

Keighla Burns & Kristen Erichsen  
Terra Mar Disaster Research  
Community Based Research  
Dr. Schorr  
3/13/13

Volusia County Department of Emergency Management:  
  
Disaster Research in the Terra Mar Community and  
Review of Emergency Websites

## ACKNOWLEDGEMENTS

We would like to thank the President of the Homeowner's Association of the Terra Mar community, and his wife, for their continued support and communication throughout this project. We would also like to thank Dr. Schorr for continually consulting with us and providing sound advice. Lastly, we would like to thank the Volusia County of Emergency Management for providing us with this opportunity.

# Table of Contents

Abstract.....	4
Introduction.....	5
Literature Review.....	7
Method.....	9
Findings.....	10
Conclusions and Recommendations.....	14
References.....	18
Appendix 1.....	19
Appendix 2.....	26
Appendix 3.....	36
Appendix 4.....	37
Appendix 5.....	40
Appendix 6.....	43

## ABSTRACT

Stetson University students Keighla Burns and Kristen Erichsen conducted research in the Terra Mar community on behalf of the Volusia County Department of Emergency Management (VCEM) to determine the effectiveness of their tornado response in December 2012, to determine residents' feelings of preparedness for a natural disaster, expectations of VCEM, and the most effective method of communication. We conducted a second research project to determine how VCEM can improve their website. Residents were most concerned with the current warning systems, and received the most support from volunteers. The most effective method of communication proved to be cellular phones and television. We found that the members of the Terra Mar Home Owners Associate stated a need for improved warning system within community and cellphone alerts would likely be an effective method of communication to warn of an oncoming disaster. Television was a common source of information for the residents. Overall, residents do not own disaster preparedness kits, although residents generally feel like they have access to preparedness information, many do not own a disaster preparedness kit. Volunteers are the most vital resource in disaster response, and comments from residents revealed that there was some damage that no agency was responsible for such as debris. Further research should be conducted to determine what would convince residents to gather this kit, and to determine what types of in-community warning systems can be put in place.

## **Introduction**

The Volusia County Department of Emergency Management (VCDEM) is necessary to ensure the safety of Volusia County residents when disaster strikes. VCDEM provides assistance to residents before, during, and after a catastrophe. It is necessary to ensure that VCDEM can effectively communicate with residents in order to prepare and protect them for disasters. However, after the recent tornado that struck the Terra Mar community, VCDEM was made aware that despite their efforts, residents still might be generally unprepared for disasters.

In order to determine how to better communicate with and prepare communities like Terra Mar, VCDEM has enlisted Stetson University students Kristen Erichsen and Keighla Burns to conduct research within the community. Specifically, VCDEM would like us to determine whether residents of the Terra Mar manufactured housing community in Edgewater, Florida were warned, prepared, and helped effectively before, during and after the recent tornado. Through survey response, Terra Mar residents will share their thoughts on the effectiveness of VCDEM outreach in relation to the recent disaster. Furthermore, VCDEM has asked us to investigate effective strategies in website design that would allow communicate with Volusia County residents more effectively.

In order to measure how effective the VCDEM services are, we must first understand the services themselves. In general, VCDEM seeks to prepare residents for disaster, to help them stay safe during the event, and to help rebuild afterwards. On the VCDEM website (<http://www.volusia.org/services/public-protection/emergency-management/>), there is information about how to properly prepare for a disaster. This information includes methods of safeguarding your home, shelter locations, and other preparedness strategies. During the course of a disaster, VCDEM activates the County Emergency Operations Center (CEOC). During this

time, the County Council Chair, County Manager and Emergency Management director convene with approximately 60 other staff to make the necessary decisions to protect the public, answer questions from and manage the 16 different cities in the county, and to prevent casualties. Before and during the disaster, VCDEM employs radio stations WNDB 1150 AM/ WHOG 95.7FM, and television channel WDSC TV-15 to broadcast information about the event. After the disaster has run its course, VCDEM continues its services by assessing damage and assisting in the process of rebuilding.

To find out how well residents of Edgewater were prepared, informed and aided before, during and after the tornado, we will administer surveys to all residents of Terra Mar. Confidentiality and anonymity will be ensured; surveys will be returned in sealed envelopes and researchers will be unaware of who completed the survey. The survey will be administered to voluntary residents via the Homeowner's Association of Terra Mar. Voluntary residents will self-report their feelings of preparedness, reactions and beliefs about disaster support, and the forms of communication and social media they use before, during, and after a disaster. Furthermore, the survey will assess usage of the VCDEM website. Despite the myriad information available on the VCDEM website, it is rarely visited, even in the event of disaster.

As a secondary project, we are conducting research to determine the elements of efficient disaster management websites. Identification of effective disaster management websites and conversations with those who run them will allow us to provide suggestions for revision of the VCDEM website. Through these two research projects we hope to increase the VCDEM's knowledge about the community's opinions and reactions to disasters, describe the disaster preparedness of the Terra Mar community, and help the VCDEM better communicate with communities like Terra Mar.

## **Literature Review**

Tornado struck the Terra Mar community without warning on December 10, 2012 (Johnson 2013). Residents rushed to safety from the tornado that television reports suggested would pass to the north of their community (Johnson 2013). Although officials reported no serious injuries to residents, “40 homes were damaged and 12 rendered uninhabitable in the Terra Mar subdivision...” (Johnson & Balona 2012). The lack of injuries in this incident is truly remarkable, considering that the National Severe Storm Center found “that occupants of such dwellings [manufactured housing], which are lighter and less well anchored, are 10 to 20 times more likely to be killed in tornadoes than those in conventional homes” (Wolfson 2012). It is imperative for the livelihood of all residents to provide them with accurate and timely information and warnings surrounding disasters.

Preparedness for disaster rests heavily on education. In fact, education is one of the primary focuses of the Policy Statement on Tornado Preparedness and Safety adopted by the American Meteorological Society (AMS) Council, which described the major aspects for reducing risks in the event of a tornado. The AMS reported that understanding dangers associated with tornadoes, and proper response to warnings of these dangers is essential components of reducing disaster risks (AMS Council 2000: 1061). Perhaps if a more effective warning system were in place, residents of Terra Mar would have been able to better protect their homes.

Of course, warnings alone cannot save a person’s life or home. Review of disaster literature has revealed several other necessary components of resident protection in the event of a disaster. First, residents need to have access to an emergency radio, and understand how to use it

(AMS Council 2000; Balluz et al. 2000: 76). Doswell and Brooks (2001: 617) found that despite their usefulness, these radios are used minimally by the public and public facilities. Second, to efficiently protect residents, disaster management agencies must take it upon themselves to educate communities on how to react to severe weather warnings as well as how to use information about shelters (Balluz et al. 2000: 76; AMS Council,2000: 1061-1062).

The underlying issue, which perhaps explains general lack of preparedness in Terra Mar, is ineffective communication. Emergency radios, like the NOAA Weather Radio, needs to be introduced to more homes (AMS Council 2000: 1063; Doswell & Brooks 2001: 617). These radios, which are battery powered, are necessary for accurate and up-to-date weather alerts. Furthermore, these radios could successfully warn those who otherwise may have no knowledge of oncoming disaster. Again, though, residents must know to take heed to these warnings (AMS Council 2000: 1061). Effectual communication and knowledge of warning severity are especially needed in high-risk communities, such as manufactured housing communities like Terra Mar (AMS Council 2000: 1065).

When communication is ineffective, a disaster can become a tragedy, especially in manufactured housing. AMS (2000: 1061) reported: “Statistics continue to show a disproportionate number of tornado-related fatalities (as high as 45%) in mobile homes.” For prevention of injury and overall risk reduction, AMS (2000: 1061-1062) points to “education planning, awareness, prompt application of basic safety rules, and correct choice of shelter,” as well as access to current information about the event. For further protection from the futility of mobile homes, Doswell and Brooks (2000: 617) recommend that construction of shelters in manufactured housing communities should be mandatory. Today, many communities lack these potentially life-saving resources.



Research on tornadoes and other major wind disasters show communities and government agencies steps to take to further ensure the safety of manufactured housing residents. These steps have not yet been taken, and the public is suffering as a result. As demonstrated in Dade County Florida, efforts to increase weather endurance of manufactured housing can save lives. After hurricane Andrew destroyed 97% of manufactured homes, and only 11% of conventional homes, Dade County revised construction standards for mobile homes, requiring that they withstand high-speed winds (Wolfson 2013). Now, these residents stand a better chance of survival and sustainability in the event of a tornado or wind disaster. The purpose of the current research is to determine how prepared residents of Terra Mar community felt during tornado, and how to improve communication between VCDEM and these residents. It is our hope that this research will contribute to an increase in sustainability of Terra Mar in the event of another disaster.

## **Method**

We are in the process of conducting a cross-sectional study on the residents of the Terra Mar community in Volusia County. This community was selected because of the extensive damage received during the tornado in December. Because of this recent disaster, we expect higher awareness and attention to disaster preparedness and response. To record resident opinions of preparedness for the disaster, communication before, during and after the disaster, as well as expectations of VCDEM, a questionnaire will be distributed to all residents. The Home Owner's Association (HOA) will distribute and collect the survey at their last meeting and last social event of the spring, in order to increase accessibility to all residents. It is our hope that at least one survey per household will be completed.

The surveys are voluntary and guarantee anonymity. Respondents are asked to refrain from writing any identifying information. Anonymity is further insured through distribution and collection of the surveys. Participants will receive the survey from the HOA in an envelope. Respondents then fill out the survey, seal it in the envelope and return it to the HOA. Since the surveys are distributed and collected through the HOA, all members should be able to respond. Only those surveys that are sealed, and are without identifying information will be used for data. The survey responses will be coded and then analyzed using statistical analysis software (SPSS).

