FEMA Chatham Emergency Management Agency
2011 Hurricane Conference
U.S. Army Corps of Engineers® Savannah District

Georgia Hurricane Evacuation Study Behavioral Analysis Results

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Dewberry

GEMA

May 24, 2011

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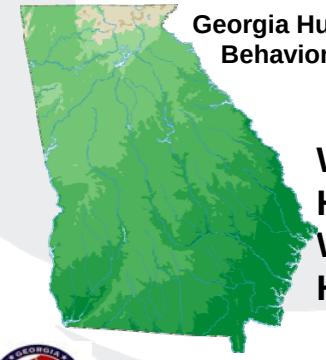

Georgia Hurricane Evacuation Study Behavioral Analysis Results

What did we do?
How did we do it?
What did it tell us?
How can we use it?

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OBJECTIVE (What did we do?)

- Conduct Telephone Sampling and Analysis of the Coastal Population to Develop Behavioral Tendencies and Trends
- Provide Input Data for the Transportation Analysis Model
- Provide Data to Local Emergency Managers to Assist with Hurricane Preparedness Planning

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METHODOLOGY (How did we do it?)

- 1698 completed interviews
  - 273 of which were cell phones
- Used Computer Assisted Telephone Interviewing (CATI)
- Random Sample
- Margin of Error (for total sample) ± 2%
  - Higher for counties
- 55% completion rate for landlines
- Average Length: 14 minutes

THE SAMPLE

Has good distribution across population sectors

Compared to Census data for the region, the sample:

- Is more educated
- Includes more women
- Is older
- Has higher household income
- Has fewer African Americans
  - 22% compared to 30% in population

