

## Appendix

**Table A1: Number of observations in each regional code**

Region	N
Alabama	17
California, Nevada, Oregon, Utah, Washington	24
Connecticut	17
Georgia and Tennessee	16
Iowa, Illinois, Minnesota, Wisconsin	17
Indiana, Kentucky, Ohio	15
Louisiana	40
Arkansas, Missouri, Oklahoma	15
Delaware, Massachusetts, Maryland, New Jersey, New York	18
North Carolina, Virginia	22
Mississippi	20
Texas	35
Pennsylvania, West Virginia	15
Northern Florida and Panhandle	10
Central Florida	70
Southern Florida	96
Total	447

**Table A2: Responses to qualitative survey questions in full sample**

<b>What factors lead you not to have flood insurance (given that you do not)? (N=259)</b>	<b>% Yes</b>
I can't afford to pay the premium along with all my other bills.	39%
I don't really worry about having my house flooded.	45%
I think the government will help me if my house is damaged in a flood even if I don't have insurance.	7%
I am not required to have flood insurance	38%
My bank made me buy flood insurance when I bought my home but I dropped it after a few years.	6%
<b>What factors lead you to have flood insurance (given that you do)? (N=232)</b>	
My bank required me to purchase flood insurance in order to get a mortgage.	58%
I worry about my house getting flooded.	39%
My house has already been flooded.	17%
I decided I can afford the premium.	27%
I do not think anyone will help me rebuild if my house is damaged by a flood and I am uninsured.	23%
<b>What thoughts below affected your thinking about whether or not you would accept this guaranteed buyout program? (N=491)</b>	
I am worried about floods.	22%
I don't really think flood risks are a big deal.	14%
I would not want to abandon my neighbors.	9%
My neighbors are likely to leave after a flood, so I might as well accept a buyout.	15%
My neighbors are likely to leave after a flood, so I will like living here even more.	7%
A buyout might hurt my community.	11%
Getting my house out of the flood plain might help my community manage floods.	15%
I have confidence in the federal government administering a buyout program.	14%
I want to stay near the water.	17%
This place is my home.	39%
I don't like interacting with the federal government.	14%
Allowing my house to be bought and the lot to be restored will be good for nature.	25%
I like the security of knowing I will be bought out quickly.	45%
I would be very happy to be paid the full value of my house after a flood.	49%
I don't believe that I would really receive the full value of my house if I accepted a buyout.	32%

Note: Respondents could check each factor that applied to their thinking about each question.

**Table A3: Interval regression results for willingness to pay, no fixed effects**

	Linear (N=447)		Ln (N=443)	
	Coefficient	S.E.	Coefficient	S.E.
Estimated risk	6.209***	1.722	0.013***	0.003
Neighbors move %	4.578***	1.809	0.006**	0.003
Years in town	3.904	3.128	0.007	0.005
Family in town	-21.07	88.98	0.053	0.143
Neighbor talk daily	61.86	98.65	0.064	0.159
Environmental concern	133.3	93.65	0.390***	0.150
Home raised	128.1	110.5	0.250	0.177
Ocean	-92.06	141.0	-0.317	0.228
HasInsurance?	-139.0	100.3	-0.267*	0.161
Premium/yr (\$)	8.680**	3.974	0.004	0.006
Ever claim	-270.6**	121.0	-0.282	0.194
Ever claim over \$25k	587.6***	167.3	0.580**	0.266
Home value \$100 to \$250k	73.06	114.8	0.406**	0.186
Home value \$250k+	62.14	131.9	0.347	0.214
Income \$70K to \$149K	218.4**	96.69	0.630***	0.155
Income \$150K+	689.0***	183.3	1.072***	0.292
Inhabitants	39.90	34.28	0.107**	0.055
Age 35 to 54	-177.3*	108.3	-0.476***	0.174
Age 55+	-85.89	118.0	-0.082	0.189
College degree	218.9**	96.56	0.349**	0.155
Advanced degree	185.8	118.4	0.371**	0.191
White	35.17	132.1	0.059	0.211
African American	-122.3	176.8	-0.149	0.284
Constant	-418.9*	229.4	3.388***	0.369
ln( $\sigma$ )	6.739***	0.036	0.290***	0.038
$\Sigma$	844.9	30.43	1.337	0.051
Log likelihood	-1435.17		-972.55947	
Prob > $\chi^2$	0.0000		0.0000	

