SUPPLEMENTAL MATERIALS

ASCE *Natural Hazards Review*

The Dimensions of Individual Support for Coastal Hazard Mitigation: Analysis of a Survey of Upper Texas Coast Residents

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Appendix S1: Survey Weight

The phone survey data were weighted to approximate the most recently available population estimates from the U.S. Census Bureau. For these data, estimates from the 2016 American Community Survey for the adult population (18 years and over) in Harris, Galveston, and Chambers Counties were used. The sample weight is calculated by taking the inverse of the probability that an individual respondent would have been selected in the final sample. This weight is based on the population of the county divided by observed sample within the county. In addition, the weight is "raked" iteratively to adjust sample estimates to population estimates on education, race, and age. Additionally, a weight to apply to the merged phone and online survey data was created using accepted techniques for combining probability and nonprobability samples (Mercer et al. 2017). First, the probability (phone) and non-probability (online) samples were merged into the same data file. Second, a logistic regression predicting membership in the non-probability sample was conducted. Third, the inverse of the probability was used to create initial weights for the non-probability sample. Fourth, the data was "raked" to match population estimates for each county. The comparison of the unweighted and the weighted samples are shown in Table S1.

Table S1. Comparison of Unweighted and Weighted Sample Estimates

	Population	**Phone Sample**		**Online Sample**		**Combined Sample**	
	(2016 ACS)	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
AGE							
18 to 24 years	13.3%	9.9%	13.3%	15.0%	13.3%	13.7%	13.3%
25 to 34 years	21.9%	15.2%	21.9%	29.2%	21.9%	26.2%	21.9%
35 to 44 years	19.5%	14.9%	19.5%	18.8%	19.5%	17.8%	19.5%
45 to 54 years	17.6%	17.4%	17.6%	13.7%	17.6%	14.3%	17.6%
55 to 65 years	14.7%	20.9%	14.7%	12.1%	14.7%	14.3%	14.7%
65 years & older	13.0%	21.7%	13.0%	11.2%	13.0%	13.7%	13.0%
RACE & ETHNICITY							

White, non-Hispanic	33.3%	66.7%	33.1%	48.3%	33.1%	52.5%	33.1%
Hispanic/Latino	40.4%	15.2%	40.1%	26.2%	40.6%	23.6%	40.1%
African American	18.0%	11.4%	18.1%	17.5%	18.1%	16.1%	18.1%
Other	8.2%	6.1%	8.3%	8.0%	8.3%	7.7%	8.3%
EDUCATION							
High School or Less	43.7%	21.3%	43.7%	25.1%	43.6%	23.4%	43.6%
Some College	29.2%	33.2%	29.2%	37.6%	29.1%	36.3%	29.1%
College Degree	27.2%	45.5%	27.2%	37.4%	27.2%	40.3%	27.2%

Note: Figures may not sum to 100% because of rounding error.

References

Mercer, Andrew W., Frauke Kreuter, Scott Keeter, and Elizabeth A. Stuart. (2017). Theory and Practice in Nonprobability Surveys: Parallels between Causal Inference and Survey Inference. *Public Opinion Quarterly*, 81(S1): 250–271. https://doi.org/10.1093/poq/nfw060.

Appendix S2. Descriptive Statistics of Independent Variables

Descriptive statistics for the independent variables in the model are given in Table S2.

Table S2. Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Seawalls and levees	2254	3.302	.88	1	4
Basins	2206	3.175	.925	1	4
Sand dunes	2238	3.26	.913	1	4
Wetlands	2254	3.35	.879	1	4
Elevation	2268	3.452	.857	1	4
Zoning	2234	3.021	.964	1	4
Buyouts	2251	3.04	1.039	1	4
Risk perception	2202	0	1	-2.666	1.7
Flood damages	2185	2.749	3.29	0	16.842
Hurricane Ike damage	2281	.363	.481	0	1
Hurricane Harvey damage	2281	28.772	33.102	0	100
Self-reliance	2254	.208	.406	0	1
State & local government responsibility	2281	.338	.473	0	1
Homeowner	2256	.604	.489	0	1
Latino	2253	.229	.42	0	1
African American	2253	.17	.376	0	1
College educated	2265	.216	.412	0	1
Galveston County	2281	.256	.437	0	1
Chambers County	2281	.032	.177	0	1

