Dec 6, 2022

The New First Line of Defense: Building Community Resilience Through Residential Risk Disclosure

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PROJECT NARRATIVE:

- Loss of life and property from flooding remains one of the most damaging climate hazards in the US, especially in the Gulf Coast region.
- Flood risk is rising due to climate change & coastal development patterns.
- It is fair to ask how we can reduce US flood risks and impacts. One option is to provide scientific flood risk information to homeowners, on the assumption that the homeowners (1) do not yet know the risks they are facing, and (2) would act to reduce their risks if provided the scientific information.
- But does everyone interpret scientific flood risk information in the same way? Regardless, does everyone respond to the same information in the same ways? These often-unstated assumptions in flood research are grounded in the Rational Actor Paradigm (RAP; Jaeger et al., 2001).
- Prior research suggests some contextual factors lead to systematic deviations from what the RAP would predict. Differences in geography, psychological heuristics, & cultural-political worldviews may result in systematic differences in (1) risk perceptions, & (2) risk responses.
- But for the case of homeowner flood risk in the Gulf Coast, we do not know enough about how scientific rationality and cultural worldviews interact to produce actions that reduce – or amplify – flood risk.

METHODS:

- 1187 participants surveyed from 196 Gulf Coast counties (*Figure 3)*
- 61 total questions
- 20 questions explore knowledge and attitudes toward flood likelihood and associated costs, and are linked to 3 different objective flood risk levels randomly assigned to each participant (*Figures 1 & 2*)
- Flood risk levels were 25-, 100-, & 500-year floodplains
- Survey responses divided into 3 multivariate regression models to evaluate influences on respondents' (1) rational adaptation decisions, (2) home mitigation decisions, whether rational or not, and (3) home-buying preference, whether rational or not

Floodplain	Participants per Floodplain	2020 # of US Properties at Risk
25-Year	393	3.6 million
100-Year	395	14.6 million
500-Year	399	21.8 million

Property data from The First National Flood Risk Assessment: Defining America's Growing Risk by First Street Foundation. http://bit.ly/3OlmR12

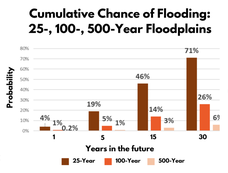


Figure 1.

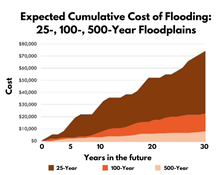


Figure 2.

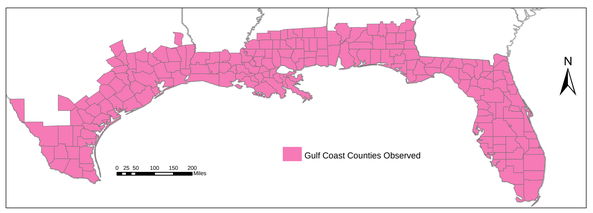


Figure 3. Map of 196 Gulf Coast Counties

PRIMARY VARIABLES OF INTEREST:

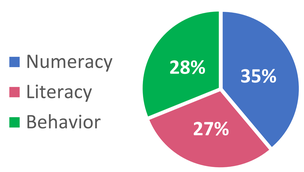
- Flood Rationality operationalized by 2 independent variables:
  - Flood Risk Literacy Index determined by 5 questions on general flood knowledge where # of correct questions >=4 is passing
  - Flood Risk Numeracy Index determined by 6 questions on flood-related chance & cost in specific homes where # of correct questions >=5 is passing
- Flood risk behaviors proxied by 2 dependent variables:
  - Mitigation Index consists of 10 questions on the likelihood of reducing risk depending on cost and chance of flooding
  - Home-Buying Index consists of 2 questions on the willingness to buy a home depending on cost or chance of flooding
- Cultural worldviews on societal structure:
  - Cultural Stratification describes how one thinks society is best served where Hierarchical (HIE) views support following rules & leaders and Egalitarianism (EGA) views support the encouragement of diversity.
  - Social Bonding describes how one views identity in society, with Individualism (IND) seeing it as individual, and Communitarianism (COM) viewing identity as social.

Top Image: Orlando, FL after Hurricane Ian. September 29, 2022. Credit: Ebenhack, AP News.
Bottom Image: Wilton Manors, FL. during King Tide. October 8, 2022. Credit: C. Polsky, FAU.