While waiting for completed surveys to be returned, we will focus on identifying effective disaster management website techniques. To do this we will review successful disaster management websites through a revised version of the University of Arizona's website coding form. Websites will be selected by putting the search term "Disaster Management website" into Google. Specific websites such as Volusia County's Department of Emergency Management website and Monroe County Florida Disaster Management are chosen for their use in this research. Therefore the sample is a non-probable purposeful sample, and not generalizable, for this research a non-probable sample will be effect for displaying productive website design.

## **Findings**

We surveyed the Terra Mar Home Owner's Association, which has a population of 52 people, and we produced a sample of 39 people; we had a 75% response rate. The sample was 33% male and 66% female, with 82% white and 17% preferring not to answer their race. The respondents reported that 97% spoke English in their household, and 3% preferred not to answer. There were 41% of respondents whose highest level of education was a high school diploma or GED, 32% received some college education, 12% received their Associates degree, 9% received their Bachelor's degree, 3% received their Masters or Ph. D, and 3% received only some high

school education. The major of respondents, 38%, preferred not to answer their household income, 24% responded more than \$50,001 a year, 12% responded \$40,001 - \$50,000 a year, and the rest of the respondents were almost evenly spread from \$10,001 - \$40,000 a year.

All respondents either did not use or never use ham radios or short wave radios for information during and after the disaster. During the disaster, 89% of respondents stated that they used televisions for information sometimes, often or always. During the disaster, 87% of respondents stated that they used cell phones for information sometimes, often or always. After the disaster 91% of the respondents stated that they used televisions and cellphones for information sometimes, often or always. During the disaster, 44% of respondents stated they did not use landline phones, whereas 43% stated they sometimes, often or always used landline phones for information. After the disaster, 71% stated that they used landline phones for information sometimes, often or always. There were 39% of respondents that stated televisions were the best source of information, 21% stated cell phones were the best source of information, 14% stated neighbors were the best source of information, 11% stated that local public safety officials were the best source of information, and 16% stated radio, internet, family members, or other sources were the best for information. Almost all respondents, 94%, stated that cellphones would be useful for communication in the future.

In the event of a future major disaster 61% of respondents stated they would leave their home, 15% stated they would not leave their home, and 21% stated they did not know. When respondents were asked about where they would go in the event of a future disaster 40% stated they would go to a family member's house, 36% stated they would go to an emergency shelter, 12% stated they would go to a hotel or motel, and 12% stated they would go to a friend's house or other. In the event of a disaster, 61% of respondents stated that a community warning system

was the greatest obstacle for their preparedness. Among the sample 62% of respondents stated that they did not have a disaster preparedness kit but would consider having one, and 21% of respondents stated they had a disaster preparedness kit and kept it up to date. When asked if respondents owned an emergency alert radio 44% stated they had one and used it frequently, 21% stated they had one but they rarely used it, 21% stated they did not own one but would like to, and 5% stated they did not own one and did not expect to.

Respondents were asked about their expected and received support, and 46% of respondents stated they received volunteer support whereas 37% expected volunteer support. Among the sample 40% of respondents received support from the police, whereas 43% expected police support. When asked if respondents expected FEMA assistance, 23% stated they did expect assistance however only 2.9% received FEMA assistance. However, the VCDEM stated that the tornado disaster was not enough damage for FEMA to provide assistance. Among the sample 26% expected insurance company support whereas 30% of respondents received insurance company support. Among the sample 6% stated they received support from the local government whereas 23% stated they expected local government support. Among the sample 17% of respondents stated they received support from the Volusia County Department of Emergency Management whereas 37% expected support from the Volusia County Department of Emergency Management.

Respondents were asked how familiar they were with the Volusia County Department of Emergency Management with 36% stated they were not familiar at all, 31% stated they were not familiar, 22% stated they were somewhat familiar, 6% stated they were familiar and 6% stated they were very familiar. When asked how helpful respondents believed the Volusia County Department of Emergency Management was 65% stated they believe the department was very

helpful, 19% stated they were helpful, 7% stated they were somewhat helpful, 7% stated they were not very helpful, and 3% stated they were not helpful at all. Among respondents 47% stated that Volusia County Department of Emergency Management could improve on outreach and communications with the public. Among the sample 33% stated that Volusia County Department of Emergency Management could improve on conducting disaster drills and exercises. Of the sample, 43% stated that Volusia County Department of Emergency Management could improve on guidance of the community after the disaster and 47% stated that Volusia County Department of Emergency Management could improve on providing disaster preparedness information to the community.

The respondents were asked if they had ever visited the Volusia County Department of Emergency Management website with 51% stated that they had not visited the website, 13% stated they had, and 15% stated they did not know the Volusia County Department of Emergency Management had a website. Among the respondents 59% stated they did not use social media for information, and of the sample 16% stated they did use Facebook.

The content analysis of disaster management sites resulted in several ratings, including: purpose and suitability to audience, content, structure, educational value, and technical quality. Volusia County's emergency management website scores were as follows:

- Purpose and Suitability: 3.75
- Content: 4.22
- Structure: 3.83
- Educational Value: 4.17
- Technical Quality: 4.27

The disaster management website that was rated the highest, in Monroe County, Florida, exceed these scores in several areas. The scores were as follows:

- Purpose and Suitability: 3.75
- Content: 4.89
- Structure: 4.83
- Educational Value: 4.33
- Technical Quality: 5

### **Conclusions and Recommendations**

The results revealed that residents use cellphones and television are by far the most effective sources of communication before, during, and after a disaster. Ham radios, on the other hand, are the least effective method of communication. To improve communication with residents, we recommend that VCEM implement a cellphone alert system. Volusia County residents could sign up to receive alerts on their cellphones. When a weather disaster is imminent, residents would receive an automatic warning call or text message. Considering that cellphones are one of the best methods of communication before, during, and after disaster, cellphone alerts could provide residents with warning information that could save lives.

A large percentage of residents would leave their home in the event of a disaster, but more research should be conducted to determine why the remaining residents would not leave. A great deal of residents said that in the event of a disaster they would evacuate to the local disaster shelter. Information regarding disaster shelter locations should be available in the Manager's Office in Terra Mar, as well as in the Terra Mar Clubhouse. The community would benefit greatly from having all disaster preparedness and response information readily available in the clubhouse. Although residents generally felt that they had access to preparedness information,

providing the information in the clubhouse would make the knowledge more accessible to all residents of the community, not just the Homeowner's Association.

Perhaps a more pressing issue than providing shelter and other preparedness information in the Terra Mar Clubhouse, residents conceded that a lack of warning system within the community was the greatest preparedness obstacle. We recommend the implementation of a Neighborhood Activation System to resolve this issue. In the event of a disaster, VCEM could notify volunteers in the community, who then notify other residents in the community via telephone. This would allow residents to quickly communicate with each other. Considering that many residents are reliant upon neighbors for information during disaster, this sort of activation system would be effective.

Residents expect to be warned before disaster strikes, but they also expect a certain level of support after the catastrophe. We found that residents generally expect support from the police, volunteers, and their insurance companies. Still, residents expected much more support than was needed. This is likely due to the fact that residents expected more damage than they actually received. However, to prevent community disappointment when FEMA and local government support are not received, information should be made accessible that outlines the circumstances required to receive FEMA/local government support.

Overall, residents suggested that VCEM needs to improve communication with residents. Implementation of cellphone alerts and a community activation system would alleviate these concerns to a certain extent. To further spread awareness about VCEM and facilitate communication between Terra Mar and VCEM, we recommend bi-annual information sessions that demonstrate the importance of ham radios (which residents do not own), and demonstrate how to create and maintain a disaster preparedness kit. The majority of respondents stated that

they did not own a preparedness kit, but would consider having one. We recommend that VCEM hosts these information sessions to help residents actually piece together their preparedness kits.

Further research should be conducted to determine what would convince residents to purchase disaster preparedness kits and ham radios. While conducting research, a resident commented that there were several post-disaster hazards (e.g. piled debris) that no organization was responsible for. As a result, piles of debris remained on residents' front lawns for weeks without being cleared. Further research needs to be conducted to assess these health risks and how to alleviate them. We also recommend that research be conducted to determine how to increase awareness of VCEM and their website. Based upon the content analysis of disaster management websites, we recommend that VCEM provide the purpose statement closer to the top of the page. We further recommend that instead of having a plethora of information on the home page, provide links on the sidebar. Simplistic home page layouts prevent visitors from being overwhelmed with information, and prevent the page from appearing cluttered. More descriptive information should be provided with the informational links to improve content and educational value. The VCEM website has a nice unifying theme, and utilizes graphic principles well. It is accessible to all audiences and is easily searchable.

It is our sincere hope that the recommendations provided will allow VCEM to improve communication with residents of Volusia County, and will assist VCEM in preparing residents for disaster. Furthermore, we hope that these recommendations will provide VCEM with useful information about resident expectations and awareness, so that they may adjust their programs to best fit the needs and expectations of residents. VCEM is a vital resource when disaster strikes, so it is imperative that the Volusia county members understand how to contact the VCEM. We



believe this accessibility will be more of a reality if VCEM adheres to the aforementioned recommendations.

