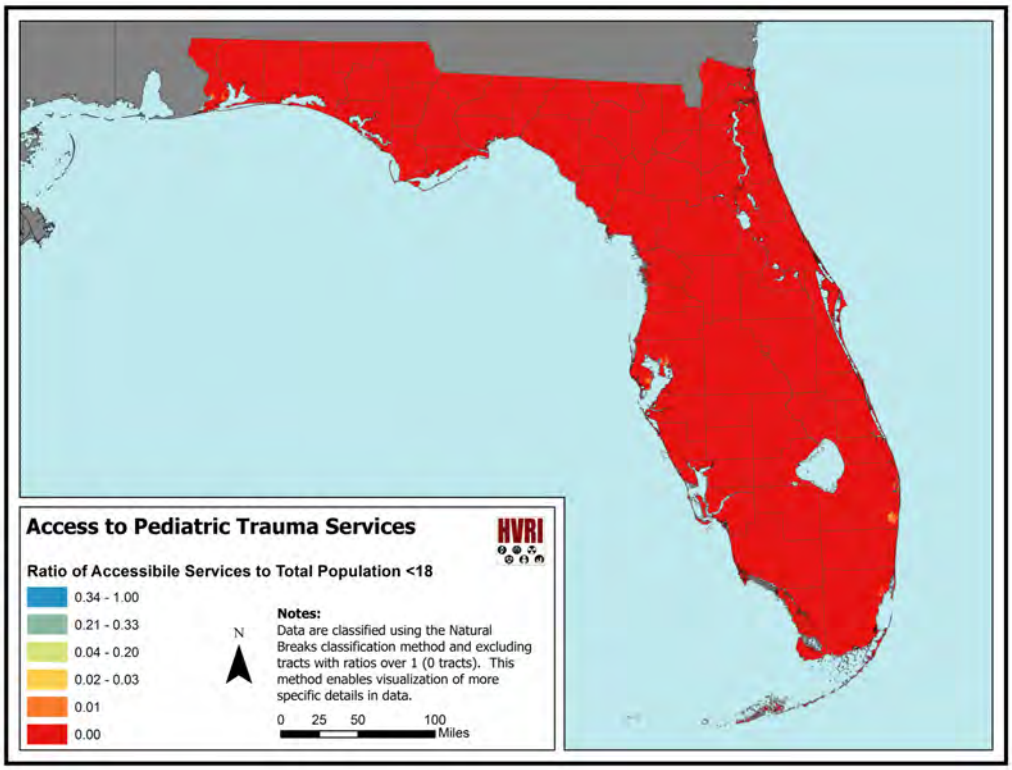

Figure T2-30: Medical Vulnerability based on access to emergency pediatric services within the State of Florida

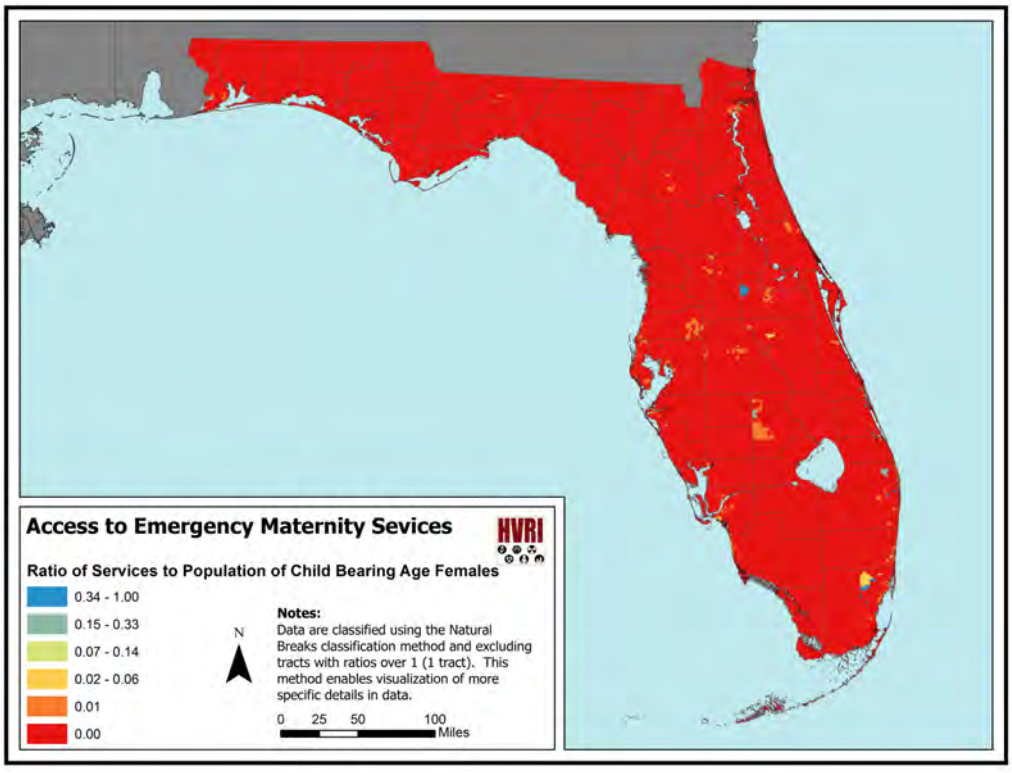

Figure T2-31: Medical Vulnerability based on access to emergency maternity services within the State of Florida

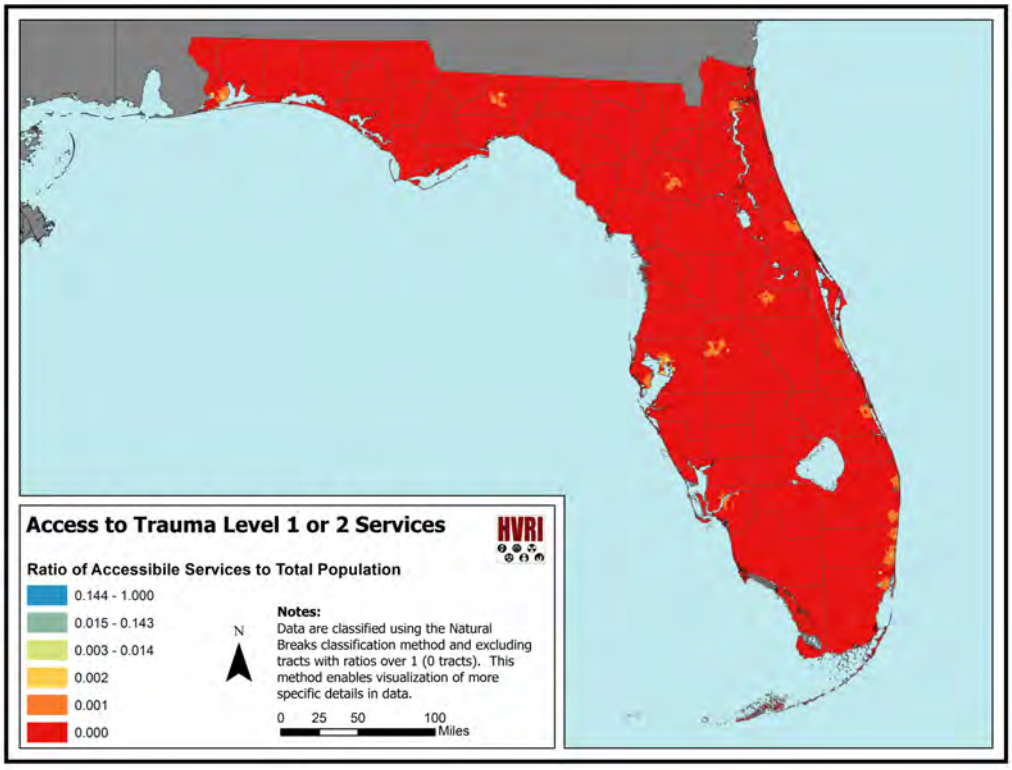

Figure T2-32: Medical Vulnerability based on access to trauma level 1 and 2 services within the State of Florida

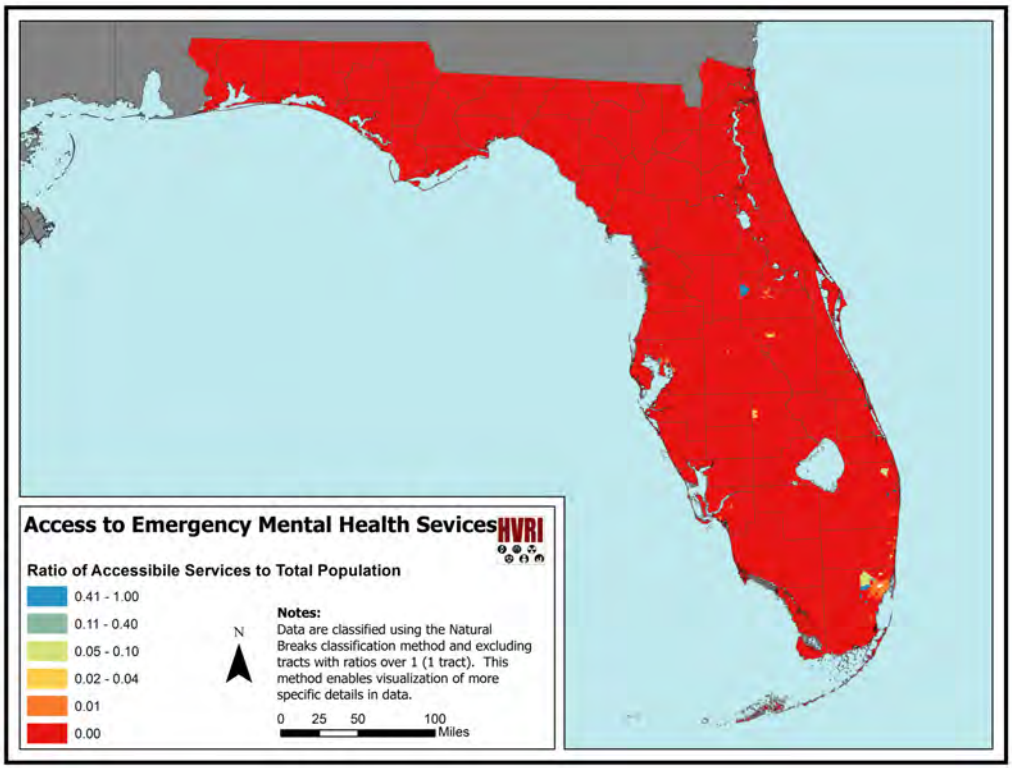

Figure T2-33: Medical Vulnerability based on access to emergency mental services within the State of Florida

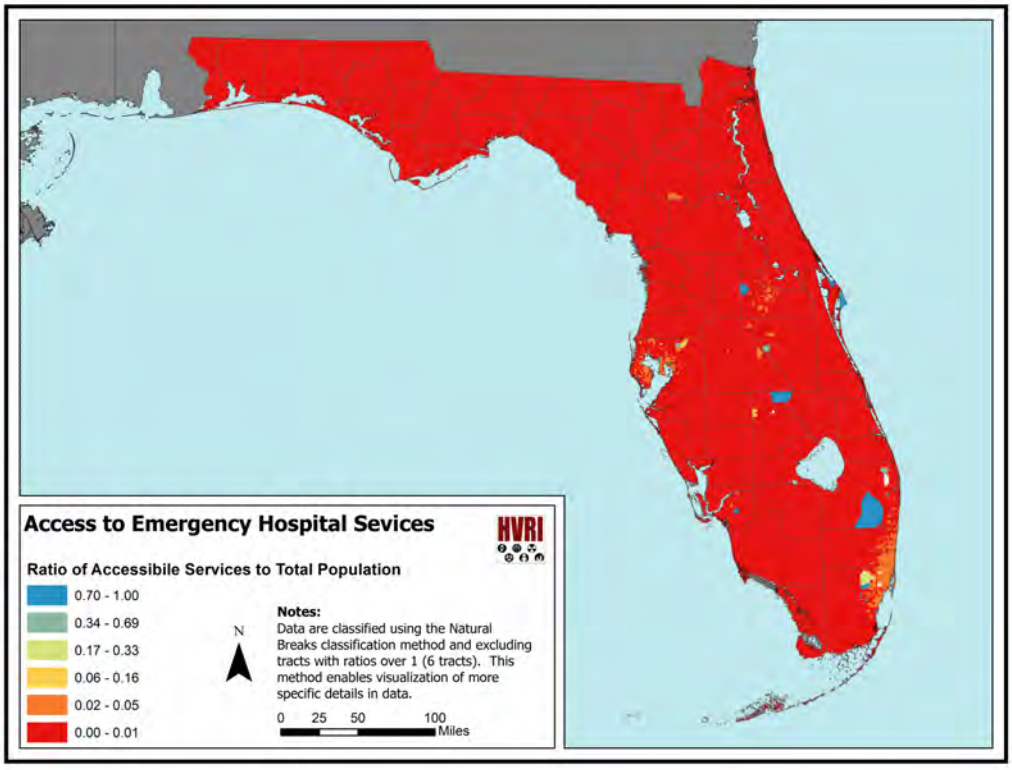

Figure T2-34: Medical Vulnerability based on access to emergency hospital services within the State of Florida

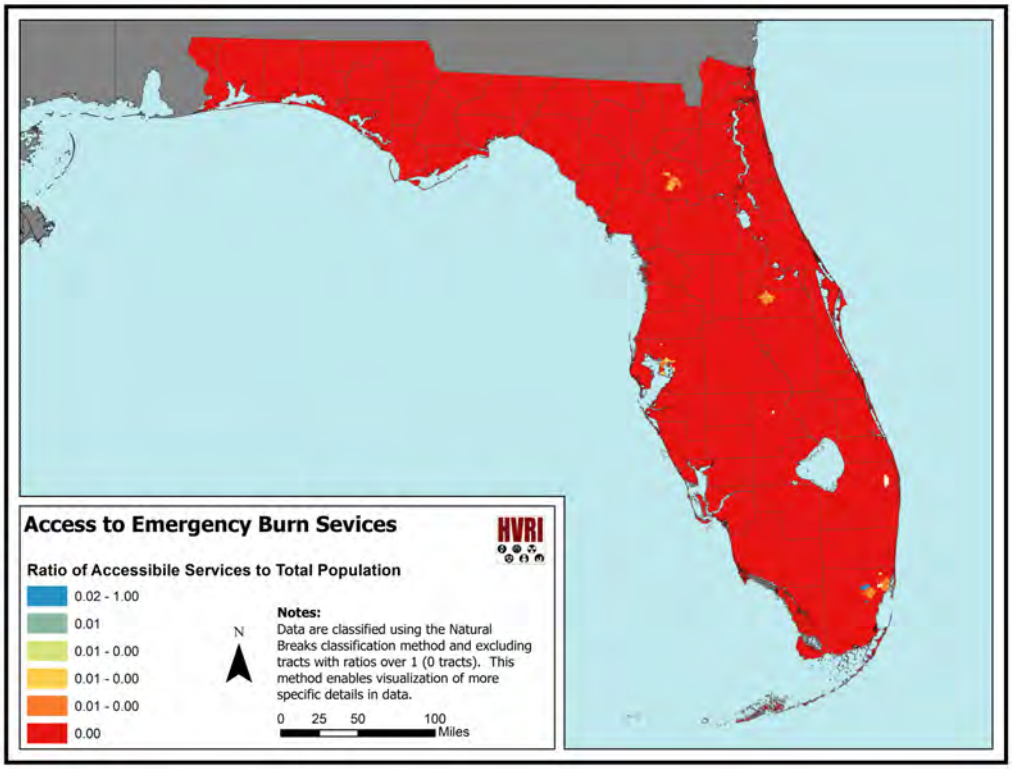

Figure T2-35: Medical Vulnerability based on access to emergency burn services within the State of Florida

Medical Need

The third tenet of medical vulnerability centers on population health and the identification of characteristics that often combine to create adverse situations for at risk populations. This portion of the assessment aims to identify and spatially quantify a host of characteristics related to poor health for the state. Understanding the spatial variations in underlying medical need will provide the baseline information needed to adequately plan for extreme hazard events. This section specifically identifies health indicators that are known to either put people at risk during disaster or (in combination) create a more vulnerable population group. To this end, we analyzed the following medical need characteristics:

- County level percentage of uninsured populations (figure T2-36)
- County level percentage of Medicaid recipients (figure T2-37)
- County level percentage of developmentally disabled populations (figure T2-38)
- County level percentage of seriously emotionally disturbed children (figure T2-39)
- County level percentage of adults with serious mental illness (figure T2-40)
- County level percentage of oxygen dependent populations (figure T2-41)
- County level percentage of adults with probably Alzheimer's Disease (figure T2-24)
- County level percentage of elders (age 65+) living alone (figure T2-43)
- County level percentage of person's reporting poor overall health (figure T2-44)
- County level percentage of diabetic populations (figure T2-45)
- Zip code level percentage of dialysis patients (figure T2-46)
- County level percentage of adults with chronic heart disease (figure T2-47)
- County level percentage of adults with hypertension (figure T2-48)
- County level percentage of adults with asthma (figure T2-49)
- County level percentage of adults with debilitating arthritis (figure T2-50)
- County level percentage of low birth weight babies (figure T2-51)
- County level per capita number of violent crimes (figure T2-52)
- County level per capita number of domestic crimes (figure T2-53)
- County level perception of access to medical care (figure T2-54)
- County level perception of medical care quality (figure T2-55)
- Zip code level of water borne communicable diseases (figure T2-56)
- Zip code level of OASDI beneficiaries (figure T2-57)
- Zip code level percentage of brain and spinal cord injuries (figure T2-58)
- Zip code level percentage of pregnant mothers enrolled in WIC program (figure T2-59)
- Zip code level percentage of children's medical service patients (figure T2-60)
- County level per capita number of nursing home beds (figure T2-61)
- County level per capita number of assisted living beds (figure T2-62)
- County level per capita number of hospice facilities (figure T2-63)

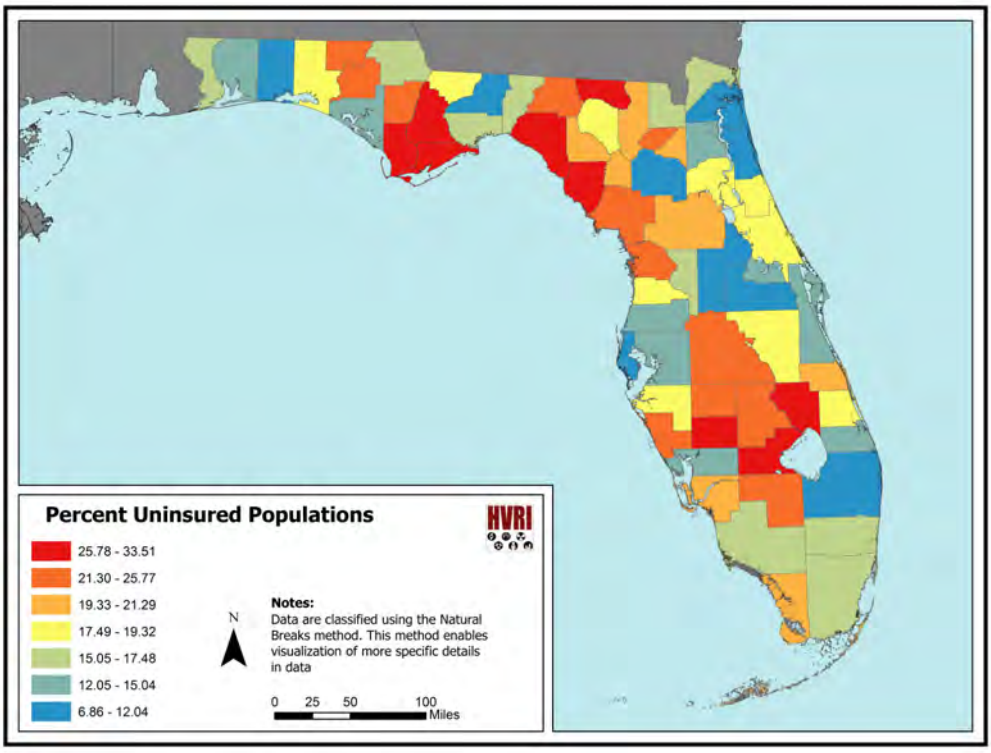

Figure T2-36: Medical Vulnerability based on uninsured populations within the State of Florida

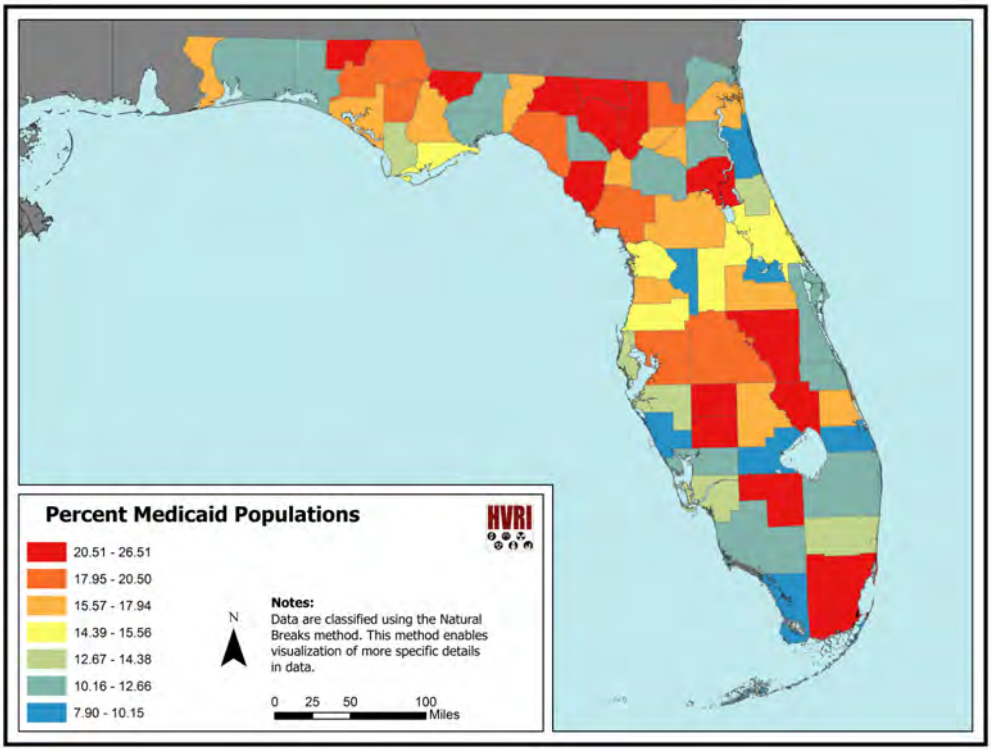

Figure T2-37: Medical Vulnerability based on Medicaid recipients within the State of Florida

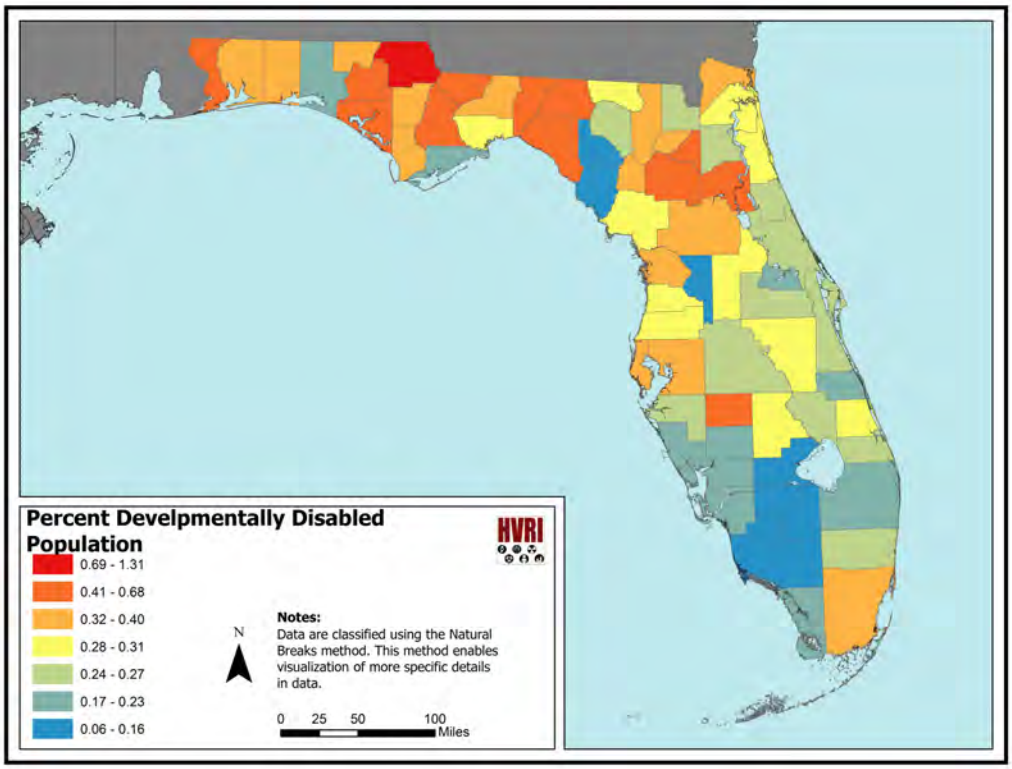

Figure T2-38: Medical Vulnerability based on developmentally disabled populations within the State of Florida

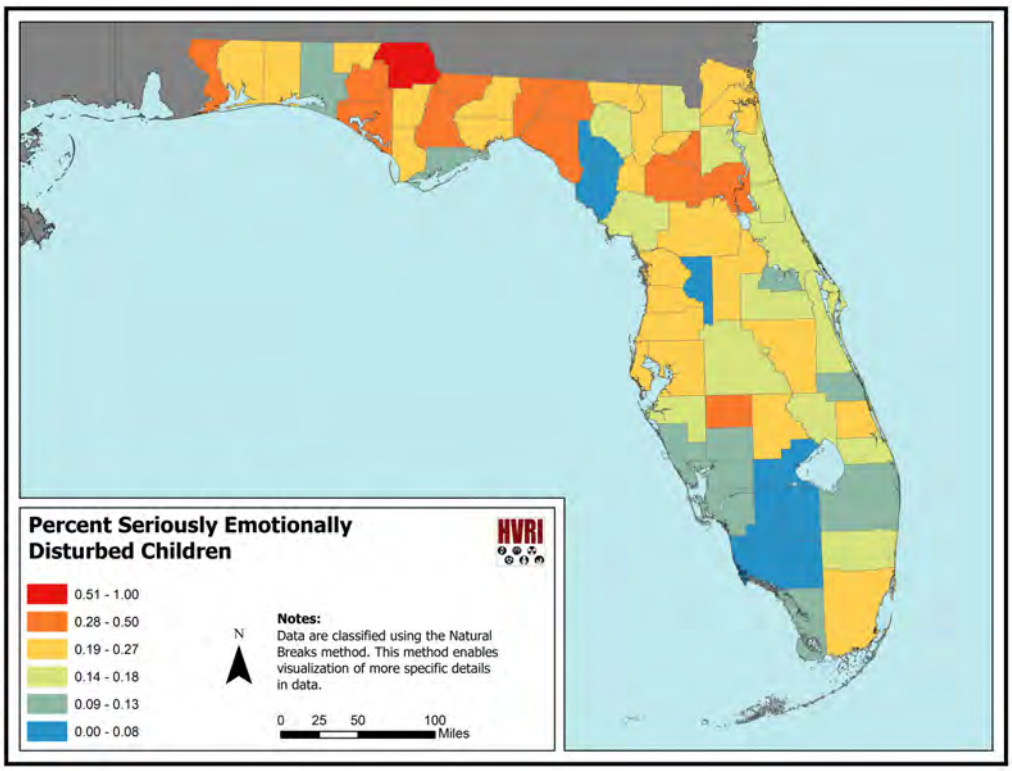

Figure T2-39: Medical Vulnerability based on seriously emotionally disturbed children within the State of Florida

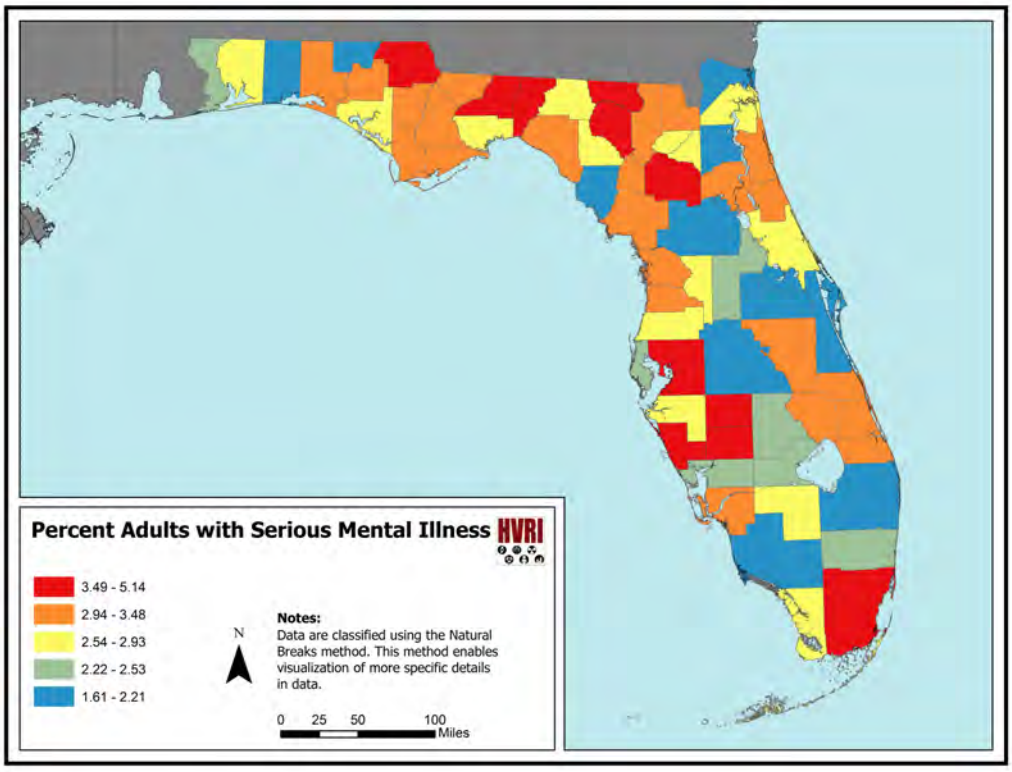

Figure T2-40: Medical Vulnerability based on adults with serious mental illness within the State of Florida

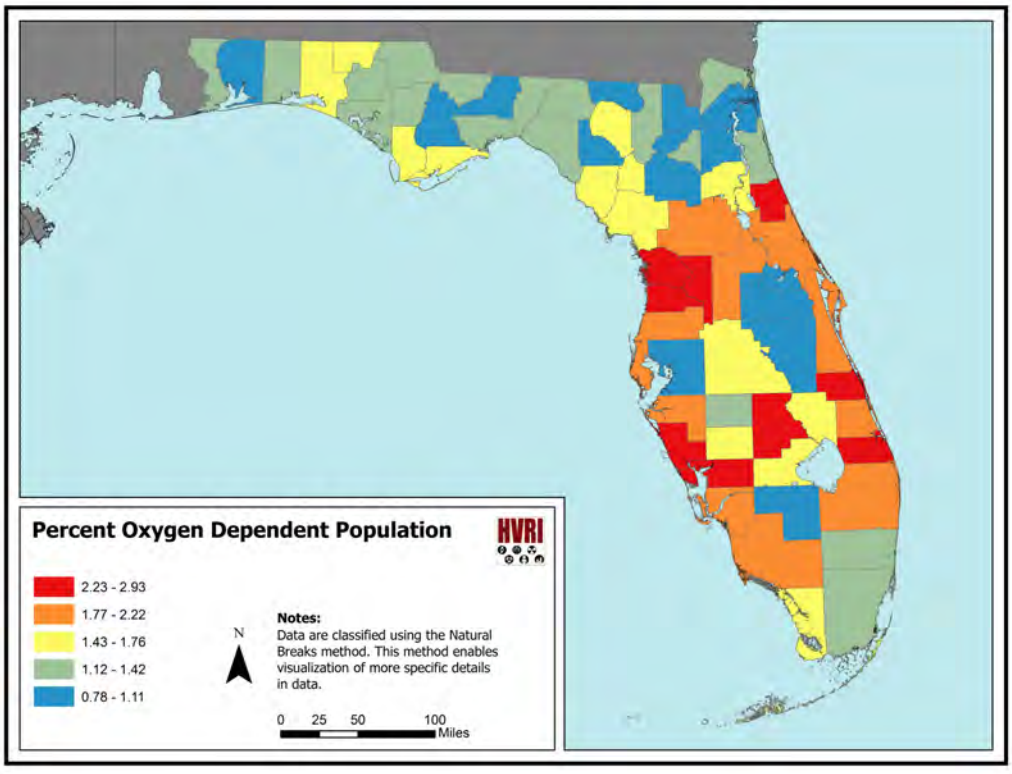

Figure T2-41: Medical Vulnerability based on oxygen dependent populations within the State of Florida

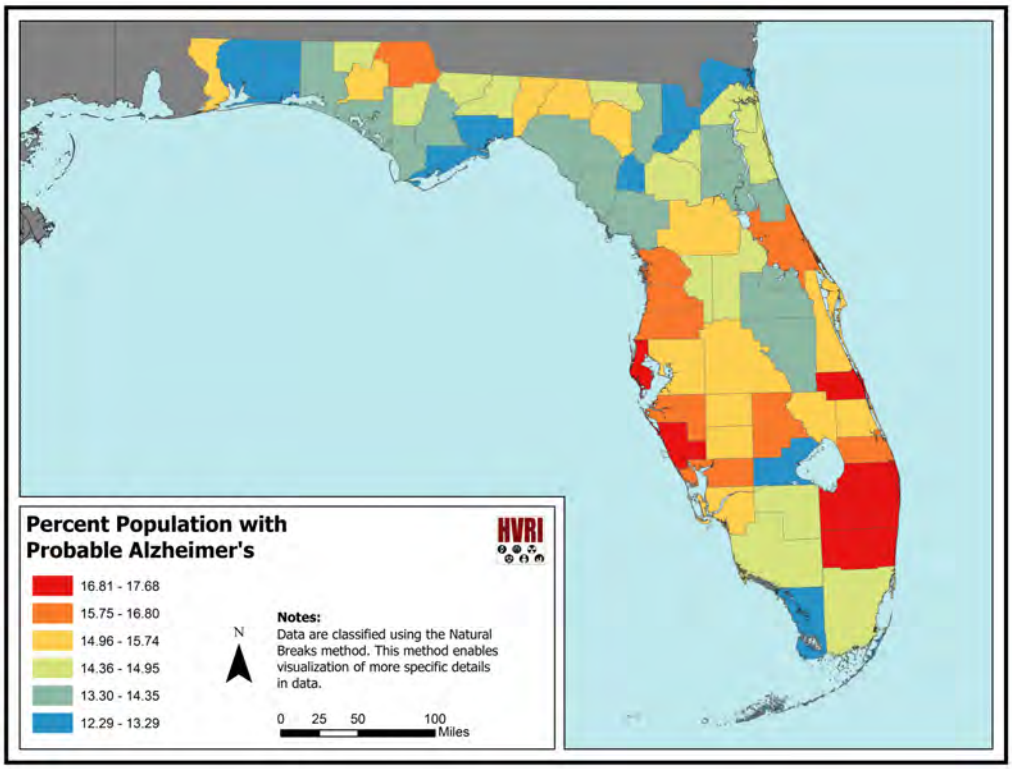

Figure T2-42: Medical Vulnerability based on population with probably Alzheimer's within the State of Florida

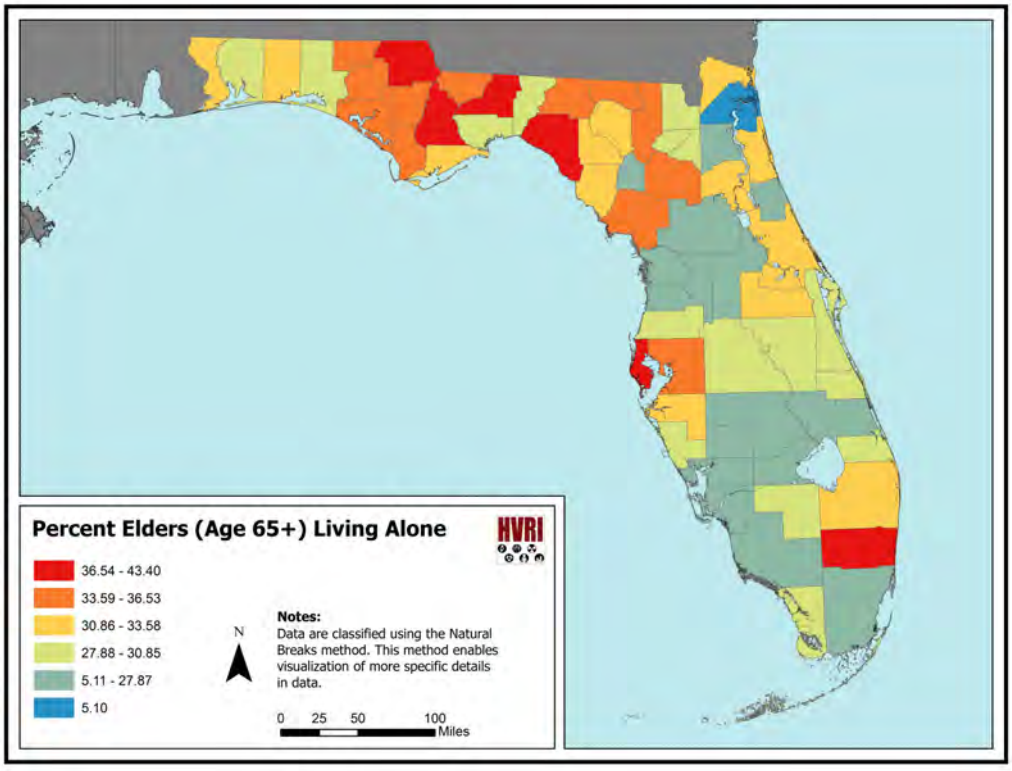

Figure T2-43: Medical Vulnerability based on elderly (Age 65+) populations living alone within the State of Florida

