



# The Impact of Housing Conditions on Hurricane and Flood Evacuation Intentions

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## Introduction

While the body of literature on risk perception has been steadily expanding, there remains a notable gap in understanding how risk perception is shaped specifically within disaster contexts. Even more limited is the research examining how housing conditions influence individuals' perceptions of risk during severe weather events. Existing disaster studies that touch on housing tend to focus on a single housing type—such as mobile or manufactured homes—and often limit their analysis to a narrow set of variables like size, age, or location. To date, no comprehensive studies have explored the broader relationship between housing conditions and risk perception, or how this relationship impacts evacuation decisions during hurricanes and flooding. This study seeks to address that gap by investigating the question: "How do housing conditions influence individuals' intentions to evacuate in the face of hurricanes and flooding?" Understanding this dynamic is especially critical for evacuation planning in Florida, where every county is vulnerable to the impacts of severe storms and rising waters. Given the state’s frequent exposure to hazards, enhancing our knowledge in this area is essential for strengthening disaster preparedness and response efforts.

## Methodology

This study employed a quantitative research design, utilizing a structured questionnaire completed by 816 participants across five Florida cities: Miami, Tallahassee, Jacksonville, Gainesville, and Ocala. The questionnaire was developed based on a comprehensive review of relevant literature and aligned with the study’s research objectives. To ensure content validity, eight scholars from diverse disciplines—including human behavior, disaster studies, construction management, and interior design—participated in a Subject Matter Expert (SME) review and face validity assessment.

Pretesting of the questionnaire was conducted with 11 participants to refine clarity and structure, followed by a pilot test with 42 participants to evaluate its performance. A sample size was determined using a 95% confidence level and a 5% confidence interval to ensure statistical adequacy. Data analysis was performed using Excel, DataTab, and SPSS, employing various statistical techniques to identify patterns and quantify behaviors and attitudes. To assess internal consistency and reliability of the instrument, both Cronbach’s Alpha (CA) and Split-Half Reliability (SHR) tests were conducted.

## Results

The analysis revealed that only two housing characteristics—(1) the need for dwelling repairs and (2) whether the dwelling is located on the ground floor—were statistically associated with differences in risk perception (see Table 1). However, logistic regression results indicated that risk perception alone did not significantly influence evacuation intentions. Instead, two behavioral variables—efficacy and social norms—emerged as strong predictors of evacuation behavior (see Table 2). It’s important to note that data collection occurred during hurricane season, but no active storm threat was present at the time. This likely influenced the observed role of risk perception. In the absence of an imminent storm, people's perception of risk did not appear to strongly motivate preparedness or evacuation intentions. This suggests that emergency communication strategies at the start of hurricane season—when no specific storm is on the radar—should not overly emphasize threat or danger, as heightened risk messaging alone may not effectively drive preparedness.

Conversely, when a storm is approaching, risk perception becomes much more relevant. Emergency messaging should adapt dynamically, placing more focus on risk when a threat is imminent. A uniform, season-long communication strategy may not be effective, as the public interprets messaging differently depending on the immediacy of the threat. While risk perception plays a nuanced role, our findings show that efficacy and social norms consistently influence preparedness behavior. Therefore, emergency communication should always prioritize clear, actionable guidance—explaining how individuals can prepare, and how those actions can meaningfully reduce harm. However, these messages should also be tailored to different groups, as perceptions of efficacy and appropriate actions may vary across populations. Additionally, reinforcing community behavior and collective action can increase the effectiveness of emergency messaging. Highlighting how many people in the community are preparing or evacuating can create a powerful sense of urgency and social proof. Social media platforms can further amplify this effect by encouraging residents to share their plans and experiences, helping to normalize and reinforce protective behaviors across the population.