Appendix S3: Risk Perception Factor Score

Principal component factor analysis was conducted to create a factor score representing the latent variable of perceived risk. The factor analysis included responses to the survey question: "How likely do you think it is that in the next 10 years there will be a flood that causes...major damage to property in your city? deaths and injuries to people in your community? major damage to your home? disruption to your job that prevents you from working? disruption of electrical, telephone, and other basic services?" Response options included: "not at all," "small extent," "moderate extent," "great extent," "very great extent." Factor loadings are given in Table S3. Given the Eigenvalues reported, only one factor was retained.

Table S3. Risk Perception Factor Loadings

Scale Items	Factor 1	Factor 2	Factor 3
major damage to property	0.80		
death and injuries	0.82		
major damage to your home	0.78		
disruption to your job	0.72		
disruption to basic services	0.77		
Percentage of Variance	60.84	22.47	9.92
Eigenvalue	3.04	0.73	0.51
Cronbach's Alpha	0.834	--	--

Appendix S4. Correlation Matrix of Independent Variables

Pairwise correlations for the independent variables in the model are given in Table S4.

Table S4. Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	1.000											
(2)	0.064*	1.000										
(3)	0.130*	0.061*	1.000									
(4)	0.221*	0.110*	0.156*	1.000								
(5)	-0.129*	-0.030	-0.056*	0.003	1.000							
(6)	-0.094*	-0.009	0.016	-0.048*	0.061*	1.000						
(7)	-0.115*	0.019	0.051*	-0.079*	0.103*	0.050*	1.000					
(8)	0.042*	-0.082*	-0.049*	0.060*	-0.006	-0.048*	-0.093*	1.000				
(9)	0.037	-0.135*	0.008	0.076*	-0.057*	-0.017	-0.186*	-0.247*	1.000			
(10)	-0.021	0.064*	0.054*	-0.094*	0.046*	0.022	0.168*	-0.143*	-0.054*	1.000		
(11)	0.020	0.406*	0.051*	0.049*	-0.009	0.001	0.028	-0.146*	-0.136*	-0.021	1.000	
(12)	-0.052*	-0.074*	0.057*	0.063*	-0.001	-0.005	0.082*	-0.045*	-0.015	0.038	-0.108*	1.000

Notes: Variable labels: (1) risk perceptions; (2) flood damages; (3) Hurricane Ike damage; (4) Hurricane Harvey damage: (5) self-reliance; (6) state & local government responsibility; (7) homeowner; (8) Latino; (9) African American; (10) college educated; (11) Galveston County; (12) Chambers County; * significance at the 0.05 level.

Appendix S5. Multinominal Regression Results

Table S5. Regression Results for Weak Support: Correlates of "support a little" (reference category: "do not support")