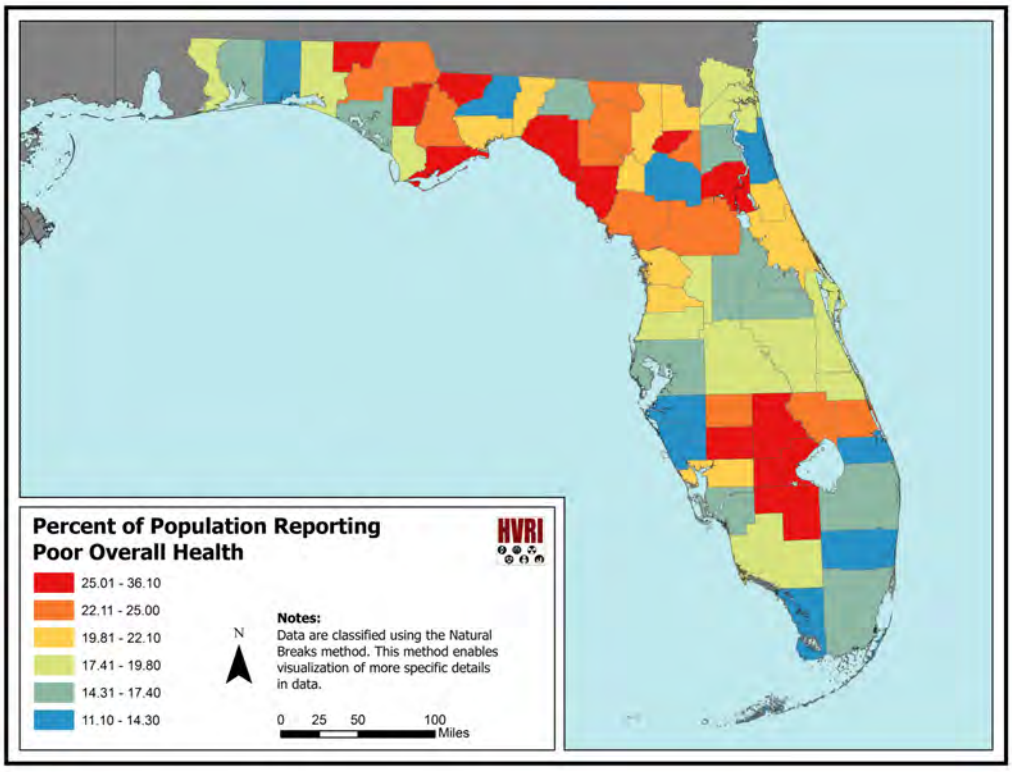

Figure T2-44: Medical Vulnerability based on populations reporting poor overall health within the State of Florida

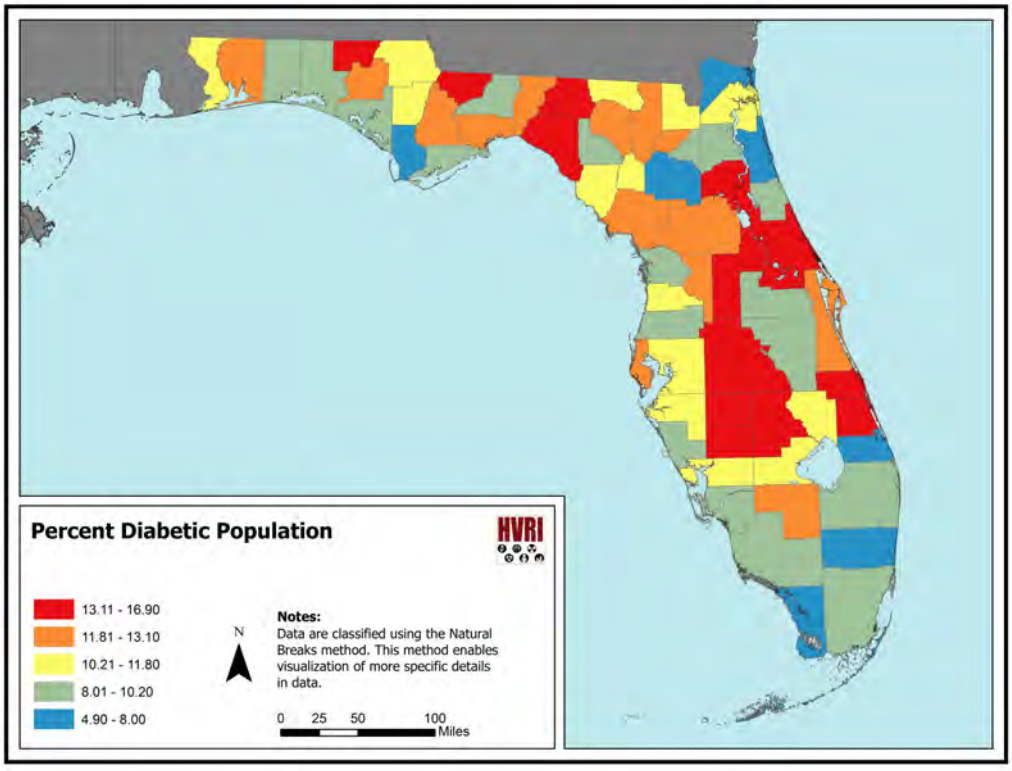

Figure T2-45: Medical Vulnerability based on percent diabetic population within the State of Florida

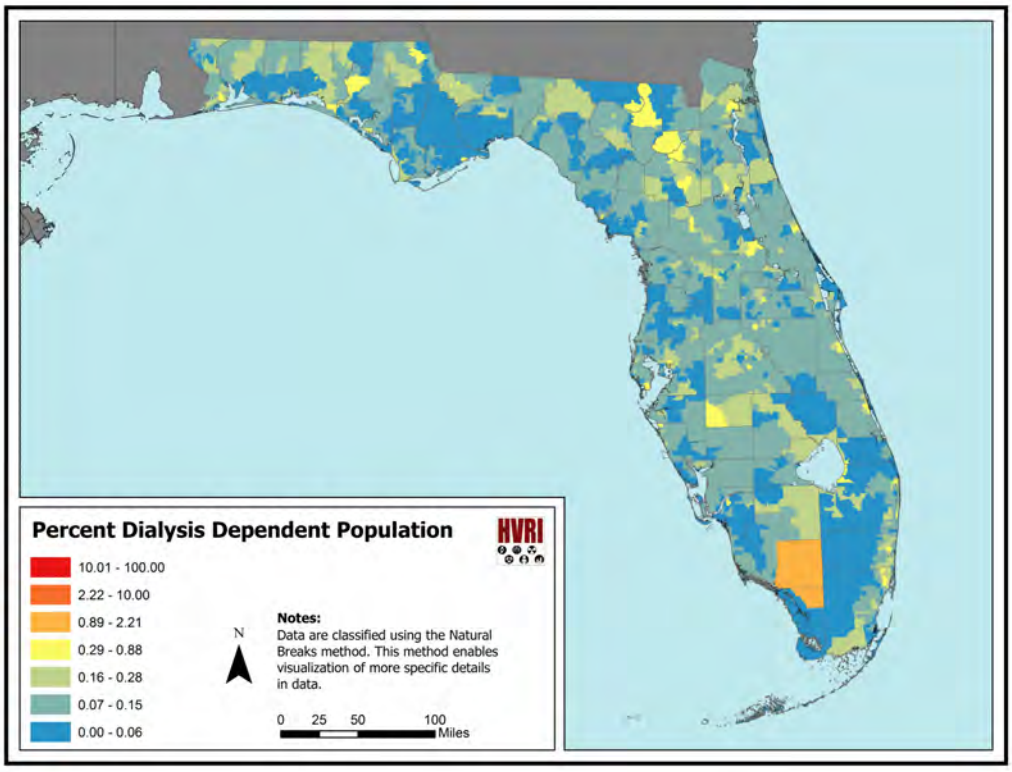

Figure T2-46: Medical Vulnerability based on dialysis dependent populations within the State of Florida

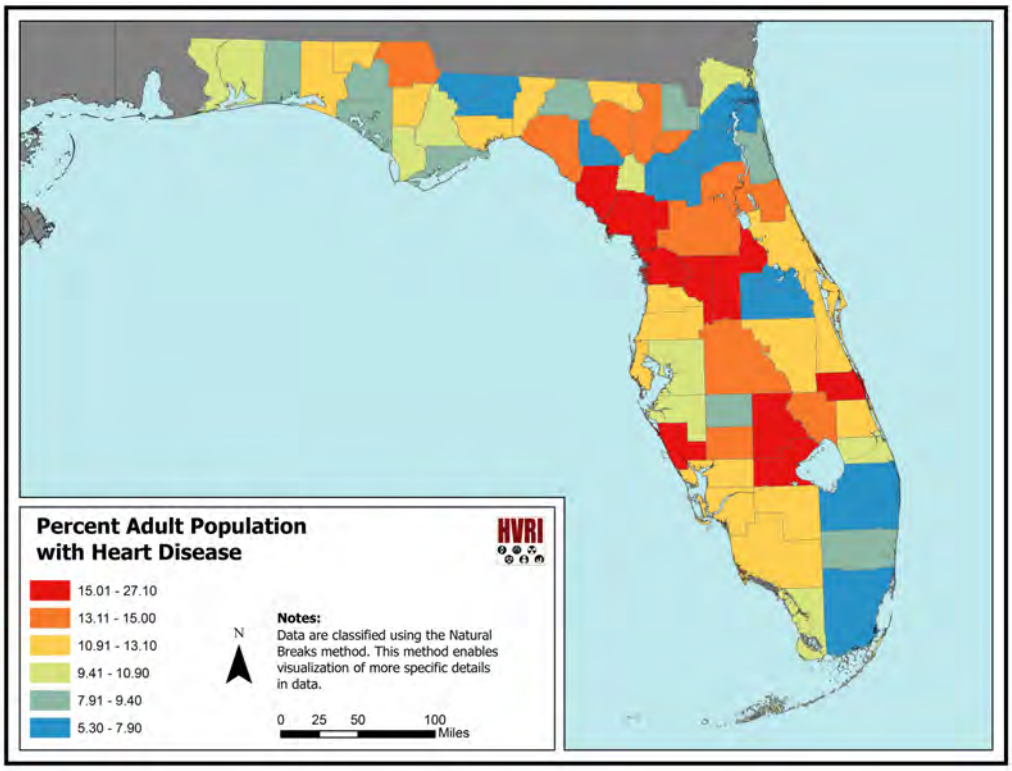

Figure T2-47: Medical Vulnerability based on adults with chronic heart disease within the State of Florida

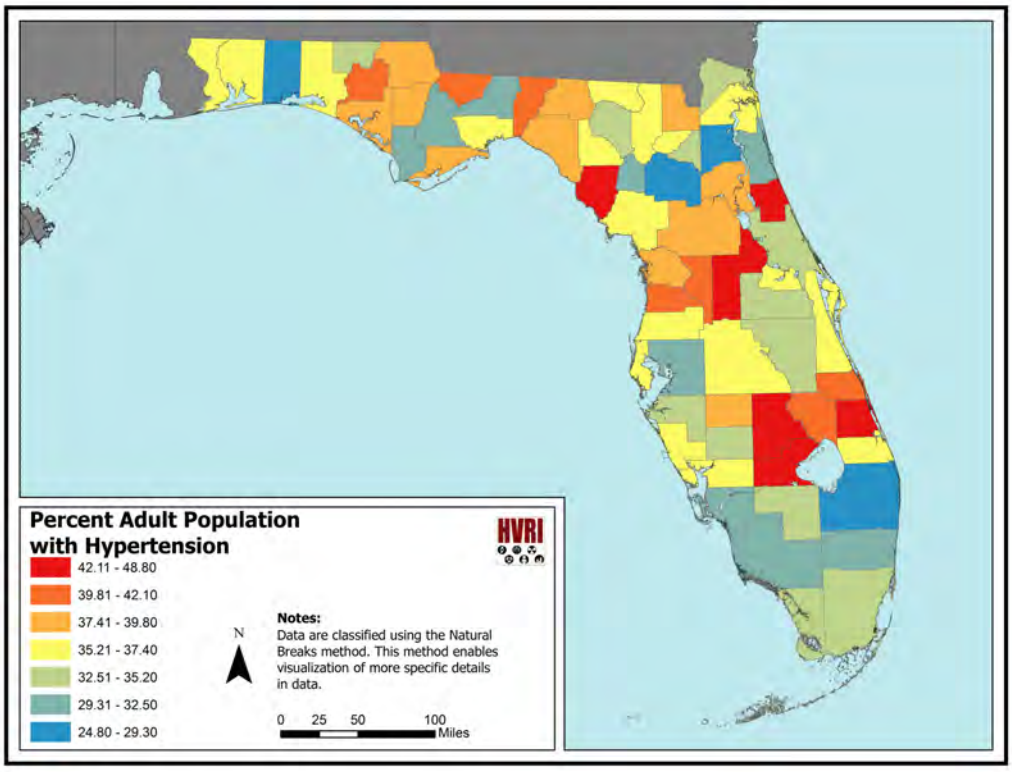

Figure T2-48: Medical Vulnerability based on adults with diagnosed hypertension within the State of Florida

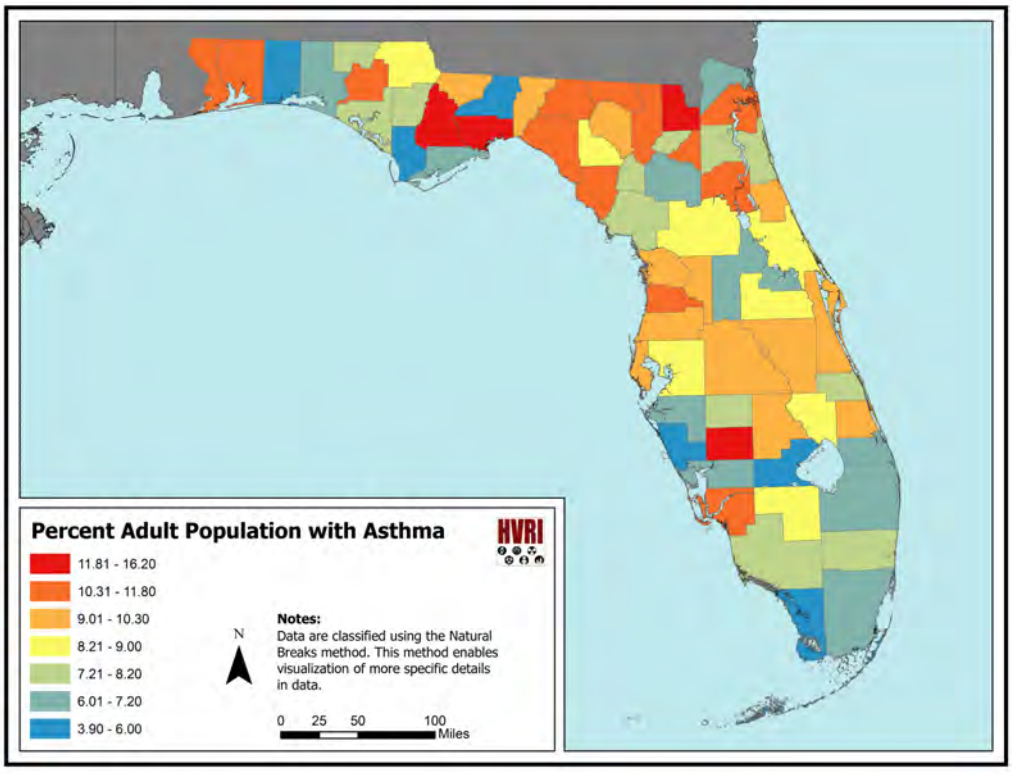

Figure T2-49: Medical Vulnerability based on adult populations with asthma within the State of Florida

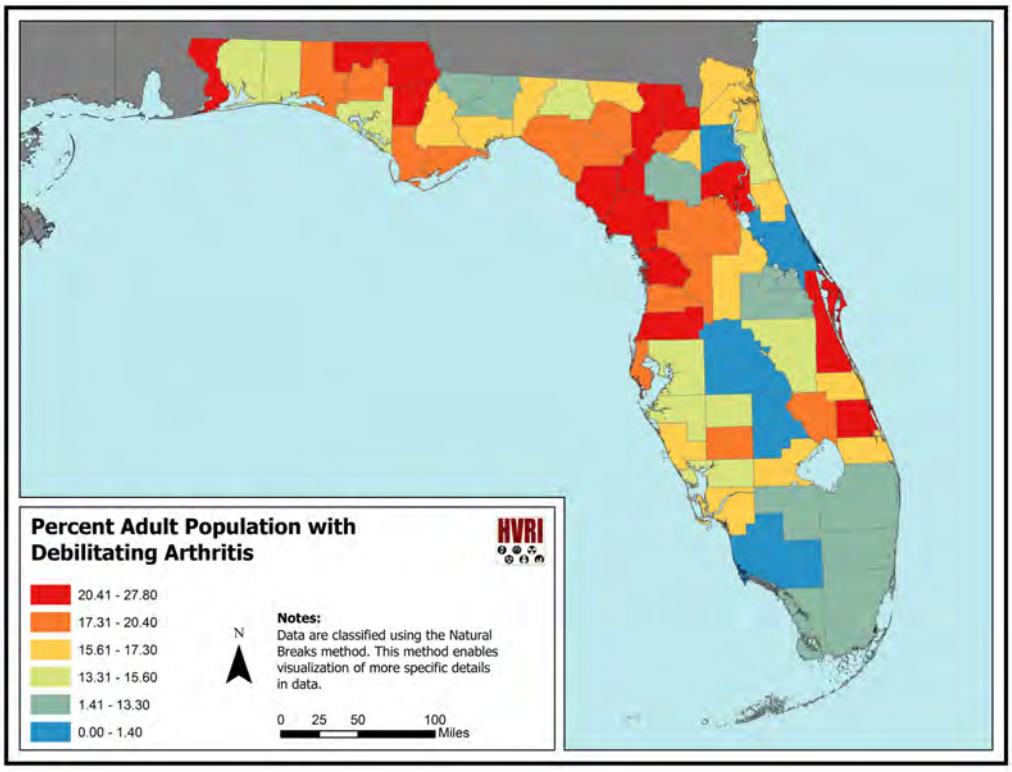

Figure T2-50: Medical Vulnerability based on adults with debilitating arthritis within the State of Florida

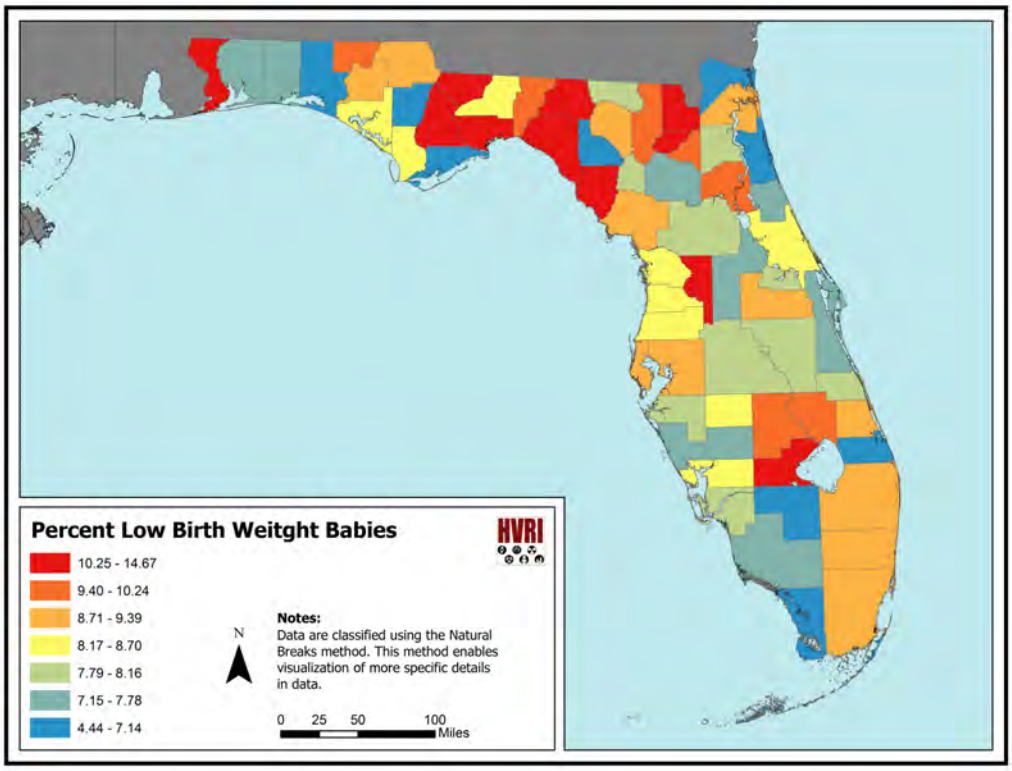

Figure T2-51: Medical Vulnerability based on low birth weight babies within the State of Florida

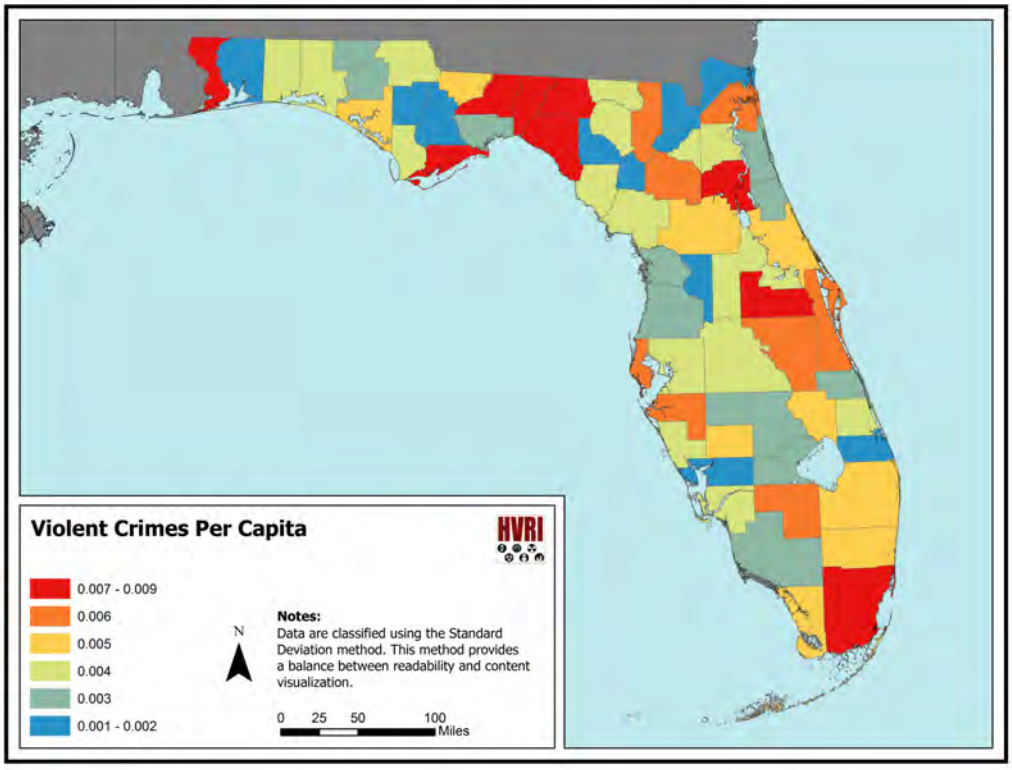

Figure T2-52: Medical Vulnerability based on per capita number of violent crimes within the State of Florida

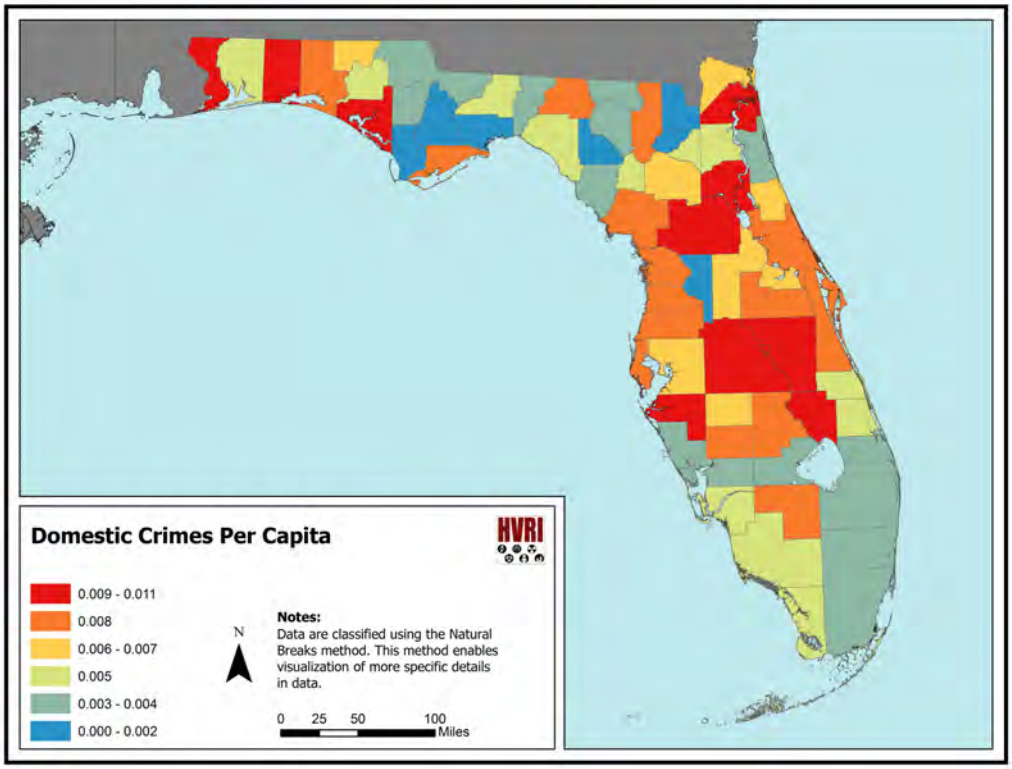

Figure T2-53: Medical Vulnerability based on per capita number of domestic crimes within the State of Florida

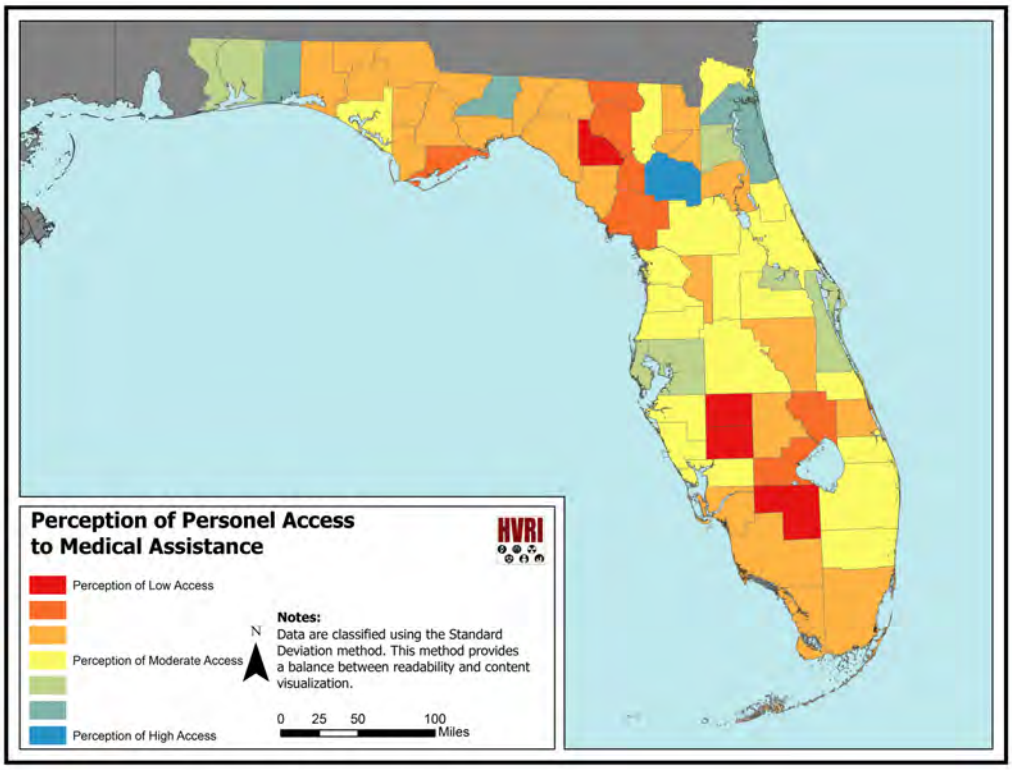

Figure T2-54: Medical Vulnerability based on perception of access to medical attention within the State of Florida

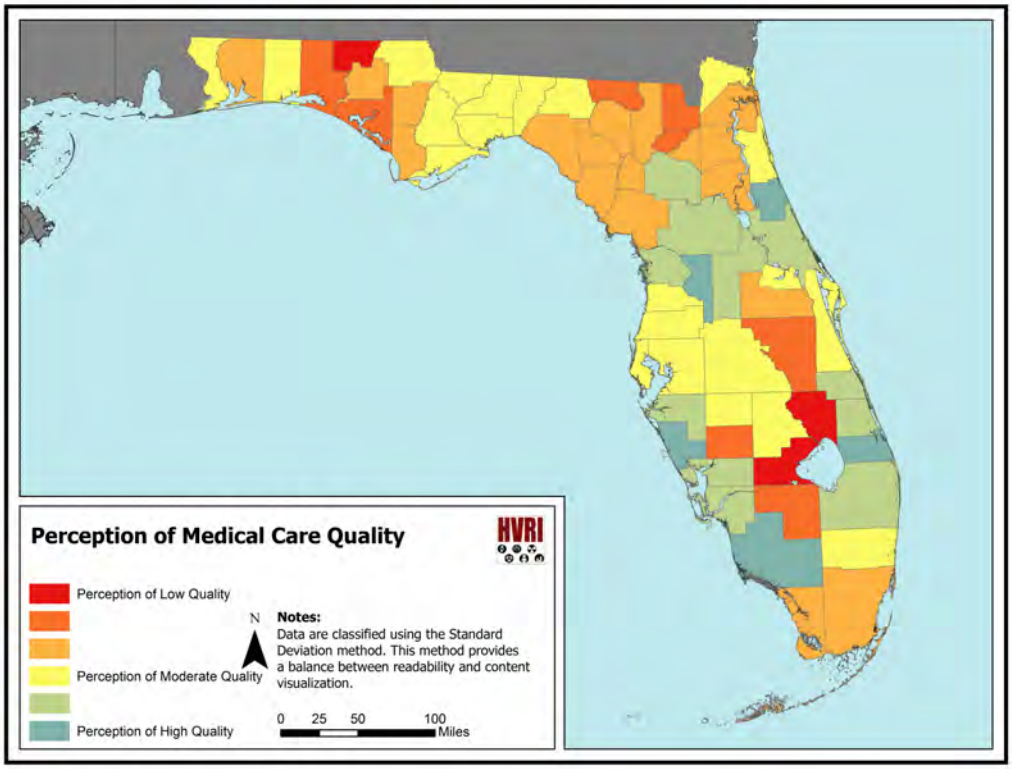

Figure T2-55: Medical Vulnerability based on perception of medical quality within the State of Florida

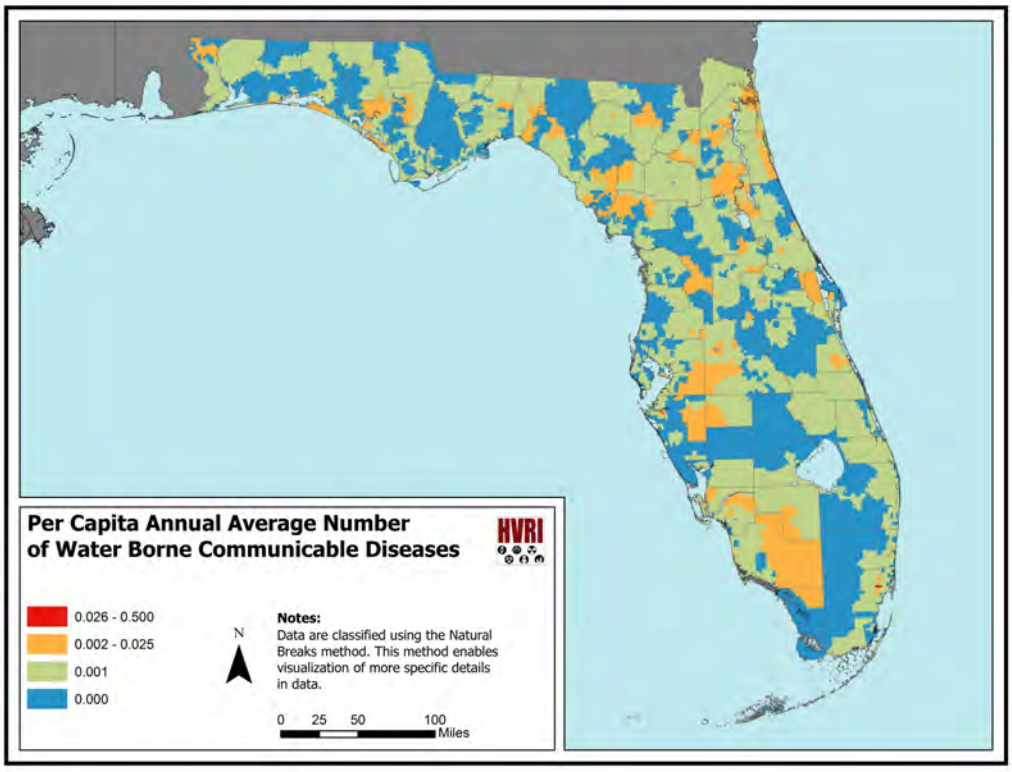

Figure T2-56: Medical Vulnerability based on average annual per capita number of water borne diseases within the State of Florida

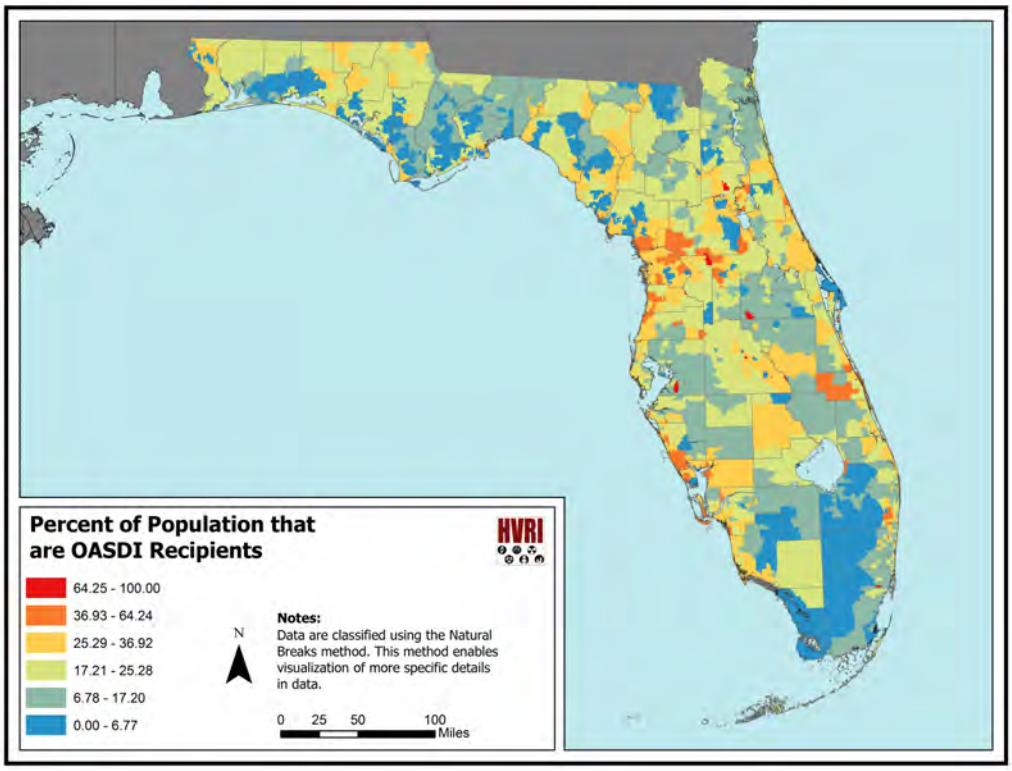

Figure T2-57: Medical Vulnerability based on OASDI beneficiaries within the State of Florida

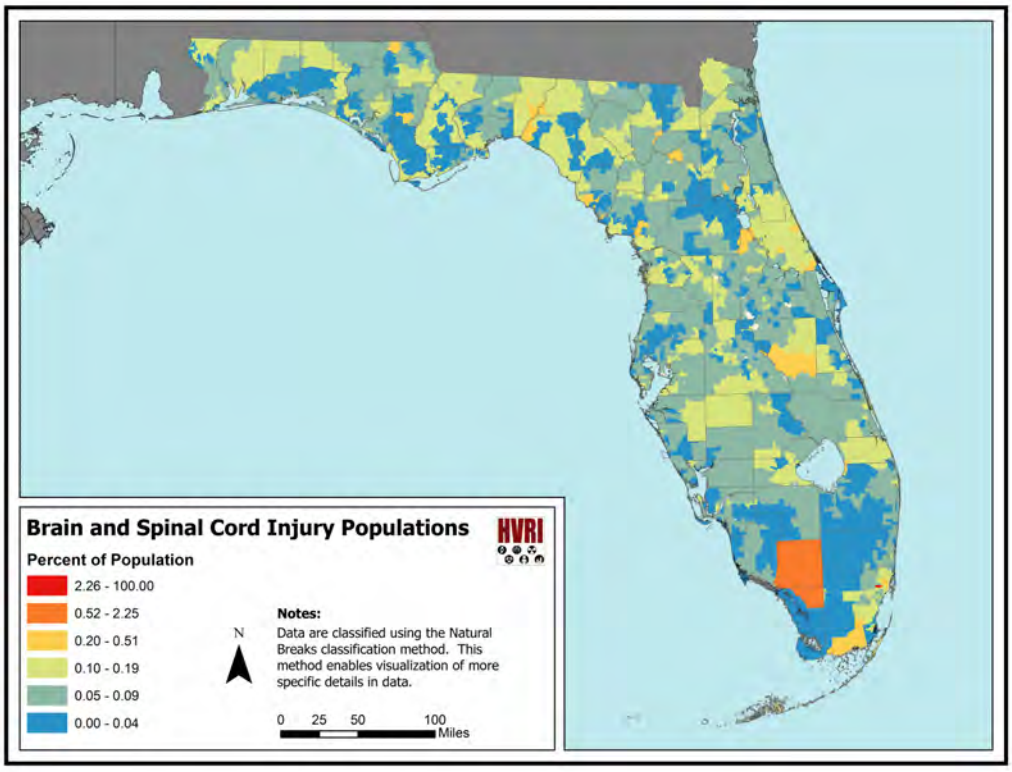

Figure T2-58: Medical Vulnerability based on brain and spinal cord injuries within the State of Florida

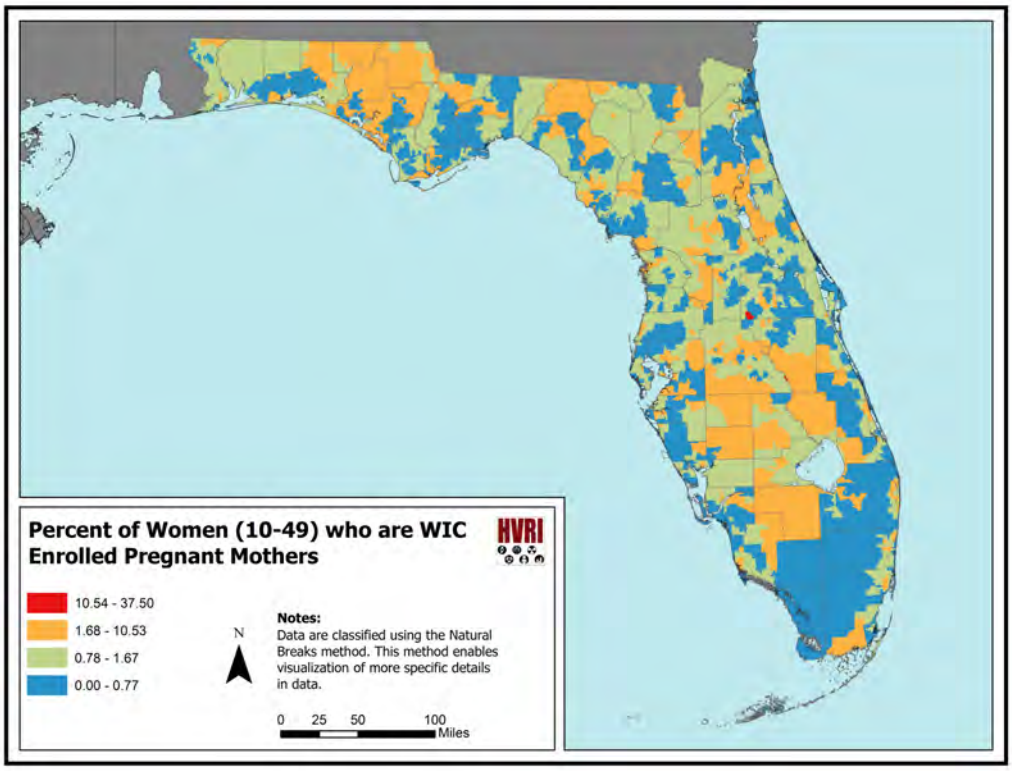

Figure T2-59: Medical Vulnerability based on WIC enrolled pregnant mothers within the State of Florida