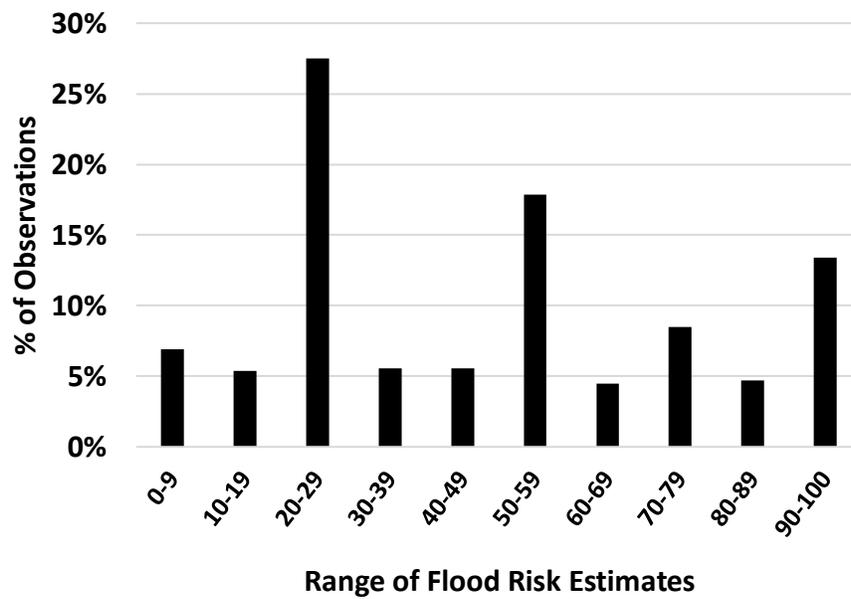
\*\*\*, \*\* and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

$\sigma$  is calculated from the estimated ln( $\sigma$ ).

**Table A4: Logit regression results with no fixed effects or clustering**

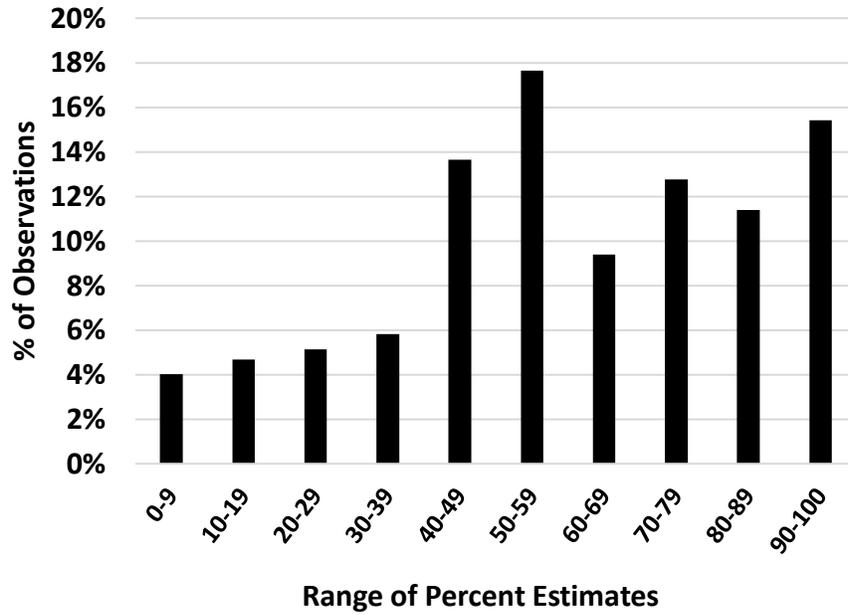
Variable	All observations (N=447)		Respondents with insurance (N=210)	
	Coefficient	S.E.	Coefficient	S.E.
Estimated risk	0.020***	0.005	0.018*	0.010
Neighbors move %	0.005	0.005	0.012	0.010
Years in town	0.022**	0.010	-0.001	0.018
Family in town	-0.478*	0.280	-0.125	0.505
Neighbor talk daily	-0.332	0.303	-0.696	0.502
Environmental concern	0.956***	0.301	1.701***	0.624
Home raised	0.444	0.372	0.836	0.732
Ocean	-0.120	0.435	1.011	0.979
HasInsurance?	0.312	0.637		
PremiumSavings	-0.127**	0.063	-0.020	0.016
HasInsurance?* PremiumSavings	0.104*	0.064		
Ever claim	0.798**	0.409	1.281*	0.676
Ever claim over \$25k	-0.051	0.631	0.181	0.988
Home value \$100 to \$250k	0.477	0.425	0.104	0.715
Home value \$250k+	0.262	0.552	-0.445	0.766
Income \$70K to \$149K	0.711**	0.298	0.537	0.488
Income \$150K+	1.110*	0.596	1.555	1.263
Inhabitants	0.311***	0.110	0.089	0.200
Age 35 to 54	-0.466	0.331	0.012	0.583
Age 55+	0.427	0.349	1.532**	0.645
College degree	-0.128	0.295	0.320	0.525
Advanced degree	-0.092	0.352	-0.239	0.623
White	0.072	0.385	-0.422	0.917
African American	3.154***	1.103	1.371	1.453
Constant	-1.980***	0.749	-1.143	1.402
Log likelihood	-205.32503		-72.658392	
Prob > $\chi^2$	0.0000		0.0036	
Pseudo R <sup>2</sup>	0.2546		0.2321	