#	Independent variable	Threat Possibility	Threat Severity
		VSF	VSF
1	Age (in years)	0.38	0.50
2	University/College	0.75	0.63
3	Role/Occupation	N/A	0.88
4	Required Dwelling Repairs	0.50	0.01
5	Is Dwelling on Ground Floor?	0.38	N/A
6	Hurricane Past Experience	0.38	0.50
-VSF (Variance Significance Factor): Very weak (0,0 < 0,1), Weak (0,1 < 0,3), Medium (0,3 < 0,5), Strong (0,5 < 0,7), Very strong (0,7 < 1)			
-VSF is only calculated for the variables with a p<0.01 (Kruskal-Wallis / Mann-Whitney U-Test).			
-VSF is a value between 1 and 0, where 1 means that the variance significantly affects the other significant variances and is not being significantly affected by any of them, and 0 means that the variance doesn’t significantly affect the other significant variances, but it is being significantly affected by all of them.			

Table 1: Variance Analysis (Risk perception)

Model	Coefficient B	Standard error	z	p	Odds Ratio	95% conf. interval
Threat Possibility	-0.12	1.13	0.1	0.916	0.89	0.1 - 8.1
Threat Severity	1.58	1.24	1.27	0.203	4.84	0.43 - 54.87
Self-Efficacy	4.17	0.63	6.63	<.001	64.74	18.86 - 222.27
Response Efficacy	4.55	0.71	6.36	<.001	94.2	23.22 - 382.19
Subjective Norms	5.98	0.78	7.62	<.001	396.31	85.15 - 1844.47
Responsibility	2.06	0.76	2.7	0.007	7.81	1.76 - 34.69
Constant	-9.91	0.94	10.58	<.001	-	-
Chi2	df	p	-2 Log-Likelihood	Adjusted R <sup>2</sup> (Nagelkerke R <sup>2</sup> )		
322.24	4	<.001	391.29	0.62		

Table 2: Logistic Regression (Dependent Variable is “Intention to Prepare an Evaluation Plan”)