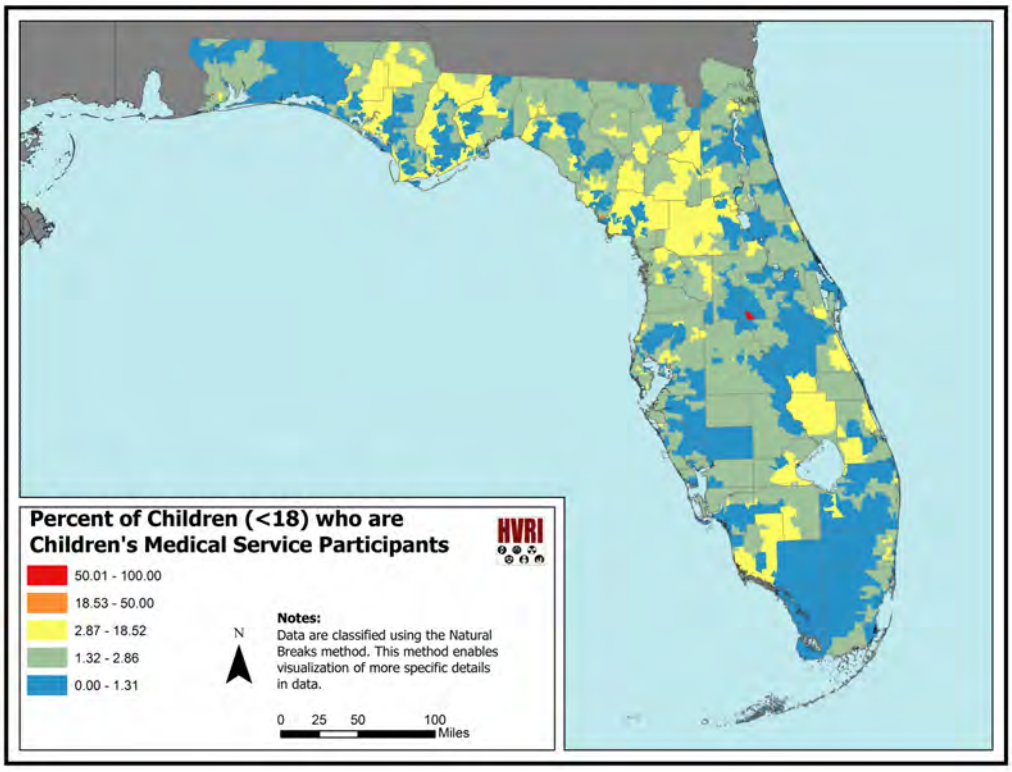

Figure T2-60: Medical Vulnerability based on children's medical service patients within the State of Florida

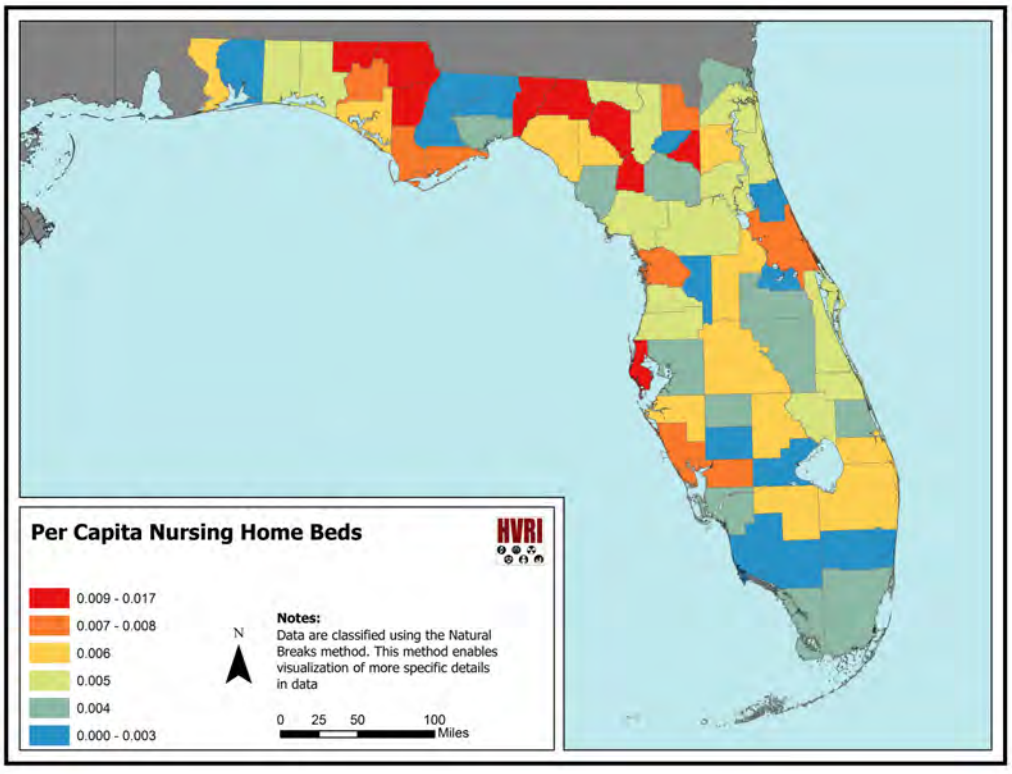

Figure T2-61: Medical Vulnerability based on per capita nursing home beds within the State of Florida

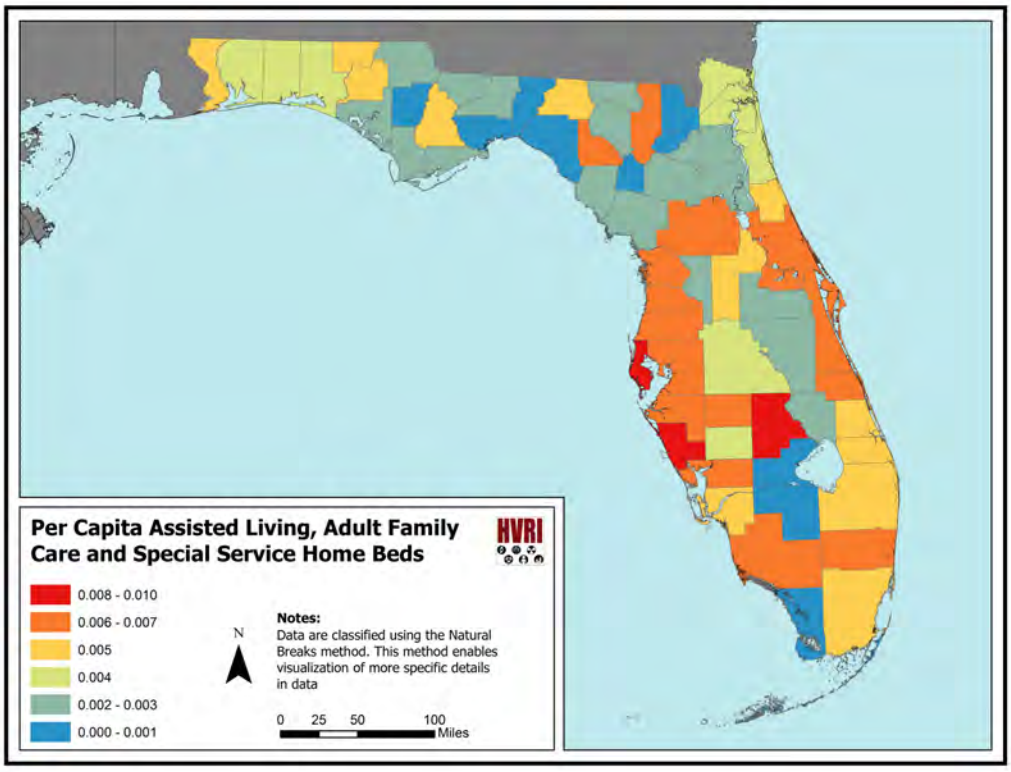

Figure T2-62: Medical Vulnerability based on per capita assisted living beds within the State of Florida

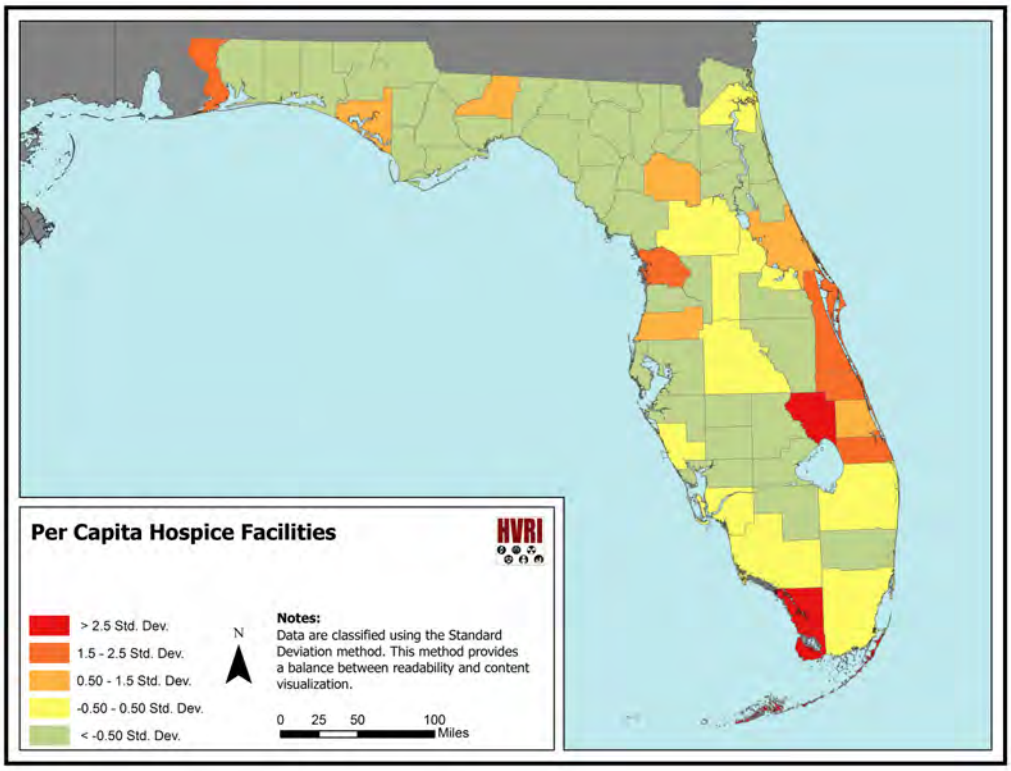

Figure T2-63: Medical Vulnerability based per capita hospice facilities within the State of Florida

Task 2 - Appendix 1 – Technical Appendix

The methods described here summarize all steps taken in the construction of a variant of Morath's (2010) Medical Vulnerability Index (MedVI) for the Florida Department of Health at the tract level for Florida. This report, divided into 3 sections, outlines each major component of these methods, including:

6. Sources of Data
7. Calculation of the MedVI Variables
8. Calculation of Tract-level MedVI Score

Sources of Data

Data used in the construction of MedVI for the State of Florida are collected from several sources as per the data type and information necessary to represent medical need, healthcare access, and capacity. **Table T2-A1** below provides the description and source for all spatial and tabular data acquired during the construction process.

Table T2-A4: Sources and descriptions of data*

Variable Name	Influence on MedVI	Description	Geography	Source	URL/Contact
QUNINSUR	+	% of the population under age 65 that is uninsured	County	FLDOH Vulnerable Population Profiles	http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html
QMEDICAID	+	% of the population enrolled in Medicaid	County	FLDOH Vulnerable Population Profiles	http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html
QDEV_DIS	+	% of the population that is developmentally disabled	County	FLDOH Vulnerable Population Profiles	http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html
QDIST_CHD	+	% of children that are seriously emotionally disturbed	County	FLDOH Vulnerable Population Profiles	http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html
QMENTILL	+	% of adults that with a serious mental illness	County	FLDOH Vulnerable Population Profiles	http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html
QO2	+	% of the population that is oxygen dependent	County	FLDOH Vulnerable Population Profiles	http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html
QALZHEIM	+	% of the population aged 65 and over with probable Alzheimer's Disease	County	FLDOH Vulnerable Population Profiles	http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html
QELDERA	+	% of the population aged 65 and over that live alone	County	FLDOH Vulnerable Population Profiles	http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html
QLOWHLTH	+	% of adults who reported their overall health as "fair" or "poor"	County	Florida CHARTS BRFSS Data	http://www.floridacharts.com/charts/brfss.aspx
QDIAB	+	% of adults with diagnosed diabetes	County	Florida CHARTS BRFSS Data	http://www.floridacharts.com/charts/brfss.aspx
QASTHMA	+	% of adults that currently have asthma	County	Florida CHARTS BRFSS Data	http://www.floridacharts.com/charts/brfss.aspx

QHEART	+	% of adults that have ever had a heart attack, angina, or coronary heart disease	County	Florida CHARTS BRFSS Data	http://www.floridacharts.com/charts/brfss.aspx
QHYPERTENS	+	% of adults with diagnosed hypertension	County	Florida CHARTS BRFSS Data	http://www.floridacharts.com/charts/brfss.aspx
QARTH	+	% of adults who are limited in any way in any usual activities because of arthritis or chronic joint symptoms	County	Florida CHARTS BRFSS Data	http://www.floridacharts.com/charts/brfss.aspx
QLBW	+	% of babies born with low birth weight	County	Florida CHARTS Birth Query System	http://www.floridacharts.com/FLQUERY/Birth/BirthRpt.aspx
VCRIMEPC	+	Violent crime offenses per capita	County	Florida Dept. of Law Enforcement	http://www.fdle.state.fl.us/Content/getdoc/8c4ed844-de81-4551-a10e-7eb31e76def0/UCR-Offense-Data.aspx
DVIOL_PC	+	Domestic violence offenses per capita	County	Florida Dept. of Law Enforcement	http://www.fdle.state.fl.us/Content/FSAC/Menu/Data---Statistics-(1)/UCR-Domestic-Violence-Data.aspx
ZAccess	+	Standardized community healthcare access score (Zscore)	County	County Health Rankings	http://www.countyhealthrankings.org/rankings/ranking-methods/download-rankings-data/FL
ZQuality	+	Standardized community healthcare quality score (Zscore)	County	County Health Rankings	http://www.countyhealthrankings.org/rankings/ranking-methods/download-rankings-data/FL
NHB_PC	+	Nursing home beds per capita	County	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
ALF_BPC	+	Assisted living, adult family care, and special service home facility beds per capita	County	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
HSPCE_PC	+	Hospice facilities per capita	County	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
HHA_PC	-	Home health agency facilities per capita	County	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
HCS_PC	-	Homemaker and companion service facilities per capita	County	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
501c3PC	-	Net funds for all 501(c)3 "other" health care organizations per capita in county	County	Urban Institute - National Center for Charitable Statistics	http://nccs.urban.org/statistics/index.cfm
MUA_CNTY	+	Medically underserved area (0 or 1)	County	Health and Human Services - Health Resources and Service Administration	http://muafind.hrsa.gov/index.aspx
MUP_CNTY	+	Medically underserved population (0 or 1)	County	Health and Human Services - Health Resources and Service	http://muafind.hrsa.gov/

				Administration	
HPSAM_CNTY	+	Health Practitioner Shortage Area - Mental (0 or 1)	County	Health and Human Services - Health Resources and Service Administration	http://hpsafind.hrsa.gov/HPSASearch.aspx
HPSAP_CNTY	+	Health Practitioner Shortage Area - Primary (0 or 1)	County	Health and Human Services - Health Resources and Service Administration	http://hpsafind.hrsa.gov/HPSASearch.aspx
Cert_Cnty	-	CERT score based on min/scaling and addition of Cert_Train, Cert_Ex, and Cert_Act at the County and Zip levels	County	Community Emergency Response Team website	http://www.citizencorps.gov/cc/CertIndex.do?reportsForState&cert=&state=FL
QDISAB	+	% of the population that are OASDI Disability recipients	ZCTA	Social Security Administration	http://www.ssa.gov/policy/docs/statcomps/oasdi_zip/index.html
QCMS	+	% of children that are Children's Medical Services clients	ZCTA	FLDOH	Contact: Robert Maiden, Robert_Maiden@doh.state.fl.us
QBRNSP	+	% of the population with and brain or spinal cord injury	ZCTA	FLDOH	Contact: 'Jide Thomas, Olajide_Thomas@doh.state.fl.us
QPREG	+	% of women aged 10-49 that are WIC enrolled pregnant mothers	ZCTA	FLDOH	Contact: 'Jide Thomas, Olajide_Thomas@doh.state.fl.us
QDIALYS	+	% of the population that are dialysis clients	ZCTA	FLDOH	Contact: Robert Maiden, Robert_Maiden@doh.state.fl.us
AVComPop	+	Per Capita average number of water borne communicable diseases 2009-2011	ZCTA	Florida Communicable Disease Frequency Reports	http://www.floridacharts.com/merlin/freqrpt.asp
Cert_Zip	-	CERT score based on addition of Cert Training, Exercises, and Activations at the County and Zip levels	ZCTA	Community Emergency Response Team website	http://www.citizencorps.gov/cc/CertIndex.do?reportsForState&cert=&state=FL
HPSAM_ZIP	+	Health Practitioner Shortage Area - Mental (0 - 1)	ZCTA	Health and Human Services - Health Resources and Service Administration	http://hpsafind.hrsa.gov/HPSASearch.aspx
GERRatNEA	-	Ratio of number of geriatric physicians within 30 minute drive time to population over age 65	ZCTA	FLDOH Practitioner Profile Information	http://ww2.doh.state.fl.us/IRM00profiling/searchform.ASP
EMRatNEA	-	Ratio of number of emergency medicine physicians within 30 minute drive time to total population	ZCTA	FLDOH Practitioner Profile Information	http://ww2.doh.state.fl.us/IRM00profiling/searchform.ASP
OBRatNEA	-	Ratio of number of obstetricians within 30 minute drive time to number of females in child bearing age (10-49)	ZCTA	FLDOH Practitioner Profile Information	http://ww2.doh.state.fl.us/IRM00profiling/searchform.ASP

PedRatNEA	-	Ratio of number of pediatricians within 30 minute drive time to number of children under age 18	ZCTA	FLDOH Practitioner Profile Information	http://ww2.doh.state.fl.us/IRM00profiling/searchform.ASP
PrimRatNEA	-	Ratio of primary care physicians within 30 minute drive time to total population	ZCTA	FLDOH Practitioner Profile Information	http://ww2.doh.state.fl.us/IRM00profiling/searchform.ASP
MUA_TR	+	Medically underserved area (0 or 1)	Tract	Health and Human Services - Health Resources and Service Administration	http://muafind.hrsa.gov/index.aspx
MUP_TR	+	Medically underserved population (0 or 1)	Tract	Health and Human Services - Health Resources and Service Administration	http://muafind.hrsa.gov/
HPSAM_TR	+	Health Practitioner Shortage Area - Mental (0 or 1)	Tract	Health and Human Services - Health Resources and Service Administration	http://muafind.hrsa.gov/
HPSAP_TR	+	Health Practitioner Shortage Area - Primary (0 or 1)	Tract	Health and Human Services - Health Resources and Service Administration	http://muafind.hrsa.gov/
FQHC_Rat	-	Ratio of Federally Qualified Health Centers within 30 minute drive time to poverty population	Tract	Health Resources and Services Administration	http://findahealthcenter.hrsa.gov/Search_HCC.aspx?byCounty=1
HB_Rat	-	Ratio of count of Hill Burton Facilities within 30 minute drive time and poverty population	Tract	Health Resources and Services Administration	http://www.hrsa.gov/gethealthcare/affordable/hillburton/facilities.html
RHC_Rat	-	Ratio of count of Rural Health Centers within 30 minute drive time of tract centroid and total population	Tract	FLDOH	Contact: Carla Ruis. Also available from AHCA (http://www.floridahealthfinder.gov/facilitylocator/ListFacilities.aspx)
EMT_Rat	-	Ratio of EMT counts based urban or rural tract class to total population	Tract	Individual County EMS Websites	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
Card_Rat	-	Ratio of count of hospitals specializing in emergency cardiac services within 8:59 or 15 minutes of tract centroid to total population	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
Strk_Rat	-	Ratio of Count of hospitals specializing in emergency stroke services within 8:59 or 15 minutes of tract centroid to total population	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx

Peds_Rat	-	Ratio of Count of hospitals specializing in emergency pediatric services within 8:59 or 15 minutes of tract centroid to population under age 18	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
Mat_Rat	-	Ratio of Count of hospitals specializing in maternal cardiac services within 8:59 or 15 minutes of tract centroid to female population of child bearing age	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
TL12_Rat	-	Ratio of Count of hospitals specializing in trauma level 1 or level 2 services within 8:59 or 15 minutes of tract centroid to total population	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
Men_Rat	-	Ratio of Count of hospitals specializing in mental health services within or 15 minutes of tract centroid to total population	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
Hosp_Rat	-	Ratio of Count of all hospitals within 30 minutes of tract centroid to total population	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
Brn_Rat	-	Ratio of Count of hospitals specializing in burn services within 8:59 or 15 minutes of tract centroid to total population	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
CHC_Rat	-	Ratio of count of County Health Clinics within 30 minute drive time of tract centroid to total population in 2010	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx
FAC_Rat	-	Ratio of count of Free Health Care Clinics within 30 minute drive time of tract centroid to poverty population in 2010	Tract	Florida Agency for Healthcare Administration	http://www.floridahealthfinder.gov/facilitylocator/facloc.aspx

Calculation of the MedVI Variables

Raw data from the sources cited above were imported into Microsoft Excel for processing and standardization. A standard variable naming convention was borrowed from the SoVI methodology, where the prefix 'Q' represents a percentage of a population, and the suffix '_PC' represents a per capita measure. For other indicators that represent a calculated population ratio, the suffix 'R' or 'Rat' was used to make this distinction when naming the variables. For each variable listed above, the standardization process involved dividing the count of the subpopulation of interest by total population, or the total population of a group (such as those aged over 65 or less than age 18). This process is amenable to using simple population counts because it controls for urban and rural phenomena in

addition to count inflation in places with a larger geographic area. For each variable where a universe population was not supplied by the source, population and group totals were supplemented using the 2010 Census Summary File 1. For data targeted to the elderly or geriatric population, the total population aged 65 and over was used (e.g. QALZHEIM). For variables involving youth or children, the total population aged under 18 was used (e.g. QDIST_CHD). Finally, for variables describing women of child bearing ages (e.g. QPREG), we selected the inclusive range of females aged 10-49, defined by NAPHSIS' (2012) statistical measure and definition for calculating total fertility rate. Some variables did not require standardization, either because it was already provided as a percentage of the population (i.e. Florida CHARTS data), or because the data did not lend itself to further manipulation (County Health Rankings data, for example, is provided as a z-score).

Certain variables described in the above table required the calculation of a drive time to determine accessibility. These variables included access to specialized medical facilities and licensed healthcare professionals. Drive times were calculated using ArcGIS Network Analyst's Origin-Destination (O-D) Cost Matrix, an algorithm that computes a table containing the total impedance from a set of origin locations to a set of destinations. Origin and Destination points were determined using the spatial locations of medical facilities and healthcare professionals. For medical facilities, point locations were derived by geocoding individual physical addresses. To represent an average accessibility from each enumeration unit, the spatial centroid of each census tract was calculated using ArcMap and physically 'snapped' to the nearest major highway. Drive times were determined between each origin point (tract centroids) and destination point (medical facilities) using the existing road network. To determine access to specialized medical professionals, physical locations were approximated using the physicians' zip code. To maintain spatial parity, origin locations for these variables unit were determined using ZCTA centroids rather than census tracts. The results of the O-D matrix produced a count of facilities within a given drive-time threshold. Thresholds were determined to capture the differences in urban and rural locales and emergent and non-emergent medical care. For Urban zip codes and census tracts, an 8 minute and 59 second drive time was used to determine access to emergent care facilities (Fitch 2005). For rural places, this threshold is extended to 15 minutes for emergent care (Price 2006). Non-emergent care, regardless of urban/rural status, is considered to be accessible within a thirty minute drive time (Bosanac et al. 1976). Variables representing access to physicians were determined using this non-emergent threshold.

Data Caveats

During the calculation and standardization of each MedVI variable, several exceptional cases were realized that required special attention for processing the data. These cases are itemized in the following notes:

1. For the raw data representing medically underserved areas and populations (i.e. MUA_COUNTY, MUP_COUNTY, MUA_TRT, and MUP_TRT), some areas were identified by Minor Civil Division Code, which is not recognized geography in Florida. Since these physical locations could not be reconciled, some data could not be included in the final analysis.
2. For several per capita and ratio variables, the census population of the enumeration unit equaled 0, while the estimated subpopulation (dialysis clients, or brain/spine patients for example) was greater than 0. For these and other instances where the value of the subpopulation was greater than the census population count, the calculated variable was set equal to 100 percent (or 1.0 for per capita measures). However, these units were these excluded from the min/max rescaling (described in the following section), and set manually to

the maximum scale value of 1.0 to avoid skewing the normalization. This caveat affected cases in the following variables: QDISAB, QBRNSP, and QDIALYS.

3. For variables representing a ratio of physicians to a patient subpopulation some units had a ratio greater than 1. In these instances, the calculated ratio was preserved, but was excluded from normalization using the method described above. Affected variable include GerRatNEA, EMRatNEA, OBRatNEA, PedRatNEA, PrimRatNEA.
4. For the calculation of FQHC_Rat, some tracts had a calculated ratio of FQHCs to population in poverty that was greater than 1. In these cases, the ratio was not altered, but was excluded from normalization as described in #3 above.
5. For the calculation of EMT_Rat, some tracts had a calculated ratio of EMTs to total population that was greater than 1. In these cases, the ratio was not altered, but was excluded from normalization as described in #3 above.
6. For some hospital accessibility variables, some tracts had a census population of 0 while having a total number of accessible hospitals > 0. In these cases, the ratio was set equal to zero. However, these units were excluded from the min/max rescaling as described in #3. These variables included: Card_Rat, Strk_Rat, Peds_Rat, Mat_Rat, TL12_Rat, Men_Rat, Hosp_Rat, and Brn_Rat.
7. For the variable HPSAM_ZIP, prisons and health centers were located and the zip code of the facility was used in the analysis.
8. Any physician with a restricted license was excluded from the access analyses and subsequent variable calculations.

Calculating the MedVI Score

To aggregate the 61 indicators in a final MedVI Score, each variable was first normalized[1] using min-max rescaling with the following equation:

(N – minimum value) / (maximum value – minimum value)

This normalization process, completed in Microsoft Excel, resulted in a set of values scaled between 0 and 1, producing a comparable range for each variable. This is beneficial, not only for aggregating the variables for the final index, but also preserving equal weight among each variable when calculating the MedVI score. Finally, this normalization method ranks the data in relative terms, allowing users to evaluate and compare and variable within a given area, and easily determine how each variable contributes to the aggregate index score after variables are combined. Normalized variables are denoted in the final dataset using the letter 'MM'. It is important to note here that several variables represented binary phenomena, and did not require rescaling: MUA_CNTY, MUP_CNTY, MUA_TR, MUP_TR, HPSAM_CNTY, HPSAP_CNTY, HPSAM_ZIP, HPSAM_TR, and HPSAP_TR. In general these variables simply determine whether an area is or is not underserved.

The normalized variables were summed based on their conceptual influence on medical vulnerability. If the variable illustrated increased medical need, low healthcare access, or diminished capacity, the variable was added to represent an increase in medical vulnerability. On the other hand, if a variable represented high healthcare access, capacity, or extraordinary resources, the variable was subtracted to indicate a reduction in overall medical vulnerability. Calculations were first performed

[1] See Data Caveats above.

separately for data at the county, zip code, and census tract level, and then combined to produce the overall MedVI score for Florida.

This produced to following equation for Florida MedVI score:

Florida MedVI =
(MUA_CNTY) + (MUP_CNTY) -(CERT_CNTY) + (HPSAM_CNTY) + (HPSAP_CNTY) +(MMQUNINSUR) + (MMQMEDICAI) + (MMQDEV_DIS) + (MMQDIST_CH) + (MMQMENTILL) + (MMQO2) + (MMQALZHEIM) + (MMQELDERA) + (MMQLOWHLTH) + (MMQDIAB) + (MMQASTHMA) + (MMQHEART) + (MMQHYPERTE) + (MMQARTH) + (MMQLBW) + (MMVCRIMEPC) + (MMDVIOL_PC) + (MMAccess) + (MMQuality) + (MMNHB_PC) + (MM_ALFBPC) + (MMHSPCEPC) - (MMHHA_PC) - (MMHCS_PC) -(MM501c3PC) + (Com_Zip) + (CERT_ZIP) + (HPSAM_ZIP) - (GerMMNEA) - (EMMMNEA) - (OBMMNEA) - (PedMMNEA) - (PrimMMNEA1) + (MMQDISAB) + (MMQBRNSP) + (MMQPREG) + (MMQCMS) + (MMQDIALYS_1) + (MUA_TR) + (MUP_TR) + (HPSAM_TR) + (HPSAP_TR) - (FQHCMMTrct) - (HBMMTrct) - (RHCMMtrct) - (EMTMMtrct) - (CardMMTr) - (StrkMMTr) - (PedsMMTr) - (MatMMTr) - (Tl12MMTr) - (MenMMTr) - (HospMMTr) - (BurnMMTr) - (CHCMMTr) - (FACMMTr)

Calculations were performed in ArcMap using the 'field calculator' function. MedVI scores were spatially joined to their respective geography for visualization. **Figure T2-A1** below shows the distribution of medical vulnerability using standard deviation classification.

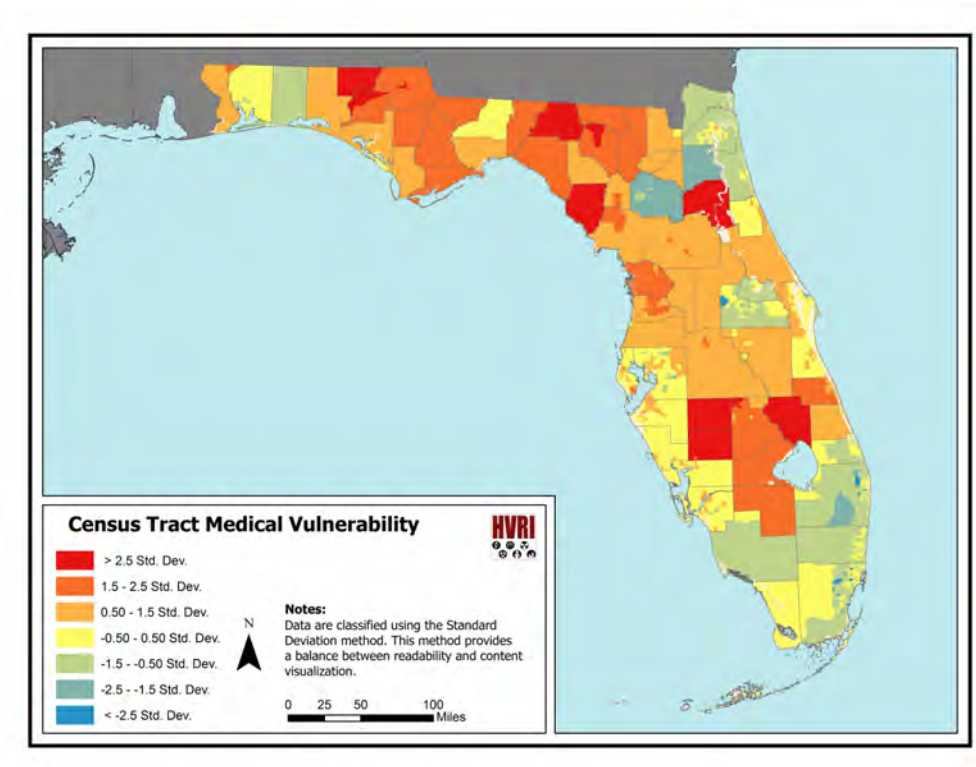

Figure T2-A1: Medical Vulnerability in Florida

References and Further Readings

Aday, L. A. (1994). Health status of vulnerable populations. *Annual Review of Public Health* **15**: 487-509.

Aday, L. A. (2001). At risk in America: The health and health care needs of vulnerable populations in the United States. San Francisco, CA: Jossey-Bass.

Bosanac, E.M., Hyg, M.S., Parkinson, R.C. and D.S.Hall. (1976). Geographic Access to Hospital Care: A 30-minnute Travel Time Standard. *Medical Care* 14(7): 616-624.

Fitch ,J. 2005. Response times: myths, measurement & management," Journal of Emergency Medical Services 30(9): 47–56.

FLDOH Key Indicators. (xxxx). Measuring Access to Health Care in Florida. Accessed July 10, 2012 from http://www.doh.state.fl.us/recruit/PDFFiles/pt3-BuildingHealthCareAccess14-24.pdf

FLDOH (2012). Vulnerable Populations. Florida Department of Health. Accessed March 30, 2012 from http://www.doh.state.fl.us/demo/bpr/VulnerablePopulations.html

Morath, D.P. (2010). Social vulnerability and public health: Developing a metric for medical emergency management. Master's Thesis. University of South Carolina, Columbia SC. Accessed January 5, 2012 from http://webra.cas.sc.edu/hvri/education/docs/Dan_Morath_2010.pdf

National Association for Public Health Statistics and Information Systems (NAPHSIS). (2012). Training Resource: Statistical Measures and Definitions. Available at: http://www.naphsis.org/index.asp?bid=1135

Price, L. 2006. Treating the clock and not the patient: ambulance response times and risk. *Quality and Safety in Health Care* 15: 127-130.

Task 3 – Hazard Vulnerability

Background

One of the first attempts at multi-hazard analysis utilized frequency and magnitude as common characteristics in an investigation that tabulated atmospheric, biologic, geologic, and hydrologic hazards for a specific region in southwestern Ontario (Hewitt and Burton, 1971). This study began a long standing discussion about the identification and use of thresholds for identifying appropriate inclusion of hazards into "assessments" and "analyses". Since then, a variety of measureable outcomes such as property damage, mortality and injury, and disruption of services has been utilized as a set of characteristics used either independently or in some combination to understand hazard impacts and losses.

Utilizing the building blocks laid by Hewitt and Burton and strengthened by countless other hazards researchers, FEMA began dissemination of hazard-mitigation actions in the mid-1990s through its Project Impact program. Since that time, FEMA has implicitly backed the use of multi-hazard analysis in arguing that risk-reduction measures from various hazards should be compatible (FEMA, 1997). In 2000, FEMA formalized its support of multi-hazard analysis as part of the planning process included in the Disaster Mitigation Act of 2000. This act continues to require states and counties to update mitigation plans on a three year cycle in order to be eligible for Hazard Mitigation Grant Program (HMGP) funding.

Multiple research efforts have focused on methodological approaches for assessing multi-hazard risk and vulnerability. In 1997 the Hazards Research Laboratory at the University of South Carolina detailed a geospatial method for place-based vulnerability assessment (Cutter et al, 1997). The National Oceanic and Atmospheric Administration's Coastal Services Center followed this effort in its production of a GIS-based software solution called the community vulnerability assessment (CVA) tool. The CVA implemented a methodology for combining hazards according to characteristics of area of impact, frequency, and potential damage magnitude (Flaxet al, 2002).

GIS was used more recently to conduct a statewide multi-hazard analysis for Kentucky (Simpson and Human, 2008). GIS is also used by the Global Natural Disaster Risk Hotspots project undertaken by the World Bank and Columbia University (Dilley, 2006). Here, hazard frequency and probability data are used to produce a spatial surface of mortality and economic-loss risk to develop a multi-hazard risk index.

A long standing set of literature describing and conceptualizing approaches for measuring and modeling hazards and vulnerability including many works on the development of indicators, metrics, and risk assessments informs the direction and content of this work (Birkmann, 2006; 2007; Birkmann and Fernando, 2008; Cutter et al, 2003; Gruntfal et al, 2006). This project views the term hazard using a very wide yet simple definition – hazards are physical threats to lives and livelihoods. Following this concept, we describe a hazard assessment as a multipart process in which hazard threats are first identified and described and then appraised for their likelihood of occurrence.

Identifying and understanding that all hazards affecting a place, community, town, county, or some larger area have origins that depend heavily on the primary causal agent of the loss causing event.

Across the landscape one may find geophysical events such as earthquakes or volcanoes, meteorological threats such as hurricanes, hail, lightning, or tornadoes, or hydrological events like flooding. Developing an approach that can combine all of these diverse threats using one model or metric offers a unique challenge – one which geographic techniques can provide a solution. Many hazards, irrespective of the specific causal agent, share space as a common characteristic that enables comparison within and between places and hazards. These common characteristics include measures of areal extent, duration, frequency, intensity, magnitude, rate of onset, and temporal spacing (Cutter, 2005). FEMA has melded these characteristics into the term `hazard identification', and supports the use of these in the ``the process of defining and describing a hazard, including its physical characteristics, magnitude and severity, probability and frequency, causative factors, and locations/areas affected'' (FEMA, 1997, page xxv).

Commonalities between the aforementioned research into multi-hazard analyses include the use of hazard frequency and area of impact for hazard identification, compilation of property and crop losses as a proxy for human system exposure and impact, the incorporation of social vulnerability, the application of geospatial systems to perform analysis and display results, and examination at multiple levels of geography (from community through multinational scales).

The methodology utilized here builds on these efforts, through the aggregation of multiple hazards, use of a wider array of hazard characteristics and historical impacts, inclusion of the Social Vulnerability Index, the creation of a Medical Vulnerability Index, and implementation in a GIS framework at the US county scale. The overall goal is to produce a descriptive product (maps) that displays the spatial variation in hazard characteristics, social vulnerability, and medical vulnerability in a product easily understood by emergency managers.

Methodology

The Hazards of Place conceptual framework serves as the methodological foundation for the integrated approach used in this product. Here the hazard potential of a place is uniquely tied to its geographic setting and social context to produce biophysical, medical and social vulnerability, which combine to produce the total vulnerability of a place (Cutter 1996). Interaction between the biophysical, medical, and social dimensions can serve either to amplify or to reduce overall vulnerability. Implementation of the hazards of place model was first performed in a study of Georgetown County, South Carolina (Cutter et al. 2000). GIS surfaces of multi-hazard frequency and social vulnerability were combined to assess the spatial variability in place vulnerability. The methodology continues to be refined to restrict the frequency analysis to damaging hazard events, spatially disaggregate historical economic losses, and apply new methods for the assessment of social vulnerability (Tate et al. 2010). This refined methodology was applied to develop the biophysical and social vulnerability geospatial datasets for the state of Florida.