**Figure A1: Respondent estimates of flood risk (N=447)**



Note: This variable captures the answer to the question “How likely do you really think it is that your home will be hit in the next 30 years by a flood so bad that the house loses more than half its value?” where the probability could range between 0 and 100.

**Figure A2: Respondent estimates of % of neighbors that would move after flood (N=447)**



Note: This variable captures the answer to the question “With this new guaranteed buyout program in place, what percent of your neighbors do you think would sell their homes and move following a very damaging flood?” where the answer could range between 0 and 100.

## Flood Policy Survey

This online survey is research being done by Professor Amy W. Ando and Graduate Student Collin Reeser of the Department of Agricultural and Consumer Economics at the University of Illinois. This survey is designed to evaluate people's willingness to take part in possible new policies related to flood prone homes.

Participation is voluntary and will take approximately 30 minutes. You will not be asked to give your name or address, and the online survey tool does not link any identifying information about you to your responses.

You should only complete this survey if you are over 18 years old and own a home that is in a flood zone. Please complete it to the best of your ability. You may choose not to answer specific questions and can stop taking the survey at any time.

Your input is very important for us. You may not benefit directly from participating, but the results of this research may help design better flood policies in the future. We are happy to provide you with a copy of the final report at your request.

Will my study-related information be kept confidential?

Yes, but not always. In general, we will not tell anyone any information about you. When this research is discussed or published, no one will know that you were in the study. However, laws and university rules might require us to disclose study data. For example, if required by laws or University Policy, study data may be seen or copied by the following people or groups:

- The university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for Protection of Research Subjects;
- University and state auditors, and Departments of the university responsible for oversight of research;
- Federal government regulatory agencies such as the Office of Human Research Protections in the Department of Health and Human Services;
- The financial sponsor of the research, The Natural Resource Defense Council

If you have any questions about this survey research or its results please contact:

Professor Amy Ando, amyando@illinois.edu, 217- 333-5130

Graduate Student Collin Reeser, creeser2@illinois.edu

If you have any questions, concerns or complaints about your rights as a participant in this study, please contact the University of Illinois Institutional Review Board at 217-333-2670 or via email at irb@illinois.edu.

You should print this information sheet for your future reference. If you agree with the above terms select "I Agree" below.

- I agree
- I do not wish to participate in this survey



1) [Here](#) you will look up the flood zone that your house is in and enter the flood zone information into the survey. Please note that information about your address will not be stored anywhere – it just helps the flood map tool to give you correct flood zone information.