## References

- AMS Council. 2000. "Policy Statement: Tornado Preparedness And Safety." *American Meteorological Society* Vol. 81(5):1061-1065.
- Balluz, Lina, Laura Schieve, Talmage Holmes, Stephanie Kiezak, Josephine Malilay. 2000. "Predictors For People's Response To A Tornado Warning: Arkansas, 1 March 1997." *Disasters* Vol. 24(1):71-77.
- Doswell, Charles A., and Harold E. Brooks. 2002. "Lessons Learned From The Damage Produced By The Tornadoes Of 3 May 1999." *American Meteorological Society* Vol. 17:611-618.
- Johnson, Mark I. 2013. "Tornado Watch Stirs Victims' Nerves." *The News-Journal West Volusia Edition*. 1C, 3C.
- Johnson, Mark I., and Patrieio G. Balona. 2012. "Storm Damages 40 Homes Near Edgewater." *The Daytona Beach News-Journal*. Retrieved February 27<sup>th</sup>, 2013 (<http://www.news-journalonline.com/article/20121210/NEWS/312109996>)
- NOAA. 2003. "Mobile Homes And Vehicles Deadly In Tornadoes." *NOAA Magazine*. Retrieved March 8<sup>th</sup>, 2013 (<http://www.noaaneews.noaa.gov/stories/s1105.htm>).
- Wolfson, Andy. 2012. "Tornado Deaths Raise Questions About Mobile Home Safety." *The (Louisville, Ky.) Courier-Journal*. Retrieved March 8<sup>th</sup>, 2013 (<http://usatoday30.usatoday.com/news/nation/story/2012-03-11/tornado-mobile-homes/53477486/1>)

## Appendix 1

Concept	Variable	Valid	Missing	Mean	Median	Mode	Standard Deviation
Demographic Information							
	edulevel	34	5	2.9	3	2	1.34
	gender	33	6	0.67	1	1	0.48
	hisorlat	31	8	0.06	0	0	0.36
	ID	39	0	20	20	1	11.4
	income	34	5	2.63	2	0	2.54
	language	35	4	1.09	1	1	0.51
	race	32	7	1	1	1	0
	TMyrslived	34	5	10.62	11	5	7.72
Communication							
	AfterCP	29	10	3.76	4	5	1.5
	AfterE	20	19	2.85	3.5	0	1.98
	AfterHR	18	21	0.33	0	0	0.49
	AfterLP	21	18	3	3	3	1.52
	AfterO	17	22	0.06	0	0	0.24
	AfterR	19	20	1.89	2	0	1.76
	AfterSM	19	20	2	2	0	1.83
	AfterTM	20	19	1.3	1	0	1.56

	AfterTV	23	16	3.87	4	4	1.18
	AfterW	19	20	2.26	3	0	1.82
	bestinfo	28	11	3.75	4	2	2
	DuringE	22	17	2.55	3	0	1.95
	DuringHR	22	17	0.18	0	0	0.39
	DuringLP	23	16	1.96	1	0	2.05
	DuringO	26	13	0.12	0	0	0.33
	DuringR	25	14	2.48	3	3	1.76
	DuringSM	21	18	1.48	0	0	1.86
	DuringTM	23	16	1.26	0	0	1.74
	DuringTV	29	10	3.76	4	4	1.41
	DuringW	20	19	2.2	3	0	1.7
	DurningCP	32	7	3.84	4	5	1.57
	FutComm	34	5	0.06	0	0	0.24
	FutCommCP	34	5	0.94	1	1	0.24
	FutCommE	34	5	0.41	0	0	0.5
	FutCommHR	34	5	0.06	0	0	0.24
	FutCommLP	34	5	0.41	0	0	0.5
	FutCommO1	34	5	0.03	0	0	0.17
	FutCommO2	34	5	0	0	0	0
	FutCommO3	34	5	0	0	0	0

	FutCommSM	34	5	0.21	0	0	0.41
	FutCommTM	34	5	0.26	0	0	0.45
	FutCommW	34	5	0.21	0	0	0.41
	radio	35	4	1.86	2	1	0.97
	leaveh	33	6	1.12	1	1	0.7
	gowhere	25	14	2.64	3	2	0.95
	notleave	0	39				
Greatest Obstacle							
	greatestobCWS	33	6	0.61	1	1	0.5
	greatestobGS	33	6	0.09	0	0	0.29
	greatestobHWS	33	6	0.15	0	0	0.36
	greatestobM	33	6	0.27	0	0	0.45
	greatestobO	33	6	0.06	0	0	0.24
	greatestobO1	33	6	0.09	0	0	0.29
	greatestobO2	33	6	0	0	0	0
	greatestobO3	33	6	0	0	0	0
	greatestobPK	33	6	0.3	0	0	0.47
	greatestobT	33	6	0.09	0	0	0.29
Preparedness Kit							
	inprekitEB	15	24	0.8	1	1	0.41
	inprekitF	15	24	0.6	1	1	0.51

	inprepkitFAK	15	24	0.67	1	1	0.49
	inprepkitFL	15	24	0.87	1	1	0.35
	inprepkitO1	15	24	0.27	0	0	0.46
	inprepkitO2	15	24	0.13	0	0	0.35
	inprepkitO3	15	24	0.13	0	0	0.35
	inprepkitR	17	22	0.65	1	1	0.49
	inprepkitW	15	24	0.47	0	0	0.52
	prepkit	34	5	2.59	3	3	0.92
	PrepKitCom	15	24	2.93	3	4	1.28
Social Media							
	likesmF	28	11	0.32	0	0	0.48
	likesmM	28	11	0	0	0	0
	likesmNONE	28	11	0.5	0.5	0	0.51
	likesmO	28	11	0.25	0	0	0.44
	likesmT	28	11	0	0	0	0
	usesmF	31	8	0.16	0	0	0.37
	usesmM	31	8	0	0	0	0
	usesmNONE	32	7	0.59	1	1	0.5
	usesmO	31	8	0.23	0	0	0.43
	usesmT	31	8	0	0	0	0
Support Expected							

	supportexp	30	9	2.2	2	0	2.07
	supportexpF	30	9	0.43	0	0	0.5
	supportexpFEMA	30	9	0.23	0	0	0.43
	supportexpIC	30	9	0.3	0	0	0.47
	supportexpLG	30	9	0.23	0	0	0.43
	supportexpO1	30	9	0.03	0	0	0.18
	supportexpO2	30	9	0	0	0	0
	supportexpO3	30	9	0	0	0	0
	supportexpP	30	9	0.43	0	0	0.5
	supportexpV	30	9	0.37	0	0	0.49
	supportexpVCDEM	30	9	0.2	0	0	0.41
Support Received							
	supportrec	35	4	0.26	0	0	0.44
	supportrecF	35	4	0.37	0	0	0.49
	supportrecFEMA	35	4	0.03	0	0	0.17
	supportrecIC	35	4	0.26	0	0	0.44
	supportrecLG	35	4	0.06	0	0	0.24
	supportrecO1	35	4	2	0	0	0.41
	supportrecO2	35	4	0.03	0	0	0.17
	supportrecO3	35	4	0	0	0	0
	supportrecP	35	4	0.4	0	0	0.5

	supportrecV	35	4	0.46	0	0	0.51
	supportrecVCDEM	35	4	0.17	0	0	0.38
Information							
	use4infoCP	35	4	0.43	0	0	0.5
	use4infoFM	35	4	0.17	0	0	0.38
	use4infoI	35	4	0.06	0	0	0.24
	use4infoN	35	4	0.57	1	1	0.5
	use4infoO	34	5	0.15	0	0	0.36
	use4infoPS	35	4	0.4	0	0	0.5
	use4infoR	35	4	0.26	0	0	0.44
	use4infoTV	35	4	0.66	1	1	0.48
VCDEM							
	VCDEMfam	36	3	3.86	4	5	1.15
	VCDEMhelp	31	8	1.65	1	1	1.08
VCDEM Improve							
	VCDEMimp	30	9	1.7	1.5	1	1.18
	VCDEMimpC	30	9	0.47	0	0	0.51
	VCDEMimpDE	30	9	0.33	0	0	0.48
	VCDEMimpDPI	30	9	0.47	0	0	0.51
	VCDEMimpG	30	9	0.43	0	0	0.5
	VCDEMimpO1	30	9	0.07	0	0	0.25



	VCDEMimpO2	30	9	0	0	0	0
	VCDEMimpO3	30	9	0	0	0	0
VCDEM Communicate							
	VCDEMinfo	33	6	0.33	0	0	0.6
	VCDEMinfoE	34	5	0	0	0	0
	VCDEMinfoO	34	5	0.12	0	0	0.33
	VCDEMinfoPC	34	5	0	0	0	0
	VCDEMinfoPComm	34	5	0.12	0	0	0.33
	VCDEMinfoR	33	6	0.03	0	0	0.17
	VCDEMinfoTV	34	5	0.06	0	0	0.24
	VCDEMinfoW	34	5	0	0	0	0
	VCDEMwebsite	31	8	0.55	0	0	0.81
	website	11	28	2.73	1	0	3.72

## Appendix 2

		Percentages
AfterCP		
	Did not use	10.3
	Never	0
	Rarely	0
	Sometimes	20.7
	Often	31
	Always	37.9
AfterE		
	Did not use	25
	Never	5
	Rarely	5
	Sometimes	15
	Often	25
	Always	25
AfterHR		
	Did not use	66.7
	Never	33
	Rarely	0
	Sometimes	0
	Often	0
	Always	0
AfterLP		
	Did not use	9.5
	Never	9.5
	Rarely	9.5
	Sometimes	28.6
	Often	28.6
	Always	14.3
AfterR		
	Did not use	36.8
	Never	5.3
	Rarely	15.8
	Sometimes	26.3
	Often	5.3
	Always	10.5
AfterSM		
	Did not use	36.8
	Never	5.3
	Rarely	15.8