Biophysical vulnerability is assessed at both the county and sub-county levels through the calculation of hazard frequency for sixteen different hazard events (table xxx). The individual hazard frequency maps join to create an aggregate multi-hazard frequency surface. Social vulnerability to hazards is assessed using the Social Vulnerability Index (Cutter et al. 2003). Additionally, a medical vulnerability index is built out for the state utilizing seminal work by Morath (2010). The multi-hazard frequency, social vulnerability, and medical vulnerability surfaces spatially combine to generate a representation of place vulnerability. This procedure is repeated for each of the 67 Florida counties. The resulting maps of multi-

hazard, social, medical, and place vulnerability may be overlain with the civic, critical infrastructure, and hazard-specific event layers to provide context and a more robust and informed mapping effort for vulnerability assessment.

Results and Findings

Figures T3-1 through T3-16 provide a visual depiction of the spatial extent of the sixteen different natural hazards used in this assessment. Following each map are two tables specifying first the percentage of census tracts within each county that intersect each hazard zone and second the total population in these vulnerable counties by hazard vulnerability classification.

Flood Hazards

Figure T3-1 show the areal extent of 100- and 500- year flood zones for the state. Not surprisingly, a majority of Palm Beach, Miami-Dade, and Monroe counties in Southern Florida have a high flood risk. Additionally, portions of the big bend area of the state including Gulf, Franklin, Wakulla, Liberty. Taylor, Dixie, and Lafayette Counties are also very flood prone. It is important to note that those tracts within the 500 year flood zone are also within the 100 year flood zone. The tables specifying tracts and populations in regards to the 500-year flood zone (tables T3-1 - T3-4) do not include the 100 year flood zone populations because planning efforts may differ between these two populations.

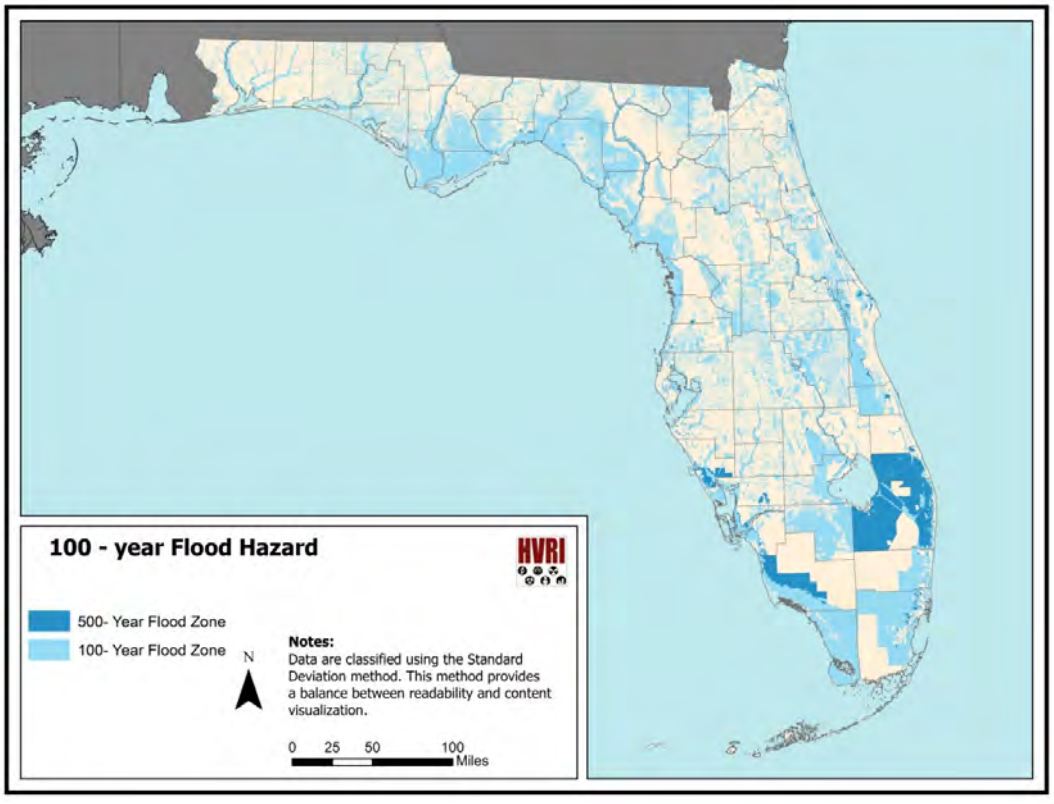

Figure T3-1: 100- and 500- Year Flood Hazard Zones for the State of Florida

Table T3-1: Percentage of census tracks per county by HazVI – 100 Year Flood classification

County Name	100 Year Flood Hazard Vulnerability		County Name	100 Year Flood Hazard Vulnerability	
	Out	In		Out	In
Alachua	1.79%	98.21%	Lee	17.47%	82.53%
Baker	0.00%	100.00%	Leon	1.47%	98.53%
Bay	0.00%	100.00%	Levy	0.00%	100.00%
Bradford	0.00%	100.00%	Liberty	0.00%	100.00%
Brevard	5.31%	94.69%	Madison	0.00%	100.00%
Broward	4.99%	95.01%	Manatee	15.38%	84.62%
Calhoun	0.00%	100.00%	Marion	4.76%	95.24%
Charlotte	0.00%	100.00%	Martin	11.76%	88.24%
Citrus	10.71%	89.29%	Miami-Dade	5.98%	94.02%
Clay	3.33%	96.67%	Monroe	3.33%	96.67%
Collier	31.51%	68.49%	Nassau	0.00%	100.00%
Columbia	0.00%	100.00%	Okaloosa	4.88%	95.12%
De Soto	0.00%	100.00%	Okeechobee	0.00%	100.00%
Dixie	0.00%	100.00%	Orange	4.83%	95.17%
Duval	12.14%	87.86%	Osceola	2.44%	97.56%
Escambia	22.54%	77.46%	Palm Beach	38.10%	61.90%
Flagler	15.00%	85.00%	Pasco	8.27%	91.73%
Franklin	0.00%	100.00%	Pinellas	20.49%	79.51%
Gadsden	0.00%	100.00%	Polk	4.55%	95.45%
Gilchrist	0.00%	100.00%	Putnam	0.00%	100.00%
Glades	0.00%	100.00%	Santa Rosa	0.00%	100.00%
Gulf	0.00%	100.00%	Sarasota	27.27%	72.73%
Hamilton	0.00%	100.00%	Seminole	0.00%	100.00%
Hardee	0.00%	100.00%	St Johns	11.70%	88.30%
Hendry	0.00%	100.00%	St Lucie	2.33%	97.67%
Hernando	0.00%	100.00%	Sumter	5.26%	94.74%
Highlands	11.11%	88.89%	Suwannee	0.00%	100.00%
Hillsborough	9.72%	90.28%	Taylor	0.00%	100.00%
Holmes	0.00%	100.00%	Union	0.00%	100.00%
Indian River	10.00%	90.00%	Volusia	11.50%	88.50%
Jackson	0.00%	100.00%	Wakulla	0.00%	100.00%
Jefferson	0.00%	100.00%	Walton	0.00%	100.00%
Lafayette	0.00%	100.00%	Washington	0.00%	100.00%
Lake	0.00%	100.00%			

Table T3-2: County total populations by HazVI – 100 Year Flood classification

County Name	100 Year Flood Hazard Vulnerability		County Name	100 Year Flood Hazard Vulnerability	
	Out	In		Out	In
Alachua	4,622	242,714	Lee	119,095	499,659
Baker	0	27,115	Leon	2,932	272,555
Bay	0	168,852	Levy	0	40,801
Bradford	0	28,520	Liberty	0	8,365
Brevard	30,403	512,966	Madison	0	19,224
Broward	83,601	1,664,465	Manatee	45,759	277,074
Calhoun	0	14,625	Marion	10,934	320,364
Charlotte	0	159,978	Martin	14,853	131,465
Citrus	5,580	135,656	Miami-Dade	131,958	2,361,169
Clay	2,094	188,771	Monroe	20	73,070
Collier	139,385	182,135	Nassau	0	73,314
Columbia	0	67,531	Okaloosa	5,974	174,848
De Soto	0	34,862	Okeechobee	0	39,996
Dixie	0	16,422	Orange	34,039	1,111,917
Duval	84,409	779,854	Osceola	6,691	261,994
Escambia	53,826	243,793	Palm Beach	510,520	808,942
Flagler	17,734	77,962	Pasco	34,254	430,443
Franklin	0	11,549	Pinellas	171,912	744,630
Gadsden	0	46,389	Polk	18,168	583,927
Gilchrist	0	16,939	Putnam	0	84,211
Glades	0	12,884	Santa Rosa	0	180,192
Gulf	0	15,863	Sarasota	106,967	170,822
Hamilton	0	14,799	Seminole	0	151,372
Hardee	0	27,731	St Johns	45,433	334,015
Hendry	0	39,140	St Lucie	3,307	419,411
Hernando	0	172,778	Sumter	0	87,023
Highlands	10,928	87,858	Suwannee	0	41,551
Hillsborough	95,988	1,133,238	Taylor	0	22,570
Holmes	0	19,927	Union	0	15,535
Indian River	15,613	122,415	Volusia	46,775	447,818
Jackson	0	49,746	Wakulla	0	30,776
Jefferson	0	14,761	Walton	0	55,043
Lafayette	0	8,870	Washington	0	24,896
Lake	0	297,052			

Table T3-3: Percentage of census tracks per county by HazVI – 500 Year Flood classification

County Name	100 Year Flood Hazard Vulnerability		County Name	100 Year Flood Hazard Vulnerability	
	Out	In		Out	In
Alachua	58.93%	41.07%	Lee	39.16%	60.84%
Baker	0.00%	100.00%	Leon	39.71%	60.29%
Bay	37.21%	62.79%	Levy	55.56%	44.44%
Bradford	75.00%	25.00%	Liberty	0.00%	100.00%
Brevard	23.89%	76.11%	Madison	40.00%	60.00%
Broward	75.90%	24.10%	Manatee	26.92%	73.08%
Calhoun	0.00%	100.00%	Marion	60.32%	39.68%
Charlotte	50.00%	50.00%	Martin	2.94%	97.06%
Citrus	32.14%	67.86%	Miami-Dade	40.54%	59.46%
Clay	16.67%	83.33%	Monroe	43.33%	56.67%
Collier	26.03%	73.97%	Nassau	8.33%	91.67%
Columbia	16.67%	83.33%	Okaloosa	70.73%	29.27%
De Soto	0.00%	100.00%	Okeechobee	0.00%	100.00%
Dixie	0.00%	100.00%	Orange	76.33%	23.67%
Duval	41.62%	58.38%	Osceola	12.20%	87.80%
Escambia	50.70%	49.30%	Palm Beach	2.98%	97.02%
Flagler	35.00%	65.00%	Pasco	33.08%	66.92%
Franklin	0.00%	100.00%	Pinellas	28.28%	71.72%
Gadsden	22.22%	77.78%	Polk	85.06%	14.94%
Gilchrist	40.00%	60.00%	Putnam	10.53%	89.47%
Glades	0.00%	100.00%	Santa Rosa	2.70%	97.30%
Gulf	0.00%	100.00%	Sarasota	43.18%	56.82%
Hamilton	0.00%	100.00%	Seminole	12.00%	88.00%
Hardee	0.00%	100.00%	St Johns	26.60%	73.40%
Hendry	0.00%	100.00%	St Lucie	37.21%	62.79%
Hernando	6.82%	93.18%	Sumter	68.42%	31.58%
Highlands	22.22%	77.78%	Suwannee	14.29%	85.71%
Hillsborough	84.95%	15.05%	Taylor	0.00%	100.00%
Holmes	0.00%	100.00%	Union	66.67%	33.33%
Indian River	33.33%	66.67%	Volusia	41.59%	58.41%
Jackson	45.45%	54.55%	Wakulla	25.00%	75.00%
Jefferson	0.00%	100.00%	Walton	45.45%	54.55%
Lafayette	0.00%	100.00%	Washington	42.86%	57.14%
Lake	57.14%	42.86%			

Table T3-4: County total populations by HazVI – 500 Year Flood classification

County Name	100 Year Flood Hazard Vulnerability		County Name	100 Year Flood Hazard Vulnerability	
	Out	In		Out	In
Alachua	138,738	108,598	Lee	218,554	400,200
Baker	0	27,115	Leon	114,016	161,471
Bay	48,434	120,418	Levy	26,645	14,156
Bradford	20,885	7,635	Liberty	0	8,365
Brevard	140,467	402,902	Madison	8,671	10,553
Broward	1,329,608	418,458	Manatee	71,291	251,542
Calhoun	0	14,625	Marion	218,547	112,751
Charlotte	62,847	97,131	Martin	3,228	143,090
Citrus	39,853	101,383	Miami-Dade	973,885	1,519,242
Clay	19,416	171,449	Monroe	30,824	42,266
Collier	55,009	266,511	Nassau	7,237	66,077
Columbia	7,017	60,514	Okaloosa	103,040	77,782
De Soto	0	34,862	Okeechobee	0	39,996
Dixie	0	16,422	Orange	794,896	351,060
Duval	327,642	536,621	Osceola	35,063	233,622
Escambia	139,456	158,163	Palm Beach	32,881	1,286,581
Flagler	42,658	53,038	Pasco	157,316	307,381
Franklin	0	11,549	Pinellas	202,202	714,340
Gadsden	8,259	38,130	Polk	526,281	75,814
Gilchrist	6,429	10,510	Putnam	5,835	78,376
Glades	0	12,884	Santa Rosa	3,088	177,104
Gulf	0	15,863	Sarasota	146,469	131,320
Hamilton	0	14,799	Seminole	20,081	131,291
Hardee	0	27,731	St Johns	96,186	283,262
Hendry	0	39,140	St Lucie	134,858	287,860
Hernando	9,494	163,284	Sumter	66,269	20,754
Highlands	19,282	79,504	Suwannee	7,016	34,535
Hillsborough	1,049,026	180,200	Taylor	0	22,570
Holmes	0	19,927	Union	11,040	4,495
Indian River	46,502	91,526	Volusia	207,891	286,702
Jackson	20,860	28,886	Wakulla	8,867	21,909
Jefferson	0	14,761	Walton	22,225	32,818
Lafayette	0	8,870	Washington	7,161	17,735
Lake	166,540	130,512			

Hurricane Storm Surge Hazards

Although every coastal area of Florida is at risk to hurricane storm surge there are certain places that share an unequal portion of the overall burden. In addition to south Florida, the elevation along the west coast makes the areas from Gulf County south to Monroe County particularly vulnerable to the effects of hurricane storm surge (Figure T3-2). Of particular interest are the counties of Levy, Citrus, and Hernando in west central Florida, which have a large proportion of their population residing in census tracts within these storm surge zone (Table T3-6)

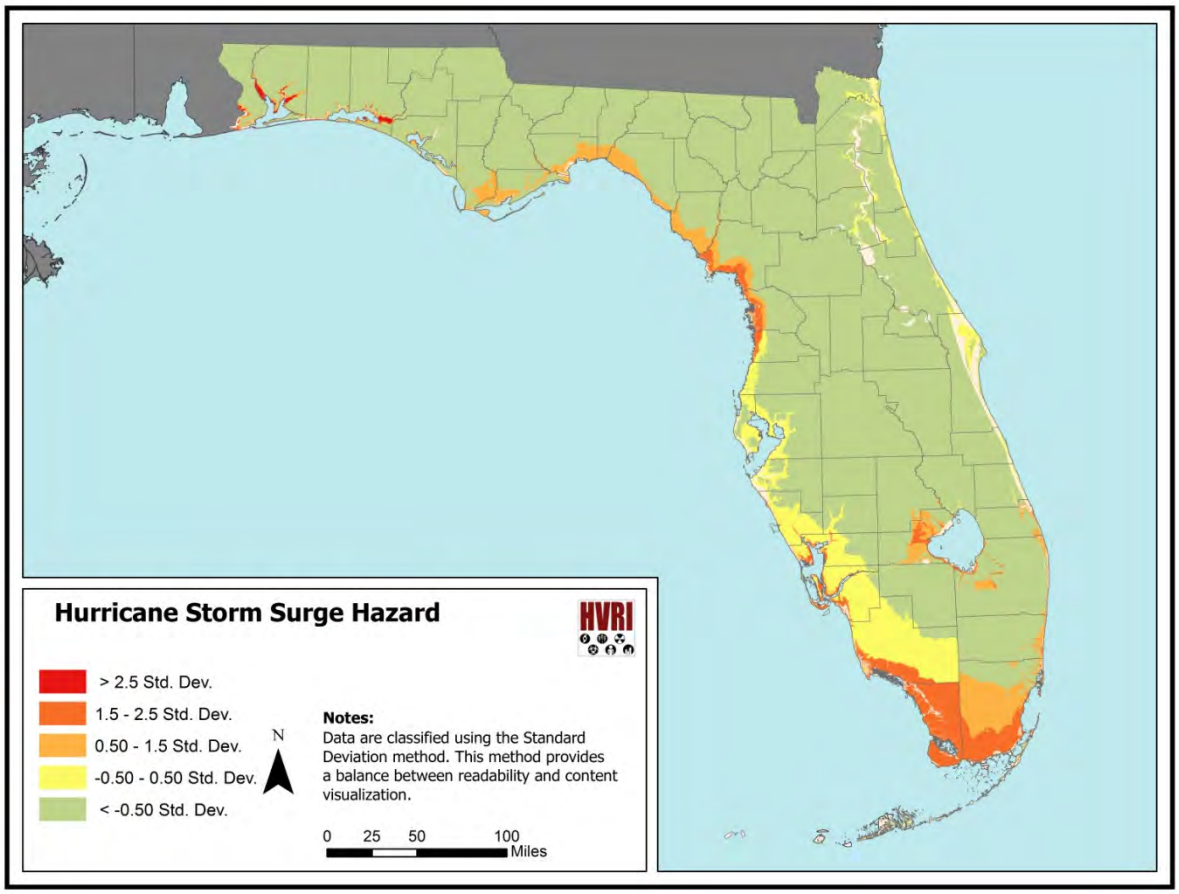

Figure T3-2: Hurricane Storm Surge Zones for the State of Florida

Table T3-5: Percentage of census tracks per county by HazVI – hurricane storm surge hazard standard deviation classification.

County Name	Hurricane Storm Surge Hazard Vulnerability			County Name	Hurricane Storm Surge Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	0.00%	43.37%	56.63%
Baker	100.00%	0.00%	0.00%	Leon	100.00%	0.00%	0.00%
Bay	9.30%	0.00%	90.70%	Levy	55.56%	0.00%	44.44%
Bradford	100.00%	0.00%	0.00%	Liberty	0.00%	0.00%	100.00%
Brevard	46.02%	53.98%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	48.48%	0.00%	51.52%	Manatee	6.41%	91.03%	2.56%
Calhoun	100.00%	0.00%	0.00%	Marion	95.24%	4.76%	0.00%
Charlotte	0.00%	7.89%	92.11%	Martin	11.76%	0.00%	88.24%
Citrus	60.71%	0.00%	39.29%	Miami-Dade	21.24%	0.00%	78.76%
Clay	33.33%	66.67%	0.00%	Monroe	3.33%	0.00%	96.67%
Collier	2.74%	41.10%	56.16%	Nassau	8.33%	91.67%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	21.95%	0.00%	78.05%
De Soto	0.00%	77.78%	22.22%	Okeechobee	27.27%	72.73%	0.00%
Dixie	33.33%	0.00%	66.67%	Orange	100.00%	0.00%	0.00%
Duval	42.20%	57.80%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	40.85%	0.00%	59.15%	Palm Beach	71.43%	0.00%	28.57%
Flagler	45.00%	55.00%	0.00%	Pasco	46.62%	53.38%	0.00%
Franklin	0.00%	0.00%	100.00%	Pinellas	23.36%	76.64%	0.00%
Gadsden	100.00%	0.00%	0.00%	Polk	100.00%	0.00%	0.00%
Gilchrist	60.00%	0.00%	40.00%	Putnam	15.79%	84.21%	0.00%
Glades	0.00%	0.00%	100.00%	Santa Rosa	8.11%	91.89%	0.00%
Gulf	0.00%	0.00%	100.00%	Sarasota	45.45%	54.55%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	4.00%	0.00%	96.00%
Hardee	66.67%	33.33%	0.00%	St Johns	6.38%	25.53%	68.09%
Hendry	0.00%	16.67%	83.33%	St Lucie	100.00%	0.00%	0.00%
Hernando	59.09%	34.09%	6.82%	Sumter	100.00%	0.00%	0.00%
Highlands	88.89%	0.00%	11.11%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	54.86%	45.14%	0.00%	Taylor	25.00%	0.00%	75.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	30.00%	70.00%	0.00%	Volusia	58.41%	41.59%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	0.00%	0.00%	100.00%
Jefferson	66.67%	0.00%	33.33%	Walton	45.45%	0.00%	54.55%
Lafayette	50.00%	0.00%	50.00%	Washington	85.71%	0.00%	14.29%
Lake	100.00%	0.00%	0.00%				

Table T3-6: County total populations by HazVI – hurricane storm surge hazard standard deviation classification.

County Name	Hurricane Storm Surge Hazard Vulnerability		
	Low	Medium	High
Alachua	247,336	0	0
Baker	27,115	0	0
Bay	18,246	0	150,606
Bradford	28,520	0	0
Brevard	310,146	233,223	0
Broward	908,435	0	839,631
Calhoun	14,625	0	0
Charlotte	0	15,933	144,045
Citrus	82,231	0	59,005
Clay	29,514	161,351	0
Collier	7,321	171,889	142,310
Columbia	67,531	0	0
De Soto	0	30,676	4,186
Dixie	4,990	0	11,432
Duval	371,995	492,268	0
Escambia	116,349	0	181,270
Flagler	53,492	42,204	0
Franklin	0	0	11,549
Gadsden	46,389	0	0
Gilchrist	8,541	0	8,398
Glades	0	0	12,884
Gulf	0	0	15,863
Hamilton	14,799	0	0
Hardee	17,384	10,347	0
Hendry	0	7,804	31,336
Hernando	102,555	57,994	12,229
Highlands	86,265	0	12,521
Hillsborough	705,419	523,807	0
Holmes	19,927	0	0
Indian River	54,957	83,071	0
Jackson	49,746	0	0
Jefferson	10,381	0	4,380
Lafayette	3,164	0	5,706
Lake	297,052	0	0

County Name	Hurricane Storm Surge Hazard Vulnerability		
	Low	Medium	High
Lee	0	271,604	347,150
Leon	275,487	0	0
Levy	26,645	0	14,156
Liberty	0	0	8,365
Madison	19,224	0	0
Manatee	22,813	294,377	5,643
Marion	327,852	3,446	0
Martin	14,853	0	131,465
Miami-Dade	528,011	0	1,965,116
Monroe	20	0	73,070
Nassau	4,059	69,255	0
Okaloosa	53,034	0	127,788
Okeechobee	12,190	27,806	0
Orange	1,145,956	0	0
Osceola	268,685	0	0
Palm Beach	969,909	0	349,553
Pasco	231,183	233,514	0
Pinellas	215,039	701,503	0
Polk	602,095	0	0
Putnam	15,365	68,846	0
Santa Rosa	10,562	169,630	0
Sarasota	144,719	133,070	0
Seminole	4,559	0	146,813
St Johns	30,079	123,897	225,472
St Lucie	422,718	0	0
Sumter	87,023	0	0
Suwannee	41,551	0	0
Taylor	3,433	0	19,137
Union	15,535	0	0
Volusia	320,071	174,522	0
Wakulla	0	0	30,776
Walton	23,726	0	31,317
Washington	18,281	0	6,615

Hurricane Wind Hazards

Central Florida has had the highest recurrence of hurricane force winds since 1851 (Figure T3-3). Among the most vulnerable to hurricane wind hazards are Brevard, Flagler, Hardee, Hillsborough, Indian River, Lake, Orange, Osceola, Polk and St. Lucie (Table T3-7). Each of these counties has nearly its entire population in the highest hurricane wind hazard class. However, no county in Florida is immune from hurricane force winds. Although it appears that portions of Charlotte, DeSoto, Hendry, and Hardee in south central Florida have the lowest historical frequency, one only needs to look back to hurricane Charley in 2004 to realize that these areas have been impacted very recently by the devastating winds of a hurricane.

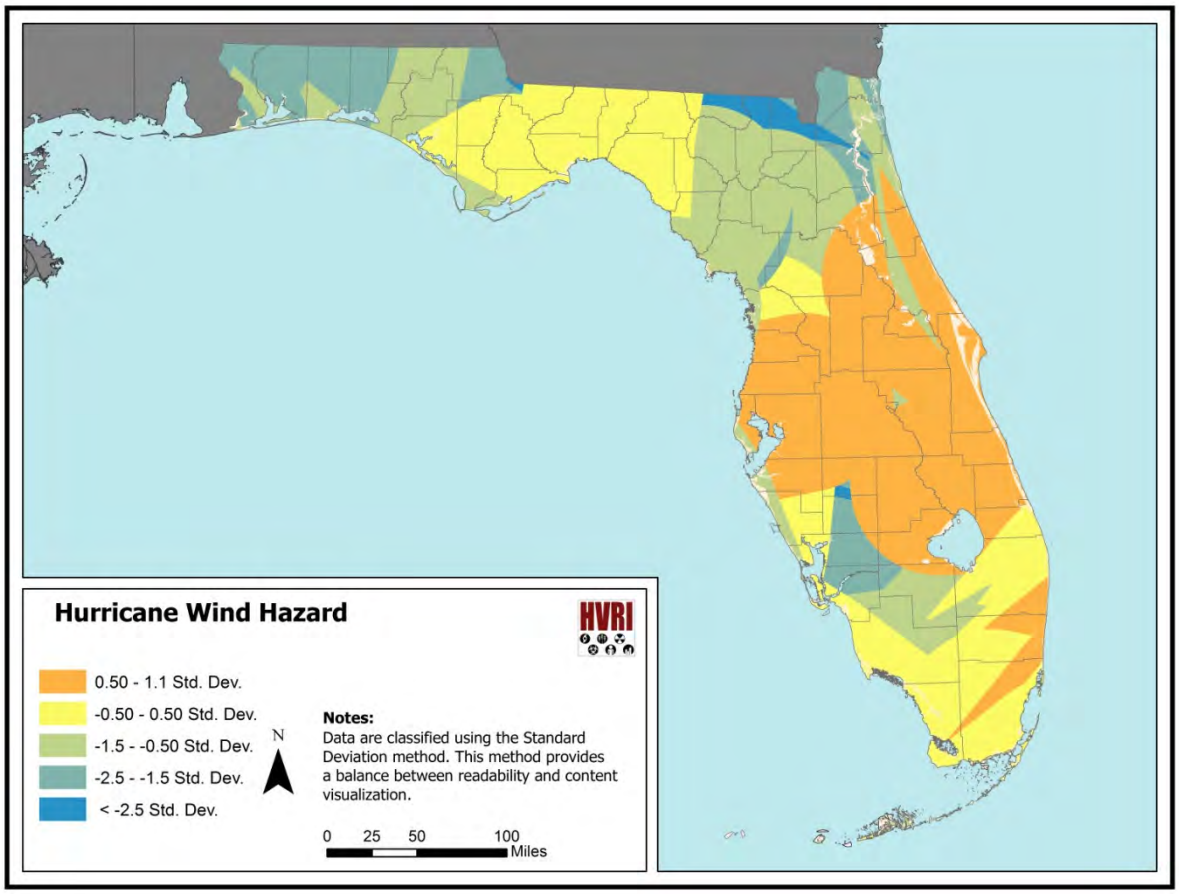

Figure T3-3: Hurricane Wind Zones for the State of Florida

Table T3-7: Percentage of census tracks per county by HazVI – hurricane wind hazard standard deviation classification.

County Name	Hurricane Wind Hazard Vulnerability		
	Low	Medium	High
Alachua	100.00%	0.00%	0.00%
Baker	100.00%	0.00%	0.00%
Bay	2.33%	97.67%	0.00%
Bradford	100.00%	0.00%	0.00%
Brevard	0.00%	0.00%	100.00%
Broward	0.00%	44.60%	55.40%
Calhoun	0.00%	100.00%	0.00%
Charlotte	10.53%	89.47%	0.00%
Citrus	3.57%	57.14%	39.29%
Clay	100.00%	0.00%	0.00%
Collier	86.30%	13.70%	0.00%
Columbia	100.00%	0.00%	0.00%
De Soto	33.33%	66.67%	0.00%
Dixie	100.00%	0.00%	0.00%
Duval	100.00%	0.00%	0.00%
Escambia	100.00%	0.00%	0.00%
Flagler	0.00%	0.00%	100.00%
Franklin	0.00%	100.00%	0.00%
Gadsden	33.33%	66.67%	0.00%
Gilchrist	100.00%	0.00%	0.00%
Glades	0.00%	100.00%	0.00%
Gulf	0.00%	100.00%	0.00%
Hamilton	100.00%	0.00%	0.00%
Hardee	0.00%	0.00%	100.00%
Hendry	16.67%	83.33%	0.00%
Hernando	0.00%	0.00%	100.00%
Highlands	0.00%	100.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%
Holmes	100.00%	0.00%	0.00%
Indian River	0.00%	0.00%	100.00%
Jackson	72.73%	27.27%	0.00%
Jefferson	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%
Lake	0.00%	0.00%	100.00%
Lee	98.19%	1.81%	0.00%
Leon	83.82%	16.18%	0.00%
Levy	88.89%	11.11%	0.00%
Liberty	0.00%	100.00%	0.00%
Madison	100.00%	0.00%	0.00%
Manatee	60.26%	0.00%	39.74%
Marion	15.87%	52.38%	31.75%
Martin	0.00%	100.00%	0.00%
Miami-Dade	0.00%	55.98%	44.02%
Monroe	30.00%	66.67%	3.33%
Nassau	100.00%	0.00%	0.00%
Okaloosa	100.00%	0.00%	0.00%
Okeechobee	0.00%	100.00%	0.00%
Orange	0.00%	0.00%	100.00%
Osceola	0.00%	0.00%	100.00%
Palm Beach	0.00%	100.00%	0.00%
Pasco	0.00%	0.00%	100.00%
Pinellas	31.56%	0.00%	68.44%
Polk	0.00%	0.00%	100.00%
Putnam	21.05%	0.00%	78.95%
Santa Rosa	70.27%	0.00%	29.73%
Sarasota	0.00%	63.64%	36.36%
Seminole	100.00%	0.00%	0.00%
St Johns	78.72%	12.77%	8.51%
St Lucie	0.00%	0.00%	100.00%
Sumter	0.00%	10.53%	89.47%
Suwannee	100.00%	0.00%	0.00%
Taylor	100.00%	0.00%	0.00%
Union	100.00%	0.00%	0.00%
Volusia	21.24%	0.00%	78.76%
Wakulla	0.00%	100.00%	0.00%
Walton	100.00%	0.00%	0.00%
Washington	85.71%	14.29%	0.00%

Table T3-8: County total populations by HazVI – hurricane wind hazard standard deviation classification.

County Name	Hurricane Wind Hazard Vulnerability		
	Low	Medium	High
Alachua	247,336	0	0
Baker	27,115	0	0
Bay	4,073	164,779	0
Bradford	28,520	0	0
Brevard	0	0	543,369
Broward	0	806,171	941,895
Calhoun	0	14,625	0
Charlotte	10,520	149,458	0
Citrus	0	88,831	52,405
Clay	190,865	0	0
Collier	271,660	49,860	0
Columbia	67,531	0	0
De Soto	13,900	20,962	0
Dixie	16,422	0	0
Duval	864,263	0	0
Escambia	297,619	0	0
Flagler	0	0	95,696
Franklin	0	11,549	0
Gadsden	16,931	29,458	0
Gilchrist	16,939	0	0
Glades	0	12,884	0
Gulf	0	15,863	0
Hamilton	14,799	0	0
Hardee	0	0	27,731
Hendry	3,912	35,228	0
Hernando	0	0	172,778
Highlands	0	98,786	0
Hillsborough	0	0	1,229,226
Holmes	19,927	0	0
Indian River	0	0	138,028
Jackson	33,805	15,941	0
Jefferson	14,761	0	0
Lafayette	8,870	0	0
Lake	0	0	297,052

County Name	Hurricane Wind Hazard Vulnerability		
	Low	Medium	High
Lee	609,365	9,389	0
Leon	233,536	41,951	0
Levy	37,547	3,254	0
Liberty	0	8,365	0
Madison	19,224	0	0
Manatee	172,487	0	150,346
Marion	49,382	181,694	100,222
Martin	0	146,318	0
Miami-Dade	0	1,316,188	1,176,939
Monroe	19,161	53,905	24
Nassau	73,314	0	0
Okaloosa	180,822	0	0
Okeechobee	0	39,996	0
Orange	0	0	1,145,956
Osceola	0	0	268,685
Palm Beach	0	1,319,462	0
Pasco	0	0	464,697
Pinellas	244,365	0	672,177
Polk	0	0	602,095
Putnam	19,152	0	65,059
Santa Rosa	113,177	0	67,015
Sarasota	0	218,463	59,326
Seminole	151,372	0	0
St Johns	250,871	87,525	41,052
St Lucie	0	0	422,718
Sumter	0	3,829	83,194
Suwannee	41,551	0	0
Taylor	22,570	0	0
Union	15,535	0	0
Volusia	124,864	0	369,729
Wakulla	0	30,776	0
Walton	55,043	0	0
Washington	22,614	2,282	0

Earthquake Hazards

Fortunately, Florida is not a very seismically active state and a majority of the state has not experienced a felt earthquake since at least 1950. However, portions of both Escambia and Santa Rosa counties in the western Panhandle (Figure T3-4) have been impacted by earthquakes with magnitudes above 4.4 or earthquakes with intensities greater than 5.0 – both capable of producing damage to homes and infrastructure. Happily, a majority of the populations in both counties tend to reside outside of these areas (Table T3-10). Continued population growth in the state does warrant continued review of this threat and the populations at risk to possible ground movement.

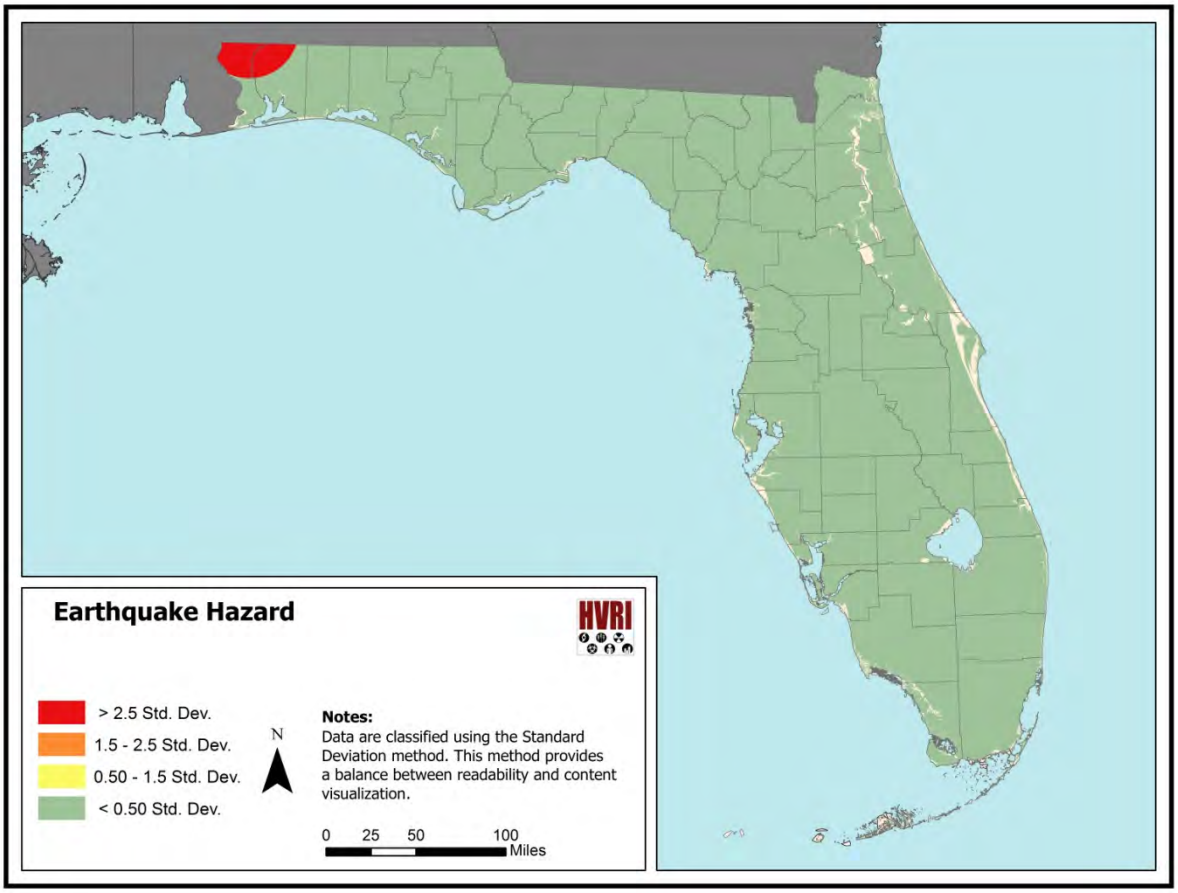

Figure T3-4: Earthquake Impact Areas for the State of Florida

Table T3-9: Percentage of census tracks per county by HazVI – earthquake hazard standard deviation classification.

County Name	Earthquake Hazard Vulnerability		
	Low	Medium	High
Alachua	100.00%	0.00%	0.00%
Baker	100.00%	0.00%	0.00%
Bay	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%
Brevard	100.00%	0.00%	0.00%
Broward	100.00%	0.00%	0.00%
Calhoun	100.00%	0.00%	0.00%
Charlotte	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%
Clay	100.00%	0.00%	0.00%
Collier	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%
De Soto	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%
Duval	100.00%	0.00%	0.00%
Escambia	95.77%	0.00%	4.23%
Flagler	100.00%	0.00%	0.00%
Franklin	100.00%	0.00%	0.00%
Gadsden	100.00%	0.00%	0.00%
Gilchrist	100.00%	0.00%	0.00%
Glades	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%
Hardee	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%
Hillsborough	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%
Jackson	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%

County Name	Earthquake Hazard Vulnerability		
	Low	Medium	High
Lee	100.00%	0.00%	0.00%
Leon	100.00%	0.00%	0.00%
Levy	100.00%	0.00%	0.00%
Liberty	100.00%	0.00%	0.00%
Madison	100.00%	0.00%	0.00%
Manatee	100.00%	0.00%	0.00%
Marion	100.00%	0.00%	0.00%
Martin	100.00%	0.00%	0.00%
Miami-Dade	100.00%	0.00%	0.00%
Monroe	100.00%	0.00%	0.00%
Nassau	100.00%	0.00%	0.00%
Okaloosa	100.00%	0.00%	0.00%
Okeechobee	100.00%	0.00%	0.00%
Orange	100.00%	0.00%	0.00%
Osceola	100.00%	0.00%	0.00%
Palm Beach	100.00%	0.00%	0.00%
Pasco	100.00%	0.00%	0.00%
Pinellas	100.00%	0.00%	0.00%
Polk	100.00%	0.00%	0.00%
Putnam	100.00%	0.00%	0.00%
Santa Rosa	100.00%	0.00%	0.00%
Sarasota	100.00%	0.00%	0.00%
Seminole	84.00%	0.00%	16.00%
St Johns	100.00%	0.00%	0.00%
St Lucie	100.00%	0.00%	0.00%
Sumter	100.00%	0.00%	0.00%
Suwannee	100.00%	0.00%	0.00%
Taylor	100.00%	0.00%	0.00%
Union	100.00%	0.00%	0.00%
Volusia	100.00%	0.00%	0.00%
Wakulla	100.00%	0.00%	0.00%
Walton	100.00%	0.00%	0.00%
Washington	100.00%	0.00%	0.00%

Table T3-10: County total populations by HazVI – earthquake hazard standard deviation classification.