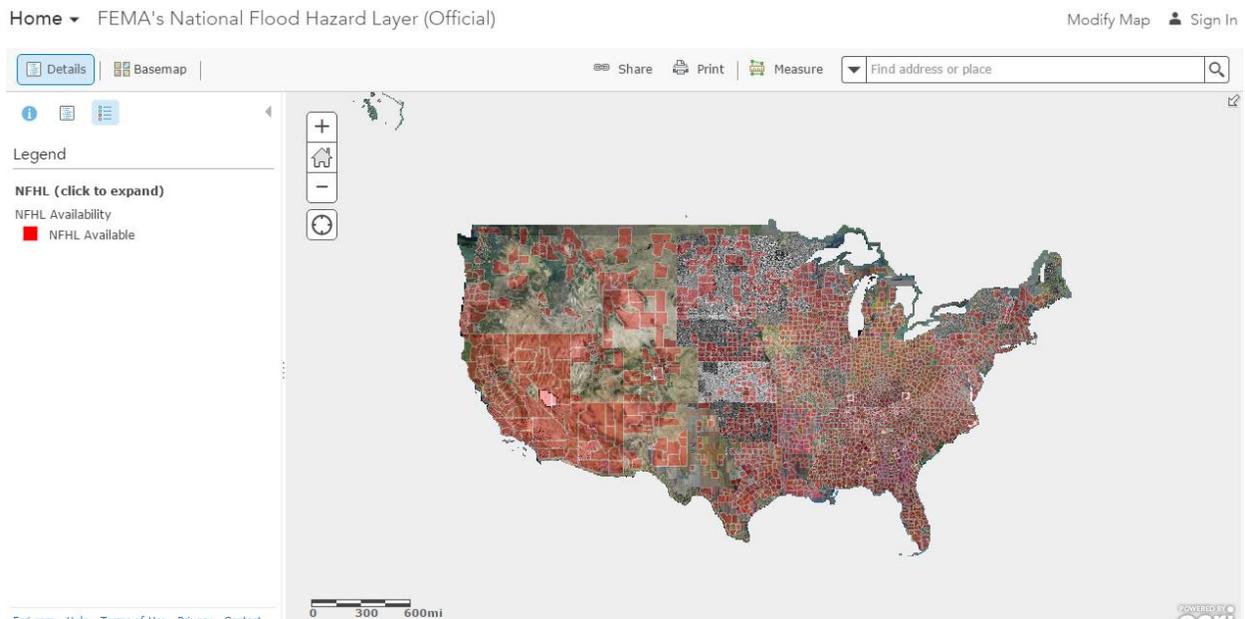
1. Type your address into the Search Bar.

2. Left click on your home. This will open an information box that lists flood zone information for the area.



3. Click the right arrow (Circled above) at the top of the box until you see "Flood Zone"

4. Select the indicated flood zone from the list below



## **Part 1: Preliminary Questions**

We will be asking several questions about your home. If you have multiple homes in different locations, please think about the address you entered in the previous question.

2) Do you own your home?

- Yes
- No

3) How much do you think your home is worth?

- Under \$49,999
- \$50,000 to 99,999
- \$100,000 to 149,999
- \$150,000 to 199,999
- \$200,000 to 249,999
- \$250,000 to 299,999
- Over \$300,000

4) Is this your main home or a second home (like a vacation house or a rental property)?

- Main home
- Second home

## **Part 2: General background information**

- Floods can cause a great deal of damage and flood risks are getting worse. Coastal towns are expected to see a 55% increase in the size of areas at high risk for flood (defined as areas with a 1 in 100 chance every year of a major flood) by the year 2100. The number of homes in high-risk flood areas along U.S. rivers is also expected to increase by 45% by the year 2100, with increases as high as 100% in some river areas of the Northwest and along small streams and rivers near the Great Lakes.
- Communities can try to reduce the risk of future flood damage in several ways, including buying out houses in areas at serious risk of flood and restoring natural areas which will protect the remaining properties nearby. Communities can also turn this land into public parks.



*In the event of a buyout, homes in flood plains can be restored to natural flood barriers as shown here.* Source: Land Conservancy of NJ: <http://www.tlc-nj.org/index.php/pr-pompton-39>.