	Sometimes	10.5
	Often	26.3
	Always	5.3
AfterTM		
	Did not use	40
	Never	30
	Rarely	10
	Sometimes	5
	Often	10
	Always	5
AfterTV		
	Did not use	4.3
	Never	0
	Rarely	4.3
	Sometimes	17.4
	Often	43.5
	Always	30.4
AfterW		
	Did not use	31.6
	Never	5.3
	Rarely	5.3
	Sometimes	31.6
	Often	15.8
	Always	10.5
bestinfo		
	Radio	3.6
	TV	39.3
	Internet	3.6
	Cell Phones	21.4
	Neighbors	14.3
	Family Members	3.6
	Local Public Safety Officials	10.7
	Other	3.6
DuringE		
	Did not use	31.8
	Never	9.1
	Rarely	13.6
	Sometimes	31.8
	Often	13.6
	Always	
DuringHR		

	Did not use	81.8
	Never	18.2
	Rarely	0
	Sometimes	0
	Often	0
	Always	0
DuringLP		
	Did not use	43.5
	Never	8.7
	Rarely	4.3
	Sometimes	13
	Often	13
	Always	17.4
DuringR		
	Did not use	24
	Never	0
	Rarely	24
	Sometimes	28
	Often	4
	Always	20
DuringSM		
	Did not use	57.1
	Never	0
	Rarely	9.5
	Sometimes	9.5
	Often	19
	Always	4.8
DuringTM		
	Did not use	52.2
	Never	17.4
	Rarely	8.7
	Sometimes	4.3
	Often	8.7
	Always	8.7
DuringTV		
	Did not use	6.9
	Never	3.4
	Rarely	0
	Sometimes	20.7
	Often	34.5
	Always	34.5

DuringW		
	Did not use	30
	Never	5
	Rarely	10
	Sometimes	30
	Often	20
	Always	5
DurningCP		
	Did not use	9.4
	Never	3.1
	Rarely	0
	Sometimes	15.6
	Often	25
	Always	46.9
edulevel		
	Some High School	2.9
	GED/High School Diploma	41.2
	Some College	32.4
	Associates	11.8
	Bachelors	8.8
	Master's/Ph. D	2.9
FutComm		
	No	94.1
	Yes	5.9
FutCommCP		
	No	5.9
	Yes	94.1
FutCommE		
	No	58.8
	Yes	41.2
FutCommHR		
	No	94.1
	Yes	5.9
FutCommLP		
	No	58.8
	Yes	41.2
FutCommSM		
	No	79.4
	Yes	20.6
FutCommTM		
	No	73.5

	Yes	26.5
FutCommW		
	No	79.4
	Yes	20.6
gender		
	Male	33.3
	Female	66.7
gowhere		
	Friend's House	8
	Family Members	40
	Emergency Shelter	36
	Hotel/Motel	12
	Other	4
greatestobCWS		
	No	39.4
	Yes	60.6
greatestobGS		
	No	90.9
	Yes	9.1
greatestobHWS		
	No	84.8
	Yes	15.2
greatestobM		
	No	72.7
	Yes	27.3
greatestobO		
	No	93.9
	Yes	6.1
greatestobPK		
	No	69.7
	Yes	30.3
greatestobT		
	No	90.9
	Yes	9.1
hisorlat		
	No	96.8
	Yes	0
	I prefer not to answer	3.2
ID		
income		
	Prefer Not to Answer	38.2

	< \$10,000	5.9
	\$10,001 - \$20,000	8.8
	\$20,001 - \$30,000	5.9
	\$30,001 - \$40,000	5.9
	\$40,001 - \$50,000	11.8
	> \$50,001	23.5
inprepkiteB		
	No	20
	Yes	80
inprepkiteF		
	No	40
	Yes	60
inprepkiteFAK		
	No	33.3
	Yes	66.7
inprepkiteFL		
	No	13.3
	Yes	86.7
inprepkiteR		
	No	35.3
	Yes	64.7
inprepkiteW		
	No	53.3
	Yes	46.7
language		
	English	97.1
	Spanish	0
	French	0
	Other	2.9
leaveh		
	No	15.2
	Yes	60.6
	I Don't Know	21.2
likesmF		
	No	67.9
	Yes	32.1
likesmM		
	No	100
	Yes	0
likesmNONE		
	No	50

	Yes	50
likesmO		
	No	75
	Yes	25
likesmT		
	No	100
	Yes	0
prepkIt		
	No	8.8
	No	61.8
	Yes	8.8
	Yes	20.6
PrepKitCom		
race		
	Caucasian/White	82.1
	African American/Black	0
	Asian	0
	Prefer Not to Answer	17.9
radio		
	No	5.1
	No	20.5
	Yes	20.5
	Yes	43.6
supportexp		
		m =
		sd =
supportexpF		
	No	
	Yes	
supportexpFEMA		
	No	76.7
	Yes	23.3
supportexpIC		
	No	70
	Yes	30
supportexpLG		
	No	76.7
	Yes	23.2
supportexpP		



	No	56.7
	Yes	43.3
supportexpV		
	No	63.3
	Yes	36.7
supportexpVCDEM		
	No	80
	Yes	20
supportrec		
	No	74.3
	Yes	25.7
supportrecF		
	No	62.9
	Yes	37.1
supportrecFEMA		
	No	97.1
	Yes	2.9
supportrecIC		
	No	74.3
	Yes	25.7
supportrecLG		
	No	94.3
	Yes	5.7
supportrecP		
	No	60
	Yes	40
supportrecV		
	No	54.3
	Yes	45.7
supportrecVCDEM		
	No	82.9
	Yes	17.1
TMyrslived		
		m =
		sd =
use4infoCP		
	No	57.1
	Yes	42.9
use4infoFM		
	No	82.9
	Yes	17.1

use4infoI		
	No	94.3
	Yes	5.7
use4infoN		
	No	42.9
	Yes	57.1
use4infoO		
	No	85.3
	Yes	14.7
use4infoPS		
	No	60
	Yes	40
use4infoR		
	No	74.3
	Yes	25.7
use4infoTV		
	No	74.3
	Yes	25.7
usesmF		
	No	83.9
	Yes	16.1
usesmM		
	No	100
	Yes	0
usesmNONE		
	No	40.6
	Yes	59.4
usesmT		
	No	100
	Yes	0
VCDEMfam		
	Very Familiar	5.6
	Familiar	5.6
	Somewhat Familiar	22.2
	Not Very Familiar	30.6
	Not Familiar at All	36.1
VCDEMhelp		
	Very Helpful	64.5
	Helpful	19.4
	Somewhat Helpful	6.5
	Not Very Helpful	6.5