	(1) Seawalls/Levees	(2) Basins	(3) Sand dunes	(4) Wetlands	(5) Elevation	(6) Zoning	(7) Buyouts
Risk perception	-0.004	0.057	0.232	0.210	0.227	0.125	0.073
	(0.182)	(0.167)	(0.140)	(0.173)	(0.191)	(0.129)	(0.110)
Flood damages	-0.007	0.181**	0.018	-0.012	0.041	0.061	0.039
	(0.081)	(0.053)	(0.054)	(0.071)	(0.055)	(0.043)	(0.038)
Hurricane Ike damage	-0.170	0.426	-0.104	0.603	-0.153	-0.106	-0.108
	(0.311)	(0.305)	(0.299)	(0.317)	(0.339)	(0.243)	(0.228)
Hurricane Harvey damage	0.003	-0.002	0.000	-0.003	0.004	0.004	0.002
	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.004)	(0.004)
Self-reliance	-0.423	-0.649*	-0.313	0.038	-0.561	-0.724**	-0.757**
	(0.303)	(0.294)	(0.315)	(0.324)	(0.332)	(0.250)	(0.232)
State & local government responsibility	-0.183	0.162	-0.126	0.247	0.594	-0.115	0.087
	(0.307)	(0.278)	(0.287)	(0.313)	(0.343)	(0.236)	(0.224)
Homeowner	0.987**	0.102	0.782**	0.504	0.572	0.585*	0.360
	(0.298)	(0.274)	(0.279)	(0.294)	(0.333)	(0.236)	(0.229)
Latino	-0.125	-0.067	-0.252	-0.334	-0.158	-0.140	0.074
	(0.316)	(0.295)	(0.319)	(0.341)	(0.347)	(0.259)	(0.251)
African American	-0.465	-0.207	-0.913**	-0.304	0.241	-0.368	0.146
	(0.395)	(0.331)	(0.346)	(0.382)	(0.452)	(0.290)	(0.292)
College educated	0.025	0.988*	0.799	0.017	-0.599	0.024	0.132
	(0.400)	(0.391)	(0.453)	(0.487)	(0.417)	(0.294)	(0.275)
Galveston County	-0.369	-0.934**	-0.295	-0.501	-0.554	-0.254	-0.358
	(0.431)	(0.323)	(0.349)	(0.441)	(0.358)	(0.307)	(0.281)
Chambers County	-1.105	-0.513	1.070	-0.205	-0.014	-1.755*	-0.970
	(0.688)	(0.711)	(1.132)	(1.183)	(0.796)	(0.736)	(0.612)
Constant	0.769*	0.864**	0.840*	0.728	0.503	0.638*	0.158
	(0.389)	(0.333)	(0.354)	(0.383)	(0.358)	(0.268)	(0.281)
N	2,040	2,013	2,034	2,039	2,048	2,029	2,041

Notes: Coefficients reported with standard errors in parentheses. ** p<0.01, * p<0.05

Table S6. Regression Results for Moderate Support: Correlates of "support some" (reference category: "do not support")

	(1) Seawalls/Levees	(2) Basins	(3) Sand dunes	(4) Wetlands	(5) Elevation	(6) Zoning	(7) Buyouts
Risk perception	0.355*	0.288	0.283*	0.433**	0.477**	0.411**	0.296**
	(0.177)	(0.156)	(0.129)	(0.162)	(0.175)	(0.118)	(0.107)
Flood damages	0.022	0.202**	0.058	-0.003	0.067	0.0802*	0.045
	(0.077)	(0.052)	(0.049)	(0.068)	(0.047)	(0.040)	(0.033)
Hurricane Ike damage	0.028	0.125	-0.215	0.487	-0.164	-0.400	0.005
	(0.283)	(0.297)	(0.275)	(0.294)	(0.309)	(0.233)	(0.210)
Hurricane Harvey damage	0.001	-0.003	-0.001	-0.003	0.001	-0.001	0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.003)
Self-reliance	-0.582*	-0.624*	-0.374	-0.357	-0.631*	-1.078**	-1.019**
	(0.275)	(0.272)	(0.291)	(0.299)	(0.294)	(0.236)	(0.217)
State & local government responsibility	0.263	0.020	-0.201	0.281	0.426	-0.106	0.196
	(0.282)	(0.262)	(0.265)	(0.288)	(0.308)	(0.223)	(0.209)
Homeowner	0.854**	0.200	0.688**	0.817**	0.862**	0.601**	0.269
	(0.273)	(0.259)	(0.254)	(0.272)	(0.298)	(0.218)	(0.207)
Latino	-0.375	-0.482	-0.343	-0.669*	-0.077	0.014	-0.024
	(0.296)	(0.280)	(0.298)	(0.311)	(0.301)	(0.239)	(0.228)
African American	-0.542	-0.766*	-1.046**	-0.555	-0.381	-0.682*	-0.408
	(0.354)	(0.315)	(0.316)	(0.354)	(0.425)	(0.276)	(0.276)
College educated	0.174	0.757*	0.864*	0.010	-0.310	-0.259	-0.154
	(0.367)	(0.375)	(0.432)	(0.472)	(0.354)	(0.274)	(0.254)
Galveston County	-0.658	-0.935**	-0.103	-0.560	-0.660*	-0.133	-0.529*
	(0.406)	(0.315)	(0.327)	(0.413)	(0.323)	(0.286)	(0.240)
Chambers County	-0.950	-0.982	1.114	1.112	-0.286	-0.082	-0.124
	(0.622)	(0.716)	(0.858)	(1.200)	(0.840)	(0.578)	(0.518)
Constant	1.749**	1.801**	1.685**	1.658**	1.410**	1.483**	0.983**
	(0.365)	(0.313)	(0.317)	(0.342)	(0.307)	(0.243)	(0.255)
N	2,040	2,013	2,034	2,039	2,048	2,029	2,041