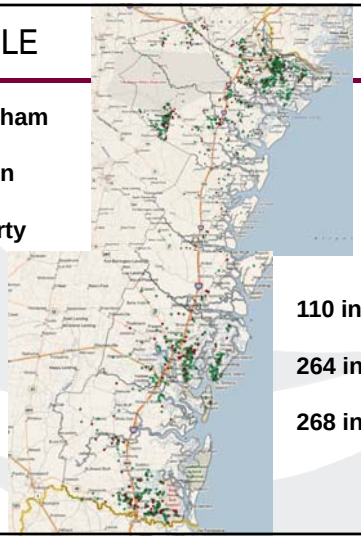
TYPICAL FOR SURVEY RESPONDENTS

THE SAMPLE

635 in Chatham

167 in Bryan

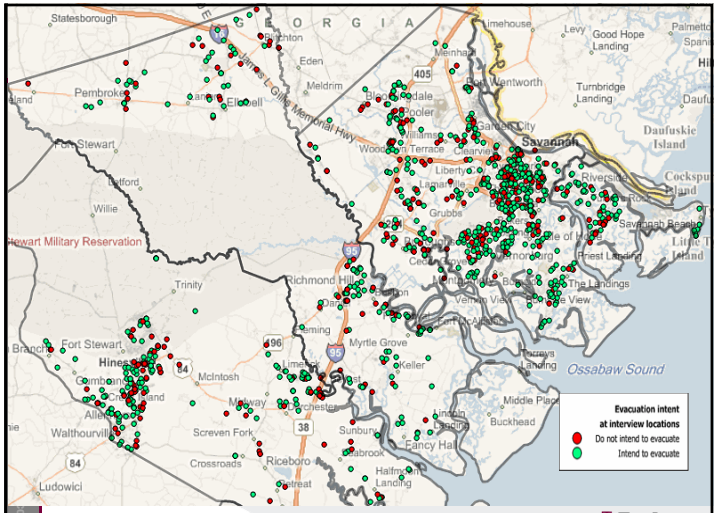
254 in Liberty

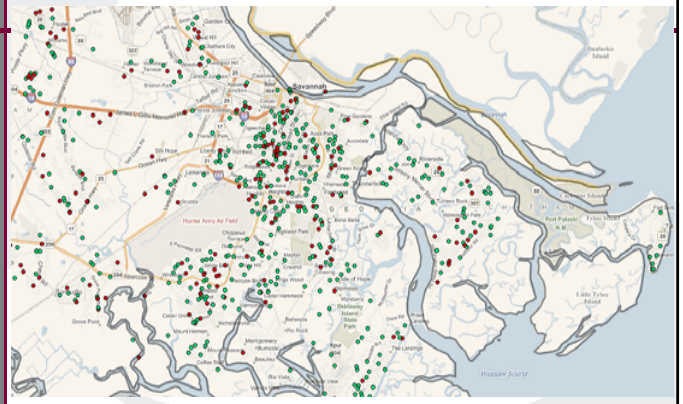


110 in McIntosh

264 in Glynn

268 in Camden





WHAT MAKES PEOPLE EVACUATE?

- Believe there is a definite risk
  - Hurricane is likely to impact where they live
- Don't feel their homes are safe
  - Susceptible to water or wind damage
- Feel need to protect others, such as children or elderly
- Have resources (car, cash for gas and food, etc.)
- Know where they are going and how they can get there
- Have been ordered to leave
- Have evacuated before

EXAMPLES OF RESULTS FROM SURVEY QUESTIONS

(What did it tell us?)

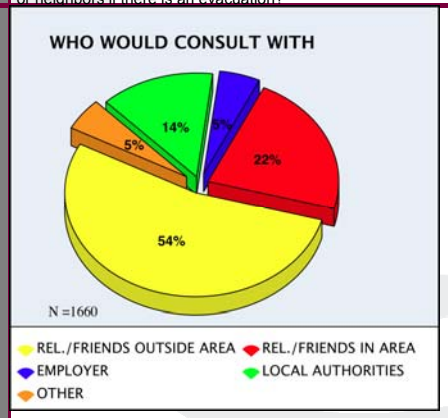
Q38. If a hurricane was threatening your area, where would you get MOST of your information?

WHERE GET HURRICANE INFORMATION:

- LOCAL TV 46%
- WEATHER CHANNEL 17%
- INTERNET 8%
- RADIO 13%
- NOAA RADIO 9%
- FRIENDS/FAMILY 2%
- OTHER 5%

- Greater use of Weather Channel in Bryan and Glynn
- 22% using internet in Bryan
- 15% in Glynn and Liberty would rely on friends/family
- African- Americans more likely to use radio
- 57% military households had received guidance from base

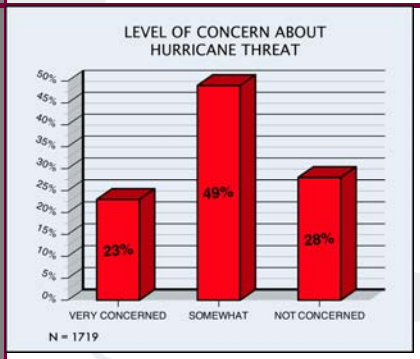
Q12. Would you consult with anyone outside of your household before making your decision about evacuation? 12A. Who would that be?
Q13. Will you have to assist others outside of your household, such as elderly parents, friends or neighbors if there is an evacuation?



Role of Social Networks

- 54% said they would consult with someone outside household, usually relatives or friends
- 41% of total sample said they would assist someone else
- 58% of these said that would affect how quickly they could leave

Q.1A. To what extent are you concerned about the threat of a hurricane?



MORE CONCERNED:

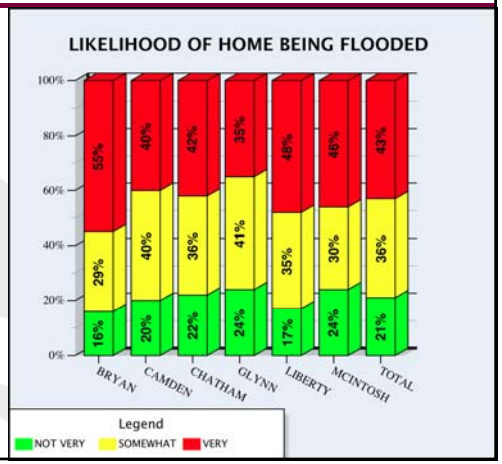
- Older residents
- Women
- African Americans
- Lower income households