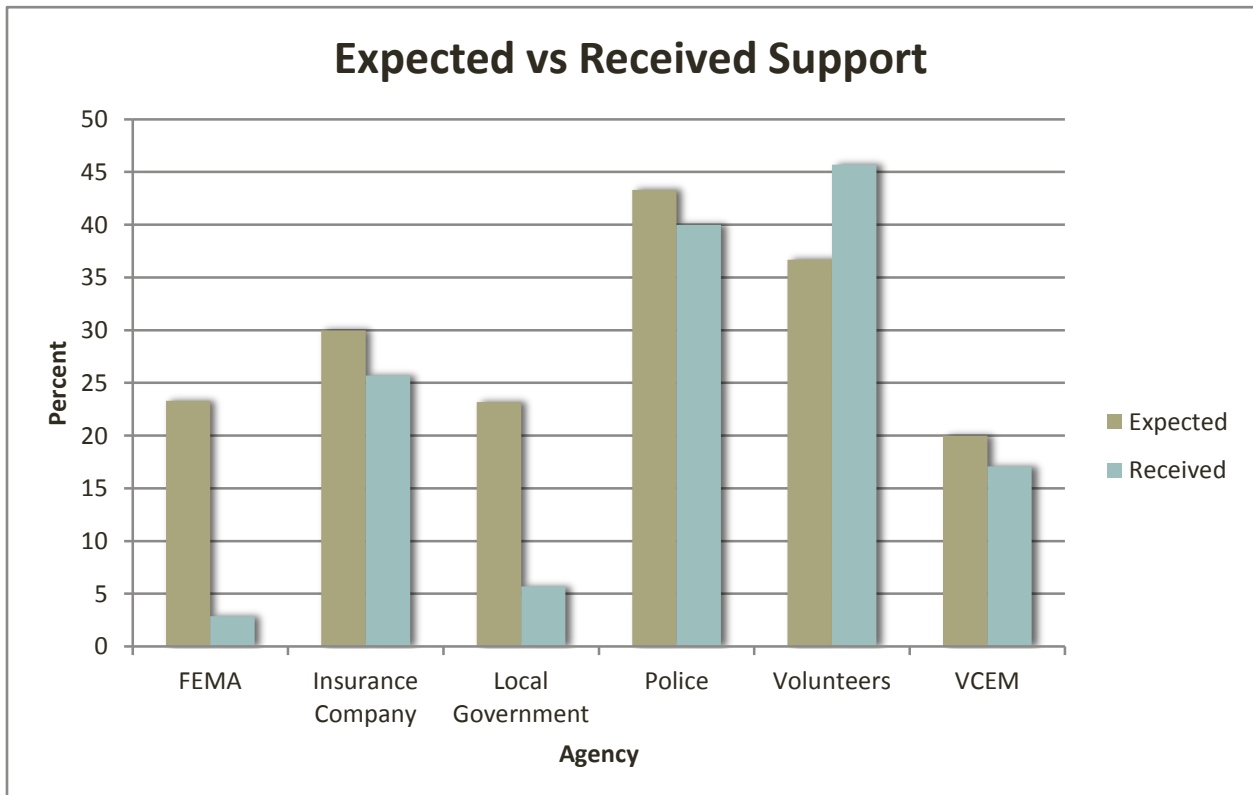
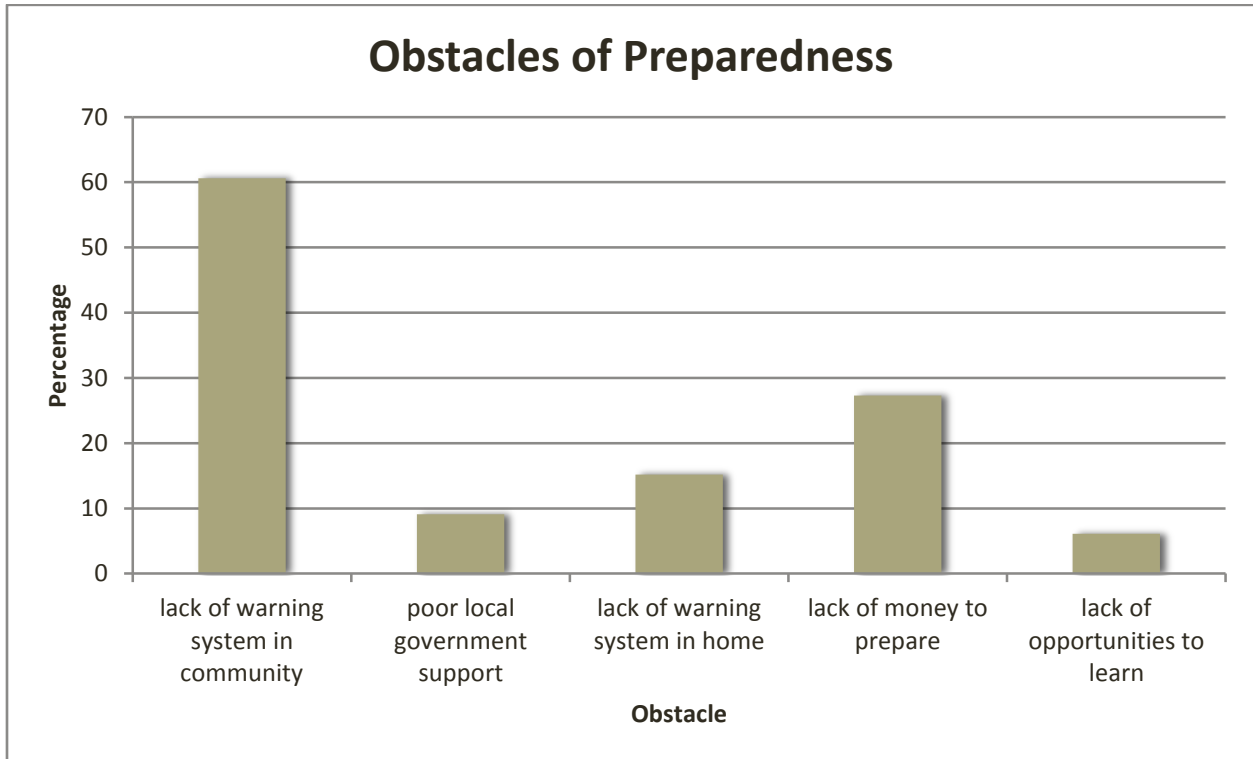
	Not Helpful	3.2
VCDEMimp		
		m =
		sd =
VCDEMimpC		
	No	53.3
	Yes	46.7
VCDEMimpDE		
	No	66.7
	Yes	33.3
VCDEMimpDPI		
	No	53.3
	Yes	46.7
VCDEMimpG		
	No	56.7
	Yes	43.3
VCDEMinfo		
	No	75.7
	Yes	24.3
VCDEMinfoE		
	No	100
	Yes	0
VCDEMinfoPC		
	No	100
	Yes	0
VCDEMinfoPComm		
	No	88.2
	Yes	11.8
VCDEMinfoR		
	No	97
	Yes	3
VCDEMinfoTV		
	No	94.1
	Yes	5.9
VCDEMinfoW		
	No	100
	Yes	0
VCDEMwebsite		
	No	51.3
	Yes	12.8
	I did not know they had one	15.4

### Appendix 3

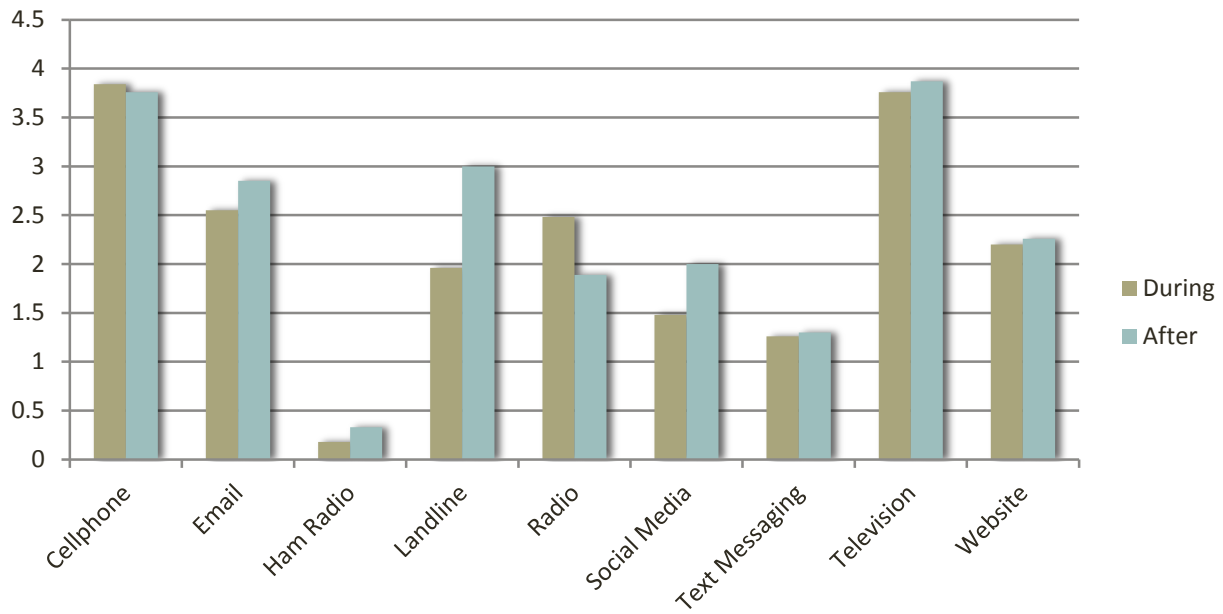
#### Demographics

- Sex
  - Male 33.3%
  - Female 66.7%
- Education Level
  - Some High School 2.9%
  - GED/High School Diploma 41.2%
  - Some College 32.4%
  - Associates 11.8%
  - Bachelors 8.8%
  - Master's/Ph. D 2.9%
- Hispanic or Latino(a)
  - No 96.8%
  - Yes 0%
  - I prefer not to answer 3.2%
- Income
  - Prefer Not to Answer 38.2%
  - Less than \$10,000 5.9%
  - \$10,001 - \$20,000 8.8%
  - \$20,001 - \$30,000 5.9%
  - \$30,001 - \$40,000 5.9%
  - \$40,001 - \$50,000 11.8%
  - More than \$50,001 23.5%
- Language
  - English 97.1%
  - Other 2.9%
- Race
  - Caucasian/White 82.1%
  - Prefer Not to Answer 17.9%