- If homeowners do not have flood insurance, the government makes no promise that it will help them at all to pay for damage to their houses caused by a flood. Those people may rebuild their houses in the same locations, but that is likely to be at their own expense.
- Currently the owner of a severely damaged house who does have insurance through the National Flood Insurance Program might be able to do two things:
  - Place a claim to get paid for at least some of the damage, and then rebuild their house in the same location (if permitted by local regulations).
  - Participate in a homeowner buyout program instead of rebuilding in the same location if a buyout program is made locally available. Under current policy:
    - The homeowner would be paid the pre-flood market value
    - The buyout process, if allowed, can take from 1-4 years after a flood because a lot of paperwork must be completed.

### **Part 3**

#### **Possible new guaranteed buyout program policy – version A**

Consider a possible new kind of program for houses that are at risk of severe damage by floods – a guaranteed buyout program. If you were to sign up for it, it would work like this:

- You would sign a permanent legal agreement promising that if a flood damages your house such that half its value (or more) is lost, then you will let the government buy your house and you will move.
  - The government would pay you the value of the house on the market before it was damaged.
  - Some of the required paperwork would be completed before a flood to make the process much faster should it be needed. The buyout, if needed, would be completed in less than three months after a bad flood.
- This arrangement gives you certainty that you will be able to sell your house for its full value quickly after a flood.
- This arrangement takes away your option to rebuild your house in the same location after severe flood damage.

5) Suppose the new policy were put in place, and you were offered the opportunity to pay to sign up for the new guaranteed buyout program. In exchange for having the certainty that you will be able to sell your house for its full value quickly after a flood (but giving up the option to rebuild after a major flood) you will pay a one-time fee.

Please think about the **largest amount of money you would be willing to pay** this year in order to be able to sign up for the guaranteed buyout program, considering your financial situation and the flood risk you face. Remember, in your location, updated flood maps say that we can expect a flood at least once every 100 years (or a 1 in 4 chance of flood over the course of a 30 year mortgage).

Consider the dollar amounts listed below. For each amount, check whether you would sign up (Yes or No) for the buyout program if that amount of money were your cost. Previous studies have found that some people overstate how much they are willing to pay. Therefore, consider thoroughly how the one-time cost will affect your budget so that you are really certain that you actually are willing to pay the money associated with each alternative that you say you would sign up.

One Time Cost for You	Yes, I would sign up	No, I would not sign up
\$0		
\$15		
\$35		
\$60		
\$150		
\$250		
\$450		
\$700		
\$1200		
\$2000		
\$3500		

**If respondent answers "No" to all amounts, go on to question 6.**

**If answers "Yes" to any, skip question 6.**

6) You answered "No" to all dollar amounts, indicating that you are not willing to sign up for this program even if it were free.

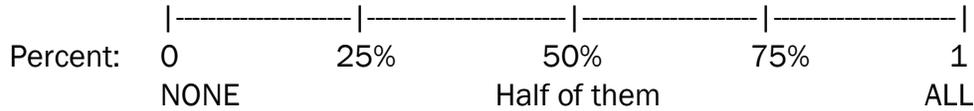
Suppose now that you would actually be paid money to sign up for the new guaranteed buyout program. In exchange for giving up the option to rebuild in the same location after a major flood you will receive a single one-time payment. This policy will only be put in place if payments to homeowners aren't too expensive. Please think about the **smallest** amount of money you would really need to be paid in order to agree to sign up for the guaranteed buyout program, considering your financial situation and the flood risk you face.

Remember, in your location, updated flood maps say that we can expect a flood at least once every 100 years (or a 1 in 4 chance of flood over the course of a 30 year mortgage)

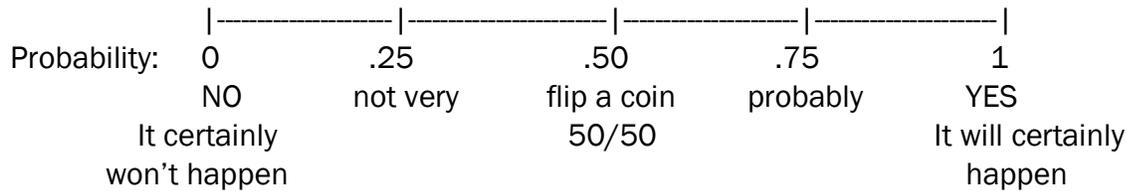
Consider the dollar amounts listed below. For each amount, check whether you would sign up (Yes or No) for the buyout program if that amount of money were the one time payment you receive. Previous studies have found that some people overstate how much they would need to be paid to accept a change they don't want. Therefore, consider thoroughly how the one-time payment will affect your budget so that you are really certain of your answers.