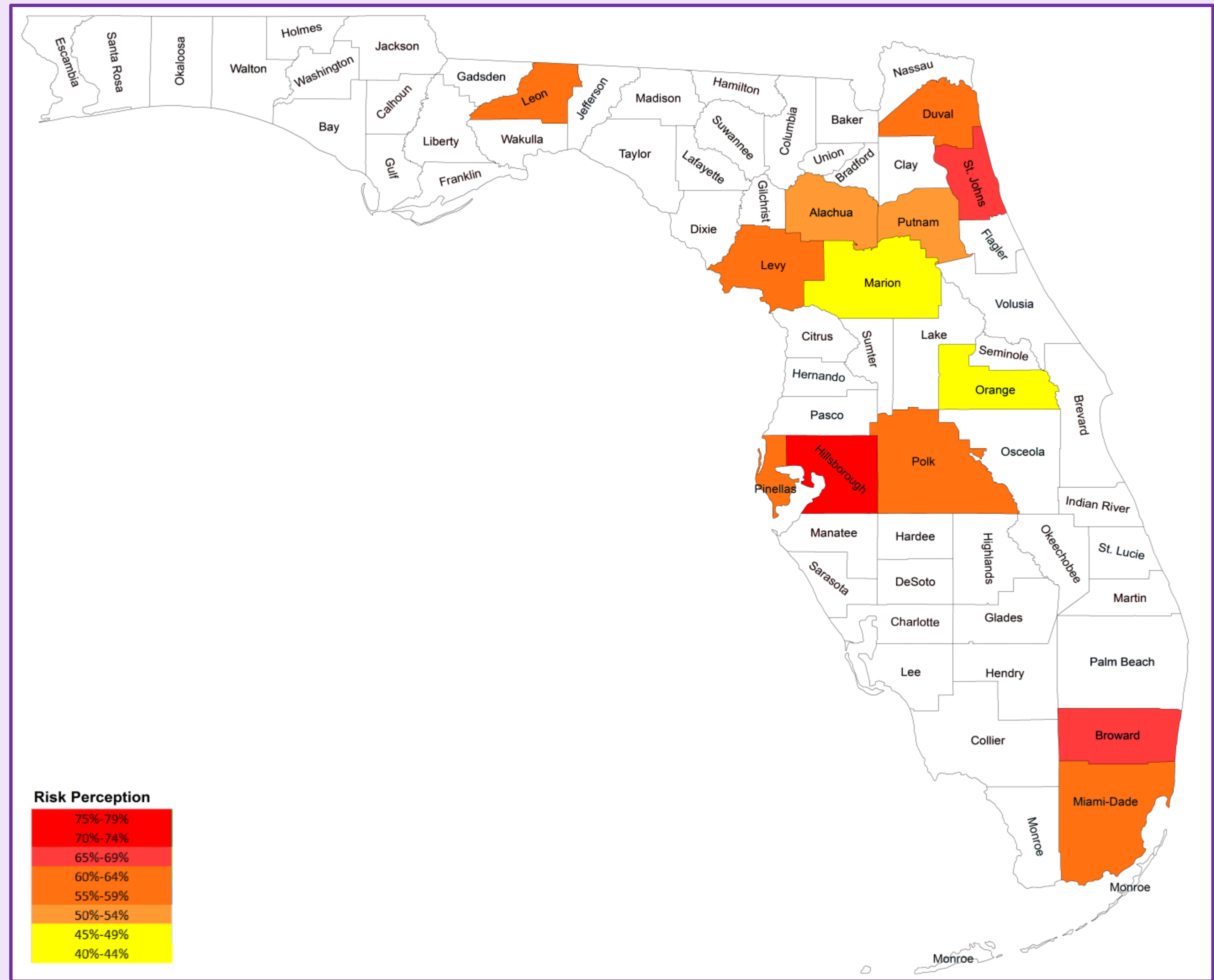


Figure 1: Risk Perception in Florida by County

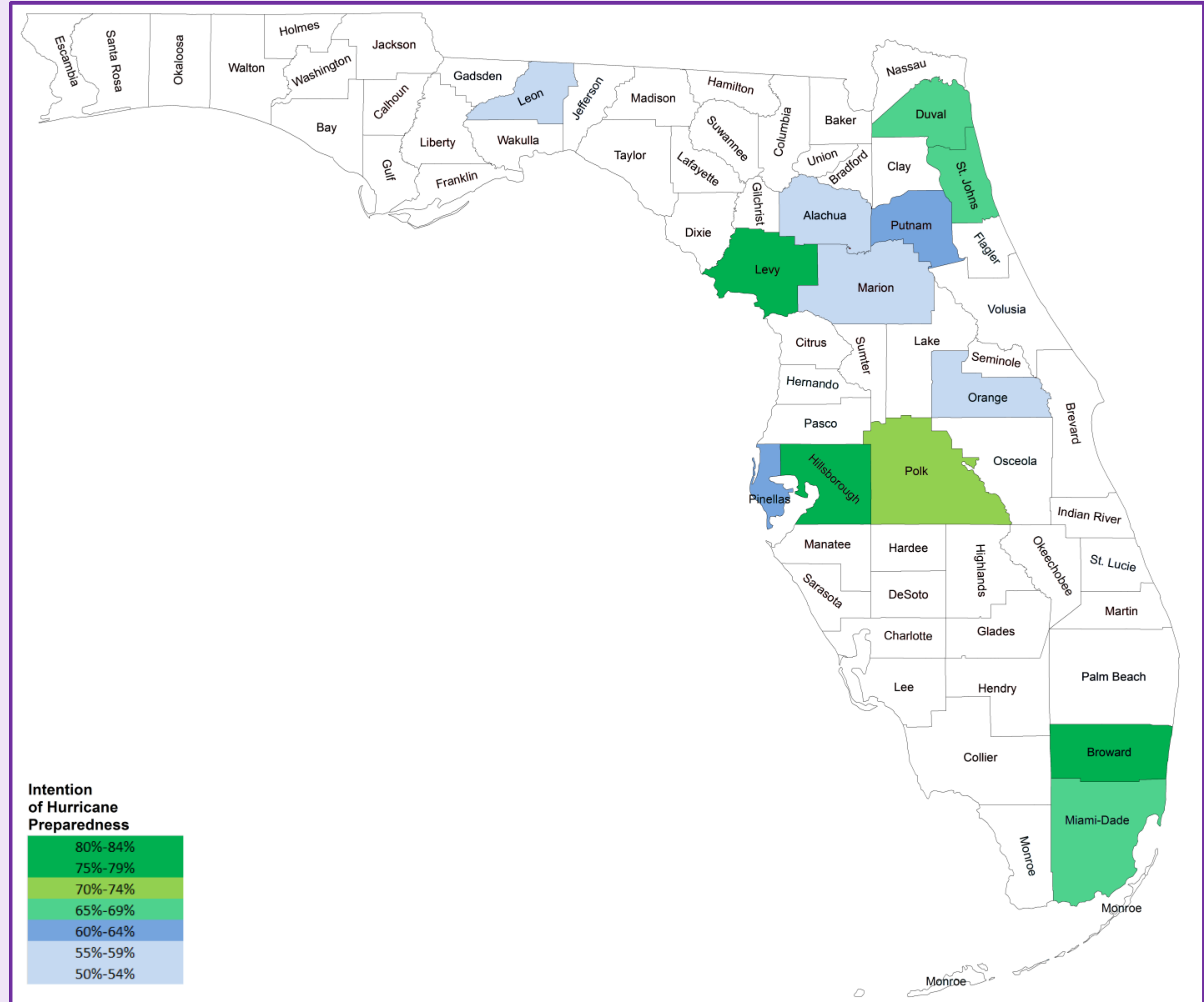


Figure 2: Intention of Hurricane Preparedness in Florida by County

## Intellectual Merit and Broader Impacts

This research makes a significant contribution to the growing field of disaster studies by addressing a notable gap in the literature concerning the relationship between housing conditions and risk perception in the context of severe weather events. While previous studies have explored housing vulnerability, most focus narrowly on specific types—such as mobile homes—or on limited structural characteristics like age or location. This study advances the field by broadening the scope to examine a more diverse range of housing conditions and their role in shaping both perceived risk and behavioral intentions. By employing a robust quantitative methodology, including a carefully validated survey instrument and a statistically representative sample across five major cities in Florida, the research delivers empirically grounded insights into how physical infrastructure influences psychological and social responses to hurricane threats. Furthermore, the findings refine our theoretical understanding of disaster behavior by distinguishing the contextual relevance of risk perception—showing that it may be less influential when no storm is present, while efficacy and social norms remain consistently predictive of preparedness actions. These insights offer important implications for behavioral modeling in disaster risk research and for the design of dynamic, context-sensitive emergency communication strategies.

This study holds significant societal relevance, particularly for communities regularly affected by hurricanes and flooding, such as those in Florida. As climate change intensifies the frequency and severity of extreme weather events, the need for more nuanced, evidence-based disaster planning becomes increasingly urgent. This research provides actionable guidance for emergency managers, public health officials, and policymakers seeking to improve community preparedness and response. By identifying key behavioral drivers—efficacy and social norms—as more consistent predictors of evacuation behavior than risk perception alone, the study supports the design of more effective, targeted public messaging. Emergency communication campaigns can benefit from these findings by tailoring messages not only to reflect the immediacy of threat but also to promote social proof and provide clear, practical steps individuals can take to prepare. Additionally, the research has implications for housing policy, particularly in under-resourced communities where dwelling conditions may exacerbate vulnerability. Promoting equitable improvements in housing infrastructure can reduce both physical and psychological disaster risk. The study also fosters interdisciplinary collaboration and training opportunities for students in fields such as disaster science, behavioral health, and urban planning—contributing to the broader educational mission of preparing the next generation of resilience-focused researchers and professionals.

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