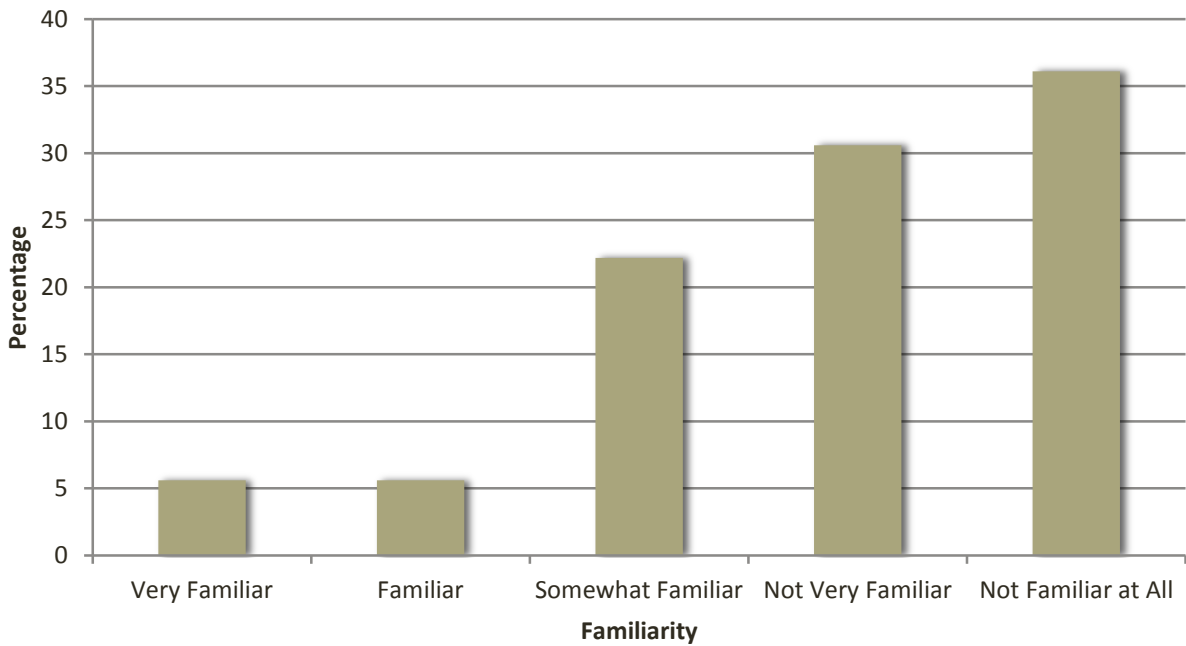
Appendix 4



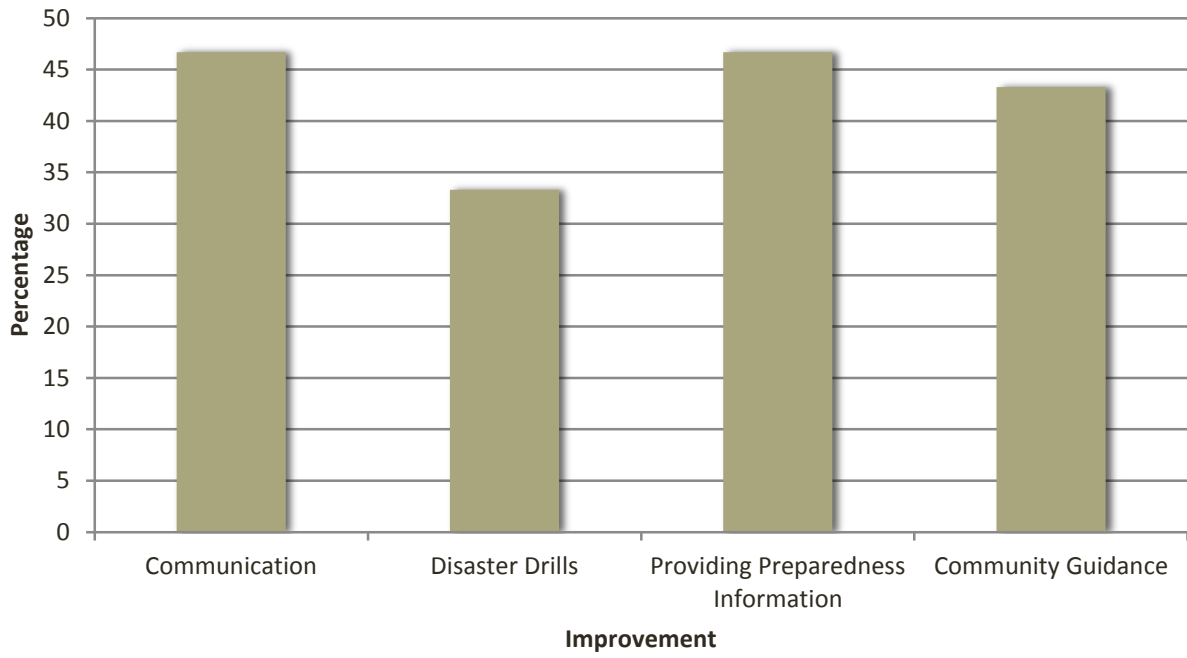
## Communications During and After Disaster



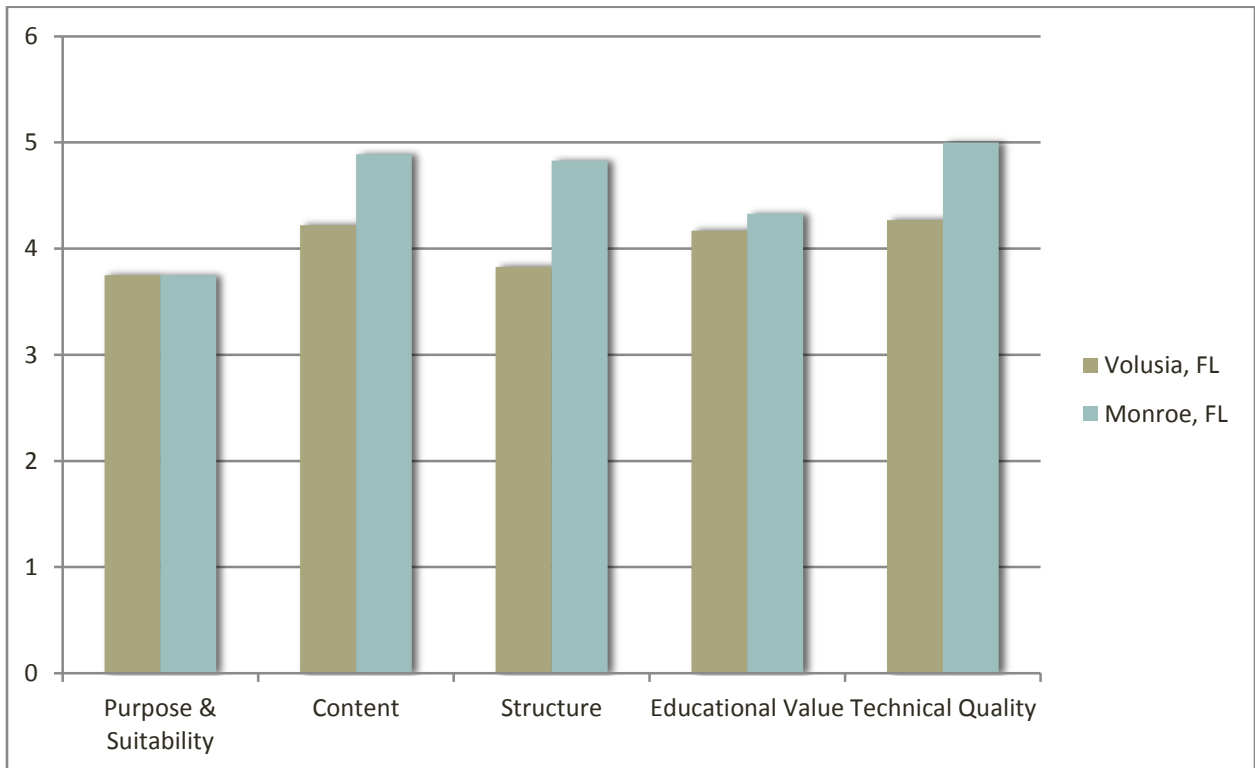
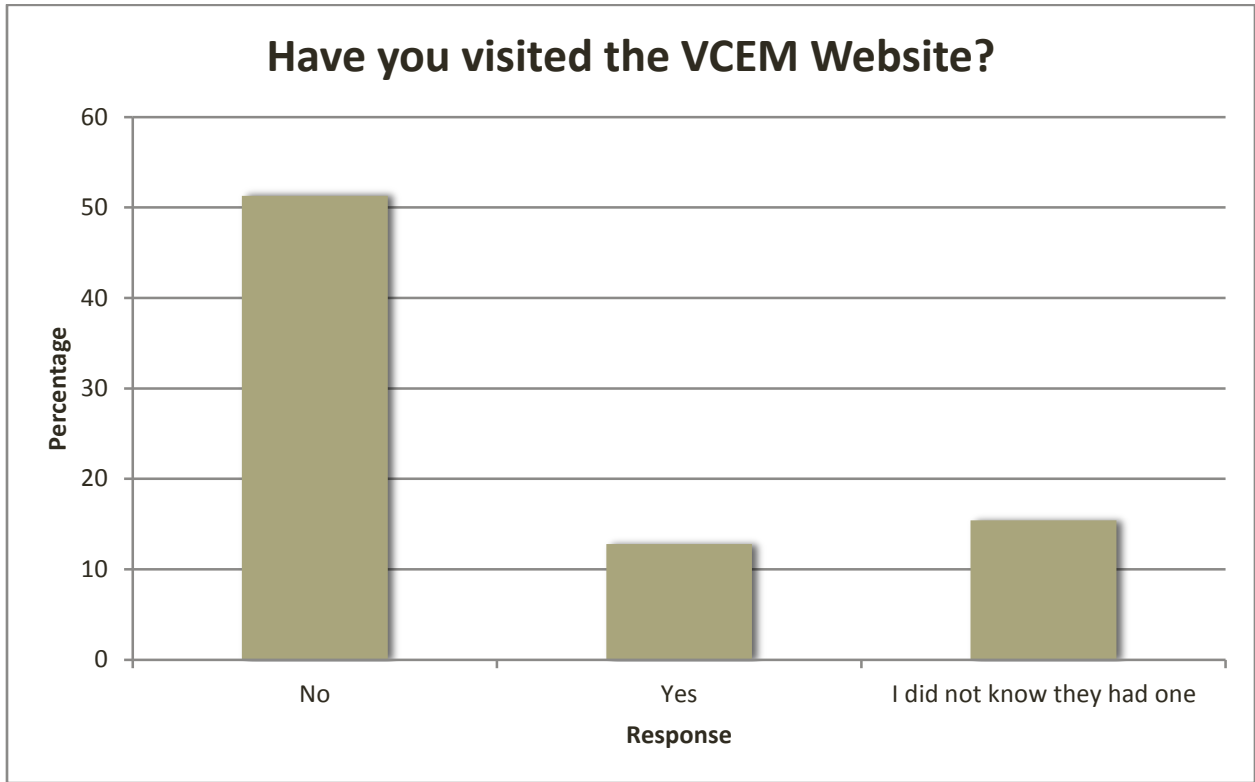
## VCEM Awareness