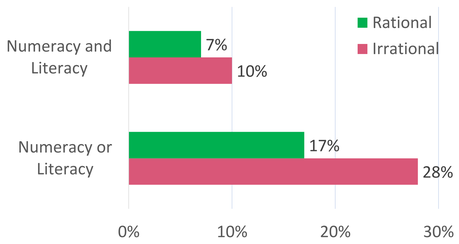
Tap or scan to learn more about the survey and results at: http://www.ces.fau.edu/crrl/nas-gulf.php

FINDINGS:

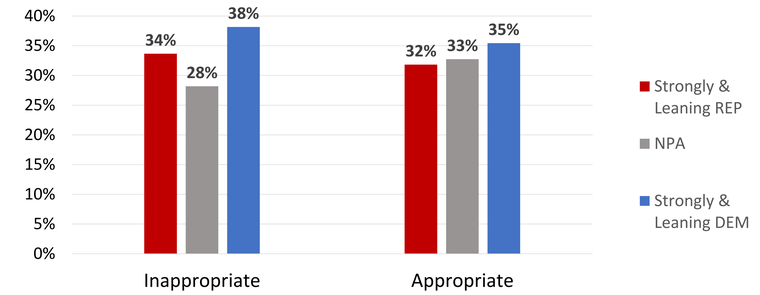
Numeracy, Literacy, & Appropriate Response Variables Alone



Numeracy, Literacy, & Appropriate Response Variables in Different Combinations

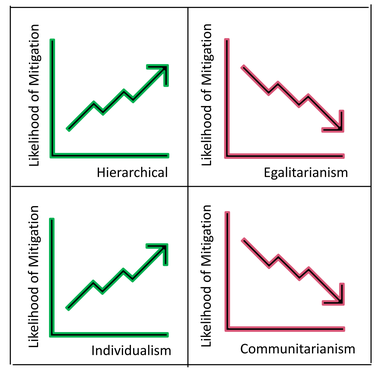


Determining Rational Response Behaviors

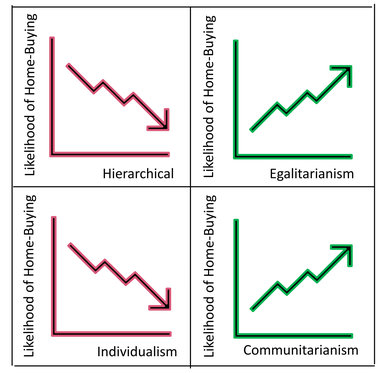


For more information on flood risk perceptions and trends, visit http://www.ces.fau.edu/crrl/nas-gulf.php

Expected Influences of Cultural Worldviews on Home Flood Mitigation



Expected Influences of Cultural Worldviews on Home Flood Willingness-to-Buy



Multivariate Regression Models: Selected values for Mitigation and Home-Buying Behaviors

	Model 2 Mitigation					Model 3 Willingness-to-Buy				
	B	SE_B	*df*	*F*	*p*	*B*	SE_B	*df*	*F*	*p*
Objective Flood Risk Level	-	-	2	1.62	.198	-	-	2	1.81	<.001
Numeracy	-	-	1	2.10	.147	-	-	1	.14	.706
Literacy	-	-	1	1.08	.299	-	-	1	.16	.685
Party Identification	.05	.02	1	9.55	.002	-.04	.02	1	2.03	.154
Political Orientation	.04	.02	1	6.43	.011	-.11	.03	1	17.79	<.001
General Individualism	-0.08	0.02	1	14.33	<.001	-0.08	0.03	1	6.63	0.01
General Communitarianism	0.03	0.02	1	2.21	0.137	-0.18	0.03	1	38.43	<.001
General Egalitarianism	-0.05	0.02	1	6.14	0.013	0.03	0.03	1	0.77	0.381
General Hierarchical Thinking	0.07	0.02	1	17.68	<.001	-0.12	0.03	1	21.74	<.001
Flood-Related Individualism	0.03	0.02	1	3.07	0.08	-0.13	0.03	1	26.67	<.001
Flood-Related Communitarianism	-0.05	0.02	1	4.89	0.027	0.15	0.03	1	2.25	<.001
Flood-Related Egalitarianism	0.01	0.02	1	0.34	0.561	-0.003	0.03	1	0.01	0.915
Flood-Related Hierarchical Thinking	-0.03	0.02	1	1.92	0.167	-0.08	0.03	1	7.02	0.008

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