One Time Payment to You	Yes, I would sign up	No, I would not sign up
\$0		
\$15		
\$35		
\$60		
\$150		
\$250		
\$450		
\$700		
\$1200		
\$2000		
\$3500		

7) **With this new guaranteed buyout program in place**, what percent of your neighbors do you think would sell their homes and move following a very damaging flood? Mark an X on the line below



8) How likely do you really think it is that your home will be hit in the next 30 years by a flood so bad that the house loses more than half its value? Mark an X on the line below



9) What thoughts below affected your thinking about whether or not you would accept this guaranteed buyout program? **Check each one that applies**

	Yes
I am worried about floods.	
I don't really think flood risks are a big deal.	
I would not want to abandon my neighbors.	
My neighbors are likely to leave after a flood, so I might as well accept a buyout.	
My neighbors are likely to leave after a flood, so I will like living here even more.	
A buyout might hurt my community.	
Getting my house out of the flood plain might help my community manage floods.	
I don't like interacting with the federal government.	
I have confidence in the federal government administering a buyout program.	
I want to stay near the water.	
This place is my home.	
Allowing my house to be bought and the lot to be restored will be good for nature.	
I like the security of knowing I will be bought out quickly.	
I would be very happy to be paid the full value of my house after a flood.	
I don't believe that I would really receive the full value of my house if I accepted a buyout.	
Other:	

**Part 4:**

10) Have you **ever** had a flood insurance policy on your home? (This is a separate policy from your homeowners policy.)

- Yes
- No

11) Do you **currently** have a flood insurance policy on your home?

- Yes
- No

**If answered No to Question 11 answer Question 12 and then skip Questions 13–16**

**If answered Yes to Question 11 skip to Question 13**

12) What factors lead you **not** to have flood insurance? Check each that applies.

- I can't afford to pay the premium along with all my other bills.
- I don't really worry about having my house flooded.
- I think the government will help me if my house is damaged in a flood even if I don't have insurance.
- I am not required to have flood insurance
- My bank made me buy flood insurance when I bought my home but I dropped it after a few years.
- Other (fill in): \_\_\_\_\_

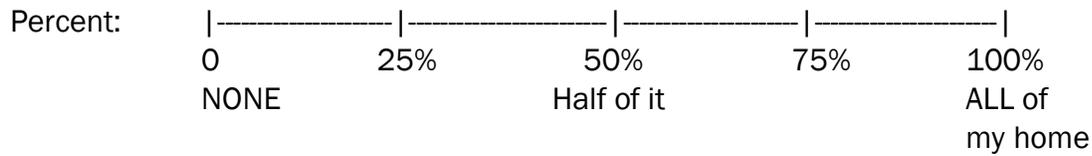
13) Does your flood insurance policy cover the full value of your home?

- Yes
- No

14) Approximately how much in dollars do you pay each year for flood insurance? (Does not include homeowners' insurance) **Please do not enter commas or dollar signs (", " "\$")**

- \$ \_\_\_\_\_

15) Under the National Flood Insurance Program you can buy insurance for up to \$250,000 for your property. How much of the value of your home is insured under your flood insurance? Mark an X on the line below



16) What factors lead you to have flood insurance? Check each that applies.