No Significant Differences (NSD) by County

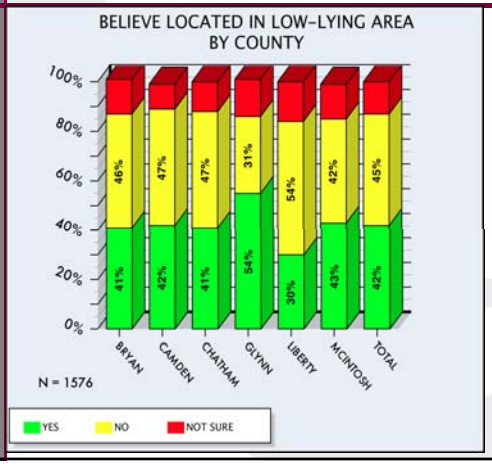
May be somewhat less concern in Bryan & Camden

Q1. How likely is it that your home would ever be seriously damaged or destroyed by the winds of a hurricane?
Q2. How likely do you think it is that your home would ever be flooded as a result of a hurricane or storm?

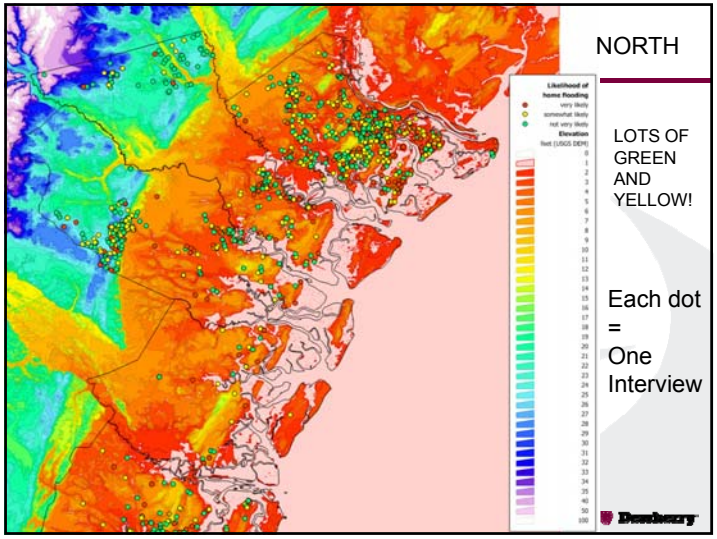
- 23% felt it was very likely and 47% somewhat likely that their home would be damaged by wind
- 43% felt it was very likely and 36% somewhat likely it would be flooded
- Significant county differences on flood question



Q3. Is your home located in an area where you would have to evacuate for storm surge in a hurricane, or are you not sure if it is?
Q4A. Would that term "low-lying" apply to where you live?



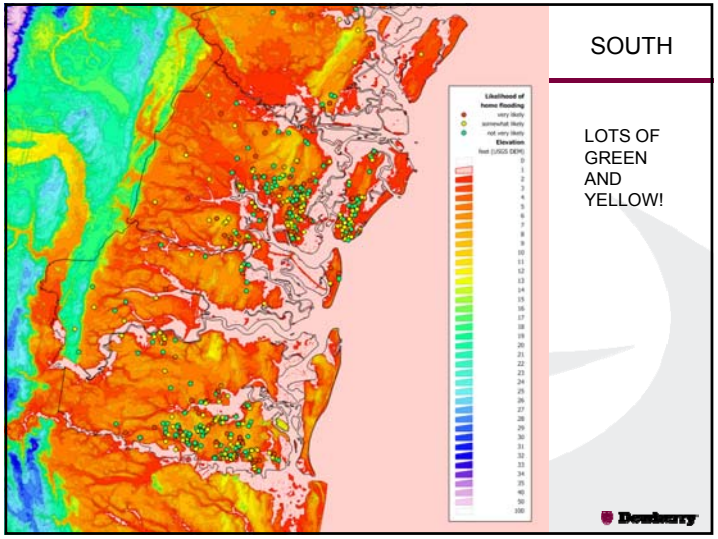
Except for Glynn more than ½ don't believe their home is in an low-lying area – or are not sure



NORTH

LOTS OF GREEN AND YELLOW!