## How VCEM Could Improve

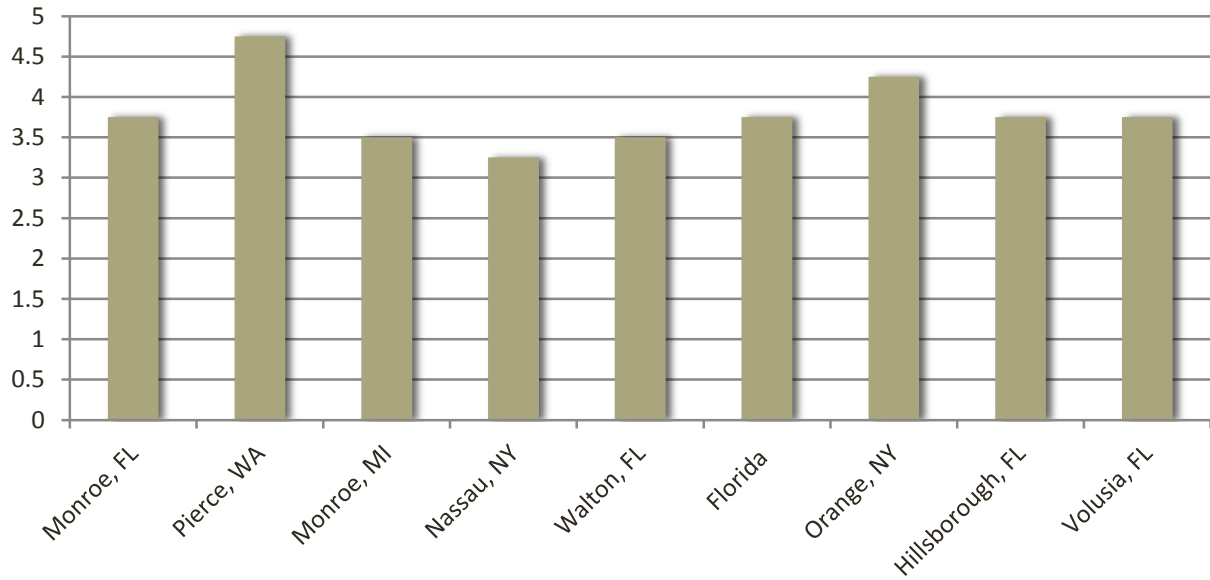


Appendix 5

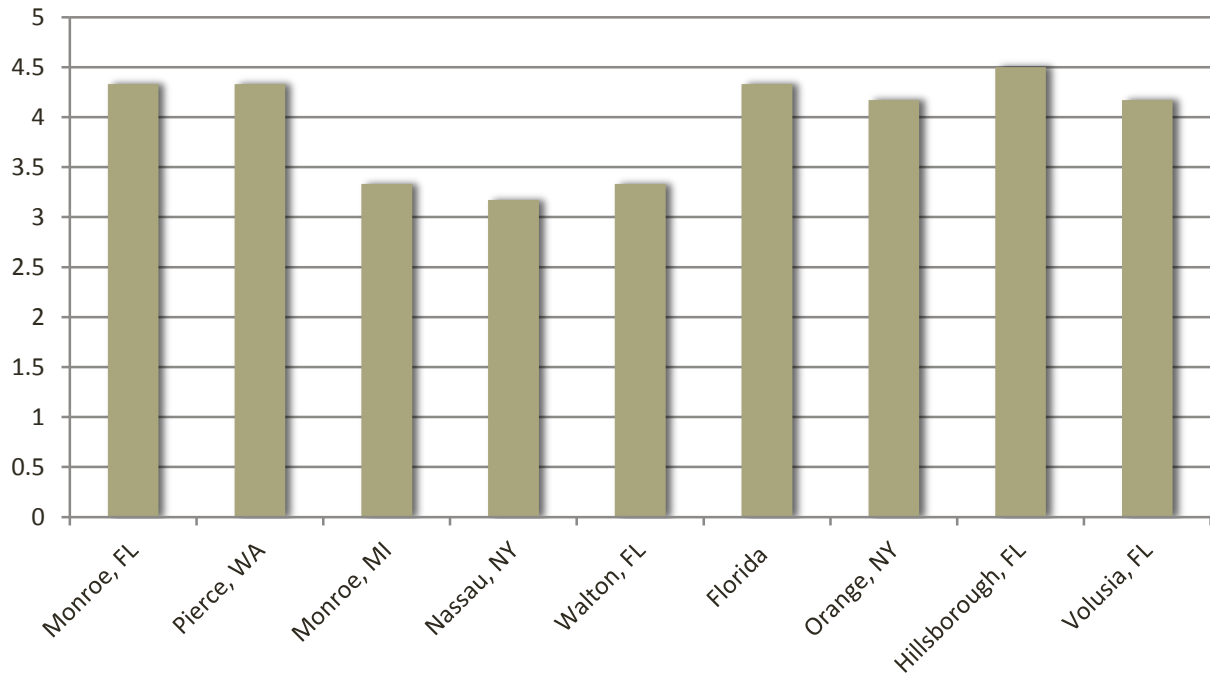




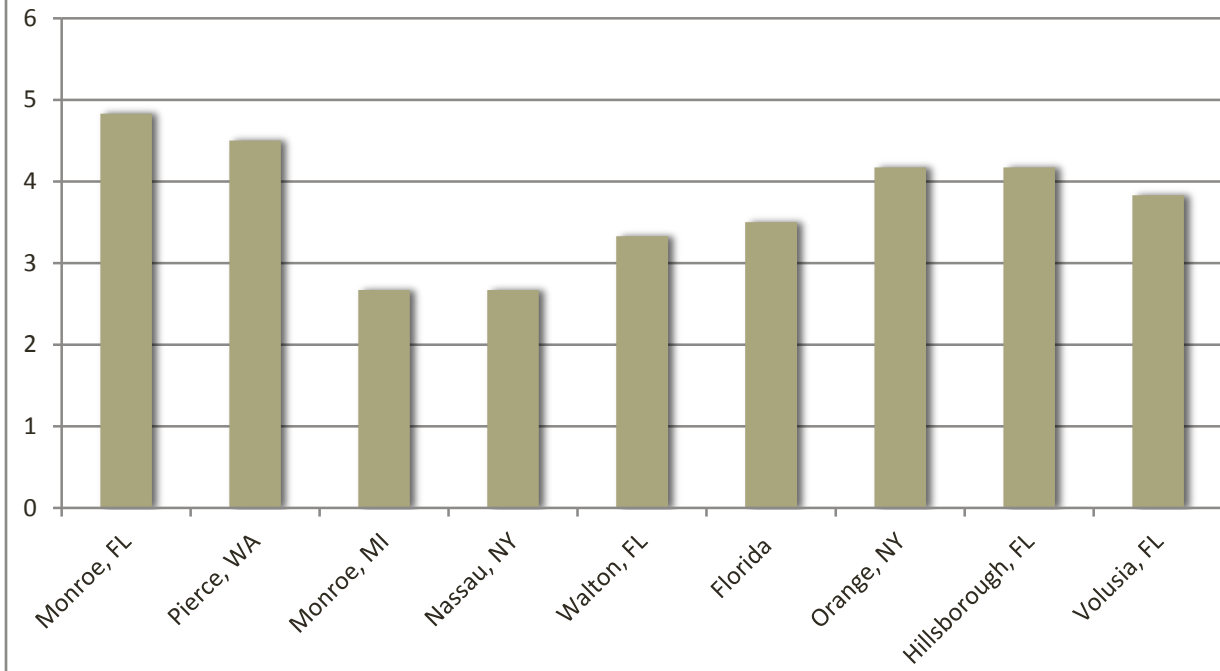
### Purpose & Suitability



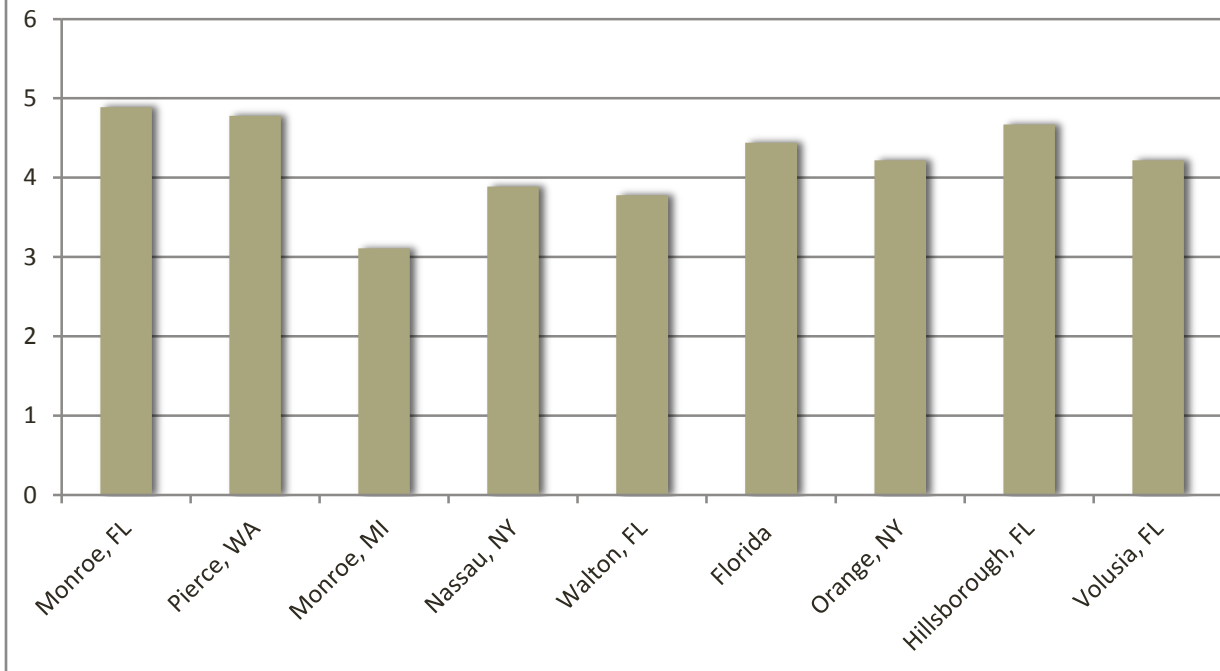
### Educational Value



## Structure



## Content



## Appendix 6

To : The Institutional Review Board, Stetson University

From: Keighla Burns & Kristen Erichsen

Community Based Research

Dr. Schorr

3/18/13

This survey is for the Terra Mar community in response to their recent tornado disaster, with the approval of the Volusia County Department of Emergency Management and the Home Owners Association.