- My bank required me to purchase flood insurance in order to get a mortgage.
- I worry about my house getting flooded.
- My house has already been flooded.
- I decided I can afford the premium.
- I do not think anyone will help me rebuild if my house is damaged by a flood and I am uninsured.
- Other (fill in): \_\_\_\_\_

17) Please check all that apply to your home

	Yes
My home is built on a crawl space	
My home is a mobile home	
My home has a basement	
My home was built before 1978	
My home has more than one level of living space	

### **Question 18 for people who answered Yes to 11**

Prices for flood insurance coverage are likely to rise in the future for many homeowners. The new price will better reflect a property's actual risk of flooding. Such a homeowner can expect their premiums to increase 5-20% each year until they are approximately double the current rates in the year 2020. For example, if you are one of those households, your flood insurance premium is likely to increase from \$750 a year to \$1500 a year by 2020.

#### **Possible new guaranteed buyout program - version B, combined with flood insurance**

Below is a different version of the guaranteed buyout program described earlier. With this version of the policy, homeowners must have flood insurance to sign up, and "payment" is in the form of reduced flood insurance rates.

**For the purposes of this question, assume if you don't sign up for the program then your insurance premium will go up from \$750 to \$1500**

If you do sign up for this program, it works like this:

- You could buy flood insurance at your current rate for as long as the house is there (rates will not go up). That rate would be lower than the rate you would otherwise have to pay, and so saves you \$1500 every year that you own your home.
- In most ways, this insurance would provide the same benefits as the current flood insurance program.
- However, you would sign a permanent legal agreement promising that if a flood damages your house such that half its value (or more) is lost, then you will let the government buy your house and you will move.
  - The government would pay the value of the house on the market before it was damaged.
  - Some of the required paperwork can be completed before a flood to make the process much faster should it be needed. The buyout would be completed in less than three months after a bad flood.
- This arrangement gives you certainty that you will be able to sell their house for its full value quickly after a flood.
- This arrangement takes away your option to rebuild your house in the same location after severe flood damage.
- This arrangement helps you to be sure your insurance stays affordable.

18) Suppose such a new policy were put in place, and you were offered the chance to sign up for this guaranteed buyout program combined with flood insurance. Think about whether you would accept that agreement starting this year, considering your financial situation and the flood risk you face.

Remember, in your location, updated flood maps say that we can expect a flood at least once every 100 years (or a 1 in 4 chance of flood over the course of a 30 year mortgage) Assume the amount of money you save each year on flood insurance by signing up for this policy would be \$1500 per year.

**Would you sign up for the policy?**

- Yes
- No

Why?: \_\_\_\_\_

### **Question 18 for people who answered No to 11**

Prices for flood insurance coverage are likely to rise in the future for many homeowners. The new price will better reflect a property's actual risk of flooding. Such a homeowner can expect their premiums to increase 5-20% each year until they are approximately double the current rates in the year 2020. For example, a home in your area with features and a value similar to yours would likely see a flood insurance premium increase from \$750 a year to \$1500 a year in 2020.

#### **Possible new guaranteed buyout program - version B, combined with flood insurance**

Below is a different version of the guaranteed buyout program described earlier. With this version of the policy, homeowners must have flood insurance to sign up, and "payment" is in the form of reduced flood insurance rates.

**For the purposes of this question, assume that you have flood insurance and if you don't sign up for the program then your insurance premium will be \$4000 a year**

If you do sign up for this program, it works like this:

- You could buy flood insurance at **\$2000** a year for as long as the house is there (rates will not go up). That rate would be lower than the rate you would otherwise have to pay, and so saves you \$2000 every year that you own your home.
- In most ways, this insurance would provide the same benefits as the currently available flood insurance program.
- However, you would sign a permanent legal agreement promising that if a flood damages your house such that half its value (or more) is lost, then you will let the government buy your house and you will move.
  - The government would pay the value of the house on the market before it was damaged.
  - Some of the required paperwork can be completed before a flood to make the process much faster should it be needed. The buyout would be completed in less than three months after a bad flood.
- This arrangement gives you certainty that you will be able to sell their house for its full value quickly after a flood.
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18) Suppose such a new policy were put in place, and you were offered the chance to sign up for this guaranteed buyout program combined with flood insurance. Think about whether you would accept that agreement starting this year, considering your financial situation and the flood risk you face.