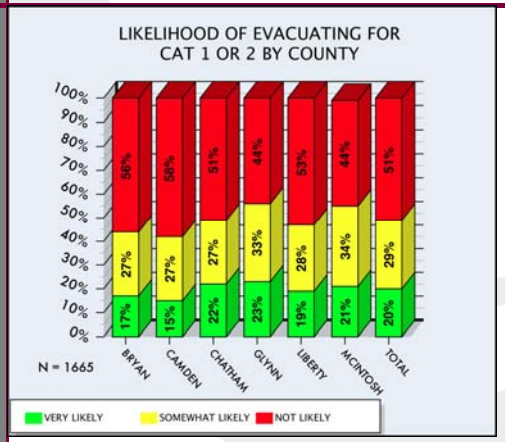
Each dot = One Interview



SOUTH

LOTS OF GREEN AND YELLOW!

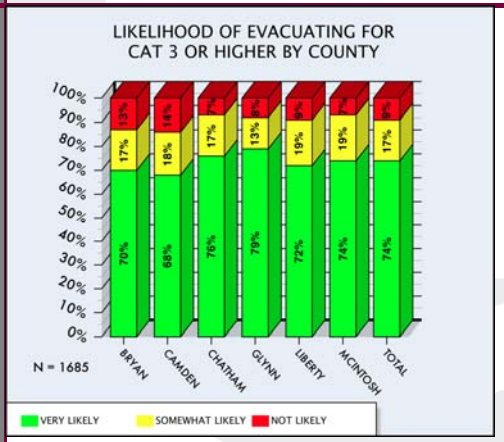
Q7. What about for a Category 1 or 2, a less serious hurricane, how likely is it that you would leave your home?



Over ½ in most counties would NOT leave

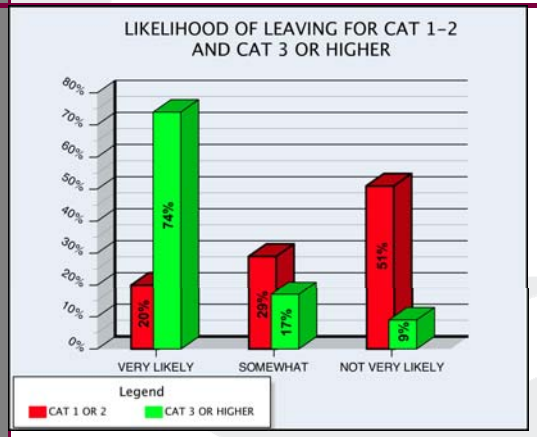
Significant County Differences

Q8. If a Category 3 or above hurricane, a major hurricane, was threatening your community, how likely is it that you would leave your home?



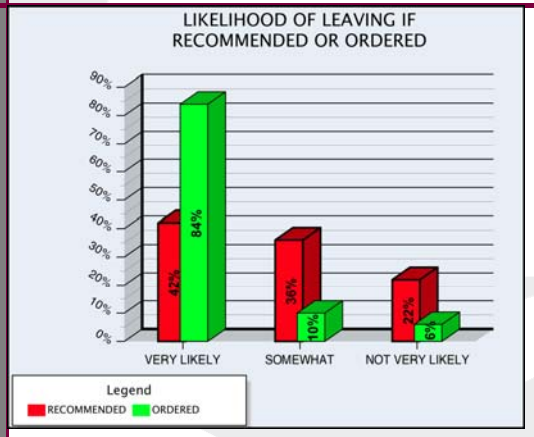
No significant county differences

DIFFERENCE ACCORDING TO STORM



Very Likely group more than 3x larger if ≥ Cat 3

DIFFERENCE IF ORDERED



Very likely 2x larger if ordered

No Significant County Differences

REASONS GIVEN FOR LEAVING

- NOT SAFE TO STAY
- Children or elders
- Health or medical needs
- Ordered by authorities
- Pets or animals