County Name	Earthquake Hazard Vulnerability			County Name	Earthquake Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	247,336	0	0	Lee	618,754	0	0
Baker	27,115	0	0	Leon	275,487	0	0
Bay	168,852	0	0	Levy	40,801	0	0
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	543,369	0	0	Madison	19,224	0	0
Broward	1,748,066	0	0	Manatee	322,833	0	0
Calhoun	14,625	0	0	Marion	331,298	0	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	141,236	0	0	Miami-Dade	2,493,127	0	0
Clay	190,865	0	0	Monroe	73,090	0	0
Collier	321,520	0	0	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	180,822	0	0
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	1,145,956	0	0
Duval	864,263	0	0	Osceola	268,685	0	0
Escambia	283,394	0	14,225	Palm Beach	1,319,462	0	0
Flagler	95,696	0	0	Pasco	464,697	0	0
Franklin	11,549	0	0	Pinellas	916,542	0	0
Gadsden	46,389	0	0	Polk	602,095	0	0
Gilchrist	16,939	0	0	Putnam	84,211	0	0
Glades	12,884	0	0	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	130,975	0	20,397
Hardee	27,731	0	0	St Johns	379,448	0	0
Hendry	39,140	0	0	St Lucie	422,718	0	0
Hernando	172,778	0	0	Sumter	87,023	0	0
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	1,229,226	0	0	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	138,028	0	0	Volusia	494,593	0	0
Jackson	49,746	0	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Wildfire Hazards

Central Florida and Southwest Florida have the highest wildfire potential (Figure T3-5). Baker, Charlotte, Collier, DeSoto, Flagler, Gilchrist, Glades, Hardee, Hendry, Highlands, Lake, Marion, Okeechobee, Orange, Osceola, and Polk Counties each have greater than 50% of their respective census tracts located in high wildfire hazard areas (Table T3-11). Nearly 2.4 million people reside in these areas with the highest wildfire risk across the state (Table T3-12).

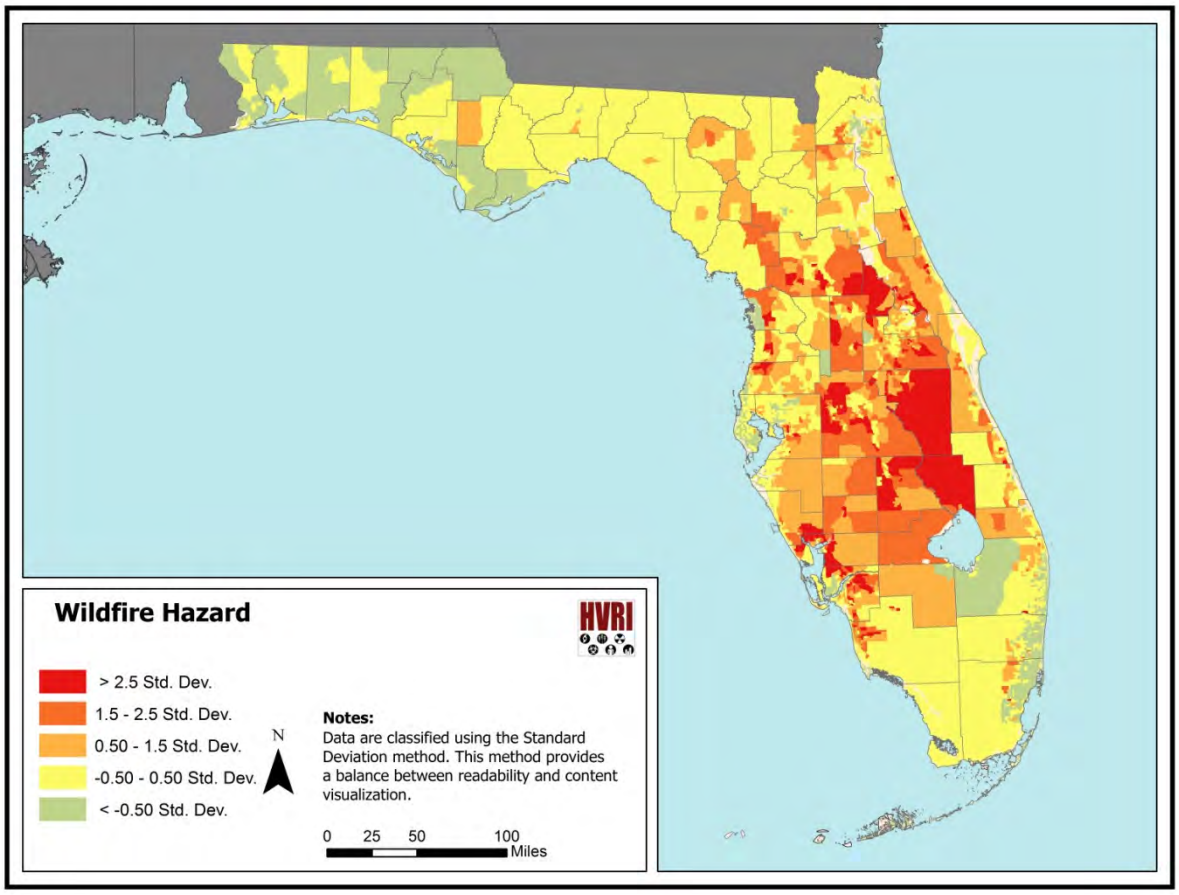

Figure T3-5: Wildfire probability by census tract for the State of Florida

Table T3-11: Percentage of census tracks per county by HazVI – wildfire hazard standard deviation classification.

County Name	Wildfire Hazard Vulnerability		
	Low	Medium	High
Alachua	23.21%	67.86%	8.93%
Baker	0.00%	50.00%	50.00%
Bay	62.79%	30.23%	6.98%
Bradford	0.00%	75.00%	25.00%
Brevard	37.17%	38.05%	24.78%
Broward	80.06%	18.01%	1.94%
Calhoun	33.33%	66.67%	0.00%
Charlotte	7.89%	26.32%	65.79%
Citrus	14.29%	42.86%	42.86%
Clay	13.33%	46.67%	40.00%
Collier	8.22%	41.10%	50.68%
Columbia	8.33%	58.33%	33.33%
De Soto	0.00%	0.00%	100.00%
Dixie	0.00%	100.00%	0.00%
Duval	43.93%	39.88%	16.18%
Escambia	91.55%	8.45%	0.00%
Flagler	0.00%	40.00%	60.00%
Franklin	75.00%	25.00%	0.00%
Gadsden	11.11%	88.89%	0.00%
Gilchrist	0.00%	40.00%	60.00%
Glades	0.00%	0.00%	100.00%
Gulf	100.00%	0.00%	0.00%
Hamilton	0.00%	100.00%	0.00%
Hardee	0.00%	16.67%	83.33%
Hendry	16.67%	33.33%	50.00%
Hernando	11.36%	50.00%	38.64%
Highlands	0.00%	18.52%	81.48%
Hillsborough	31.35%	53.92%	14.73%
Holmes	100.00%	0.00%	0.00%
Indian River	10.00%	56.67%	33.33%
Jackson	100.00%	0.00%	0.00%
Jefferson	0.00%	100.00%	0.00%
Lafayette	0.00%	100.00%	0.00%
Lake	3.57%	30.36%	66.07%

County Name	Wildfire Hazard Vulnerability		
	Low	Medium	High
Lee	27.71%	27.11%	45.18%
Leon	17.65%	79.41%	2.94%
Levy	0.00%	55.56%	44.44%
Liberty	0.00%	100.00%	0.00%
Madison	0.00%	100.00%	0.00%
Manatee	33.33%	55.13%	11.54%
Marion	1.59%	38.10%	60.32%
Martin	26.47%	41.18%	32.35%
Miami-Dade	82.82%	14.48%	2.70%
Monroe	100.00%	0.00%	0.00%
Nassau	41.67%	58.33%	0.00%
Okaloosa	92.68%	7.32%	0.00%
Okeechobee	0.00%	9.09%	90.91%
Orange	0.48%	49.28%	50.24%
Osceola	0.00%	19.51%	80.49%
Palm Beach	53.87%	38.99%	7.14%
Pasco	28.57%	51.13%	20.30%
Pinellas	80.33%	18.85%	0.82%
Polk	1.30%	34.42%	64.29%
Putnam	15.79%	57.89%	26.32%
Santa Rosa	16.22%	75.68%	8.11%
Sarasota	18.18%	61.36%	20.45%
Seminole	56.00%	44.00%	0.00%
St Johns	25.53%	59.57%	14.89%
St Lucie	2.33%	70.93%	26.74%
Sumter	5.26%	73.68%	21.05%
Suwannee	0.00%	57.14%	42.86%
Taylor	0.00%	75.00%	25.00%
Union	0.00%	100.00%	0.00%
Volusia	19.47%	34.51%	46.02%
Wakulla	0.00%	100.00%	0.00%
Walton	54.55%	45.45%	0.00%
Washington	71.43%	28.57%	0.00%

Table T3-12: County total populations by HazVI – wildfire hazard standard deviation classification.

County Name	Wildfire Hazard Vulnerability			County Name	Wildfire Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	54,276	160,489	32,571	Lee	179,702	156,938	282,114
Baker	0	15,050	12,065	Leon	56,518	208,771	10,198
Bay	90,902	66,891	11,059	Levy	0	18,179	22,622
Bradford	0	22,845	5,675	Liberty	0	8,365	0
Brevard	152,954	218,209	172,206	Madison	0	19,224	0
Broward	1,291,101	376,185	80,780	Manatee	86,217	190,372	46,244
Calhoun	8,196	6,429	0	Marion	0	116,919	214,379
Charlotte	9,748	30,220	120,010	Martin	31,669	51,142	63,507
Citrus	11,660	53,074	76,502	Miami-Dade	1,995,615	401,349	96,163
Clay	17,107	69,292	104,466	Monroe	73,090	0	0
Collier	19,025	120,870	181,625	Nassau	29,998	43,316	0
Columbia	8,456	34,163	24,912	Okaloosa	158,733	22,089	0
De Soto	0	0	34,862	Okeechobee	0	4,221	35,775
Dixie	0	16,422	0	Orange	0	477,658	668,298
Duval	295,756	376,863	191,644	Osceola	0	39,977	228,708
Escambia	265,393	32,226	0	Palm Beach	680,979	534,013	104,470
Flagler	0	25,977	69,719	Pasco	116,282	247,357	101,058
Franklin	7,583	3,966	0	Pinellas	722,858	185,851	7,833
Gadsden	5,992	40,397	0	Polk	3,842	205,964	392,289
Gilchrist	0	6,324	10,615	Putnam	7,854	47,937	28,420
Glades	0	0	12,884	Santa Rosa	23,021	144,049	13,122
Gulf	15,863	0	0	Sarasota	28,359	158,193	91,237
Hamilton	0	14,799	0	Seminole	74,426	76,946	0
Hardee	0	959	26,772	St Johns	67,630	207,658	104,160
Hendry	7,112	12,782	19,246	St Lucie	4,686	277,472	140,560
Hernando	16,033	80,074	76,671	Sumter	10	44,647	42,366
Highlands	0	11,996	86,790	Suwannee	0	21,492	20,059
Hillsborough	316,180	707,037	206,009	Taylor	0	16,530	6,040
Holmes	19,927	0	0	Union	0	15,535	0
Indian River	9,693	68,949	59,386	Volusia	62,081	154,462	278,050
Jackson	49,746	0	0	Wakulla	0	30,776	0
Jefferson	0	14,761	0	Walton	24,518	30,525	0
Lafayette	0	8,870	0	Washington	15,999	8,897	0
Lake	4,850	67,419	224,783				

Coastal Hazards

Coastal hazards other than flooding and storm surge have mainly affected Palm Beach and Broward Counties in Southeast Florida and to a lesser extent Miami-Dade, Escambia, and Bay Counties over the past 51 years (Figure T3-6). The total population living in these most threatened counties exceeds 5.4 million (table T3-14) with an additional 5 million plus people living in areas of moderate historical frequency for loss causing coastal events (table T3-14).

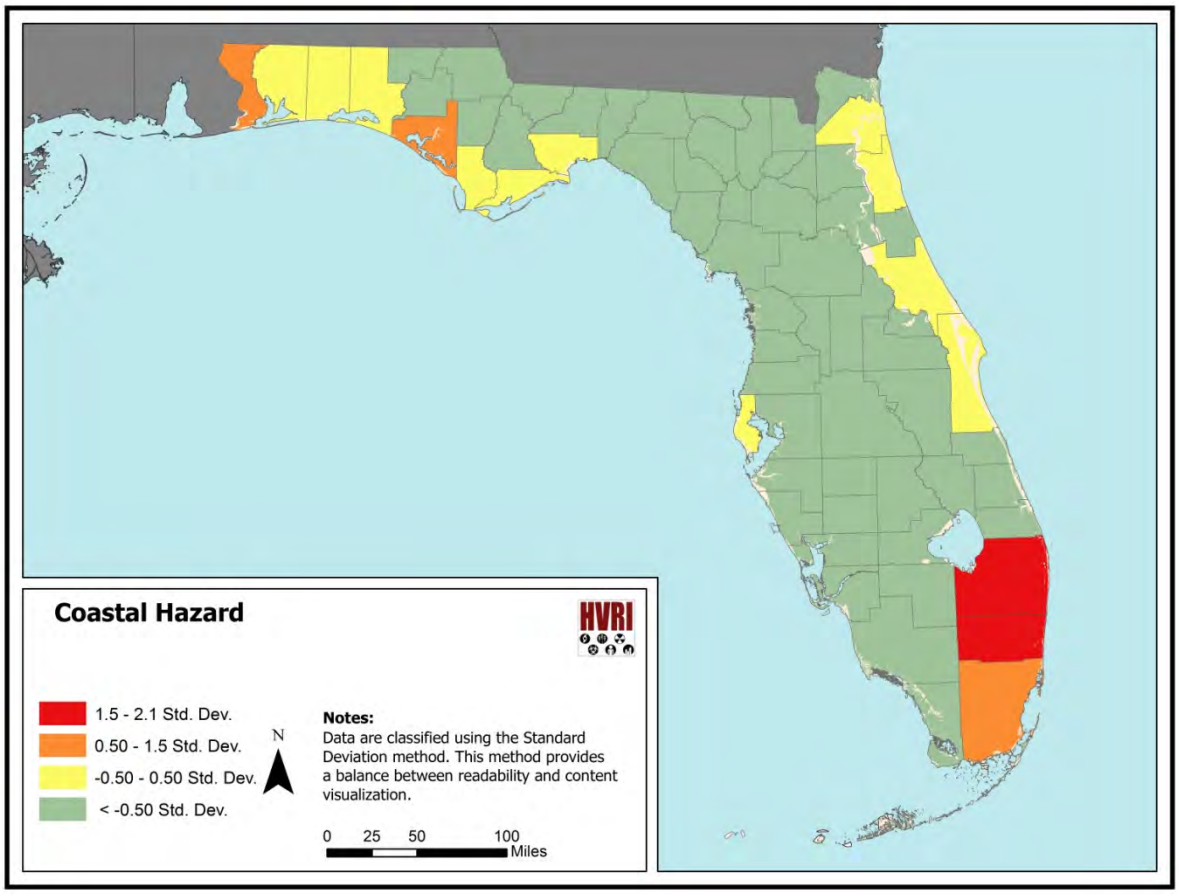

Figure T3-6: Frequency of Coastal Hazard Occurrence by county for the State of Florida

Table T3-13: Percentage of census tracks per county by HazVI – coastal hazard standard deviation classification.

County Name	Coastal Hazard Vulnerability			County Name	Coastal Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	100.00%	0.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	100.00%	0.00%	0.00%
Bay	0.00%	0.00%	100.00%	Levy	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	0.00%	100.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	0.00%	0.00%	100.00%	Manatee	0.00%	100.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	100.00%	0.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	0.00%	0.00%	100.00%
Clay	100.00%	0.00%	0.00%	Monroe	0.00%	100.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	0.00%	100.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	0.00%	100.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	0.00%	100.00%	0.00%	Orange	100.00%	0.00%	0.00%
Duval	0.00%	100.00%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	0.00%	0.00%	100.00%	Palm Beach	0.00%	0.00%	100.00%
Flagler	0.00%	100.00%	0.00%	Pasco	100.00%	0.00%	0.00%
Franklin	0.00%	100.00%	0.00%	Pinellas	0.00%	100.00%	0.00%
Gadsden	100.00%	0.00%	0.00%	Polk	100.00%	0.00%	0.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	89.47%	10.53%	0.00%
Glades	100.00%	0.00%	0.00%	Santa Rosa	0.00%	100.00%	0.00%
Gulf	0.00%	100.00%	0.00%	Sarasota	0.00%	100.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	0.00%	100.00%	0.00%
Hardee	100.00%	0.00%	0.00%	St Johns	0.00%	100.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	100.00%	0.00%	0.00%	Taylor	0.00%	100.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	0.00%	100.00%	0.00%	Volusia	0.00%	100.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	0.00%	100.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	0.00%	100.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-14: County total populations by HazVI – coastal hazard standard deviation classification.

County Name	Coastal Hazard Vulnerability			County Name	Coastal Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	247,336	0	0	Lee	618,754	0	0
Baker	27,115	0	0	Leon	275,487	0	0
Bay	0	0	168,852	Levy	40,801	0	0
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	0	543,369	0	Madison	19,224	0	0
Broward	0	0	1,748,066	Manatee	0	322,833	0
Calhoun	14,625	0	0	Marion	331,298	0	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	141,236	0	0	Miami-Dade	0	0	2,493,127
Clay	190,865	0	0	Monroe	0	73,090	0
Collier	321,520	0	0	Nassau	0	73,314	0
Columbia	67,531	0	0	Okaloosa	0	180,822	0
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	0	16,422	0	Orange	1,145,956	0	0
Duval	0	864,263	0	Osceola	268,685	0	0
Escambia	0	0	297,619	Palm Beach	0	0	1,319,462
Flagler	0	95,696	0	Pasco	464,697	0	0
Franklin	0	11,549	0	Pinellas	0	916,542	0
Gadsden	46,389	0	0	Polk	602,095	0	0
Gilchrist	16,939	0	0	Putnam	74,364	9,847	0
Glades	12,884	0	0	Santa Rosa	0	180,192	0
Gulf	0	15,863	0	Sarasota	0	277,789	0
Hamilton	14,799	0	0	Seminole	0	151,372	0
Hardee	27,731	0	0	St Johns	0	379,448	0
Hendry	39,140	0	0	St Lucie	422,718	0	0
Hernando	172,778	0	0	Sumter	87,023	0	0
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	1,229,226	0	0	Taylor	0	22,570	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	0	138,028	0	Volusia	0	494,593	0
Jackson	49,746	0	0	Wakulla	0	30,776	0
Jefferson	14,761	0	0	Walton	0	55,043	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Drought Hazards

Drought hazards are mainly a threat faced by the southern 1/3 of the state. However, Bradford and Union Counties in north central Florida have also faced historically high levels of drought over the past 51 years (Figure T3-7). Fortunately, with the exception of Palm Beach, the counties with the highest frequency of occurrence have relatively low populations (Table T3-16).

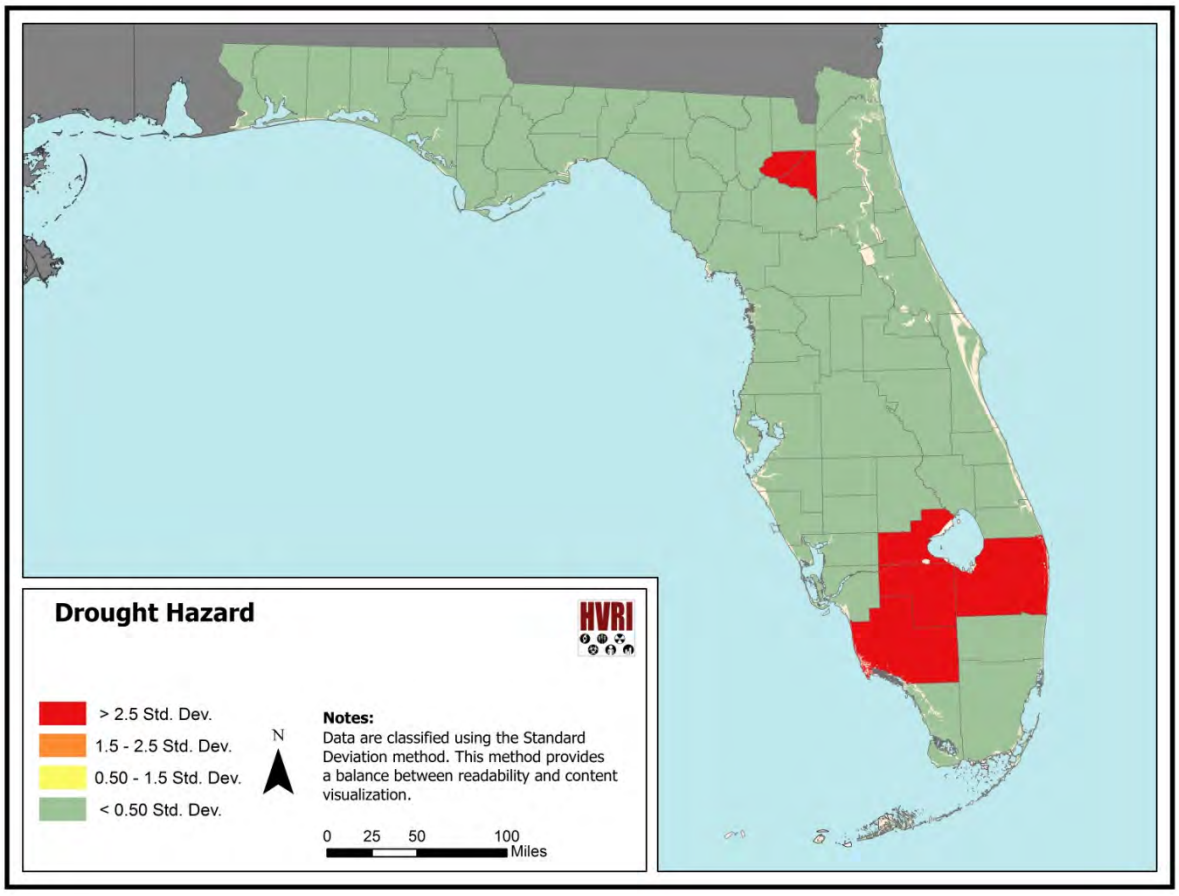

Figure T3-7: Frequency of Drought Hazard Occurrence by county for the State of Florida

Table T3-15: Percentage of census tracks per county by HazVI – drought hazard standard deviation classification.

County Name	Drought Hazard Vulnerability			County Name	Drought Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	100.00%	0.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	100.00%	0.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	100.00%	0.00%	0.00%
Bradford	0.00%	0.00%	100.00%	Liberty	100.00%	0.00%	0.00%
Brevard	100.00%	0.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	100.00%	0.00%	0.00%	Manatee	100.00%	0.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	100.00%	0.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	100.00%	0.00%	0.00%
Clay	100.00%	0.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	0.00%	0.00%	100.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	100.00%	0.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	100.00%	0.00%	0.00%
Duval	100.00%	0.00%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	100.00%	0.00%	0.00%	Palm Beach	0.00%	0.00%	100.00%
Flagler	100.00%	0.00%	0.00%	Pasco	100.00%	0.00%	0.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	100.00%	0.00%	0.00%
Gadsden	100.00%	0.00%	0.00%	Polk	100.00%	0.00%	0.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	100.00%	0.00%	0.00%
Glades	0.00%	0.00%	100.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	100.00%	0.00%	0.00%
Hardee	100.00%	0.00%	0.00%	St Johns	100.00%	0.00%	0.00%
Hendry	0.00%	0.00%	100.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	100.00%	0.00%	0.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	0.00%	0.00%	100.00%
Indian River	100.00%	0.00%	0.00%	Volusia	100.00%	0.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-16: County total populations by HazVI – drought hazard standard deviation classification.

County Name	Drought Hazard Vulnerability			County Name	Drought Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	247,336	0	0	Lee	618,754	0	0
Baker	27,115	0	0	Leon	275,487	0	0
Bay	168,852	0	0	Levy	40,801	0	0
Bradford	0	0	28,520	Liberty	8,365	0	0
Brevard	543,369	0	0	Madison	19,224	0	0
Broward	1,748,066	0	0	Manatee	322,833	0	0
Calhoun	14,625	0	0	Marion	331,298	0	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	141,236	0	0	Miami-Dade	2,493,127	0	0
Clay	190,865	0	0	Monroe	73,090	0	0
Collier	0	0	321,520	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	180,822	0	0
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	1,145,956	0	0
Duval	864,263	0	0	Osceola	268,685	0	0
Escambia	297,619	0	0	Palm Beach	0	0	1,319,462
Flagler	95,696	0	0	Pasco	464,697	0	0
Franklin	11,549	0	0	Pinellas	916,542	0	0
Gadsden	46,389	0	0	Polk	602,095	0	0
Gilchrist	16,939	0	0	Putnam	84,211	0	0
Glades	0	0	12,884	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	151,372	0	0
Hardee	27,731	0	0	St Johns	379,448	0	0
Hendry	0	0	39,140	St Lucie	422,718	0	0
Hernando	172,778	0	0	Sumter	87,023	0	0
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	1,229,226	0	0	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	0	0	15,535
Indian River	138,028	0	0	Volusia	494,593	0	0
Jackson	49,746	0	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Fog Hazards

Polk County in central Florida stands as the county with the highest number of loss causing fog events in the state over the past 51 years (Figure T3-8). However, take note of the fact that nearly every west central county has had significantly higher than average number of loss causing fog events. More than 5.2 million people live in areas with the highest frequency of fog induced losses (Table T3-18).

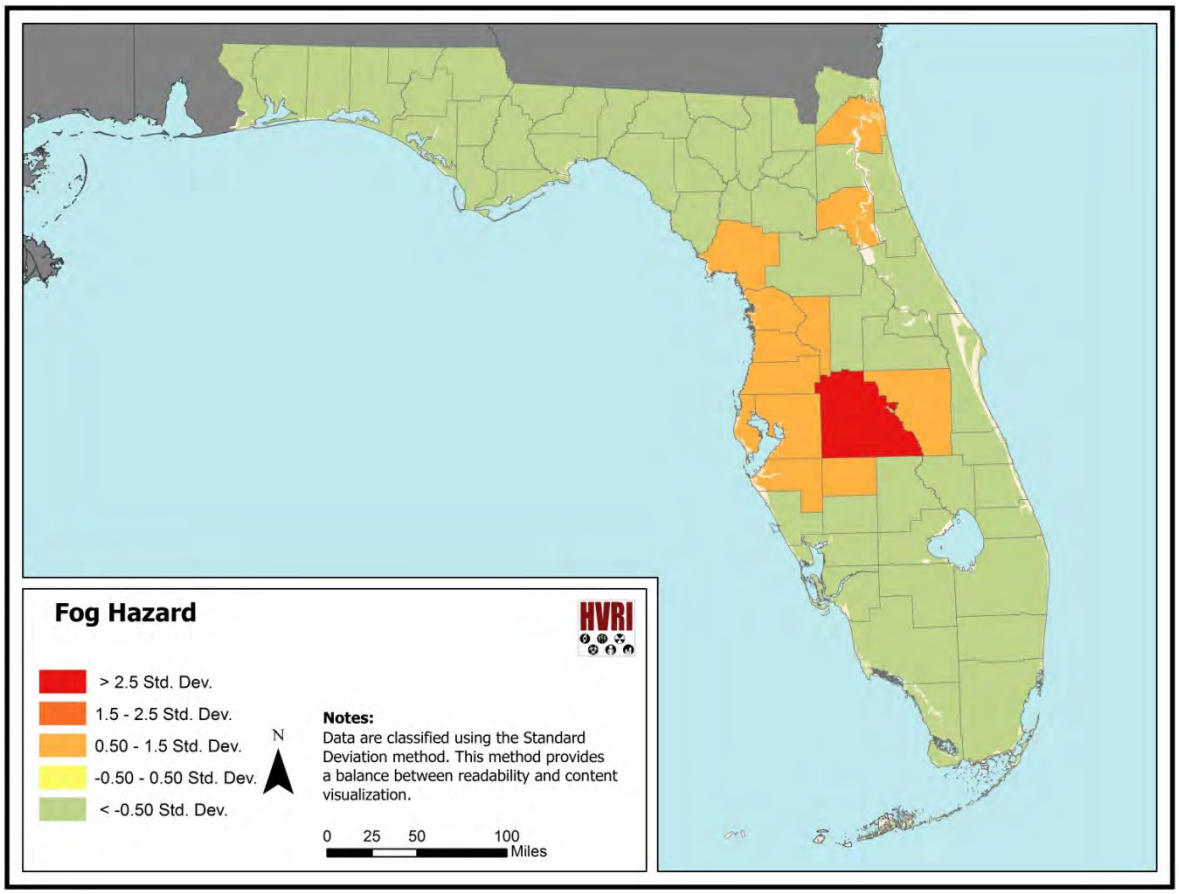

Figure T3-8: Frequency of Fog Hazard Occurrence by county for the State of Florida

Table T3-17: Percentage of census tracks per county by HazVI – fog hazard standard deviation classification.

County Name	Fog Hazard Vulnerability			County Name	Fog Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	100.00%	0.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	100.00%	0.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	0.00%	0.00%	100.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	100.00%	0.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	100.00%	0.00%	0.00%	Manatee	0.00%	0.00%	100.00%
Calhoun	100.00%	0.00%	0.00%	Marion	100.00%	0.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	0.00%	0.00%	100.00%	Miami-Dade	100.00%	0.00%	0.00%
Clay	100.00%	0.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	100.00%	0.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	100.00%	0.00%	0.00%
Duval	0.00%	0.00%	100.00%	Osceola	0.00%	0.00%	100.00%
Escambia	100.00%	0.00%	0.00%	Palm Beach	100.00%	0.00%	0.00%
Flagler	100.00%	0.00%	0.00%	Pasco	0.00%	0.00%	100.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	0.00%	0.00%	100.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	0.00%	100.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	10.53%	0.00%	89.47%
Glades	100.00%	0.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	100.00%	0.00%	0.00%
Hardee	0.00%	0.00%	100.00%	St Johns	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	0.00%	0.00%	100.00%	Sumter	0.00%	0.00%	100.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	100.00%	0.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-18: County total populations by HazVI – fog hazard standard deviation classification.

County Name	Fog Hazard Vulnerability			County Name	Fog Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	247,336	0	0	Lee	618,754	0	0
Baker	27,115	0	0	Leon	275,487	0	0
Bay	168,852	0	0	Levy	0	0	40,801
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	543,369	0	0	Madison	19,224	0	0
Broward	1,748,066	0	0	Manatee	0	0	322,833
Calhoun	14,625	0	0	Marion	331,298	0	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	0	0	141,236	Miami-Dade	2,493,127	0	0
Clay	190,865	0	0	Monroe	73,090	0	0
Collier	321,520	0	0	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	180,822	0	0
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	1,145,956	0	0
Duval	0	0	864,263	Osceola	0	0	268,685
Escambia	297,619	0	0	Palm Beach	1,319,462	0	0
Flagler	95,696	0	0	Pasco	0	0	464,697
Franklin	11,549	0	0	Pinellas	0	0	916,542
Gadsden	46,389	0	0	Polk	0	0	602,095
Gilchrist	16,939	0	0	Putnam	9,847	0	74,364
Glades	12,884	0	0	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	151,372	0	0
Hardee	0	0	27,731	St Johns	379,448	0	0
Hendry	39,140	0	0	St Lucie	422,718	0	0
Hernando	0	0	172,778	Sumter	0	0	87,023
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	0	0	1,229,226	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	138,028	0	0	Volusia	494,593	0	0
Jackson	49,746	0	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Hail Hazards

The pattern of loss causing hail events is centralized in two main areas – southeast in Miami-Dade and Broward Counties, and in the greater Tampa Bay Area in west central Florida (Figure T3-9). This pattern suggests a strong urban bias in that areas with greater populations may have influenced the reporting of hail events over the past 51 years. However, crops have also been a historical source of income in a majority of these counties and may also influence the rate of damage causing hail event reports.

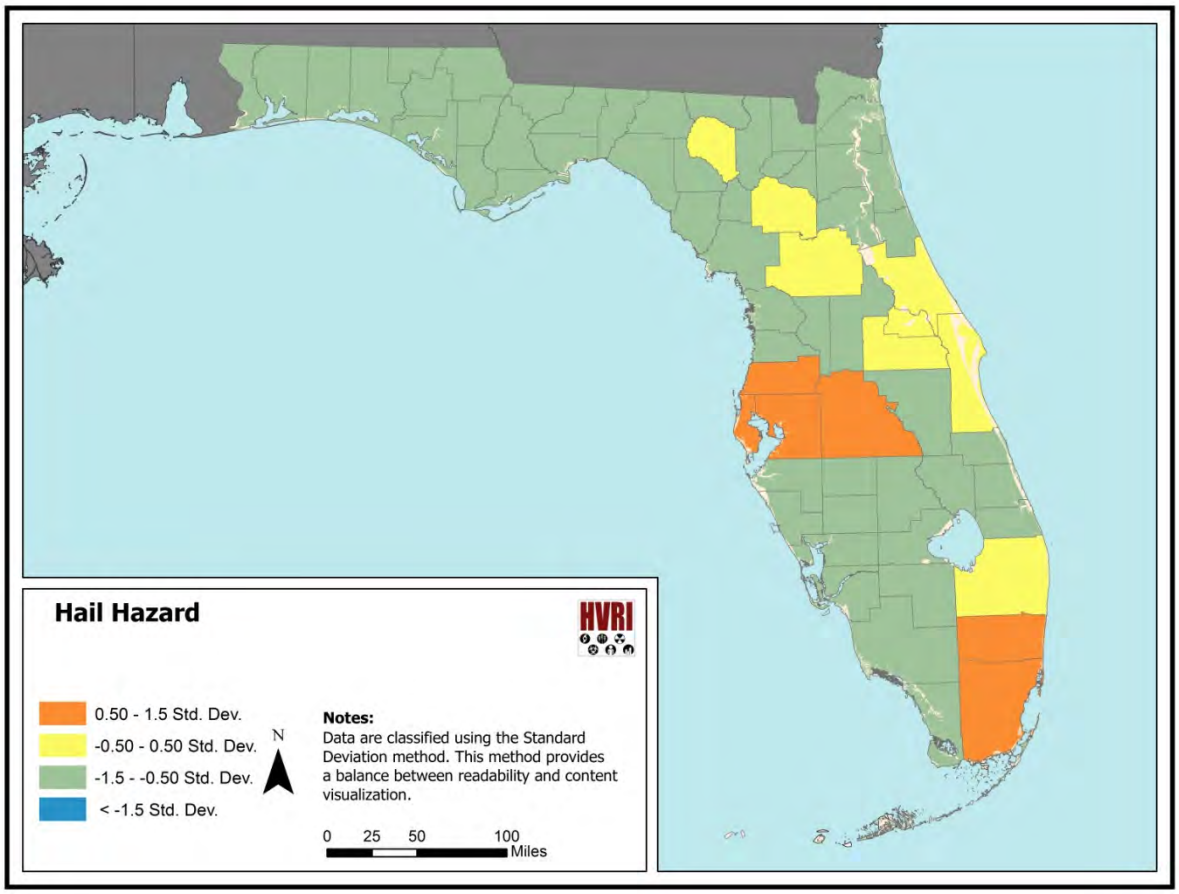

Figure T3-9: Frequency of Hail Hazard Occurrence by county for the State of Florida

Table T3-19: Percentage of census tracks per county by HazVI – hail hazard standard deviation classification.

County Name	Fog Hazard Vulnerability			County Name	Fog Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	0.00%	100.00%	0.00%	Lee	100.00%	0.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	100.00%	0.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	100.00%	0.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	0.00%	0.00%	100.00%	Manatee	100.00%	0.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	100.00%	0.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	0.00%	0.00%	100.00%
Clay	100.00%	0.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	100.00%	0.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	0.00%	100.00%	0.00%
Duval	100.00%	0.00%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	100.00%	0.00%	0.00%	Palm Beach	0.00%	100.00%	0.00%
Flagler	100.00%	0.00%	0.00%	Pasco	0.00%	0.00%	100.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	0.00%	0.00%	100.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	0.00%	100.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	100.00%	0.00%	0.00%
Glades	100.00%	0.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	100.00%	0.00%	0.00%
Hardee	100.00%	0.00%	0.00%	St Johns	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	0.00%	100.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	0.00%	100.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-20: County total populations by HazVI – hail hazard standard deviation classification.

County Name	Fog Hazard Vulnerability			County Name	Fog Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	0	247,336	0	Lee	618,754	0	0
Baker	27,115	0	0	Leon	275,487	0	0
Bay	168,852	0	0	Levy	40,801	0	0
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	543,369	0	0	Madison	19,224	0	0
Broward	0	0	1,748,066	Manatee	322,833	0	0
Calhoun	14,625	0	0	Marion	331,298	0	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	141,236	0	0	Miami-Dade	0	0	2,493,127
Clay	190,865	0	0	Monroe	73,090	0	0
Collier	321,520	0	0	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	180,822	0	0
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	0	1,145,956	0
Duval	864,263	0	0	Osceola	268,685	0	0
Escambia	297,619	0	0	Palm Beach	0	1,319,462	0
Flagler	95,696	0	0	Pasco	0	0	464,697
Franklin	11,549	0	0	Pinellas	0	0	916,542
Gadsden	46,389	0	0	Polk	0	0	602,095
Gilchrist	16,939	0	0	Putnam	84,211	0	0
Glades	12,884	0	0	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	151,372	0	0
Hardee	27,731	0	0	St Johns	379,448	0	0
Hendry	39,140	0	0	St Lucie	0	422,718	0
Hernando	172,778	0	0	Sumter	87,023	0	0
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	0	0	1,229,226	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	138,028	0	0	Volusia	0	494,593	0
Jackson	49,746	0	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Heat Hazards

Lee County has had the highest incidence of loss causing heat events over the past 51 years (Figure T3-10). Here, heat waves in 1998 and 2009 caused four fatalities, or 30% of the total heat related fatalities for the entire state. Heat hazards pose a significant threat to elderly and home bound populations as well those who do not have access to cooling centers in times of need. Planning should take into account the proportion of total population that is elderly, as this segment will be the most vulnerable to the effects of heat hazards.

