


Coastal County Vulnerability: Population Needs and Disaster Preparedness



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Research Objectives

- **Develop a list of vulnerability indicators**
- **Apply indicators to Florida coastal counties**
 - Coasts are the places with highest concentration of people and values
 - Focus on densely populated areas
 - Collect data informing indicators
 - Compare across counties
- **Obtain the perspective of emergency management in focus areas**
 - To what extent is risk analysis employed in decision making
 - How are decisions made
 - Infrastructure – resource availability
- **Assess implications of hurricane threat – preparedness, mitigation and response efforts**

What is Vulnerability?

Vulnerability is the degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with, adverse impacts

- Social - socioeconomic status, age, gender, family structure, race, and ethnicity
- Physical - critical infrastructure, building stock, the materials and methods of fabrication, and building codes
- Environmental - soil composition, slope angle, and topography, environmental degradation, land use planning, the location of human settlements
- Residual - previous disaster experiences, perceptions, and preparations

The Social and Residual Aspects

Vulnerability is a product of social inequalities and those characteristics of the people and places that make them less able to cope with and rebound from disaster events.

- *Income* - low income residents are more likely to live in hazardous areas and less likely to mitigate homes; less access to transportation
- *Age, gender, and family structure*
- *Race and ethnicity* – access to resources and information
- *Special needs* - physical or language
- *Occupation* – a local economy that primarily relies on one sector is more vulnerable

Previous experience may negatively or positively influence vulnerability:

- Experience may give residents a false sense of security
- Experience may influence residents to take action where none is needed, e.g. evacuation

Social Vulnerability in Florida

- Coastal counties with high population density - Broward, Duval, Hillsborough, Manatee, Miami-Dade, Palm Beach, Pasco, Pinellas, and St. Johns
 - Include 51% of Florida's population
 - Poverty rates range from 8.4% in Pinellas to 14.6% in Miami-Dade
 - Almost half a million families with income below the poverty line, 30% of them with children under 18
 - Over 10% of population is in single member household, over 65

Social And Economic Factors

About a quarter of Florida residents are not aware if their home is located in an evacuation zone.

Inside FEMA Floodplain	Broward	Miami-Dade	Palm Beach	Duval	Hillsborough	Pinellas
Population	369,001 (21%)	1,208,891 (48%)	240,964 (18%)	142,126 (16%)	309,697 (25%)	285,367 (31%)
Population Over 65	52,576 (21%)	170,607 (48%)	59,095 (21%)	16,922 (18%)	37,367 (26%)	66,606 (34%)
Population in Poverty	55,104 (22%)	183,058 (45%)	24,064 (15%)	14,498 (12%)	35,200 (21%)	27,543 (25%)

Social And Economic Factors: Household Composition

- Natural Hazards have a disproportionately adverse effect on the elderly.
- Over 1.5 million elderly in studied counties, 48% of state's elderly.
- 25% of Florida's elderly live alone.

County	Female Householders, No Husband, Children Under 18
Miami-Dade	9.1%
Duval	8.6%
Hillsborough	8.6%
Broward	8.2%
Palm Beach	6.7%
Pinellas	6.0%
Manatee	5.8%
Pasco	5.5%
St. Johns	5.4%

County	HH with 65 and Over	HH with 65+ Living Alone
Manatee	23.0%	14.20%
Palm Beach	21.6%	15.0%
Pinellas	21.1%	15.6%
Pasco	20.7%	12.5%
St. Johns	15.4%	9.4%
Broward	14.2%	11.3%
Miami-Dade	14.0%	9.0%
Hillsborough	11.7%	7.9%
Duval	11.0%	8.2%

- Over 10% of households are single adult with children.
- A third of single adult families with children are below the poverty line.

Social and Economic Factors: Income and Language

Income Below poverty level	Broward	Miami-Dade	Palm Beach	Duval	Hillsborough	Pinellas	Pasco
All families	9.7%	14.6%	9.4%	11.0%	11.3%	8.4%	10.1%
With children under 18 years	13.7%	19.8%	16.1%	17.7%	17.3%	14.9%	16.4%
Married couple families	5.6%	9.4%	5.0%	4.4%	5.2%	4.6%	6.4%
With children under 18 years	6.9%	11.0%	8.0%	6.5%	7.2%	6.7%	9.6%
Female householder, no husband	21.2%	27.1%	24.9%	28.8%	29.1%	20.7%	25.7%
With children under 18 years	27.5%	36.0%	32.2%	37.8%	35.9%	29.0%	33.5%

County	Speak English less than "very well"
Miami-Dade	35.4%
Broward	15.0%
Palm Beach	12.9%
Hillsborough	10.1%
Manatee	7.4%
Pinellas	5.4%
Duval	4.9%
Pasco	4.5%

The Residual Aspect

	2006	2007	2009	2011	2013
Perception of vulnerability	46.1%	54.4%	47.6%	49.8%	57.0%
Information access	87.1%	90.1%	92.8%	90.4%	93.3%
Plan of action	85.0%	85.3%	86.7%	70.1%	74.5%
Evacuate if ordered	27.5%	36.8%	40.2%	39.9%	37.6%

- Only about a third of respondents are prepared at the start of hurricane season.
- Approximately a third would begin preparations when a hurricane watch is issued (48 hours in advance).
- 29% would rely on emergency supplies from government or other agencies.

The Emergency Management Perspective

- *Awareness*
 - Emergency managers are aware of the risks posed by hurricanes to vulnerable populations.
 - Plans include special registries, information is disseminated through various channels, evacuation route and shelter planning
 - “Plans can be made but ultimately we don’t know how the population will react.”
- *Resources*
 - Intergovernmental coordination is improving.
 - “No local government would be prepared to respond to a category 3 hurricane... we would be overwhelmed...”
 - Emergency managers are required to do more with less.

CONCLUSIONS

- Risk awareness – do we know how people will react to a strong hurricane?
- Mitigation and preparedness - how to incentivize residents to make effort
- Barriers to hurricane mitigation, as well as opportunities for improving knowledge and use of mitigation techniques
- The effects of land use planning and building codes
 - people will not limit development on the floodplains without strict regulations and the threat of punishment, e.g., withdrawal of eligibility for low cost-flood insurance or eligibility for disaster assistance
 - resistance in Florida and other coastal states to efforts to restrict building close to the beaches, where storm surges might flood property