Remember, in your location, updated flood maps say that we can expect a flood at least once every 100 years (or a 1 in 4 chance of flood over the course of a 30 year mortgage)

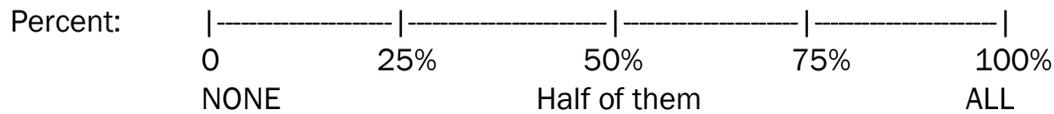
Assume the amount of money you save each year on flood insurance by signing up for this policy would be \$2000 per year.

**Would you sign up for the policy?**

- Yes
- No

Why?: \_\_\_\_\_

19) With this new guaranteed buyout program in place, what percent of your neighbors do you think would sell their homes and move following a very damaging flood? Mark an X on the line below.



**Part 5: Follow up questions**

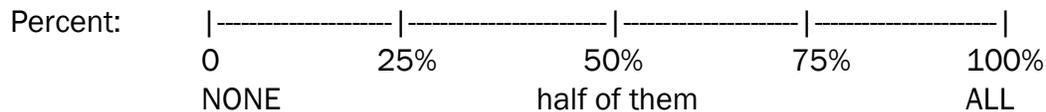
20) Has your home ever been raised above the ground by raising its foundation, having it built on fill, or putting it on stilts or pilings? Examples are:



*Figure 1 These homes have been elevated.*

- Yes
- No
- Don't Know

21) What percent of homes in your town do you think have had flood damage in the last 20 years? Mark an X on the line below.



22) To the best of your knowledge how many flood insurance claims have you or previous owners made on your current home in the last 20 years? Pick one.

- 0
- 1
- 2
- 3
- 4+

23) In the worst flood you have experienced, how much flood damage did your home suffer? Pick one.

- None, or I have not experienced a flood
- Less than \$4000
- \$4000 - \$24,999
- \$25,000 - \$99,000
- \$100,000 or more
- I don't know

24) Have you made two or more flood insurance claims of at least \$1,000 on your property in the last 10 years? Pick one.

- Yes
- No
- Not sure

25) Did you know that most flood insurance policies are provided by the federal government?

- Yes
- No

26) How many people live in your home, including children? \_\_\_\_

27) How many years have you lived in your town? (This includes previous homes in the same town) \_\_\_\_ years

28) Did you think about flood risk when you were deciding to live there? Pick one.

- Yes
- Sort of
- No

29) What is your combined annual household income? Check one.

- Less than \$20,000
- \$20,000 to \$29,999
- \$30,000 to \$39,999
- \$40,000 to \$49,999
- \$50,000 to \$59,999
- \$60,000 to \$69,999
- \$70,000 to \$79,999
- \$80,000 to \$89,999
- \$90,000 to \$99,999
- \$100,000 to \$124,000
- \$125,000 to \$149,999
- \$150,000 to \$299,000
- \$300,000 to \$500,000
- \$500,000 or more

30) What is your age?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 65
- 65 and older

31) What is the highest level of education you have completed?

- Less than high school
- High school / GED
- Some college
- 2-year college degree
- Bachelor's degree
- Master's degree
- Doctoral degree
- Other advanced degree (such as JD or MD)

32) What is your gender?

- Female
- Male
- \_\_\_\_\_



33) What is your race? Pick one.

- White/Caucasian
- African American
- Hispanic/Latino
- Asian
- Native American
- Pacific Islander
- \_\_\_\_\_

34) Do you have family living in other homes in your community?

- Yes
- No

35) How often do you talk with the people in your neighborhood? Pick one.

- Never
- Less than once a month
- Once a month
- 2 or 3 times a month
- Once a week
- Every day

36) What is your zip code? \_\_\_\_\_

37) How worried are you that a flood could harm each of the following (check one for each):

	Not at all	A little worried	Very worried	Don't know
a) Your household finances				
b) Your emotional well-being				
c) Your physical health				
d) Your safety				
e) The future of your community				

38) Do you have any comments for us about this survey? \_\_\_\_\_

THANK YOU FOR ANSWERING THE SURVEY