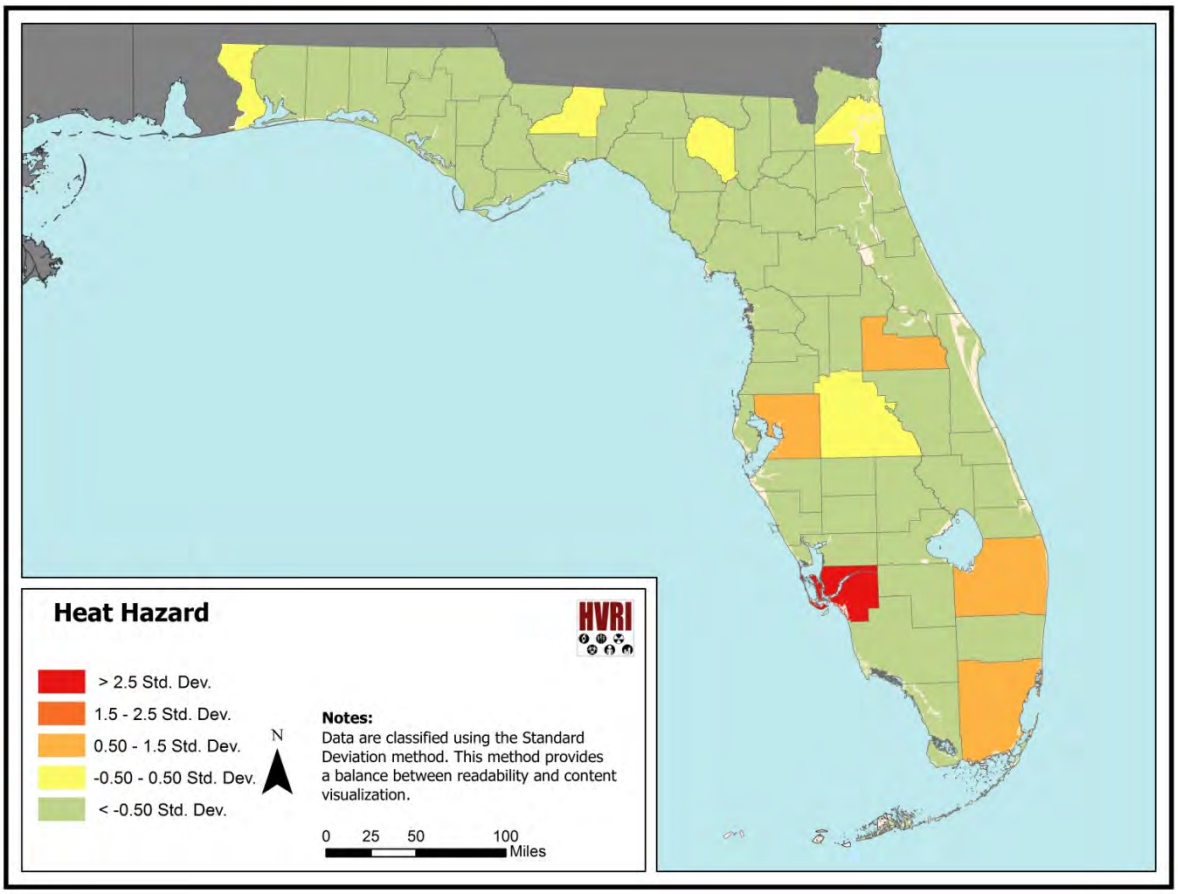

Figure T3-10: Frequency of Heat Hazard Occurrence by county for the State of Florida

Table T3-21: Percentage of census tracks per county by HazVI – heat hazard standard deviation classification.

County Name	Heat Hazard Vulnerability			County Name	Heat Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	0.00%	0.00%	100.00%
Baker	100.00%	0.00%	0.00%	Leon	0.00%	100.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	100.00%	0.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	100.00%	0.00%	0.00%	Manatee	100.00%	0.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	100.00%	0.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	0.00%	0.00%	100.00%
Clay	100.00%	0.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	100.00%	0.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	0.00%	0.00%	100.00%
Duval	0.00%	100.00%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	0.00%	100.00%	0.00%	Palm Beach	0.00%	0.00%	100.00%
Flagler	100.00%	0.00%	0.00%	Pasco	100.00%	0.00%	0.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	100.00%	0.00%	0.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	100.00%	0.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	100.00%	0.00%	0.00%
Glades	100.00%	0.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	100.00%	0.00%	0.00%
Hardee	100.00%	0.00%	0.00%	St Johns	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	0.00%	100.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	100.00%	0.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-22: County total populations by HazVI – heat hazard standard deviation classification.

County Name	Heat Hazard Vulnerability		
	Low	Medium	High
Alachua	247,336	0	0
Baker	27,115	0	0
Bay	168,852	0	0
Bradford	28,520	0	0
Brevard	543,369	0	0
Broward	1,748,066	0	0
Calhoun	14,625	0	0
Charlotte	159,978	0	0
Citrus	141,236	0	0
Clay	190,865	0	0
Collier	321,520	0	0
Columbia	67,531	0	0
De Soto	34,862	0	0
Dixie	16,422	0	0
Duval	0	864,263	0
Escambia	0	297,619	0
Flagler	95,696	0	0
Franklin	11,549	0	0
Gadsden	46,389	0	0
Gilchrist	16,939	0	0
Glades	12,884	0	0
Gulf	15,863	0	0
Hamilton	14,799	0	0
Hardee	27,731	0	0
Hendry	39,140	0	0
Hernando	172,778	0	0
Highlands	98,786	0	0
Hillsborough	0	0	1,229,226
Holmes	19,927	0	0
Indian River	138,028	0	0
Jackson	49,746	0	0
Jefferson	14,761	0	0
Lafayette	8,870	0	0
Lake	297,052	0	0

County Name	Heat Hazard Vulnerability		
	Low	Medium	High
Lee	0	0	618,754
Leon	0	275,487	0
Levy	40,801	0	0
Liberty	8,365	0	0
Madison	19,224	0	0
Manatee	322,833	0	0
Marion	331,298	0	0
Martin	146,318	0	0
Miami-Dade	0	0	2,493,127
Monroe	73,090	0	0
Nassau	73,314	0	0
Okaloosa	180,822	0	0
Okeechobee	39,996	0	0
Orange	0	0	1,145,956
Osceola	268,685	0	0
Palm Beach	0	0	1,319,462
Pasco	464,697	0	0
Pinellas	916,542	0	0
Polk	0	602,095	0
Putnam	84,211	0	0
Santa Rosa	180,192	0	0
Sarasota	277,789	0	0
Seminole	151,372	0	0
St Johns	379,448	0	0
St Lucie	422,718	0	0
Sumter	87,023	0	0
Suwannee	0	41,551	0
Taylor	22,570	0	0
Union	15,535	0	0
Volusia	494,593	0	0
Wakulla	30,776	0	0
Walton	55,043	0	0
Washington	24,896	0	0

Lightning Hazards

The pattern of lightning related loss events is dispersed across the state with Broward County standing out as the loss leader (Figure T3-11). Looking at a finer geographic scale, the major urban areas of the state including Miami-Dade, Palm Beach, and Tampa-St. Petersburg are also above average in loss causing lightning events. Surprisingly, Jacksonville is not among the most vulnerable.

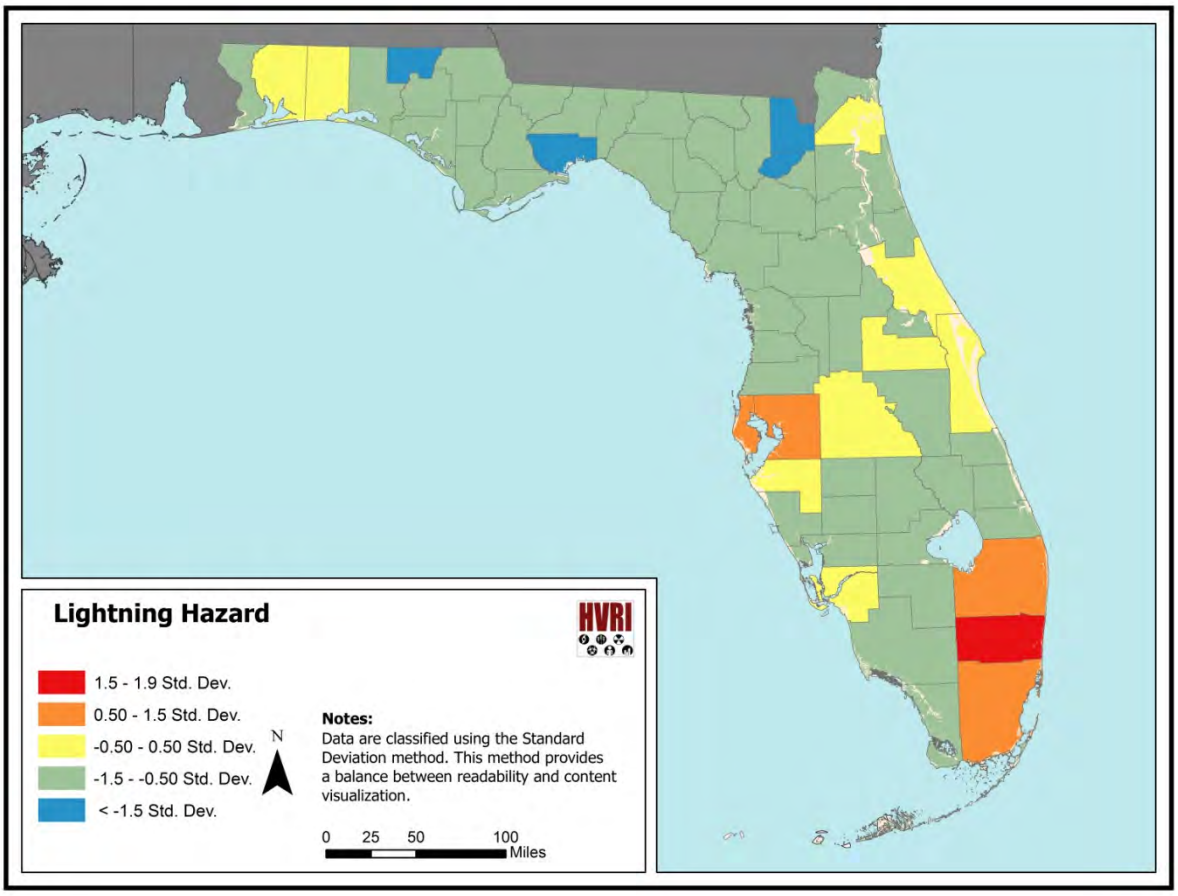

Figure T3-11: Frequency of Lightning Hazard Occurrence by county for the State of Florida

Table T3-23: Percentage of census tracks per county by HazVI – lightning hazard standard deviation classification.

County Name	Heat Hazard Vulnerability			County Name	Heat Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	0.00%	0.00%	100.00%
Baker	100.00%	0.00%	0.00%	Leon	0.00%	100.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	100.00%	0.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	100.00%	0.00%	0.00%	Manatee	100.00%	0.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	100.00%	0.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	0.00%	0.00%	100.00%
Clay	100.00%	0.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	100.00%	0.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	0.00%	0.00%	100.00%
Duval	0.00%	100.00%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	0.00%	100.00%	0.00%	Palm Beach	0.00%	0.00%	100.00%
Flagler	100.00%	0.00%	0.00%	Pasco	100.00%	0.00%	0.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	100.00%	0.00%	0.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	100.00%	0.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	100.00%	0.00%	0.00%
Glades	100.00%	0.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	100.00%	0.00%	0.00%
Hardee	100.00%	0.00%	0.00%	St Johns	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	0.00%	100.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	100.00%	0.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-24: County total populations by HazVI – lightning hazard standard deviation classification.

County Name	Lighning Hazard Vulnerability			County Name	Lighning Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	247,336	0	0	Lee	0	618,754	0
Baker	27,115	0	0	Leon	275,487	0	0
Bay	168,852	0	0	Levy	40,801	0	0
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	0	543,369	0	Madison	19,224	0	0
Broward	0	0	1,748,066	Manatee	322,833	0	0
Calhoun	14,625	0	0	Marion	331,298	0	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	141,236	0	0	Miami-Dade	0	0	2,493,127
Clay	190,865	0	0	Monroe	73,090	0	0
Collier	321,520	0	0	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	0	180,822	0
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	0	1,145,956	0
Duval	0	864,263	0	Osceola	268,685	0	0
Escambia	297,619	0	0	Palm Beach	0	1,319,462	0
Flagler	95,696	0	0	Pasco	464,697	0	0
Franklin	11,549	0	0	Pinellas	0	0	916,542
Gadsden	46,389	0	0	Polk	0	602,095	0
Gilchrist	16,939	0	0	Putnam	84,211	0	0
Glades	12,884	0	0	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	151,372	0	0
Hardee	27,731	0	0	St Johns	379,448	0	0
Hendry	39,140	0	0	St Lucie	422,718	0	0
Hernando	172,778	0	0	Sumter	87,023	0	0
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	0	0	1,229,226	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	138,028	0	0	Volusia	494,593	0	0
Jackson	49,746	0	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Severe Storm Hazards

Duval (Jacksonville), Hillsborough (Tampa), and Polk Counties have seen the highest historical impacts from severe storms over the past 51 years. In addition, Escambia, Santa Rosa, Marion, Pasco, and Pinellas counties have all had above average numbers of loss causing severe storm events since 1960 (Figure T3-12). During this time period more than 121 people have perished and nearly 400 have been injured by severe storms and damages have surpassed $460 million.

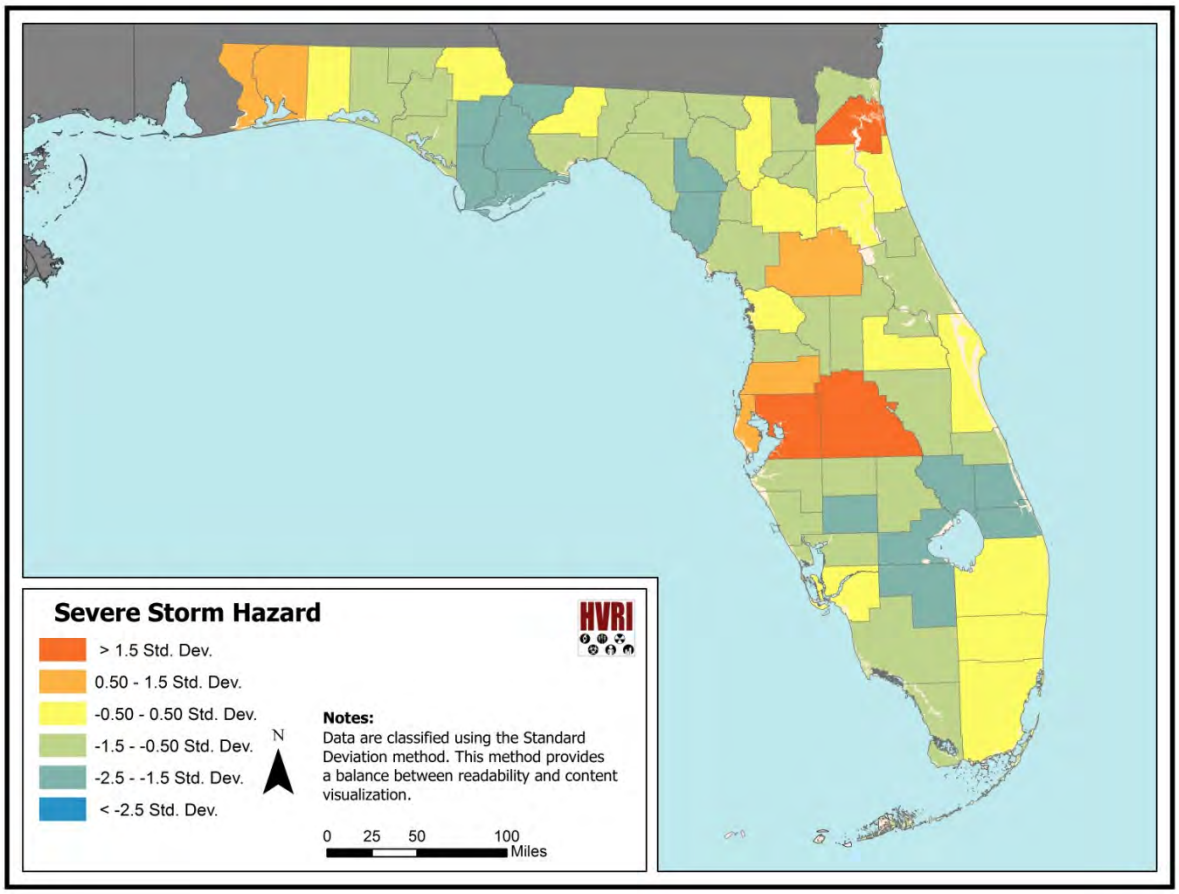

Figure T3-12: Frequency of Severe Storm Hazard Occurrence by county for the State of Florida

Table T3-25: Percentage of census tracks per county by HazVI – severe storm hazard standard deviation classification.

County Name	Severe Storm Hazard Vulnerability			County Name	Severe Storm Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	0.00%	100.00%	0.00%	Lee	0.00%	100.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	0.00%	100.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	0.00%	100.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	0.00%	100.00%	0.00%	Manatee	100.00%	0.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	0.00%	100.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	0.00%	100.00%	0.00%
Clay	0.00%	100.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	0.00%	100.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	0.00%	100.00%	0.00%
Duval	0.00%	0.00%	100.00%	Osceola	100.00%	0.00%	0.00%
Escambia	0.00%	0.00%	100.00%	Palm Beach	0.00%	100.00%	0.00%
Flagler	100.00%	0.00%	0.00%	Pasco	0.00%	0.00%	100.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	0.00%	100.00%	0.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	0.00%	100.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	10.53%	89.47%	0.00%
Glades	100.00%	0.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	0.00%	0.00%	100.00%
Hardee	100.00%	0.00%	0.00%	St Johns	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	100.00%	0.00%	0.00%
Jackson	0.00%	100.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-26: County total populations by HazVI – severe storm hazard standard deviation classification.

County Name	Severe Storm Hazard Vulnerability			County Name	Severe Storm Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	0	247,336	0	Lee	0	618,754	0
Baker	27,115	0	0	Leon	0	275,487	0
Bay	168,852	0	0	Levy	40,801	0	0
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	0	543,369	0	Madison	19,224	0	0
Broward	0	1,748,066	0	Manatee	322,833	0	0
Calhoun	14,625	0	0	Marion	0	331,298	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	141,236	0	0	Miami-Dade	0	2,493,127	0
Clay	0	190,865	0	Monroe	73,090	0	0
Collier	321,520	0	0	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	0	180,822	0
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	0	1,145,956	0
Duval	0	0	864,263	Osceola	268,685	0	0
Escambia	0	0	297,619	Palm Beach	0	1,319,462	0
Flagler	95,696	0	0	Pasco	0	0	464,697
Franklin	11,549	0	0	Pinellas	0	916,542	0
Gadsden	46,389	0	0	Polk	0	0	602,095
Gilchrist	16,939	0	0	Putnam	9,847	74,364	0
Glades	12,884	0	0	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	0	0	151,372
Hardee	27,731	0	0	St Johns	379,448	0	0
Hendry	39,140	0	0	St Lucie	422,718	0	0
Hernando	172,778	0	0	Sumter	87,023	0	0
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	0	0	1,229,226	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	138,028	0	0	Volusia	494,593	0	0
Jackson	0	49,746	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Tornado Hazards

Florida has a disproportionately high frequency of tornadoes compared to all the other states in the nation and the highest property damage per square mile from tornadoes of any state in the country. While other states may have more and larger tornadoes in total, the dense population and built environment in Florida enable losses from tornadoes to rise year after year. Hillsborough and Polk Counties in central Florida have seen the most loss causing tornado events since 1960 (Figure T3-13). Here, a mix of urban populations and rural farm land combine to put considerable populations at risk (Table T3-28).

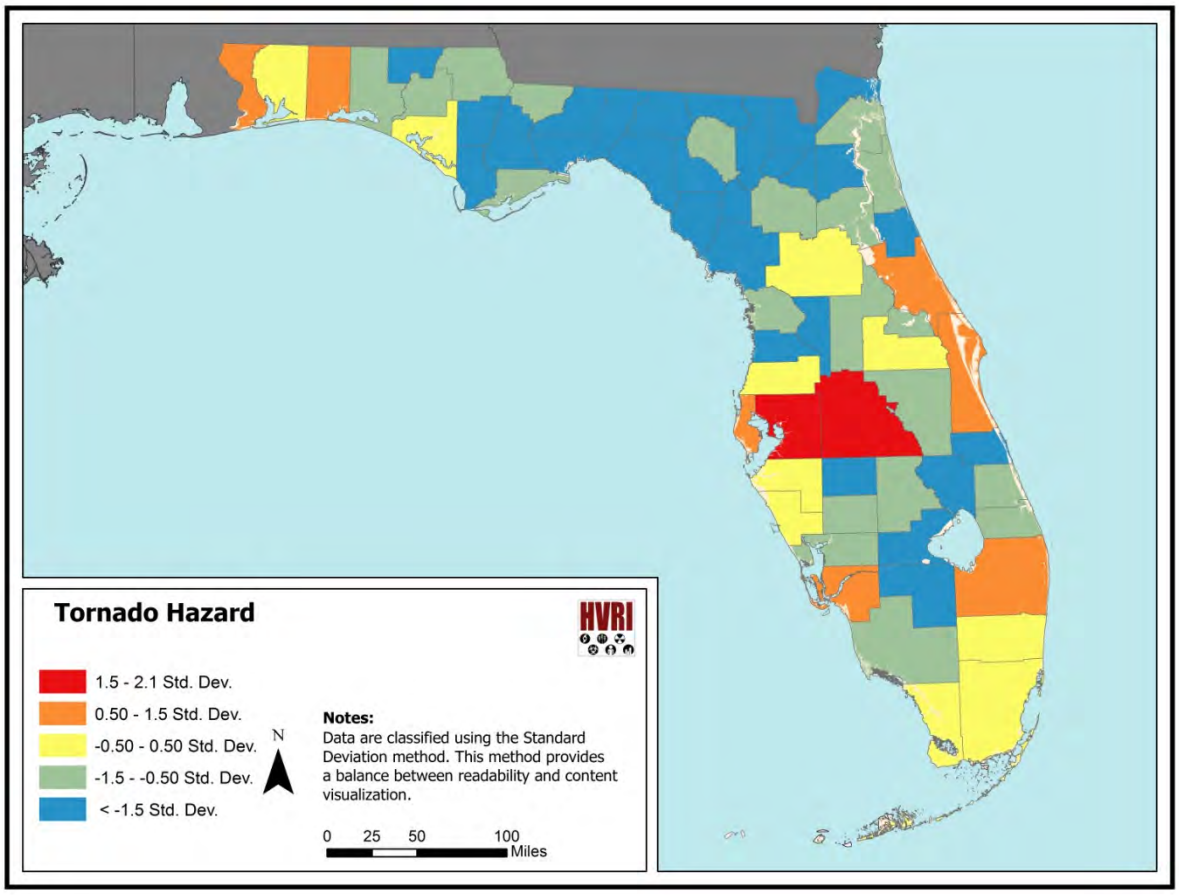

Figure T3-13: Frequency of Tornado Hazard Occurrence by county for the State of Florida

Table T3-27: Percentage of census tracks per county by HazVI – tornado hazard standard deviation classification.

County Name	Tornado Hazard Vulnerability			County Name	Tornado Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	0.00%	100.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	100.00%	0.00%	0.00%
Bay	0.00%	100.00%	0.00%	Levy	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	0.00%	0.00%	100.00%	Madison	100.00%	0.00%	0.00%
Broward	0.00%	100.00%	0.00%	Manatee	0.00%	100.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	0.00%	100.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	0.00%	100.00%	0.00%
Clay	100.00%	0.00%	0.00%	Monroe	0.00%	100.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	0.00%	0.00%	100.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	0.00%	100.00%	0.00%
Duval	100.00%	0.00%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	0.00%	100.00%	0.00%	Palm Beach	0.00%	100.00%	0.00%
Flagler	100.00%	0.00%	0.00%	Pasco	0.00%	100.00%	0.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	0.00%	0.00%	100.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	0.00%	100.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	100.00%	0.00%	0.00%
Glades	100.00%	0.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	0.00%	100.00%	0.00%
Hardee	100.00%	0.00%	0.00%	St Johns	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	0.00%	0.00%	100.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-28: County total populations by HazVI – tornado hazard standard deviation classification.

County Name	Tornado Hazard Vulnerability			County Name	Tornado Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	247,336	0	0	Lee	0	618,754	0
Baker	27,115	0	0	Leon	275,487	0	0
Bay	0	168,852	0	Levy	40,801	0	0
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	0	0	543,369	Madison	19,224	0	0
Broward	0	1,748,066	0	Manatee	0	322,833	0
Calhoun	14,625	0	0	Marion	0	331,298	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	141,236	0	0	Miami-Dade	0	2,493,127	0
Clay	190,865	0	0	Monroe	0	73,090	0
Collier	321,520	0	0	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	0	0	180,822
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	0	1,145,956	0
Duval	864,263	0	0	Osceola	268,685	0	0
Escambia	0	297,619	0	Palm Beach	0	1,319,462	0
Flagler	95,696	0	0	Pasco	0	464,697	0
Franklin	11,549	0	0	Pinellas	0	0	916,542
Gadsden	46,389	0	0	Polk	0	0	602,095
Gilchrist	16,939	0	0	Putnam	84,211	0	0
Glades	12,884	0	0	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	0	151,372	0
Hardee	27,731	0	0	St Johns	379,448	0	0
Hendry	39,140	0	0	St Lucie	422,718	0	0
Hernando	172,778	0	0	Sumter	87,023	0	0
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	0	0	1,229,226	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	138,028	0	0	Volusia	0	0	494,593
Jackson	49,746	0	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Wind Hazards

Besides tornado hazards, Hillsborough County has also seen the highest number of loss causing wind events (Figure T3-14). These events are either related to thunderstorm outflows or pressure gradient forces that have caused more than 80 injuries, 5 fatalities, and more than $16 million in property and crop damage since 1960.

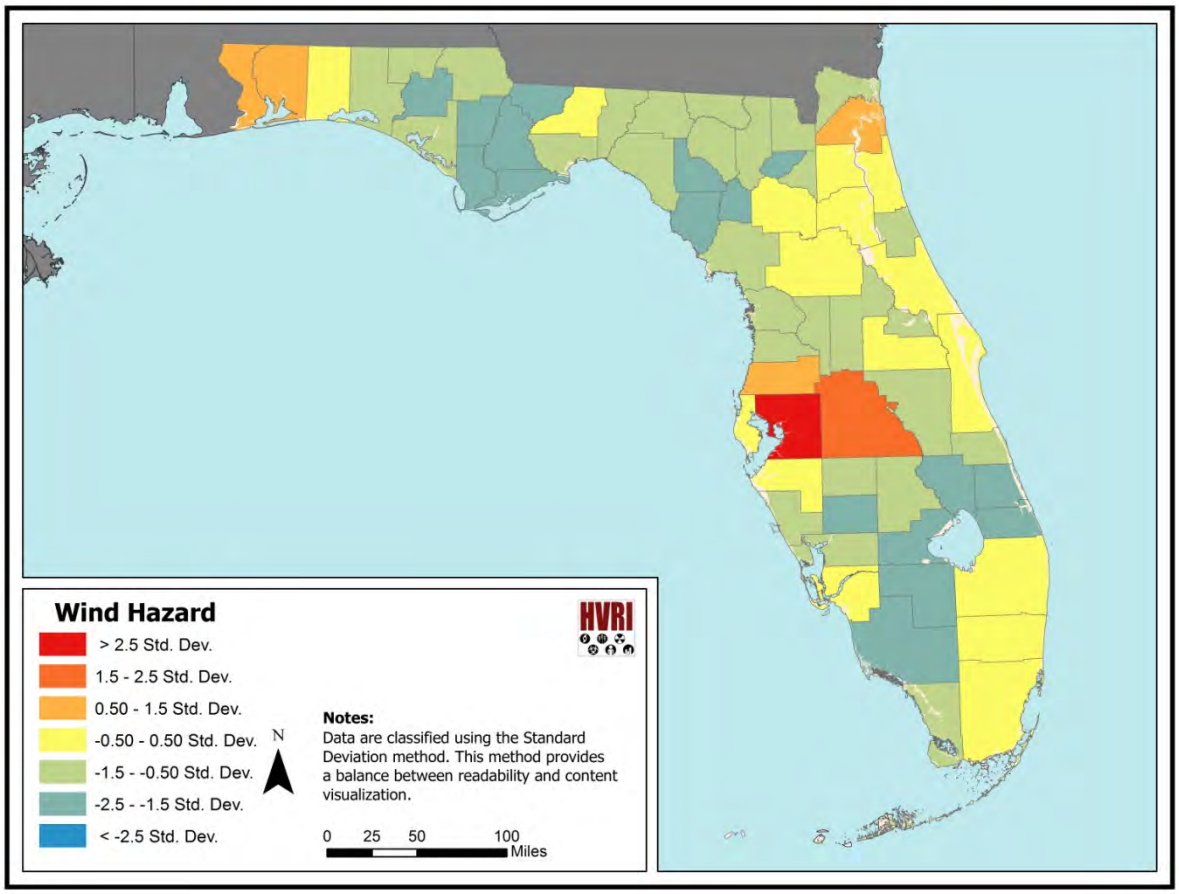

Figure T3-14: Frequency of Wind Hazard Occurrence by county for the State of Florida

Table T3-29: Percentage of census tracks per county by HazVI – wind hazard standard deviation classification.

County Name	Wind Hazard Vulnerability			County Name	Wind Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	0.00%	100.00%	0.00%	Lee	0.00%	100.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	0.00%	100.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	0.00%	100.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	0.00%	100.00%	0.00%	Manatee	100.00%	0.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	0.00%	100.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	0.00%	100.00%	0.00%
Clay	100.00%	0.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	0.00%	100.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	0.00%	100.00%	0.00%
Duval	0.00%	0.00%	100.00%	Osceola	100.00%	0.00%	0.00%
Escambia	0.00%	100.00%	0.00%	Palm Beach	0.00%	100.00%	0.00%
Flagler	100.00%	0.00%	0.00%	Pasco	0.00%	100.00%	0.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	0.00%	100.00%	0.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	0.00%	100.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	10.53%	89.47%	0.00%
Glades	100.00%	0.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	0.00%	100.00%	0.00%
Hardee	100.00%	0.00%	0.00%	St Johns	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	100.00%	0.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-30: County total populations by HazVI – wind hazard standard deviation classification.

County Name	Wind Hazard Vulnerability			County Name	Wind Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	0	247,336	0	Lee	0	618,754	0
Baker	27,115	0	0	Leon	0	275,487	0
Bay	168,852	0	0	Levy	40,801	0	0
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	0	543,369	0	Madison	19,224	0	0
Broward	0	1,748,066	0	Manatee	322,833	0	0
Calhoun	14,625	0	0	Marion	0	331,298	0
Charlotte	159,978	0	0	Martin	146,318	0	0
Citrus	141,236	0	0	Miami-Dade	0	2,493,127	0
Clay	190,865	0	0	Monroe	73,090	0	0
Collier	321,520	0	0	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	0	180,822	0
De Soto	34,862	0	0	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	0	1,145,956	0
Duval	0	0	864,263	Osceola	268,685	0	0
Escambia	0	297,619	0	Palm Beach	0	1,319,462	0
Flagler	95,696	0	0	Pasco	0	464,697	0
Franklin	11,549	0	0	Pinellas	0	916,542	0
Gadsden	46,389	0	0	Polk	0	0	602,095
Gilchrist	16,939	0	0	Putnam	9,847	74,364	0
Glades	12,884	0	0	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	0	151,372	0
Hardee	27,731	0	0	St Johns	379,448	0	0
Hendry	39,140	0	0	St Lucie	422,718	0	0
Hernando	172,778	0	0	Sumter	87,023	0	0
Highlands	98,786	0	0	Suwannee	41,551	0	0
Hillsborough	0	0	1,229,226	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	138,028	0	0	Volusia	494,593	0	0
Jackson	49,746	0	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Winter Hazards

Miami-Date and Hardee Counties have had the highest number of loss causing winter weather events since 1960 (Figure T3-15). Here, crop losses have tallied more than $450 billion dollars with seven of the top ten loss causing events occurring in Hardee County between 1983 and 2000.

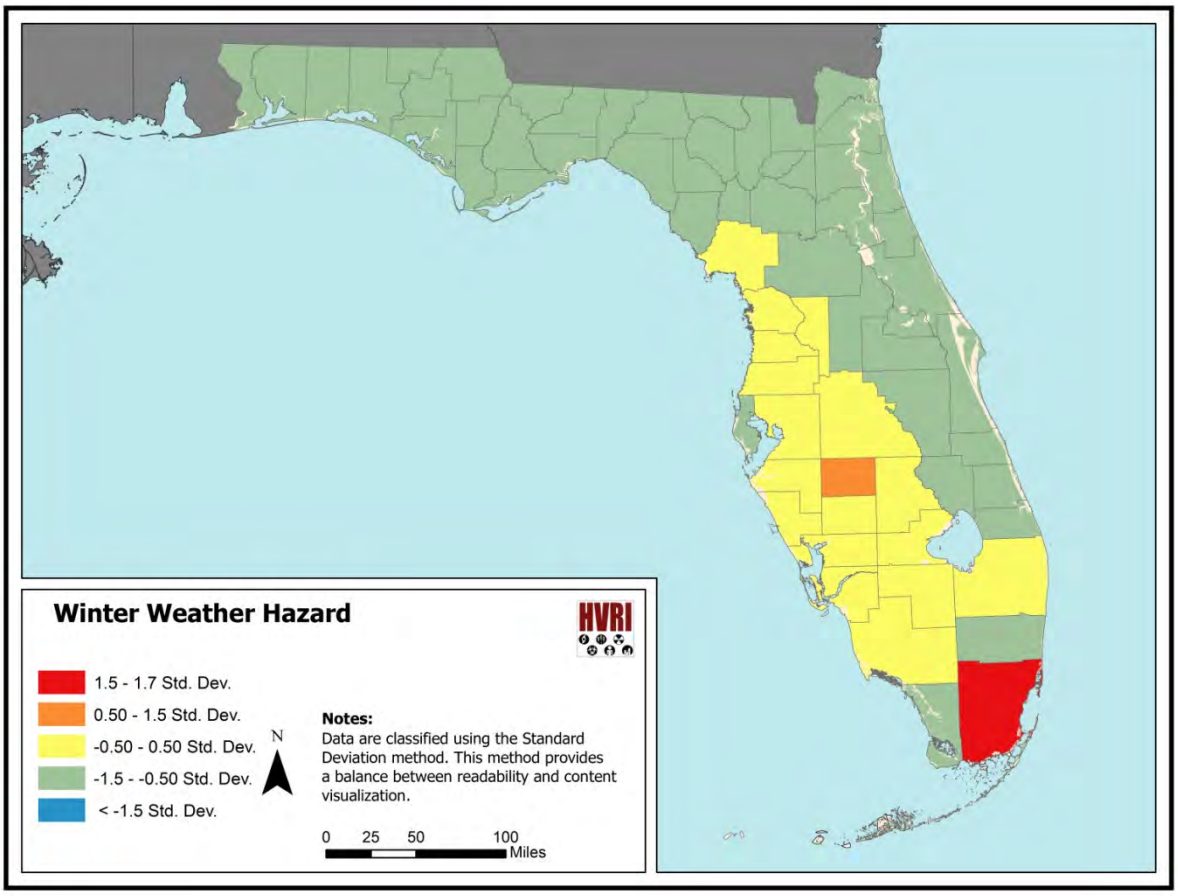

Figure T3-15: Frequency of Winter Weather Hazard Occurrence by county for the State of Florida

Table T3-31: Percentage of census tracks per county by HazVI – winter hazard standard deviation classification.

County Name	Winter Hazard Vulnerability			County Name	Winter Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	0.00%	100.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	100.00%	0.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	0.00%	0.00%	100.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	100.00%	0.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	0.00%	100.00%	0.00%	Manatee	0.00%	100.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	100.00%	0.00%	0.00%
Charlotte	0.00%	100.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	0.00%	0.00%	100.00%	Miami-Dade	0.00%	0.00%	100.00%
Clay	100.00%	0.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	0.00%	100.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	100.00%	0.00%	0.00%
De Soto	0.00%	0.00%	100.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	100.00%	0.00%	0.00%
Duval	100.00%	0.00%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	100.00%	0.00%	0.00%	Palm Beach	0.00%	100.00%	0.00%
Flagler	100.00%	0.00%	0.00%	Pasco	0.00%	0.00%	100.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	100.00%	0.00%	0.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	0.00%	100.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	100.00%	0.00%	0.00%
Glades	0.00%	100.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	100.00%	0.00%	0.00%
Hardee	0.00%	0.00%	100.00%	St Johns	0.00%	100.00%	0.00%
Hendry	0.00%	100.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	0.00%	0.00%	100.00%	Sumter	0.00%	0.00%	100.00%
Highlands	0.00%	0.00%	100.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	100.00%	0.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-32: County total populations by HazVI – winter hazard standard deviation classification.

County Name	Winter Hazard Vulnerability			County Name	Winter Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	247,336	0	0	Lee	0	618,754	0
Baker	27,115	0	0	Leon	275,487	0	0
Bay	168,852	0	0	Levy	0	0	40,801
Bradford	28,520	0	0	Liberty	8,365	0	0
Brevard	543,369	0	0	Madison	19,224	0	0
Broward	0	1,748,066	0	Manatee	0	322,833	0
Calhoun	14,625	0	0	Marion	331,298	0	0
Charlotte	0	159,978	0	Martin	146,318	0	0
Citrus	0	0	141,236	Miami-Dade	0	0	2,493,127
Clay	190,865	0	0	Monroe	73,090	0	0
Collier	0	321,520	0	Nassau	73,314	0	0
Columbia	67,531	0	0	Okaloosa	180,822	0	0
De Soto	0	0	34,862	Okeechobee	39,996	0	0
Dixie	16,422	0	0	Orange	1,145,956	0	0
Duval	864,263	0	0	Osceola	268,685	0	0
Escambia	297,619	0	0	Palm Beach	0	1,319,462	0
Flagler	95,696	0	0	Pasco	0	0	464,697
Franklin	11,549	0	0	Pinellas	916,542	0	0
Gadsden	46,389	0	0	Polk	0	0	602,095
Gilchrist	16,939	0	0	Putnam	84,211	0	0
Glades	0	12,884	0	Santa Rosa	180,192	0	0
Gulf	15,863	0	0	Sarasota	277,789	0	0
Hamilton	14,799	0	0	Seminole	151,372	0	0
Hardee	0	0	27,731	St Johns	0	379,448	0
Hendry	0	39,140	0	St Lucie	422,718	0	0
Hernando	0	0	172,778	Sumter	0	0	87,023
Highlands	0	0	98,786	Suwannee	41,551	0	0
Hillsborough	0	0	1,229,226	Taylor	22,570	0	0
Holmes	19,927	0	0	Union	15,535	0	0
Indian River	138,028	0	0	Volusia	494,593	0	0
Jackson	49,746	0	0	Wakulla	30,776	0	0
Jefferson	14,761	0	0	Walton	55,043	0	0
Lafayette	8,870	0	0	Washington	24,896	0	0
Lake	297,052	0	0				

Aggregating all the HazVI information up to the tract level for the state provides a slightly different view of the same spatial patterns (Figure T3-16) and enables users to delve into the data to understand the drivers of hazard vulnerability at the county and sub county level. Table T3-33 provides a breakdown of the number of tracts within each county based on the maximum hazard frequency score for each of the sixteen natural hazards assessed in this analysis.