Notes: Coefficients reported with standard errors in parentheses. ** p<0.01, * p<0.05

Table S7. Regression Results for Strong Support: Correlates of "support a lot" (reference category: "do not support")

	(1) Seawalls/Levees	(2) Basins	(3) Sand dunes	(4) Wetlands	(5) Elevation	(6) Zoning	(7) Buyouts
Risk perception	0.776**	0.738**	0.706**	0.686**	0.917**	0.792**	0.704**
	(0.176)	(0.158)	(0.128)	(0.164)	(0.172)	(0.123)	(0.104)
Flood damages	0.018	0.244**	0.089	0.019	0.038	0.0961*	0.054
	(0.076)	(0.051)	(0.048)	(0.066)	(0.046)	(0.041)	(0.033)
Hurricane Ike damage	0.234	0.208	0.334	0.637*	-0.327	-0.235	-0.167
	(0.279)	(0.290)	(0.269)	(0.284)	(0.294)	(0.231)	(0.204)
Hurricane Harvey damage	-0.004	-0.006	-0.00906*	-0.00838*	-0.003	0.000	-0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.003)
Self-reliance	-0.795**	-0.740**	-0.649*	-0.611*	-0.944**	-0.936**	-1.250**
	(0.268)	(0.268)	(0.289)	(0.293)	(0.272)	(0.233)	(0.217)
State & local government responsibility	0.160	0.178	0.064	0.310	0.610*	0.067	0.185
	(0.279)	(0.261)	(0.262)	(0.283)	(0.294)	(0.224)	(0.205)
Homeowner	1.084**	0.651*	1.082**	0.961**	0.807**	0.896**	0.410*
	(0.271)	(0.258)	(0.251)	(0.265)	(0.284)	(0.220)	(0.202)
Latino	-0.829**	-0.822**	-1.128**	-1.074**	-0.309	-0.683**	-0.468*
	(0.296)	(0.281)	(0.299)	(0.308)	(0.284)	(0.247)	(0.226)
African American	-0.391	-0.604*	-1.391**	-1.225**	-0.171	-0.886**	-0.135
	(0.345)	(0.304)	(0.317)	(0.349)	(0.408)	(0.272)	(0.259)
College educated	0.225	1.098**	1.243**	0.807	-0.230	0.203	-0.062
	(0.368)	(0.370)	(0.420)	(0.462)	(0.342)	(0.274)	(0.248)
Galveston County	0.252	-1.097**	0.284	-0.201	-0.332	-0.513	-0.383
	(0.402)	(0.311)	(0.335)	(0.406)	(0.309)	(0.286)	(0.236)
Chambers County	-0.427	-0.121	2.517**	1.459	0.521	-0.483	-0.269
	(0.632)	(0.699)	(0.870)	(1.154)	(0.758)	(0.592)	(0.452)
Constant	2.219**	1.915**	2.032**	2.420**	2.821**	1.423**	1.554**
	(0.365)	(0.313)	(0.316)	(0.337)	(0.284)	(0.249)	(0.252)
N	2,040	2,013	2,034	2,039	2,048	2,029	2,041

Notes: Coefficients reported with standard errors in parentheses. ** p<0.01, * p<0.05