## Cover Letter

Stetson University students, Keighla Burns and Kristen Erichsen, in partnership with Pat White and Larry LaHue of the Volusia County Department of Emergency Management, are conducting research on resident preparedness and response to the recent tornado disaster. This survey asks questions about preparedness for a disaster, perceptions of Volusia County Department of Emergency Management, and technology use in the event of a disaster. Participation in this survey is voluntary. The researchers can guarantee anonymity, since no names are requested in the surveys. Surveys will be distributed through the Homeowner's Association. Upon completion please seal the survey in the attached envelope and return it to the Homeowner's Association. The demographic information will be used for analysis purposes only, and not to identify participants. Your participation in this survey will help the Volusia County Department of Emergency Management to respond more effectively to future major disasters. It will also assist them in improving communication with Volusia County residents before, during and after a major disaster.

## Emergency Management Survey

Thank you for taking time to fill out this survey. Please do not place any identifying information on the survey or the envelope beyond the answers submitted on the survey. The researchers can guarantee anonymity, since no names are requested in the surveys. Upon completion, please place your survey in the attached envelope and seal it. Return the sealed envelope to the Homeowner's Association as soon as possible. The demographic information will be used for analysis purposes only, and not to identify participants. Surveys will be distributed and collected in sealed envelopes by the Homeowner's Association. The survey asks questions about preparedness, perceptions of Volusia County Department of Emergency Management, and communication in the event of a major of a disaster. Participation in this survey is voluntary. Your response to this survey will help the Volusia County Department of Emergency Management to respond more effectively to future major disasters.

1a. If there were a threat of another major disaster, that would affect your home, would you leave your home?

- Yes, I would leave my home (Please answer question 1b.)
- No, I would not leave my home (Please answer question 1c.)
- I don't know if I would leave my home (Please answer question 1c.)

1b. If you would leave your home, where would you go?

- Go to a friend's house
- Go to a family member's house
- Go to an emergency shelter
- Go to a hotel/motel
- Other (Please Specify) : \_\_\_\_\_

1c. Why would you not leave your home (Please Specify) :

\_\_\_\_\_

2a. During the December 10<sup>th</sup> tornado disaster, which of the following did you use for information?

(CHECK ALL THAT APPLY)

- Radio
- TV
- Internet
- Cell Phones
- Neighbors
- Family Members
- Local public safety officials (ex. fire, police, etc.)
- Other (Please Specify): \_\_\_\_\_

2b. Which of the above checked information sources was the most important for you (Please Specify):

\_\_\_\_\_

4. What is/are the greatest obstacle(s) to prepare for a major disaster? (CHECK ALL THAT APPLY)

- Lack of preparedness knowledge
- Lack of opportunities to learn more about disaster preparedness for my home
- Poor local government support
- Lack of transportation
- Lack of money to prepare
- Lack of warning systems in my community
- Lack of warning systems in my home
- Other 1 (Please Specify): \_\_\_\_\_
- Other 2 (Please Specify): \_\_\_\_\_
- Other 3 (Please Specify): \_\_\_\_\_

5. Do you own an emergency alert radio?

- Yes and I use it frequently
- Yes but I rarely use it
- No but I would like to own one
- No and I don't expect to own one

6a. Do you have a disaster preparedness kit?

- Yes and I keep it up to date (Go to question 6b)
- Yes but I rarely keep it up to date (Go to question 6b)
- No but I would consider having one (Go to question 7)
- No and I don't expect to (Go to question 7)

6b. Which of these items do you have in your preparedness kit? (CHECK ALL THAT APPLY)

- I do not own a disaster preparedness kit
- Radio
- Flash light
- Extra batteries
- Water for 3 days for each person
- Food for 3 days for each person
- First Aid Kit
- Other 1 (Please Specify): \_\_\_\_\_
- Other 2 (Please Specify): \_\_\_\_\_
- Other 3 (Please Specify): \_\_\_\_\_

7. How familiar are you with the Volusia County Department of Emergency Management?

- Very familiar
- Familiar
- Somewhat Familiar
- Not Very Familiar
- Not Familiar at All



8. How helpful do you believe the Volusia County Department of Emergency Management was during the recent tornado disaster in your community?

- Very helpful
- Helpful
- Somewhat helpful
- Not Very Helpful
- Not helpful

9. Based on your recent experiences with the December 10th tornado disaster in your community, in which of the following areas could the Volusia County Department of Emergency Management improve? (CHECK ALL THAT APPLY)

- No improvement needed
- Improve outreach and communications with the public
- Conducting disaster drills and exercises
- Improved guidance for the community after the disaster
- Providing disaster preparedness information to the community
- Other 1 (Please Specify): \_\_\_\_\_
- Other 2 (Please Specify): \_\_\_\_\_
- Other 3 (Please Specify): \_\_\_\_\_

10. How have you received new information, from any source, in the past month from the Volusia County Department of Emergency Management? (CHECK ALL THAT APPLY)

- I have received no new information from any source
- Personal Communication
- Phone Call
- Radio
- Email
- TV
- Website
- Other (Please Specify): \_\_\_\_\_

11. What kind of support did you receive after the December 10th tornado disaster? (CHECK ALL THAT APPLY)

- I received no assistance
- FEMA Assistance
- Local Government Assistance
- Police Assistance
- Firefighter Assistance
- Volunteers Assistance
- Volusia County Department of Emergency Management Assistance
- Insurance Company Assistance
- Other 1 (Please Specify): \_\_\_\_\_
- Other 2 (Please Specify): \_\_\_\_\_
- Other 3 (Please Specify): \_\_\_\_\_

12. What kind of support were you expecting after the recent tornado disaster?

(CHECK ALL THAT APPLY)

- I expected no assistance
- FEMA Assistance
- Local Government Assistance
- Police Assistance
- Firefighter Assistance
- Volunteers Assistance
- Volusia County Department of Emergency Management Assistance
- Insurance Company Assistance
- Other 1 (Please Specify): \_\_\_\_\_
- Other 2 (Please Specify): \_\_\_\_\_
- Other 3 (Please Specify): \_\_\_\_\_

13. During a major disaster, what types of social media are you likely to use?

(CHECK ALL THAT APPLY)

- Facebook
- Myspace
- Twitter
- None
- Other: \_\_\_\_\_

14. During the recent December 10th tornado disaster, what types of social media did you use?

(CHECK ALL THAT APPLY)

- Facebook
- Myspace
- Twitter
- None
- Other: \_\_\_\_\_

15. What was the most useful method of communication **DURING** the recent December 10th tornado disaster? (Please circle one option for each method you used.)

Landline Phone	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Cell Phone	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Text Messaging	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Short wave/Ham Radio	Did Not Use.	Never	Rarely	Sometimes	Often	Always
TV	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Computer – Social Media	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Computer – Email	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Computer – Websites	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Radio	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Other (Please Specify):	_____					

16. What was the most useful method of communication **AFTER** the recent December 10th tornado disaster? (Please circle one option for each method you used.)

Landline Phone	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Cell Phone	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Text Messaging	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Short wave/Ham Radio	Did Not Use.	Never	Rarely	Sometimes	Often	Always
TV	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Computer – Social Media	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Computer – Email	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Computer – Websites	Did Not Use.	Never	Rarely	Sometimes	Often	Always
Radio	Did Not Use.	Never	Rarely	Sometimes	Often	Always

Other (Please Specify): \_\_\_\_\_

17. During a future major disaster, what types of communication technology would you use?

(CHECK ALL THAT APPLY)

- Cell Phone
- Text Messaging
- Landline Phone
- Computer – Social Media Site
- Computer – Email
- Computer – Websites
- Short wave/Ham radio
- None
- Other 1 (Please Specify): \_\_\_\_\_
- Other 2 (Please Specify): \_\_\_\_\_
- Other 3 (Please Specify): \_\_\_\_\_

18. Have you ever visited the Volusia County Department of Emergency Management website?

- Yes
- No
- I didn't know they had one

19. If yes, rate your experience using the website:

Excellent    10    9    8    7    6    5    4    3    2    1    Horrible

## Demographic Information:

1. What is your gender?

- Male
- Female
- Prefer not to answer

2. What is your level of education?

- Some High School
- GED/High School Diploma
- Some College
- Associates
- Bachelors
- Master's/Ph. D

3. How many years have you lived in the Tera Mar community? \_\_\_\_\_ Years

4. What is your race/ethnicity? (CHECK ALL THAT APPLY)

- Caucasian/White
- African American/Black
- Asian
- Other: \_\_\_\_\_

5. Do you consider yourself to be Hispanic/Latino(a)? (Please Circle One)

- Yes
- No
- I prefer not to answer

6. What is the primary language spoken in your household?

- English
- Spanish
- French
- Other: \_\_\_\_\_

7. What is your household income?

- Prefer Not to Answer
- Less than \$10,000
- \$10,001 to \$20,000
- \$20,001 to \$30,000
- \$30,001 to \$40,000
- \$40,001 to \$50,000
- \$50,000 or higher

Thank you for completing our survey. Please seal your survey into the envelope attached and return it to the Home Owners Association Club House as soon as possible.

Please do not include any identifying information ON the survey or the envelope beyond the answers submitted in the survey.