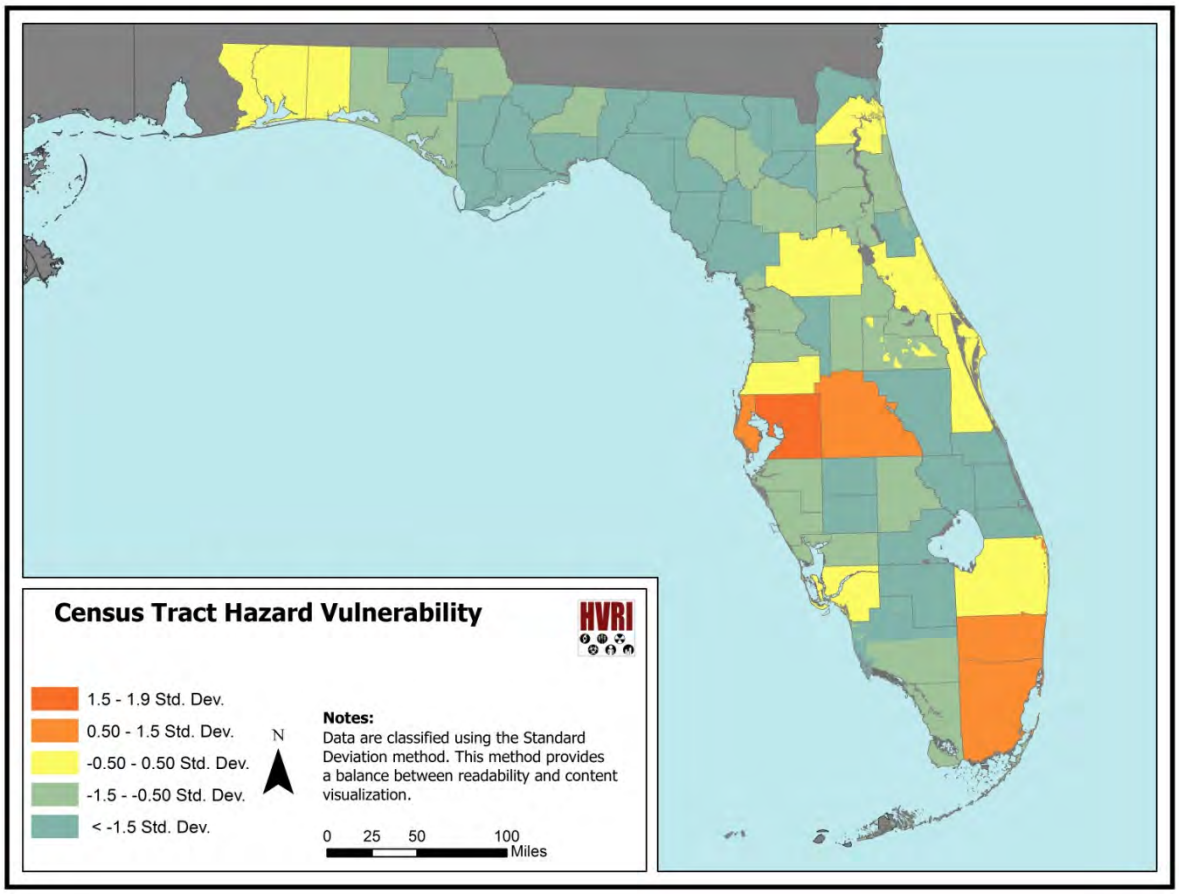

Figure T3-16: Hazard Vulnerability for census tracts within the State of Florida

Table T3-33: Percentage of census tracks per county by HazVI standard deviation classification

County Name	Hazard Vulnerability			County Name	Hazard Vulnerability		
	Low	Medium	High		Low	Medium	High
Alachua	100.00%	0.00%	0.00%	Lee	0.00%	100.00%	0.00%
Baker	100.00%	0.00%	0.00%	Leon	100.00%	0.00%	0.00%
Bay	100.00%	0.00%	0.00%	Levy	100.00%	0.00%	0.00%
Bradford	100.00%	0.00%	0.00%	Liberty	100.00%	0.00%	0.00%
Brevard	0.00%	100.00%	0.00%	Madison	100.00%	0.00%	0.00%
Broward	0.00%	0.00%	100.00%	Manatee	100.00%	0.00%	0.00%
Calhoun	100.00%	0.00%	0.00%	Marion	0.00%	100.00%	0.00%
Charlotte	100.00%	0.00%	0.00%	Martin	100.00%	0.00%	0.00%
Citrus	100.00%	0.00%	0.00%	Miami-Dade	0.00%	0.00%	100.00%
Clay	100.00%	0.00%	0.00%	Monroe	100.00%	0.00%	0.00%
Collier	100.00%	0.00%	0.00%	Nassau	100.00%	0.00%	0.00%
Columbia	100.00%	0.00%	0.00%	Okaloosa	0.00%	100.00%	0.00%
De Soto	100.00%	0.00%	0.00%	Okeechobee	100.00%	0.00%	0.00%
Dixie	100.00%	0.00%	0.00%	Orange	91.79%	8.21%	0.00%
Duval	0.00%	100.00%	0.00%	Osceola	100.00%	0.00%	0.00%
Escambia	0.00%	100.00%	0.00%	Palm Beach	0.00%	97.32%	2.68%
Flagler	100.00%	0.00%	0.00%	Pasco	0.00%	100.00%	0.00%
Franklin	100.00%	0.00%	0.00%	Pinellas	0.00%	0.00%	100.00%
Gadsden	100.00%	0.00%	0.00%	Polk	0.00%	0.00%	100.00%
Gilchrist	100.00%	0.00%	0.00%	Putnam	100.00%	0.00%	0.00%
Glades	100.00%	0.00%	0.00%	Santa Rosa	100.00%	0.00%	0.00%
Gulf	100.00%	0.00%	0.00%	Sarasota	100.00%	0.00%	0.00%
Hamilton	100.00%	0.00%	0.00%	Seminole	0.00%	100.00%	0.00%
Hardee	100.00%	0.00%	0.00%	St Johns	100.00%	0.00%	0.00%
Hendry	100.00%	0.00%	0.00%	St Lucie	100.00%	0.00%	0.00%
Hernando	100.00%	0.00%	0.00%	Sumter	100.00%	0.00%	0.00%
Highlands	100.00%	0.00%	0.00%	Suwannee	100.00%	0.00%	0.00%
Hillsborough	0.00%	0.00%	100.00%	Taylor	100.00%	0.00%	0.00%
Holmes	100.00%	0.00%	0.00%	Union	100.00%	0.00%	0.00%
Indian River	100.00%	0.00%	0.00%	Volusia	0.00%	100.00%	0.00%
Jackson	100.00%	0.00%	0.00%	Wakulla	100.00%	0.00%	0.00%
Jefferson	100.00%	0.00%	0.00%	Walton	100.00%	0.00%	0.00%
Lafayette	100.00%	0.00%	0.00%	Washington	100.00%	0.00%	0.00%
Lake	100.00%	0.00%	0.00%				

Table T3-34: County total populations by HazVI standard deviation classification

County Name	Hazard Vulnerability		
	Low	Medium	High
Alachua	247,336	0	0
Baker	27,115	0	0
Bay	168,852	0	0
Bradford	28,520	0	0
Brevard	0	543,369	0
Broward	0	0	1,748,066
Calhoun	14,625	0	0
Charlotte	159,978	0	0
Citrus	141,236	0	0
Clay	190,865	0	0
Collier	321,520	0	0
Columbia	67,531	0	0
De Soto	34,862	0	0
Dixie	16,422	0	0
Duval	0	864,263	0
Escambia	0	297,619	0
Flagler	95,696	0	0
Franklin	11,549	0	0
Gadsden	46,389	0	0
Gilchrist	16,939	0	0
Glades	12,884	0	0
Gulf	15,863	0	0
Hamilton	14,799	0	0
Hardee	27,731	0	0
Hendry	39,140	0	0
Hernando	172,778	0	0
Highlands	98,786	0	0
Hillsborough	0	0	1,229,226
Holmes	19,927	0	0
Indian River	138,028	0	0
Jackson	49,746	0	0
Jefferson	14,761	0	0
Lafayette	8,870	0	0
Lake	297,052	0	0

County Name	Hazard Vulnerability		
	Low	Medium	High
Lee	0	618,754	0
Leon	275,487	0	0
Levy	40,801	0	0
Liberty	8,365	0	0
Madison	19,224	0	0
Manatee	322,833	0	0
Marion	0	331,298	0
Martin	146,318	0	0
Miami-Dade	0	0	2,493,127
Monroe	73,090	0	0
Nassau	73,314	0	0
Okaloosa	0	180,822	0
Okeechobee	39,996	0	0
Orange	1,041,142	104,814	0
Osceola	268,685	0	0
Palm Beach	0	1,288,213	31,249
Pasco	0	464,697	0
Pinellas	0	0	916,542
Polk	0	0	602,095
Putnam	84,211	0	0
Santa Rosa	180,192	0	0
Sarasota	277,789	0	0
Seminole	0	151,372	0
St Johns	379,448	0	0
St Lucie	422,718	0	0
Sumter	87,023	0	0
Suwannee	41,551	0	0
Taylor	22,570	0	0
Union	15,535	0	0
Volusia	0	494,593	0
Wakulla	30,776	0	0
Walton	55,043	0	0
Washington	24,896	0	0

Task 3 - Appendix 1 – Technical Appendix

The methods described here summarize all steps taken in the construction of the Hazard Vulnerability Index (HazVI) for the Florida Department of Health at the tract level for Florida. This report, divided into 4 sections, outlines each major component of these methods, including:

1. Sources of Data
2. Preprocessing of Raw Data
3. Calculation of Hazard Frequency
4. Calculation of Tract-level HazVI Score

Sources of Data

Data used in the construction of HazVI for the State of Florida are collected from several sources as per the data type and information needed to represent each hazard type. **Table A3-1** below provides the description and source for all spatial and tabular data acquired during the construction process.

Table A3-1: Sources and descriptions of data*

Hazard Type	Data Type	Date Ranges	Source	URL/Contact
Earthquakes	Buffered Points	1850 - 2012	USGS- Global Earthquake Search	http://earthquake.usgs.gov/earthquakes/eqarchives/epic/epic_global.php
Wildfires	Probability Surface	N/A	FLDEM	Contact: Richard Butgereit, FLDEM (Richard.Butgereit@em.myflorida.com)
500-year Flood Zone	Polygons	N/A	FLDEM provided merged State DFIRMS and FEMA Q3, used HAZUS to backfill Okeechobee County	Contact: Richard Butgereit, FLDEM (Richard.Butgereit@em.myflorida.com)
100-year Flood Zone	Polygons	N/A	FLDEM provided merged State DFIRMS and FEMA Q3, used HAZUS to backfill Okeechobee County	Contact: Richard Butgereit, FLDEM (Richard.Butgereit@em.myflorida.com)
Hurricane Wind (Tracks)	Buffered Lines	1851 - 2010	NOAA NCDC IBTrACS	ftp://eclipse.ncdc.noaa.gov/pub/ibtracs/v03r03/all/shp/
Hurricane Storm Surge (SLOSH)	Polygons	N/A	FLDEM	http://floridadisaster.org/gis/data/index.htm#stormsurge
Winter Weather	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx
Wind	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx

Severe Storm	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx
Lightning	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx
Heat	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx
Hail	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx
Fog	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx
Drought	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx
Coastal	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx
Tornado	Tabular (County)	1960 - 2010	Spatial Hazard Events and Losses Database for the United States (SHELDUS)	http://webra.cas.sc.edu/hvri/products/sheldus.aspx

**Some Notes on Data Sources*

Earthquake data downloaded from the USGS Global Earthquake Search was combined from two separate databases (both available at the source cited above) to include events prior to 1973. From 1973 to present, data were downloaded from the current USGS/NEIC Preliminary Determination of Epicenters (PDE) database. For events that occurred prior to 1973, data were collected from the Significant U.S. Earthquakes database. While that database reaches back to 1568, historical records of disaster occurrence were not contiguous or well documented prior to the 19th Century. To preserve data reliability and contiguity, a beginning year of 1850 was chosen for this analysis. Additionally, to ensure that the data represented significant (i.e. loss-causing) events, a minimum magnitude threshold of 4.4 and minimum intensity of V were employed (see Bollinger et al 1993; Tate et al. 2010; USGS 2012).

Thresholds for inclusion for each hazard type were chosen to represent the potential for damages, or in the case of SHELDUS, historical events that produced losses or casualties. For Floods, the threshold for inclusion is based on the 100- and 500-year return period. For hurricane wind, the minimum threshold included storms with a Saffir-Simpson Category 1 or greater. Finally, for storm surge, the minimum storm intensity captured by the available SLOSH data included tropical storms.

Earthquakes

Tabular event data downloaded from USGS Global Earthquake Search were imported into ArcMap and converted to a point-level data layer using the approximate latitude and longitude of the earthquake epicenter. Previous research has explored the empirical relationship between earthquake magnitude and area of damage (Bolliger et al. 1993). To represent the approximate zone of impact for each earthquake event, Bolliger et al.'s (1993) equation was used to derive impact area from moment magnitude:

$$\log A = 0.57 + 0.66M$$

Where A is the approximate area of earthquake impact, and M is moment magnitude. To determine the buffer radius, circular areas were converted to radii using the equation: $A = \pi r^2$, where A is the area of a circle and r is the radius. The resulting radii were used to define the appropriate buffer distance for each earthquake, representing the spatial extent for each historical event.

Wildfires

The wildfire risk surface (30 meter grid cell size) provided by the Florida Dept. of Emergency Management (FLDEM) represents the probability of an acre burning if ignited. To aggregate wildfire risk to a manageable spatial unit, zonal statistics were used in ArcMap to determine the average wildfire probability within each census tract.

100- and 500- year Flood Zones

The 100- and 500- year flood zones provided by the FLDEM represent a near-contiguous dataset comprised of records from State Digital Flood Rate Insurance Map (where available) and FEMA Q3. However, neither dataset provided flood data coverage for Okeechobee County. To approximate the areal extent of the 100- and 500-year flood return period for this area, we created supplementary flood hazard layers using hydraulic modeling in HAZUS-MH, following the methodology outlined by Gall et al. (2007). The resulting layers were then merged with the flood data provided FLDEM to provide a contiguous flood risk surface for the state.

Hurricane Wind

Historical hurricane tracks downloaded from NOAA NCDC IBTrACS were imported into ArcMAP for spatial processing. As many storms were represented as multiple discrete line segments (based on several attributes including wind speed and location), it was necessary to first remove sections of the storm track that did not represent a damaging hurricane wind hazard (i.e. less than category 1). Next, discrete sections of single storm tracks were dissolved based on unique storm ID to create a single, unbroken spatial feature for each storm. It is important to note, however, that some features do appear to be discontinuous. This occurs when a storm weakens below category 1 (such as after making landfall) and restrengthens in a subsequent operational period. To represent the approximate zone of impact from hurricane-force winds, we used a 100 mile track width (i.e. 50-mile buffer), as suggested by Tate et al. (2010) and Willoughby et al. (2007).

Hurricane Storm Surge

SLOSH zones provided by FLDEM represent overland storm surge produced by hurricanes and tropical storms in the state of Florida. Surge polygons were imported into ArcMap for hazard frequency processing (described below).

SHELDUS Loss-causing Events

Data downloaded from SHELDUS represent loss causing events for the following hazard types in the state of Florida: winter weather, wind, severe storm, lightning, heat, hail, fog, drought, coastal and tornado. Data were aggregated by hazard type and location of occurrence (i.e. county) using a pivot table in Microsoft Excel. Finally, tabular data were joined to a county shapefile for spatial processing in ArcMap.

Calculation of Hazard Frequency

The historical frequency of occurrence is represented as the inverse of the period of record. For example, if there are 51 years of SHELDUS records, the frequency of each individual event is calculated as 1 divided by 51. Likewise, if historical frequency is calculated for discrete spatial events, such as earthquakes or hurricanes, the frequency for each event is equal to 1 divided by the number of years in record. For events that overlap spatially over a given area, this overlap is taken into account. For example, if separate sections of three different hurricanes overlap in a given area over a 100-year period, the historical frequency for that location is 3 / 100, or 0.03. This logic was used to determine historical hazard frequency for each hazard type that included a historical record (i.e. earthquakes, hurricane winds, and SHELDUS events). Similarly, for flood hazards, the expected return interval was used to approximate hazard frequency, where 100-year floods have a frequency of 1 / 100, or 0.01 and 500-year floods have a frequency of 1 / 500, or 0.002.

For hazard events that did not include a historical record, the probability or occurrence was substituted for historical frequency. For wildfires, this was simply the probability of an acre burning if ignited, averaged for each census tract. For storm surge, an average probability of occurrence was determined using the regional storm landfall probabilities provided by Dr. William Gray's US Landfalling Hurricane Web Project (http://e-transit.org/hurricane/welcome.html). Different probabilities were derived based on spatial location and hurricane strength. If a surge zone inundated a county that was not listed in any of the landfall probability regions, the surge direction and source of wind/floodwater was assessed visually and an appropriate region was assigned on an ad-hoc basis.

Calculating the HazVI Score

Once the procedure for determining hazard frequency was completed for each hazard type, the frequencies were summed in each spatial unit and overlapping area to develop a multihazard frequency map. The results of the frequency-based spatial analysis help to determine the location where hazards occur most often in the state of Florida, illustrating the relative impacts from each threat source. Aggregating this detailed geospatial data to a level that can be utilized by planners and emergency managers required a simply geospatial dissolve function (Figure A3-1). Here, the intersection of each hazard zone with census tract geographies for the state produced a census track level HazVI in which

each tract inherited the maximum hazard value for every coincident hazard zone. For example, 100-year flood zone designation was given to every track that was coincident with any portion of the 100-year flood layer.

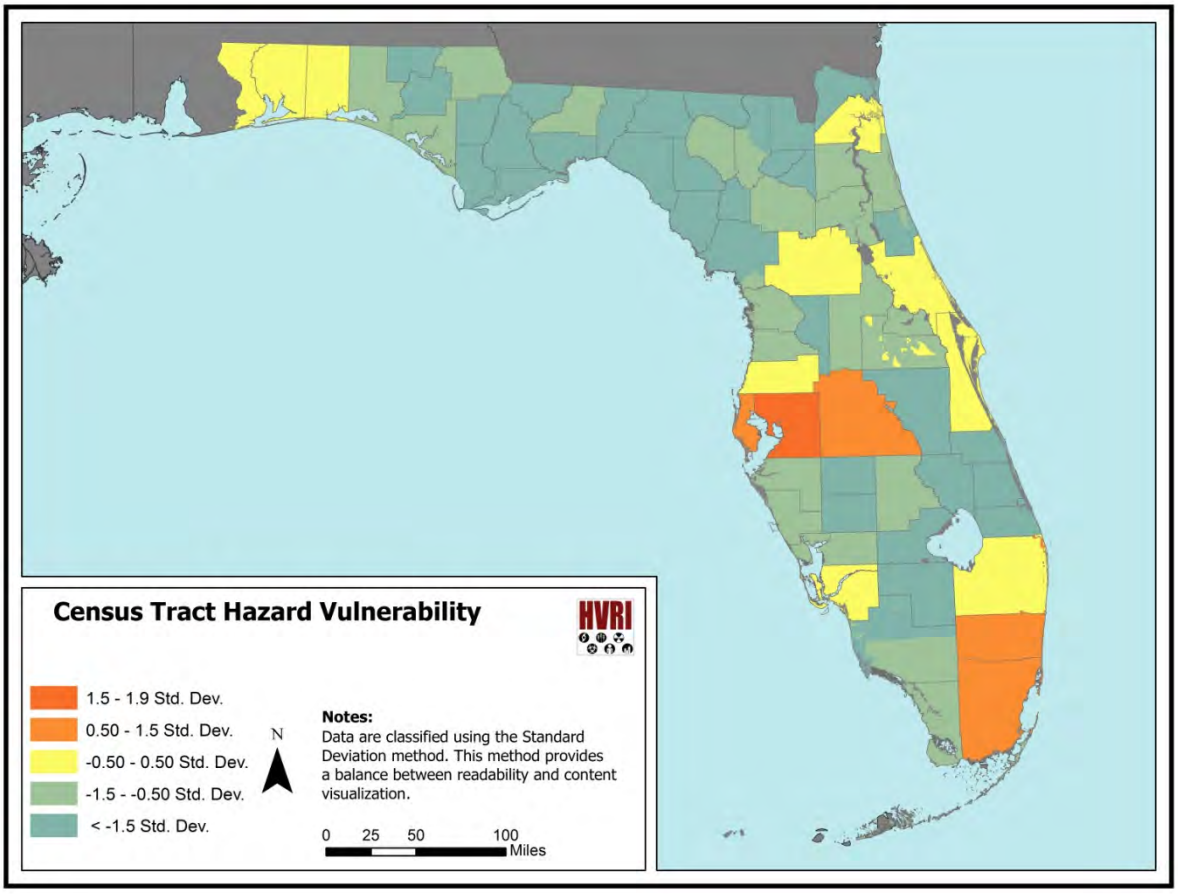

Figure A3-1: Hazard Vulnerability in Florida

References and Further Readings

Conducting a Hazards Assessment

Advisory Committee on the International Decade for Natural Hazard Reduction. (1987). *Confronting Natural Disasters: An International Decade for Natural Hazard Reduction*. National Academy Press, Washington, D.C.-USA.

Federal Emergency Management Agency and National Emergency Management Association. (1997). *State Capability Assessment for Readiness (CAR).* Report Version 1, Washington, D. C.-USA.

Hewitt, K. and I. Burton. (1971). *The hazardousness of a place: A regional ecology of damaging events*. Department of Geography, University of Toronto, Toronto, Ontario-Canada.

Institution of Civil Engineers. (1995). *Megacities: reducing vulnerability to natural disasters*. Thomas Telford Press, London-England.

Kates, R. and J. Kasperson. (1983). Comparative risk analysis of technological hazards (a review). *Proceedings of National Academy of Science USA*, 80: 7027-7038.

National Research Council. (1991*). A Safer Future: Reducing the Impacts of Natural Disasters*. National Academy Press, Washington, D.C.-USA.

Tate E., S.L. Cutter, and M. Berry. (2010). Integrated multihazard mapping. *Environment and Planning B*: Planning and Design 37(4): 646–663.

Physical Vulnerability

Berke, P. R. and T. Beatley. 1992. *Planning for Earthquakes: Risk, Politics, and Policy*. Johns Hopkins Press, Baltimore-USA.

Bollinger, G.A., M.C. Chapman, and M.S. Sibol. (1993). A comparison of earthquake damage areas as a function of magnitude across the United States. *Bulletin of the Seismological Society of America* 83(4): 1064-1080.

Coburn, A. and R. Spence. (1992). *Earthquake Protection*. John Wiley and Sons, New York-USA.

Coch, N. K. 1995. *Geohazards*. Prentice Hall, Englewood Cliffs, New Jersey-USA.

Dagel, K. (1997). Defining Drought in Marginal Areas: The Role of Perception. *The Professional Geographer, 49*: 192-202.

Ebert, C. (1989). *Disasters: Violence of Nature and Threats by Man*. Kendall/Hunt, Dubuque, Iowa-USA.

Gall, M., B.J. Boruff, and S.L. Cutter. (2007). Assessing flood hazard zones in the absence of digital floodplain maps: a comparison of alternative approaches. *Natural Hazards Review* 8(1): 1-21.

Heathcote, R. (1969). Drought in Australia: A problem of perception. *Geographical Review, 59*: 175-194.

Livingston, M. (1996). "Living on the Edge." *The State*. February 20. Columbia, South Carolina-USA.

Palmer, W. (1965). *Meteorological Drought*. Research Paper No. 45. U.S. Weather Bureau.

Smith, K. 1992. *Environmental Hazards: Assessing Risk and Reducing Disaster*. Routledge, London-England.

South Carolina Seismic Network. (1996). *South Carolina Earthquakes, 1698-1995*. University of South Carolina, Columbia, South Carolina-USA.

South Carolina State Budget and Control Board. (1981-1996). *South Carolina Statistical Abstract*. Columbia, South Carolina-USA.

U.S. Department of Transportation. (1993). *1993 Emergency Response Guidebook*. Washington, D.C.-USA.

USGS. (2012). Magnitude/Intensity Comparison. United States Geological Survey Earthquake Hazards Program. Available from: http://earthquake.usgs.gov/learn/topics/mag_vs_int.php

Willoughby H.E., E.N. Rappaport, and F.D. Marks. (2007). Hurricane forecasting: the state of the art. *Natural Hazards Review* 8(3): 45-49.

Task 4 – Integration of SoVI, MedVI, and HazVI

Tasks 1-3 of this project provide us an individual glimpse into social vulnerability, hazard vulnerability, and medical vulnerability across the state of Florida. These tasks alone and resultant geospatial layers, analysis, and findings are a strong foundation from which to construct emergency management plans, procedures, and identify areas where additional support (before during and after disaster) will dramatically alter the overall ability of places to adequately respond to and rebound from disasters. However, the combination of these three pieces into a composite view of SoVI, MedVI, and HazVI has the potential to raise awareness and inform decision making, planning, and resource allocation in more ways than any single later could do alone.

This final task – integration and display of the three geospatial surfaces – is simple in terms of the techniques used in the aggregation but leads to a completely different understanding of how these individual surfaces interact. Figures T4-1 – T4-3 display the bivariate representations of the interaction of the spatial MedVI, SoVI, and HazVI surfaces. Accompanying these is a set of tables identifying the number of census tracts and the total populations residing within each of the numerous combinations of these layers (T4-1 – T4-8).

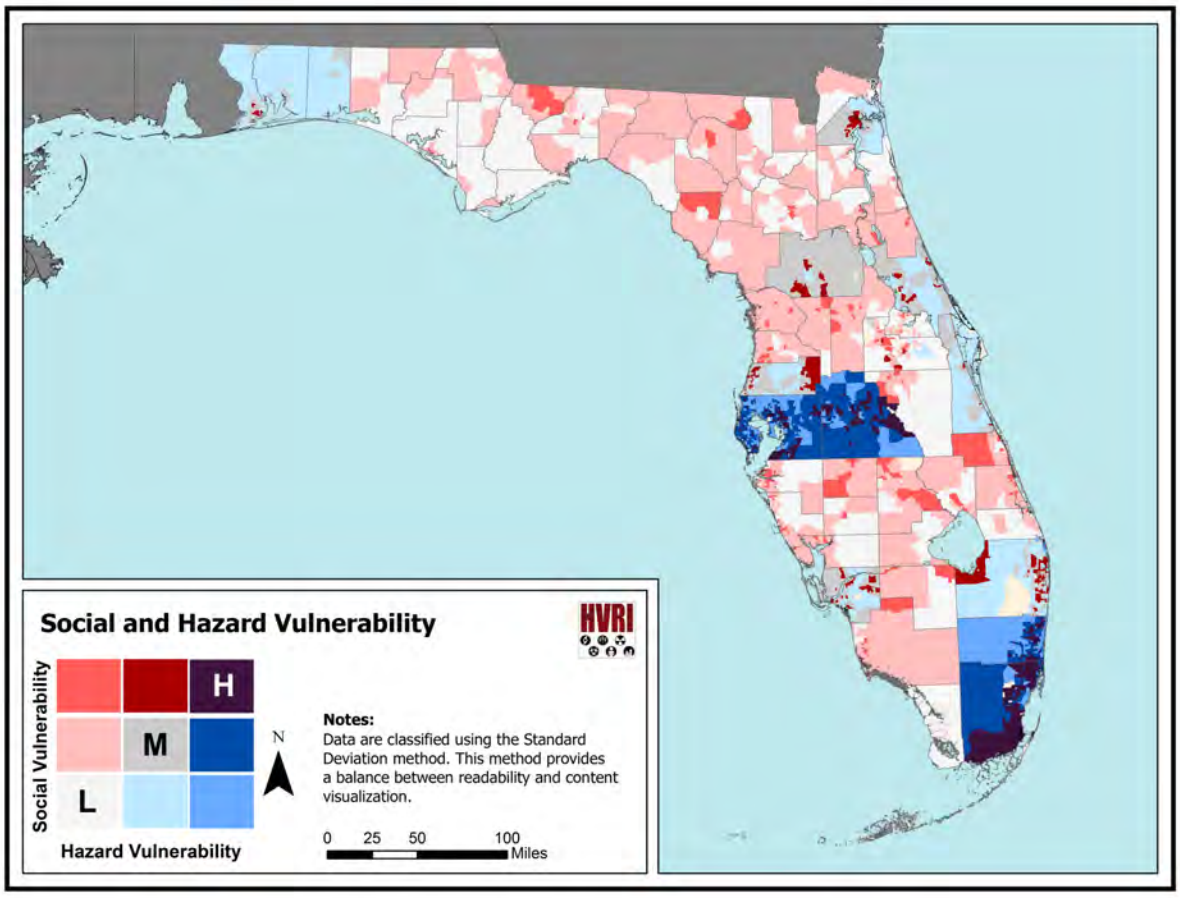

Figure T4-1: Social and Hazard Vulnerability Integration within the state of Florida

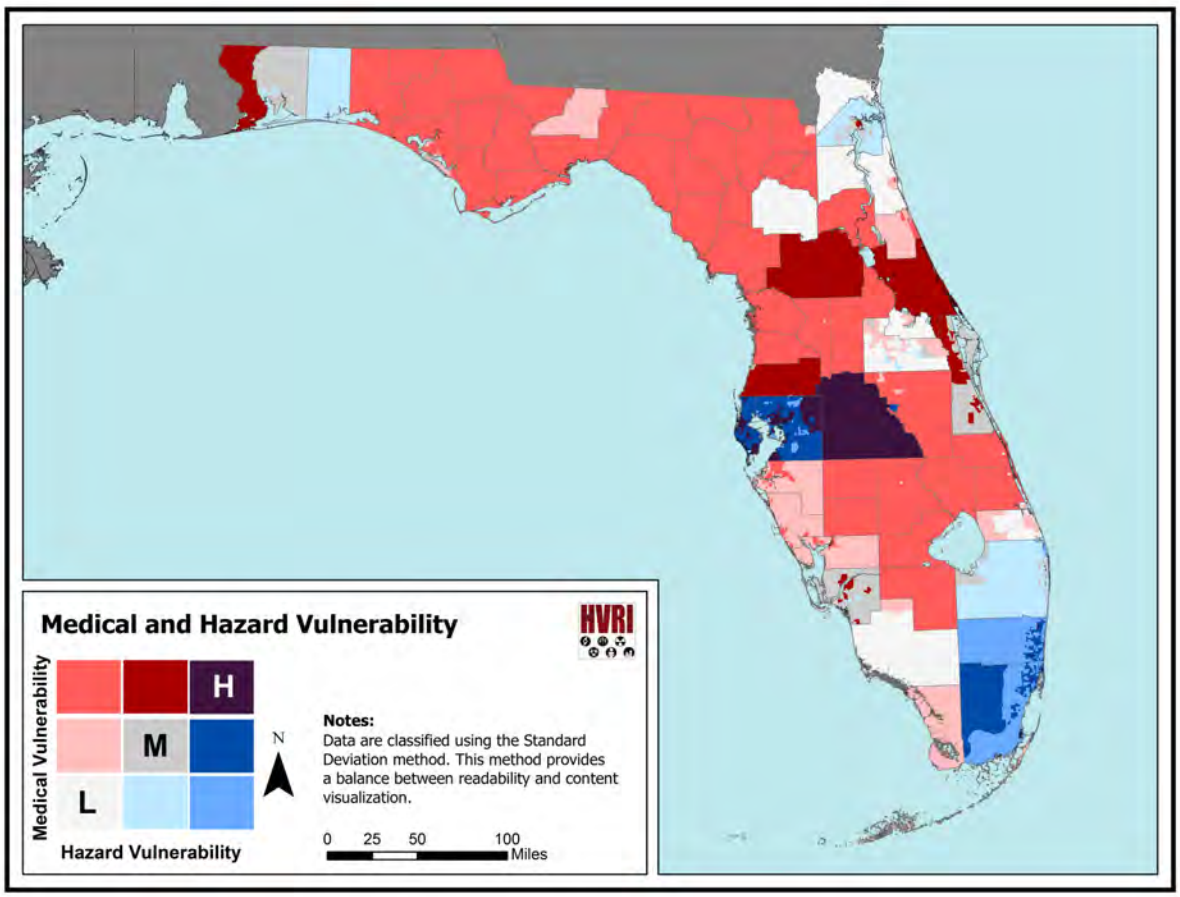

Figure T4-2: Medical and Hazard Vulnerability Integration within the state of Florida

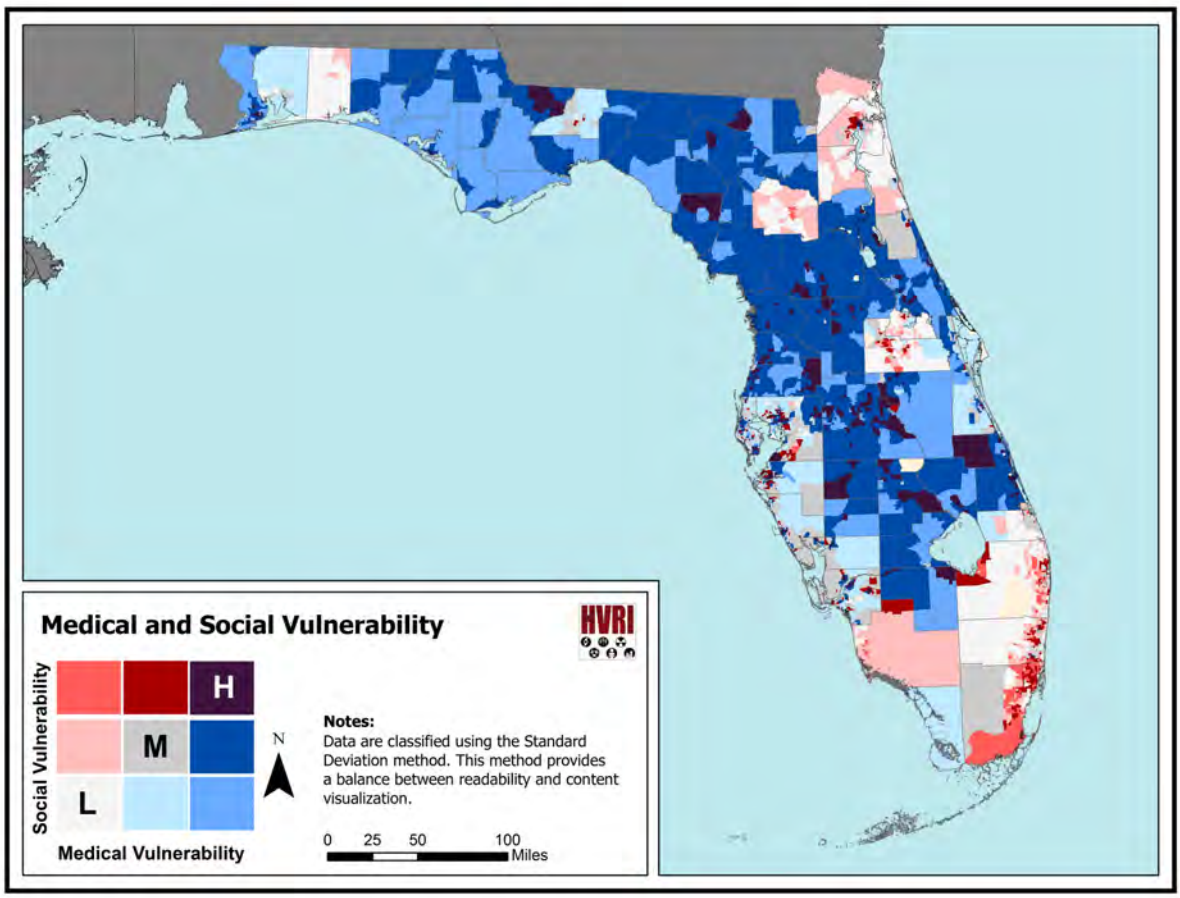

Figure T4-3: Social and Medical Vulnerability Integration within the state of Florida

Table T4-1: Count of census tracts within each standard deviation class for HazVI, SoVI, and MedVI

County	Low HazVI	Moderate HazVI	High HazVI	Low MedVI	Moderate MedVI	High MedVI	Low SoVI	Moderate SoVI	High SoVI
ALACHUA	56	0	0	56	0	0	38	14	4
BAKER	4	0	0	0	1	3	1	3	0
BAY	43	0	0	0	11	32	24	16	3
BRADFORD	4	0	0	0	0	4	1	3	0
BREVARD	0	113	0	2	84	27	45	60	6
BROWARD	0	0	361	255	102	4	107	141	113
CALHOUN	3	0	0	0	0	3	2	1	0
CHARLOTTE	38	0	0	0	31	7	2	31	5
CITRUS	28	0	0	1	0	27	0	23	4
CLAY	30	0	0	30	0	0	11	18	1
COLLIER	73	0	0	68	5	0	23	35	15
COLUMBIA	12	0	0	0	0	12	4	7	1
DESOTO	9	0	0	0	0	9	3	4	2
DIXIE	3	0	0	0	0	3	1	1	1
DUVAL	0	173	0	103	60	10	69	68	36
ESCAMBIA	0	71	0	0	1	70	30	29	12
FLAGLER	20	0	0	0	14	6	1	16	3
FRANKLIN	4	0	0	0	0	4	3	1	0
GADSDEN	9	0	0	0	0	9	0	4	5
GILCHRIST	5	0	0	0	0	5	2	3	0
GLADES	3	0	0	0	0	3	1	2	0
GULF	3	0	0	0	0	3	2	1	0
HAMILTON	3	0	0	0	0	3	0	2	1
HARDEE	6	0	0	0	0	6	0	4	2
HENDRY	6	0	0	0	0	6	1	2	3
HERNANDO	44	0	0	0	0	44	4	25	15
HIGHLANDS	27	0	0	0	1	26	3	15	8
HILLSBOROUGH	0	0	319	27	207	85	119	124	73
HOLMES	4	0	0	0	0	4	0	4	0
INDIAN RIVER	30	0	0	1	0	29	4	19	6
JACKSON	11	0	0	0	0	11	4	7	0
JEFFERSON	3	0	0	0	0	3	1	2	0
LAFAYETTE	2	0	0	0	0	2	1	1	0
LAKE	56	0	0	0	0	56	3	44	9

Table T4-1 continued: Count of census tracts within each standard deviation class for HazVI, SoVI, and MedVI

County	Low HazVI	Moderate HazVI	High HazVI	Low MedVI	Moderate MedVI	High MedVI	Low SoVI	Moderate SoVI	High SoVI
LEE	0	166	0	3	131	32	43	91	31
LEON	68	0	0	3	65	0	40	22	6
LEVY	9	0	0	0	0	9	1	8	0
LIBERTY	2	0	0	0	0	2	2	0	0
MADISON	5	0	0	0	0	5	0	5	0
MANATEE	78	0	0	0	61	17	19	41	18
MARION	0	63	0	1	0	62	5	43	13
MARTIN	34	0	0	22	12	0	13	19	2
MIAMI-DADE	0	0	518	339	175	4	70	84	358
MONROE	30	0	0	1	29	0	25	5	0
NASSAU	12	0	0	12	0	0	7	5	0
OKALOOSA	0	41	0	41	0	0	33	8	0
OKEECHOBEE	11	0	0	0	0	11	2	6	3
ORANGE	190	17	0	142	65	0	93	64	49
OSCEOLA	41	0	0	0	2	39	8	20	13
PALM BEACH	0	327	9	279	57	0	111	111	110
PASCO	0	133	0	0	2	131	20	86	27
PINELLAS	0	0	244	1	175	68	82	128	34
POLK	0	0	154	0	1	153	26	77	51
PUTNAM	17	0	0	0	0	17	2	11	3
SANTA ROSA	0	24	0	12	12	0	20	4	0
SARASOTA	94	0	0	0	78	16	25	58	11
SEMINOLE	86	0	0	74	12	0	39	40	7
ST. JOHNS	39	0	0	32	5	2	28	10	1
ST. LUCIE	44	1	0	1	1	43	2	31	11
SUMTER	19	0	0	0	1	18	2	11	5
SUWANNEE	7	0	0	0	0	7	1	5	1
TAYLOR	4	0	0	0	0	4	1	3	0
UNION	3	0	0	0	0	3	2	1	0
VOLUSIA	0	113	0	0	0	113	26	69	18
WAKULLA	4	0	0	0	0	4	2	2	0
WALTON	11	0	0	0	0	11	9	2	0
WASHINGTON	7	0	0	0	0	7	4	3	0