REASONS FOR STAYING:

- DON'T BELIEVE STORM IS GOING TO HIT HERE
- BELIEVE HOME IS SAFE
- Traffic concerns
- Stay to protect home
- Pets or animals
- No resources to leave
- No place to go
- Person in household is staying

MODEL OF EVACUATORS

	Experience	Perceived Risk	Socio-Economic	Minority Status	Family and Household	All Variables*
How Long Lived in Area	0.852					0.905
Evacuated Before	2.625					2.814
Talked About What Would Do If Hurricane Threatens	1.479					1.357
Risk of flooding from hurricane		2.018				1.932
Safety given as reason for evacuating		1.788				1.793
Years of Education			1.022			1.011
Household Income (by $10K)			1.004			1.006
Owns single-family home			0.679			0.626
African-American				1.688		1.651
Someone in Household Over 65					0.962	0.880
Someone 12 Years Old or Younger					1.393	1.322
Respondent is Female					1.620	1.852
Household Has Pets or Animals					0.893	1.21

Variable very significantly increases odds of NOT evacuating p<=.01

Variable somewhat significantly increases odds of not evacuating .05=>p>.01

Variable somewhat significantly increases odds of evacuating .05=>p>.01

Variable very significantly increases odds of evacuating p<=.01

No color = Not Significant

MODEL OF EVACUATORS: Interpretation of logistic regression

This is a logistic regression model that analyzes the combined effect of various items measured in the survey (variables) on intent to evacuate. Red and pink indicate that the item in the leftmost column, if true, makes a person less likely to evacuate. Dark and light green indicates the item if true will make the person more likely to evacuate*. Each column has an analysis of a different grouping of questions, with the last column on the right combining them all.

Description of columns:

Experience – the longer people have lived in the area, the less likely they are to evacuate. On the other hand, if they have evacuated before or had planning discussions about what to do for hurricane, they will be more likely to evacuate.

Perceived Risk – people who mention flood risk or personal safety in their answers are much more likely to evacuate.

Socio-economic effects – being more educated has no effect on intent to evacuate; higher income people are slightly more likely to evacuate whereas single family homeowners are less likely to evacuate than renters or apartment dwellers.

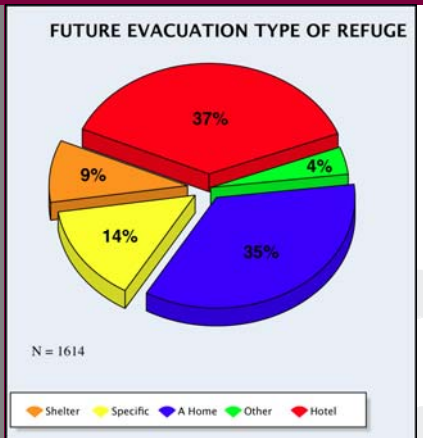
Minority status effects – African-Americans are more likely to evacuate.

Family and household effects – presence of an older person in the household or having pets or animals has no effect on evacuation intent. Households with a female respondents were children 12 or younger are more likely to evacuate.

All variables - this column shows the unique effect of all the items when they are combined. One way of looking at this column is that it shows things that are uniquely important and might be important to address specifically as part of a more general public education effort. The results are similar to the other columns with different groupings of variables although in two cases the effect of a variable disappears when it is put together with everything else. The effect of how long someone has lived in the area disappears since it is picked up in combination with other variables. The same is true for the household having a child 12 or younger.