Table T4-2: Total population within each standard deviation class for HazVI, SoVI, and MedVI

County	Low HazVI	Moderate HazVI	High HazVI	Low MedVI	Moderate MedVI	High MedVI	Low SoVI	Moderate SoVI	High SoVI
ALACHUA	247,336	0	0	247,336	0	0	164,583	63,347	19,406
BAKER	27,115	0	0	0	6,684	20,431	5,381	21,734	0
BAY	168,852	0	0	0	41,056	127,796	97,320	62,686	8,846
BRADFORD	28,520	0	0	0	0	28,520	6,327	22,193	0
BREVARD	0	543,369	0	0	385,131	158,238	213,201	309,321	20,847
BROWARD	0	0	1,748,066	1,190,932	530,018	27,116	455,093	735,676	557,297
CALHOUN	14,625	0	0	0	0	14,625	6,429	8,196	0
CHARLOTTE	159,978	0	0	0	127,744	32,234	5,994	136,079	17,905
CITRUS	141,236	0	0	0	0	141,236	0	123,812	17,424
CLAY	190,865	0	0	190,865	0	0	98,608	86,946	5,311
COLLIER	321,520	0	0	297,103	24,417	0	66,377	178,461	76,682
COLUMBIA	67,531	0	0	0	0	67,531	23,211	41,448	2,872
DESOTO	34,862	0	0	0	0	34,862	12,113	14,157	8,592
DIXIE	16,422	0	0	0	0	16,422	4,990	4,101	7,331
DUVAL	0	864,263	0	565,268	264,174	34,821	369,321	347,003	147,939
ESCAMBIA	0	297,619	0	0	3,223	294,396	130,328	127,368	39,923
FLAGLER	95,696	0	0	0	71,175	24,521	3,217	76,595	15,884
FRANKLIN	11,549	0	0	0	0	11,549	8,745	2,804	0
GADSDEN	46,389	0	0	0	0	46,389	0	21,356	25,033
GILCHRIST	16,939	0	0	0	0	16,939	5,152	11,787	0
GLADES	12,884	0	0	0	0	12,884	3,748	9,136	0
GULF	15,863	0	0	0	0	15,863	12,787	3,076	0
HAMILTON	14,799	0	0	0	0	14,799	0	13,039	1,760
HARDEE	27,731	0	0	0	0	27,731	0	17,101	10,630
HENDRY	39,140	0	0	0	0	39,140	5,578	11,716	21,846
HERNANDO	172,778	0	0	0	0	172,778	10,220	100,257	62,301
HIGHLANDS	98,786	0	0	0	1	98,785	1,063	62,607	35,116
HILLSBOROUGH	0	0	1,229,226	71,311	849,989	307,926	449,983	499,458	279,785
HOLMES	19,927	0	0	0	0	19,927	0	19,927	0
INDIAN RIVER	138,028	0	0	0	0	138,028	17,131	99,009	21,888
JACKSON	49,746	0	0	0	0	49,746	19,748	29,998	0
JEFFERSON	14,761	0	0	0	0	14,761	5,885	8,876	0
LAFAYETTE	8,870	0	0	0	0	8,870	3,164	5,706	0
LAKE	297,052	0	0	0	0	297,052	22,025	234,222	40,805

Table T4-2 continued: Total population within each standard deviation class for HazVI, SoVI, and MedVI

County	Low HazVI	Moderate HazVI	High HazVI	Low MedVI	Moderate MedVI	High MedVI	Low SoVI	Moderate SoVI	High SoVI
LEE	0	618,754	0	3,941	478,225	136,588	126,181	396,255	96,318
LEON	275,487	0	0	9,798	265,689	0	162,695	94,894	17,898
LEVY	40,801	0	0	0	0	40,801	1,402	39,399	0
LIBERTY	8,365	0	0	0	0	8,365	8,365	0	0
MADISON	19,224	0	0	0	0	19,224	0	19,224	0
MANATEE	322,833	0	0	0	249,308	73,525	80,935	160,941	80,957
MARION	0	331,298	0	0	0	331,298	23,319	214,832	93,147
MARTIN	146,318	0	0	90,263	56,055	0	54,681	87,546	4,091
MIAMI-DADE	0	0	2,493,127	1,543,269	937,344	12,514	222,655	365,609	1,904,863
MONROE	73,090	0	0	20	73,070	0	55,956	17,134	0
NASSAU	73,314	0	0	73,314	0	0	40,878	32,436	0
OKALOOSA	0	180,822	0	180,822	0	0	144,237	36,585	0
OKEECHOBEE	39,996	0	0	0	0	39,996	7,573	22,307	10,116
ORANGE	1,041,142	104,814	0	774,517	371,439	0	535,154	363,495	247,307
OSCEOLA	268,685	0	0	0	4,108	264,577	23,908	147,877	96,900
PALM BEACH	0	1,288,213	31,249	1,088,242	231,220	0	427,853	491,191	400,418
PASCO	0	464,697	0	0	5,987	458,710	84,205	296,135	84,357
PINELLAS	0	0	916,542	1,669	641,881	272,992	290,449	504,344	121,749
POLK	0	0	602,095	0	3	602,092	86,045	302,342	213,708
PUTNAM	74,364	0	0	0	0	74,364	7,775	56,109	10,480
SANTA ROSA	0	148,168	0	77,376	70,792	0	127,031	21,137	0
SARASOTA	379,448	0	0	0	315,852	63,596	93,826	244,626	40,996
SEMINOLE	422,718	0	0	389,242	33,476	0	192,076	204,741	25,901
ST. JOHNS	190,039	0	0	164,184	18,182	7,673	141,600	44,284	4,155
ST. LUCIE	277,789	3,204	0	0	3,204	277,789	12,064	222,219	46,710
SUMTER	87,023	0	0	0	0	87,023	2,080	35,518	49,425
SUWANNEE	41,551	0	0	0	0	41,551	1,803	32,732	7,016
TAYLOR	22,570	0	0	0	0	22,570	7,877	14,693	0
UNION	15,535	0	0	0	0	15,535	11,040	4,495	0
VOLUSIA	0	494,593	0	0	0	494,593	105,686	305,671	83,236
WAKULLA	30,776	0	0	0	0	30,776	17,199	13,577	0
WALTON	55,043	0	0	0	0	55,043	43,686	11,357	0
WASHINGTON	24,896	0	0	0	0	24,896	14,709	10,187	0

Table T4-3: Count of census tracts within each standard deviation class for MedVI based on SoVI Class.

County	No SoVI			Low SoVI			Moderate SoVI			High SoVI		
	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi
ALACHUA	0	0	0	38	0	0	14	0	0	4	0	0
BAKER	0	0	0	0	0	1	0	1	2	0	0	0
BAY	0	0	0	0	7	17	0	4	12	0	0	3
BRADFORD	0	0	0	0	0	1	0	0	3	0	0	0
BREVARD	2	0	0	0	37	8	0	43	17	0	4	2
BROWARD	0	0	0	97	10	0	109	30	2	49	62	2
CALHOUN	0	0	0	0	0	2	0	0	1	0	0	0
CHARLOTTE	0	0	0	0	2	0	0	26	5	0	3	2
CITRUS	1	0	0	0	0	0	0	0	23	0	0	4
CLAY	0	0	0	11	0	0	18	0	0	1	0	0
COLLIER	0	0	0	23	0	0	35	0	0	10	5	0
COLUMBIA	0	0	0	0	0	4	0	0	7	0	0	1
DESOTO	0	0	0	0	0	3	0	0	4	0	0	2
DIXIE	0	0	0	0	0	1	0	0	1	0	0	1
DUVAL	0	0	0	57	11	1	39	27	2	7	22	7
ESCAMBIA	0	0	0	0	1	29	0	0	29	0	0	12
FLAGLER	0	0	0	0	0	1	0	12	4	0	2	1
FRANKLIN	0	0	0	0	0	3	0	0	1	0	0	0
GADSDEN	0	0	0	0	0	0	0	0	4	0	0	5
GILCHRIST	0	0	0	0	0	2	0	0	3	0	0	0
GLADES	0	0	0	0	0	1	0	0	2	0	0	0
GULF	0	0	0	0	0	2	0	0	1	0	0	0
HAMILTON	0	0	0	0	0	0	0	0	2	0	0	1
HARDEE	0	0	0	0	0	0	0	0	4	0	0	2
HENDRY	0	0	0	0	0	1	0	0	2	0	0	3
HERNANDO	0	0	0	0	0	4	0	0	25	0	0	15
HIGHLANDS	0	0	1	0	1	2	0	0	15	0	0	8
HILLSBOROUGH	3	0	0	19	85	15	4	87	33	1	35	37
HOLMES	0	0	0	0	0	0	0	0	4	0	0	0
INDIAN RIVER	1	0	0	0	0	4	0	0	19	0	0	6
JACKSON	0	0	0	0	0	4	0	0	7	0	0	0
JEFFERSON	0	0	0	0	0	1	0	0	2	0	0	0
LAFAYETTE	0	0	0	0	0	1	0	0	1	0	0	0
LAKE	0	0	0	0	0	3	0	0	44	0	0	9

Table T4-3 Continued: Count of census tracts within each standard deviation class for MedVI based on SoVI Class.

County	No SoVI			Low SoVI			Moderate SoVI			High SoVI		
	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi
LEE	1	0	0	2	40	1	0	72	19	0	19	12
LEON	0	0	0	2	38	0	1	21	0	0	6	0
LEVY	0	0	0	0	0	1	0	0	8	0	0	0
LIBERTY	0	0	0	0	0	2	0	0	0	0	0	0
MADISON	0	0	0	0	0	0	0	0	5	0	0	0
MANATEE	0	0	0	0	18	1	0	33	8	0	10	8
MARION	1	0	1	0	0	5	0	0	43	0	0	13
MARTIN	0	0	0	11	2	0	10	9	0	1	1	0
MIAMI-DADE	6	0	0	50	19	1	71	13	0	212	143	3
MONROE	0	0	0	1	24	0	0	5	0	0	0	0
NASSAU	0	0	0	7	0	0	5	0	0	0	0	0
OKALOOSA	0	0	0	33	0	0	8	0	0	0	0	0
OKEECHOBEE	0	0	0	0	0	2	0	0	6	0	0	3
ORANGE	1	0	0	77	16	0	43	21	0	21	28	0
OSCEOLA	0	0	0	0	1	7	0	1	19	0	0	13
PALM BEACH	4	0	0	101	10	0	99	12	0	75	35	0
PASCO	0	0	0	0	1	19	0	1	85	0	0	27
PINELLAS	0	0	0	1	68	13	0	96	32	0	11	23
POLK	0	0	0	0	0	26	0	0	77	0	1	50
PUTNAM	0	0	1	0	0	2	0	0	11	0	0	3
SANTA ROSA	0	0	0	11	9	0	1	3	0	0	0	0
SARASOTA	0	0	0	0	25	0	0	45	13	0	8	3
SEMINOLE	0	0	0	35	4	0	38	2	0	1	6	0
ST. JOHNS	0	0	0	24	4	0	8	1	1	0	0	1
ST. LUCIE	1	0	0	0	0	2	0	1	30	0	0	11
SUMTER	0	1	0	0	0	2	0	0	11	0	0	5
SUWANNEE	0	0	0	0	0	1	0	0	5	0	0	1
TAYLOR	0	0	0	0	0	1	0	0	3	0	0	0
UNION	0	0	0	0	0	2	0	0	1	0	0	0
VOLUSIA	0	0	0	0	0	26	0	0	69	0	0	18
WAKULLA	0	0	0	0	0	2	0	0	2	0	0	0
WALTON	0	0	0	0	0	9	0	0	2	0	0	0
WASHINGTON	0	0	0	0	0	4	0	0	3	0	0	0

Table T4-4: Total population within each standard deviation class for MedVI based on SoVI Class.

County	No SoVI			Low SoVI			Moderate SoVI			High SoVI		
	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi
ALACHUA	0	0	0	164,583	0	0	63,347	0	0	19,406	0	0
BAKER	0	0	0	0	0	5,381	0	6,684	15,050	0	0	0
BAY	0	0	0	0	26,702	70,618	0	14,354	48,332	0	0	8,846
BRADFORD	0	0	0	0	0	6,327	0	0	22,193	0	0	0
BREVARD	0	0	0	0	154,601	58,600	0	216,154	93,167	0	14,376	6,471
BROWARD	0	0	0	406,426	48,667	0	571,118	150,766	13,792	213,388	330,585	13,324
CALHOUN	0	0	0	0	0	6,429	0	0	8,196	0	0	0
CHARLOTTE	0	0	0	0	5,994	0	0	113,431	22,648	0	8,319	9,586
CITRUS	0	0	0	0	0	0	0	0	123,812	0	0	17,424
CLAY	0	0	0	98,608	0	0	86,946	0	0	5,311	0	0
COLLIER	0	0	0	66,377	0	0	178,461	0	0	52,265	24,417	0
COLUMBIA	0	0	0	0	0	23,211	0	0	41,448	0	0	2,872
DESOTO	0	0	0	0	0	12,113	0	0	14,157	0	0	8,592
DIXIE	0	0	0	0	0	4,990	0	0	4,101	0	0	7,331
DUVAL	0	0	0	309,451	53,786	6,084	220,114	123,163	3,726	35,703	87,225	25,011
ESCAMBIA	0	0	0	0	3,223	127,105	0	0	127,368	0	0	39,923
FLAGLER	0	0	0	0	0	3,217	0	59,608	16,987	0	11,567	4,317
FRANKLIN	0	0	0	0	0	8,745	0	0	2,804	0	0	0
GADSDEN	0	0	0	0	0	0	0	0	21,356	0	0	25,033
GILCHRIST	0	0	0	0	0	5,152	0	0	11,787	0	0	0
GLADES	0	0	0	0	0	3,748	0	0	9,136	0	0	0
GULF	0	0	0	0	0	12,787	0	0	3,076	0	0	0
HAMILTON	0	0	0	0	0	0	0	0	13,039	0	0	1,760
HARDEE	0	0	0	0	0	0	0	0	17,101	0	0	10,630
HENDRY	0	0	0	0	0	5,578	0	0	11,716	0	0	21,846
HERNANDO	0	0	0	0	0	10,220	0	0	100,257	0	0	62,301
HIGHLANDS	0	0	0	0	1	1,062	0	0	62,607	0	0	35,116
HILLSBOROUGH	0	0	0	46,376	350,417	53,190	19,740	363,832	115,886	5,195	135,740	138,850
HOLMES	0	0	0	0	0	0	0	0	19,927	0	0	0
INDIAN RIVER	0	0	0	0	0	17,131	0	0	99,009	0	0	21,888
JACKSON	0	0	0	0	0	19,748	0	0	29,998	0	0	0
JEFFERSON	0	0	0	0	0	5,885	0	0	8,876	0	0	0
LAFAYETTE	0	0	0	0	0	3,164	0	0	5,706	0	0	0
LAKE	0	0	0	0	0	22,025	0	0	234,222	0	0	40,805

Table T4-4 Continued: Total population within each standard deviation class for MedVI based on SoVI Class.

County	No SoVI			Low SoVI			Moderate SoVI			High SoVI		
	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi
LEE	0	0	0	3,941	116,442	5,798	0	305,872	90,383	0	55,911	40,407
LEON	0	0	0	6,170	156,525	0	3,628	91,266	0	0	17,898	0
LEVY	0	0	0	0	0	1,402	0	0	39,399	0	0	0
LIBERTY	0	0	0	0	0	8,365	0	0	0	0	0	0
MADISON	0	0	0	0	0	0	0	0	19,224	0	0	0
MANATEE	0	0	0	0	78,087	2,848	0	126,754	34,187	0	44,467	36,490
MARION	0	0	0	0	0	23,319	0	0	214,832	0	0	93,147
MARTIN	0	0	0	47,852	6,829	0	40,194	47,352	0	2,217	1,874	0
MIAMI-DADE	0	0	0	153,250	66,952	2,453	304,522	61,087	0	1,085,497	809,305	10,061
MONROE	0	0	0	20	55,936	0	0	17,134	0	0	0	0
NASSAU	0	0	0	40,878	0	0	32,436	0	0	0	0	0
OKALOOSA	0	0	0	144,237	0	0	36,585	0	0	0	0	0
OKEECHOBEE	0	0	0	0	0	7,573	0	0	22,307	0	0	10,116
ORANGE	0	0	0	454,103	81,051	0	209,739	153,756	0	110,675	136,632	0
OSCEOLA	0	0	0	0	176	23,732	0	3,932	143,945	0	0	96,900
PALM BEACH	0	0	0	391,769	36,084	0	433,576	57,615	0	262,897	137,521	0
PASCO	0	0	0	0	3,600	80,605	0	2,387	293,748	0	0	84,357
PINELLAS	0	0	0	1,669	237,142	51,638	0	370,285	134,059	0	34,454	87,295
POLK	0	0	0	0	0	86,045	0	0	302,342	0	3	213,705
PUTNAM	0	0	0	0	0	7,775	0	0	56,109	0	0	10,480
SANTA ROSA	0	0	0	72,707	54,324	0	4,669	16,468	0	0	0	0
SARASOTA	0	0	0	0	93,826	0	0	196,239	48,387	0	25,787	15,209
SEMINOLE	0	0	0	182,984	9,092	0	199,563	5,178	0	6,695	19,206	0
ST. JOHNS	0	0	0	128,402	13,198	0	35,782	4,984	3,518	0	0	4,155
ST. LUCIE	0	0	0	0	0	12,064	0	3,204	219,015	0	0	46,710
SUMTER	0	0	0	0	0	2,080	0	0	35,518	0	0	49,425
SUWANNEE	0	0	0	0	0	1,803	0	0	32,732	0	0	7,016
TAYLOR	0	0	0	0	0	7,877	0	0	14,693	0	0	0
UNION	0	0	0	0	0	11,040	0	0	4,495	0	0	0
VOLUSIA	0	0	0	0	0	105,686	0	0	305,671	0	0	83,236
WAKULLA	0	0	0	0	0	17,199	0	0	13,577	0	0	0
WALTON	0	0	0	0	0	43,686	0	0	11,357	0	0	0
WASHINGTON	0	0	0	0	0	14,709	0	0	10,187	0	0	0

Table T4-5: Count of census tracts within each standard deviation class for MedVI based on HazVI Class.

County	Low HazVi			Moderate HazVi			High HazVi		
	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi
ALACHUA	56	0	0	0	0	0	0	0	0
BAKER	0	1	3	0	0	0	0	0	0
BAY	0	11	32	0	0	0	0	0	0
BRADFORD	0	0	4	0	0	0	0	0	0
BREVARD	0	0	0	2	84	27	0	0	0
BROWARD	0	0	0	0	0	0	255	102	4
CALHOUN	0	0	3	0	0	0	0	0	0
CHARLOTTE	0	31	7	0	0	0	0	0	0
CITRUS	1	0	27	0	0	0	0	0	0
CLAY	30	0	0	0	0	0	0	0	0
COLLIER	68	5	0	0	0	0	0	0	0
COLUMBIA	0	0	12	0	0	0	0	0	0
DESOTO	0	0	9	0	0	0	0	0	0
DIXIE	0	0	3	0	0	0	0	0	0
DUVAL	0	0	0	103	60	10	0	0	0
ESCAMBIA	0	0	0	0	1	70	0	0	0
FLAGLER	0	14	6	0	0	0	0	0	0
FRANKLIN	0	0	4	0	0	0	0	0	0
GADSDEN	0	0	9	0	0	0	0	0	0
GILCHRIST	0	0	5	0	0	0	0	0	0
GLADES	0	0	3	0	0	0	0	0	0
GULF	0	0	3	0	0	0	0	0	0
HAMILTON	0	0	3	0	0	0	0	0	0
HARDEE	0	0	6	0	0	0	0	0	0
HENDRY	0	0	6	0	0	0	0	0	0
HERNANDO	0	0	44	0	0	0	0	0	0
HIGHLANDS	0	1	26	0	0	0	0	0	0
HILLSBOROUGH	0	0	0	0	0	0	27	207	85
HOLMES	0	0	4	0	0	0	0	0	0
INDIAN RIVER	1	0	29	0	0	0	0	0	0
JACKSON	0	0	11	0	0	0	0	0	0
JEFFERSON	0	0	3	0	0	0	0	0	0
LAFAYETTE	0	0	2	0	0	0	0	0	0
LAKE	0	0	56	0	0	0	0	0	0

Table T4-5 Continued: Count of census tracts within each standard deviation class for MedVI based on HazVI Class.

County	Low HazVi			Moderate HazVi			High HazVi		
	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi
LEE	0	0	0	3	131	32	0	0	0
LEON	3	65	0	0	0	0	0	0	0
LEVY	0	0	9	0	0	0	0	0	0
LIBERTY	0	0	2	0	0	0	0	0	0
MADISON	0	0	5	0	0	0	0	0	0
MANATEE	0	61	17	0	0	0	0	0	0
MARION	0	0	0	1	0	62	0	0	0
MARTIN	22	12	0	0	0	0	0	0	0
MIAMI-DADE	0	0	0	0	0	0	339	175	4
MONROE	1	29	0	0	0	0	0	0	0
NASSAU	12	0	0	0	0	0	0	0	0
OKALOOSA	0	0	0	41	0	0	0	0	0
OKEECHOBEE	0	0	11	0	0	0	0	0	0
ORANGE	130	60	0	12	5	0	0	0	0
OSCEOLA	0	2	39	0	0	0	0	0	0
PALM BEACH	0	0	0	270	57	0	9	0	0
PASCO	0	0	0	0	2	131	0	0	0
PINELLAS	0	0	0	0	0	0	1	175	68
POLK	0	0	0	0	0	0	0	1	153
PUTNAM	0	0	17	0	0	0	0	0	0
SANTA ROSA	0	0	0	12	12	0	0	0	0
SARASOTA	0	78	16	0	0	0	0	0	0
SEMINOLE	74	12	0	0	0	0	0	0	0
ST. JOHNS	32	5	2	0	0	0	0	0	0
ST. LUCIE	1	0	43	0	1	0	0	0	0
SUMTER	0	1	18	0	0	0	0	0	0
SUWANNEE	0	0	7	0	0	0	0	0	0
TAYLOR	0	0	4	0	0	0	0	0	0
UNION	0	0	3	0	0	0	0	0	0
VOLUSIA	0	0	0	0	0	113	0	0	0
WAKULLA	0	0	4	0	0	0	0	0	0
WALTON	0	0	11	0	0	0	0	0	0
WASHINGTON	0	0	7	0	0	0	0	0	0

Table T4-6: Total population within each standard deviation class for MedVI based on HazVI Class.

County	Low HazVi			Moderate HazVi			High HazVi		
	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi
ALACHUA	247,336	0	0	0	0	0	0	0	0
BAKER	0	6,684	20,431	0	0	0	0	0	0
BAY	0	41,056	127,796	0	0	0	0	0	0
BRADFORD	0	0	28,520	0	0	0	0	0	0
BREVARD	0	0	0	0	385,131	158,238	0	0	0
BROWARD	0	0	0	0	0	0	1,190,932	530,018	27,116
CALHOUN	0	0	14,625	0	0	0	0	0	0
CHARLOTTE	0	127,744	32,234	0	0	0	0	0	0
CITRUS	0	0	141,236	0	0	0	0	0	0
CLAY	190,865	0	0	0	0	0	0	0	0
COLLIER	297,103	24,417	0	0	0	0	0	0	0
COLUMBIA	0	0	67,531	0	0	0	0	0	0
DESOTO	0	0	34,862	0	0	0	0	0	0
DIXIE	0	0	16,422	0	0	0	0	0	0
DUVAL	0	0	0	565,268	264,174	34,821	0	0	0
ESCAMBIA	0	0	0	0	3,223	294,396	0	0	0
FLAGLER	0	71,175	24,521	0	0	0	0	0	0
FRANKLIN	0	0	11,549	0	0	0	0	0	0
GADSDEN	0	0	46,389	0	0	0	0	0	0
GILCHRIST	0	0	16,939	0	0	0	0	0	0
GLADES	0	0	12,884	0	0	0	0	0	0
GULF	0	0	15,863	0	0	0	0	0	0
HAMILTON	0	0	14,799	0	0	0	0	0	0
HARDEE	0	0	27,731	0	0	0	0	0	0
HENDRY	0	0	39,140	0	0	0	0	0	0
HERNANDO	0	0	172,778	0	0	0	0	0	0
HIGHLANDS	0	1	98,785	0	0	0	0	0	0
HILLSBOROUGH	0	0	0	0	0	0	71,311	849,989	307,926
HOLMES	0	0	19,927	0	0	0	0	0	0
INDIAN RIVER	0	0	138,028	0	0	0	0	0	0
JACKSON	0	0	49,746	0	0	0	0	0	0
JEFFERSON	0	0	14,761	0	0	0	0	0	0
LAFAYETTE	0	0	8,870	0	0	0	0	0	0
LAKE	0	0	297,052	0	0	0	0	0	0

Table T4-A6 Continued: Total population within each standard deviation class for MedVI based on HazVI Class.

County	Low HazVi			Moderate HazVi			High HazVi		
	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi	Low MedVi	Moderate MedVi	High MedVi
LEE	0	0	0	3,941	478,225	136,588	0	0	0
LEON	9,798	265,689	0	0	0	0	0	0	0
LEVY	0	0	40,801	0	0	0	0	0	0
LIBERTY	0	0	8,365	0	0	0	0	0	0
MADISON	0	0	19,224	0	0	0	0	0	0
MANATEE	0	249,308	73,525	0	0	0	0	0	0
MARION	0	0	0	0	0	331,298	0	0	0
MARTIN	90,263	56,055	0	0	0	0	0	0	0
MIAMI-DADE	0	0	0	0	0	0	1,543,269	937,344	12,514
MONROE	20	73,070	0	0	0	0	0	0	0
NASSAU	73,314	0	0	0	0	0	0	0	0
OKALOOSA	0	0	0	180,822	0	0	0	0	0
OKEECHOBEE	0	0	39,996	0	0	0	0	0	0
ORANGE	710,230	330,912	0	64,287	40,527	0	0	0	0
OSCEOLA	0	4,108	264,577	0	0	0	0	0	0
PALM BEACH	0	0	0	1,056,993	231,220	0	31,249	0	0
PASCO	0	0	0	0	5,987	458,710	0	0	0
PINELLAS	0	0	0	0	0	0	1,669	641,881	272,992
POLK	0	0	0	0	0	0	0	3	602,092
PUTNAM	0	0	74,364	0	0	0	0	0	0
SANTA ROSA	0	0	0	77,376	70,792	0	0	0	0
SARASOTA	0	315,852	63,596	0	0	0	0	0	0
SEMINOLE	389,242	33,476	0	0	0	0	0	0	0
ST. JOHNS	164,184	18,182	7,673	0	0	0	0	0	0
ST. LUCIE	0	0	277,789	0	3,204	0	0	0	0
SUMTER	0	0	87,023	0	0	0	0	0	0
SUWANNEE	0	0	41,551	0	0	0	0	0	0
TAYLOR	0	0	22,570	0	0	0	0	0	0
UNION	0	0	15,535	0	0	0	0	0	0
VOLUSIA	0	0	0	0	0	494,593	0	0	0
WAKULLA	0	0	30,776	0	0	0	0	0	0
WALTON	0	0	55,043	0	0	0	0	0	0
WASHINGTON	0	0	24,896	0	0	0	0	0	0

Table T4-7: Count of census tracts within each standard deviation class for HazVI based on SoVI Class.

County	No SoVI			Low SoVI			Moderate SoVI			High SoVI		
	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi
ALACHUA	0	0	0	38	0	0	14	0	0	4	0	0
BAKER	0	0	0	1	0	0	3	0	0	0	0	0
BAY	0	0	0	24	0	0	16	0	0	3	0	0
BRADFORD	0	0	0	1	0	0	3	0	0	0	0	0
BREVARD	0	2	0	0	45	0	0	60	0	0	6	0
BROWARD	0	0	0	0	0	107	0	0	141	0	0	113
CALHOUN	0	0	0	2	0	0	1	0	0	0	0	0
CHARLOTTE	0	0	0	2	0	0	31	0	0	5	0	0
CITRUS	1	0	0	0	0	0	23	0	0	4	0	0
CLAY	0	0	0	11	0	0	18	0	0	1	0	0
COLLIER	0	0	0	23	0	0	35	0	0	15	0	0
COLUMBIA	0	0	0	4	0	0	7	0	0	1	0	0
DESOTO	0	0	0	3	0	0	4	0	0	2	0	0
DIXIE	0	0	0	1	0	0	1	0	0	1	0	0
DUVAL	0	0	0	0	69	0	0	68	0	0	36	0
ESCAMBIA	0	0	0	0	30	0	0	29	0	0	12	0
FLAGLER	0	0	0	1	0	0	16	0	0	3	0	0
FRANKLIN	0	0	0	3	0	0	1	0	0	0	0	0
GADSDEN	0	0	0	0	0	0	4	0	0	5	0	0
GILCHRIST	0	0	0	2	0	0	3	0	0	0	0	0
GLADES	0	0	0	1	0	0	2	0	0	0	0	0
GULF	0	0	0	2	0	0	1	0	0	0	0	0
HAMILTON	0	0	0	0	0	0	2	0	0	1	0	0
HARDEE	0	0	0	0	0	0	4	0	0	2	0	0
HENDRY	0	0	0	1	0	0	2	0	0	3	0	0
HERNANDO	0	0	0	4	0	0	25	0	0	15	0	0
HIGHLANDS	1	0	0	3	0	0	15	0	0	8	0	0
HILLSBOROUGH	0	0	3	0	0	119	0	0	124	0	0	73
HOLMES	0	0	0	0	0	0	4	0	0	0	0	0
INDIAN RIVER	1	0	0	4	0	0	19	0	0	6	0	0
JACKSON	0	0	0	4	0	0	7	0	0	0	0	0
JEFFERSON	0	0	0	1	0	0	2	0	0	0	0	0
LAFAYETTE	0	0	0	1	0	0	1	0	0	0	0	0
LAKE	0	0	0	3	0	0	44	0	0	9	0	0

Table T4-7 Continued: Count of census tracts within each standard deviation class for HazVI based on SoVI Class.

County	No SoVI			Low SoVI			Moderate SoVI			High SoVI		
	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi
LEE	0	1	0	0	43	0	0	91	0	0	31	0
LEON	0	0	0	40	0	0	22	0	0	6	0	0
LEVY	0	0	0	1	0	0	8	0	0	0	0	0
LIBERTY	0	0	0	2	0	0	0	0	0	0	0	0
MADISON	0	0	0	0	0	0	5	0	0	0	0	0
MANATEE	0	0	0	19	0	0	41	0	0	18	0	0
MARION	0	2	0	0	5	0	0	43	0	0	13	0
MARTIN	0	0	0	13	0	0	19	0	0	2	0	0
MIAMI-DADE	0	0	6	0	0	70	0	0	84	0	0	358
MONROE	0	0	0	25	0	0	5	0	0	0	0	0
NASSAU	0	0	0	7	0	0	5	0	0	0	0	0
OKALOOSA	0	0	0	0	33	0	0	8	0	0	0	0
OKEECHOBEE	0	0	0	2	0	0	6	0	0	3	0	0
ORANGE	1	0	0	88	5	0	59	5	0	42	7	0
OSCEOLA	0	0	0	8	0	0	20	0	0	13	0	0
PALM BEACH	0	4	0	0	103	8	0	110	1	0	110	0
PASCO	0	0	0	0	20	0	0	86	0	0	27	0
PINELLAS	0	0	0	0	0	82	0	0	128	0	0	34
POLK	0	0	0	0	0	26	0	0	77	0	0	51
PUTNAM	1	0	0	2	0	0	11	0	0	3	0	0
SANTA ROSA	0	0	0	0	20	0	0	4	0	0	0	0
SARASOTA	0	0	0	25	0	0	58	0	0	11	0	0
SEMINOLE	0	0	0	39	0	0	40	0	0	7	0	0
ST. JOHNS	0	0	0	28	0	0	10	0	0	1	0	0
ST. LUCIE	1	0	0	2	0	0	30	1	0	11	0	0
SUMTER	1	0	0	2	0	0	11	0	0	5	0	0
SUWANNEE	0	0	0	1	0	0	5	0	0	1	0	0
TAYLOR	0	0	0	1	0	0	3	0	0	0	0	0
UNION	0	0	0	2	0	0	1	0	0	0	0	0
VOLUSIA	0	0	0	0	26	0	0	69	0	0	18	0
WAKULLA	0	0	0	2	0	0	2	0	0	0	0	0
WALTON	0	0	0	9	0	0	2	0	0	0	0	0
WASHINGTON	0	0	0	4	0	0	3	0	0	0	0	0

Table T4-8: Total population within each standard deviation class for HazVI based on SoVI Class.

County	No SoVI			Low SoVI			Moderate SoVI			High SoVI		
	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi
ALACHUA	0	0	0	164,583	0	0	63,347	0	0	19,406	0	0
BAKER	0	0	0	0	0	5,381	0	6,684	15,050	0	0	0
BAY	0	0	0	0	26,702	70,618	0	14,354	48,332	0	0	8,846
BRADFORD	0	0	0	0	0	6,327	0	0	22,193	0	0	0
BREVARD	0	0	0	0	154,601	58,600	0	216,154	93,167	0	14,376	6,471
BROWARD	0	0	0	406,426	48,667	0	571,118	150,766	13,792	213,388	330,585	13,324
CALHOUN	0	0	0	0	0	6,429	0	0	8,196	0	0	0
CHARLOTTE	0	0	0	0	5,994	0	0	113,431	22,648	0	8,319	9,586
CITRUS	0	0	0	0	0	0	0	0	123,812	0	0	17,424
CLAY	0	0	0	98,608	0	0	86,946	0	0	5,311	0	0
COLLIER	0	0	0	66,377	0	0	178,461	0	0	52,265	24,417	0
COLUMBIA	0	0	0	0	0	23,211	0	0	41,448	0	0	2,872
DESOTO	0	0	0	0	0	12,113	0	0	14,157	0	0	8,592
DIXIE	0	0	0	0	0	4,990	0	0	4,101	0	0	7,331
DUVAL	0	0	0	309,451	53,786	6,084	220,114	123,163	3,726	35,703	87,225	25,011
ESCAMBIA	0	0	0	0	3,223	127,105	0	0	127,368	0	0	39,923
FLAGLER	0	0	0	0	0	3,217	0	59,608	16,987	0	11,567	4,317
FRANKLIN	0	0	0	0	0	8,745	0	0	2,804	0	0	0
GADSDEN	0	0	0	0	0	0	0	0	21,356	0	0	25,033
GILCHRIST	0	0	0	0	0	5,152	0	0	11,787	0	0	0
GLADES	0	0	0	0	0	3,748	0	0	9,136	0	0	0
GULF	0	0	0	0	0	12,787	0	0	3,076	0	0	0
HAMILTON	0	0	0	0	0	0	0	0	13,039	0	0	1,760
HARDEE	0	0	0	0	0	0	0	0	17,101	0	0	10,630
HENDRY	0	0	0	0	0	5,578	0	0	11,716	0	0	21,846
HERNANDO	0	0	0	0	0	10,220	0	0	100,257	0	0	62,301
HIGHLANDS	0	0	0	0	1	1,062	0	0	62,607	0	0	35,116
HILLSBOROUGH	0	0	0	46,376	350,417	53,190	19,740	363,832	115,886	5,195	135,740	138,850
HOLMES	0	0	0	0	0	0	0	0	19,927	0	0	0
INDIAN RIVER	0	0	0	0	0	17,131	0	0	99,009	0	0	21,888
JACKSON	0	0	0	0	0	19,748	0	0	29,998	0	0	0
JEFFERSON	0	0	0	0	0	5,885	0	0	8,876	0	0	0
LAFAYETTE	0	0	0	0	0	3,164	0	0	5,706	0	0	0
LAKE	0	0	0	0	0	22,025	0	0	234,222	0	0	40,805

Table T4-8 Continued: Total population within each standard deviation class for HazVI based on SoVI Class.

County	No SoVI			Low SoVI			Moderate SoVI			High SoVI		
	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi	Low HazVi	Moderate HazVi	High HazVi
LEE	0	0	0	3,941	116,442	5,798	0	305,872	90,383	0	55,911	40,407
LEON	0	0	0	6,170	156,525	0	3,628	91,266	0	0	17,898	0
LEVY	0	0	0	0	0	1,402	0	0	39,399	0	0	0
LIBERTY	0	0	0	0	0	8,365	0	0	0	0	0	0
MADISON	0	0	0	0	0	0	0	0	19,224	0	0	0
MANATEE	0	0	0	0	78,087	2,848	0	126,754	34,187	0	44,467	36,490
MARION	0	0	0	0	0	23,319	0	0	214,832	0	0	93,147
MARTIN	0	0	0	47,852	6,829	0	40,194	47,352	0	2,217	1,874	0
MIAMI-DADE	0	0	0	153,250	66,952	2,453	304,522	61,087	0	1,085,497	809,305	10,061
MONROE	0	0	0	20	55,936	0	0	17,134	0	0	0	0
NASSAU	0	0	0	40,878	0	0	32,436	0	0	0	0	0
OKALOOSA	0	0	0	144,237	0	0	36,585	0	0	0	0	0
OKEECHOBEE	0	0	0	0	0	7,573	0	0	22,307	0	0	10,116
ORANGE	0	0	0	454,103	81,051	0	209,739	153,756	0	110,675	136,632	0
OSCEOLA	0	0	0	0	176	23,732	0	3,932	143,945	0	0	96,900
PALM BEACH	0	0	0	391,769	36,084	0	433,576	57,615	0	262,897	137,521	0
PASCO	0	0	0	0	3,600	80,605	0	2,387	293,748	0	0	84,357
PINELLAS	0	0	0	1,669	237,142	51,638	0	370,285	134,059	0	34,454	87,295
POLK	0	0	0	0	0	86,045	0	0	302,342	0	3	213,705
PUTNAM	0	0	0	0	0	7,775	0	0	56,109	0	0	10,480
SANTA ROSA	0	0	0	72,707	54,324	0	4,669	16,468	0	0	0	0
SARASOTA	0	0	0	0	93,826	0	0	196,239	48,387	0	25,787	15,209
SEMINOLE	0	0	0	182,984	9,092	0	199,563	5,178	0	6,695	19,206	0
ST. JOHNS	0	0	0	128,402	13,198	0	35,782	4,984	3,518	0	0	4,155
ST. LUCIE	0	0	0	0	0	12,064	0	3,204	219,015	0	0	46,710
SUMTER	0	0	0	0	0	2,080	0	0	35,518	0	0	49,425
SUWANNEE	0	0	0	0	0	1,803	0	0	32,732	0	0	7,016
TAYLOR	0	0	0	0	0	7,877	0	0	14,693	0	0	0
UNION	0	0	0	0	0	11,040	0	0	4,495	0	0	0
VOLUSIA	0	0	0	0	0	105,686	0	0	305,671	0	0	83,236
WAKULLA	0	0	0	0	0	17,199	0	0	13,577	0	0	0
WALTON	0	0	0	0	0	43,686	0	0	11,357	0	0	0
WASHINGTON	0	0	0	0	0	14,709	0	0	10,187	0	0	0