** The numbers in the cells are "odds" in the sense that gamblers use the term; for example, in the second column, if someone has evacuated before the odds of them evacuating again are 2.6 times higher. Another technical point is that the numbers (and colors) show the unique contribution of each item. For example, living longer in an area also means being more likely to have evacuated before. The results shown factor out this overlapping effect to enable comparison of how much each item uniquely contributes to predicting likelihood of evacuating.*

Q16. If you HAD to evacuate outside of your county, where would you MOST likely go? Would you go to a public shelter in a neighboring county, a hotel, or someplace else?



PROJECTED PUBLIC SHELTER USE:

- Bryan 8%
- Camden 6%
- Chatham 9%
- Liberty 10%
- McIntosh 15%
- African Americans more likely to say they would go to a shelter

Of past evacuaters, those who said they stayed in shelters ranged from 1% in Bryan to 10% in McIntosh.

EVACUATION CONDITIONS

- 70% could leave within one day
- 94% would take pets
- Would take 1.5 cars per household
- 11% would take other vehicle: trailer, camper, boat, etc.
- Most would take either I-95 or I-16
- Most would travel between 50-100 miles
- Most would go to inland Georgia
- Would expect to return in about 3 days
- 7% would leave someone behind

Q16. If you HAD to evacuate for a hurricane, would you need public or government-provided transportation?

WOULD NEED PUBLIC TRANSPORTATION:

- **BRYAN 3%**
- **CAMDEN 5%**
- **CHATHAM 7%**
- **GLYNN 6%**
- **LIBERTY 6%**
- **MCINTOSH 6%**

More likely to need if:
- Lower income
- Mobile home
- African American
- Live alone

Only 17 persons had registered

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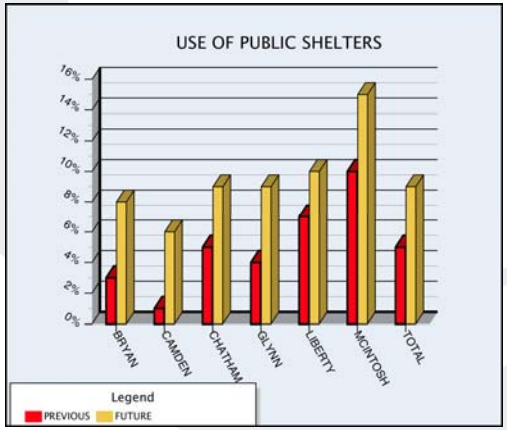
COMPARISON OF PREVIOUS SHELTER USE WITH PROJECTED FUTURE USE



Projected use is always higher than actual use

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Georgia Hurricane Evacuation Study Behavioral Analysis Results

HOW CAN WE USE IT?

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GOOD NEWS

- Most are concerned about hurricanes
- Nearly half have evacuated before
- There is considerable concern about wind damage
- Most said they had a hurricane plan
- Most would leave for a major storm
- Most would leave if ordered to do so
- Most could leave within a day after decision made
- Most are aware that there will be no shelters in their counties

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MAYBE NOT SO GOOD NEWS

- Less concern about flooding
- Great deal of confusion about whether they live in a low-lying area
- Nearly half don't think their home is in danger of flooding
- Most would not leave for Cat 1 or 2 storm
- It is very likely that most would not leave if an evacuation was only recommended

IMPLICATIONS

- Need for better risk communication, particularly in relation to surge and inland flooding
- Need mechanisms for informing citizens about the elevation and flood risk of their homes
- Women and children could be targeted for educational campaigns
- Need to address citizen concerns about evacuation traffic problems
- Potential for increased use of new technologies for communication
- Need more specific information about public transportation needs

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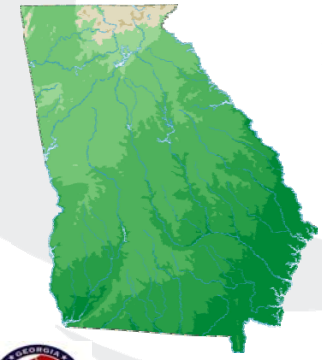

THE BEHAVIORAL ANALYSIS FOR THE GEORGIA HURRICANE EVACUATION STUDY WAS CONDUCTED BY:

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