

US Tsunami Survey
New Hanover County, North Carolina
Communities:
Wrightsville Beach and Carolina Beach

Collaborators Report

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Part 1: Introduction

This report describes some of the finalized results from a 3-year NSF study that builds a model of tsunami preparedness and response to warnings in the United States. The study was funded by a grant from the National Science Foundation, Human and Social Dynamics Program (Award #0527387). Our goals are to assist at-risk communities in understanding tsunami dangers, planning for hazard intervention and adopting mitigation practices. At the same time, this research has created a capability to predict the factors that facilitate and hinder the adoption of protective measures for tsunamis.

Approximately 3,000 individuals in 6 communities throughout the United States participated in this project. These communities are Ocean Shores, Washington; Kodiak, Alaska; Seaside, Oregon; Coronado, California; Kaua'i County, Hawaii and New Hanover County, North Carolina. This report focuses on the results from the New Hanover County coastal towns of Wrightsville Beach and Carolina Beach. Publications comparing data from all locations will be available at a later date.

The New Hanover County beach communities were chosen to participate in the larger study for a number of reasons. First, the New Hanover County coastal region is an Atlantic case with only a low level of risk of tsunami. Second, the region has long experience with hurricane hazards (Hurricanes Bertha, Fran, Bonnie, Dennis, and Floyd all made landfall here between July 1996 and September 1999). As part of this experience New Hanover County was a FEMA Project Impact Community (1997-2001) and received special funding intended to enhance its disaster preparedness. Thirdly, the onset of the survey coincided with the local office of the National Weather Service's implementation of the "Tsunami Ready" program in New Hanover County. This presented the unique opportunity to conduct an evaluation study of the public awareness campaign about Tsunami preparedness that would be led by the National Weather Service. This report is broken into 5 parts: Introduction, Survey Methods, Demographics, Key Findings and Data Tables. Sample surveys are located in Appendix A and B.

Part 2: Survey Methods

The project includes two survey phases separated by approximately 12 months; the educational treatment which was deployed at the six month period (May and June of 2007); and a series of phone interviews. Respondents were asked approximately 62 closed-ended and 6 open-ended questions during phase 1 (appendix A); phase 2 surveys consist of approximately 34 closed-ended questions and include some repeat questions from those in phase 1 (appendix B). Phone interviews consisting of 10 open-ended questions were conducted with a small subset of participants, although the data from these are not yet available in report form.

In Phase 1, 448 New Hanover County households participated in this study; a response rate of 36% on the 1,220 surveys mailed to the entire population of Wrightsville Beach and to a random sample of residents of Carolina Beach. In phase 2, 196 completed the second follow up survey with 99% stating they were the same person who completed phase 1.

The evaluation component of the study was conducted as follows: Respondents were surveyed with the standard Phase I instrument. Respondents were subsequently randomly selected into three groups. Group A received a tsunami educational brochure, Group B received a tsunami educational DVD (both products were produced by Tom Matheson of the local national weather service office) and the control group, Group C received no additional materials. In addition an effort was made to create a fourth group which would have received a lecture from Mr. Matheson on tsunami readiness. Unfortunately of the more than 50 individuals invited via phone contact to two lecture opportunities fewer than 10 actually participated.

Part 3: Demographic Information

From the completed surveys, 94% of participants defined themselves as full time residents, and 93% as owning their home. Participants have lived in North Carolina for an average of 20 years, in New Hanover County an average of 20 years (although 36% have lived in the county 10 years or fewer), and in their place of residence for an average of 18 years. A slight majority of respondents are male (50.7%); they are almost all white (98%); and they tend to be older (55% were aged 55 and older) and are very well educated with 34% having earned at least a bachelor's degree and an additional 28% reporting having earned post-graduate degrees. With 62% reporting completion of higher education and graduate school, the southeastern North Carolina coastal region is clearly highly educated. No significant change is seen from phase 1 to phase 2. Specific demographic data comparing phase one and phase two are shown in the table below.

Community Demographics

	Phase One	Phase Two
Gender		
Male	52.2%	53.6%
Female	47.8%	46.4%
Age		
18 to 19 years	0.4%	0.5%
20 to 24 years	0.2%	0.0%
25 to 34 years	14.8%	6.6%
35 to 44 years	14.4%	9.1%
45 to 54 years	21.5%	20.3%
55 to 59 years	14.4%	14.9%
60 to 64 years	13.5%	18.0%
65 to 74 years	15.6%	17.3%
75 to 84 years	9.4%	10.6%
85 years and older	2.4%	2.5%
Length of Residence		
	Years	Years
North Carolina	20	20
New Hanover County	20	20
Your place of residence	18	18
Own home	92.7%	93%
Rent home	5.7%	6%
Race		
White	98.4%	99.5%
African American or Black	0.2%	0.2%
American Indian/Alaska Native	0.2%	0.2%
Asian	0.0%	0.0%
Hispanic/Latino	0.8%	0.0%
Other	0.0%	0.0%

Community Demographics

	Phase One	Phase Two
Education		
Less than 9 th grade	0.2%	0.2%
9 th to 12 th grade, no diploma	1.1%	1.1%
High School Graduate (includes equivalency)	8.0%	7.8%
Some college, no degree	18.5%	18.1%
Associate degree	8.7%	8.5%
Bachelor's degree	34.7%	33.9%
Graduate or professional degree	28.8%	28.1%
Marital Status		
Never married	9.4%	9.4%
Living with a partner	4.4%	4.4%
Now married	66.3%	66.3%
Separated	1.1%	1.1%
Widowed	8.7%	8.7%
Divorced	10.1%	10.1%
Income		
Less than \$10,000	1.3%	1.3%
\$10,000 to \$14,999	1.5%	1.5%
\$15,000 to \$24,999	4.1%	4.1%
\$25,000 to \$34,999	5.1%	5.1%
\$35,000 to \$49,999	10.2%	10.2%
\$50,000 to \$74,999	21.9%	21.9%
\$75,000 to \$99,999	16.3%	16.3%
\$100,000 to \$149,999	16.3%	16.3%
\$150,000 to \$199,999	10.2%	10.2%
\$200,000 or more	13.1%	5.1%

Part 4: Executive Summary

The inclusion of New Hanover County in this broader research effort was intended to allow researchers to systematically identify problems of hazard preparedness in a community with a low risk of tsunami hazard. The identification of systematic evidence about what people do and do not know and what they might learn are some of the most critical findings of this research effort and dovetails significantly with the broader research goals of assisting at-risk communities in understanding tsunami dangers, planning for hazard intervention, and adopting mitigation practices.

The summary findings for our community are:

- The majority of residents are not knowledgeable about tsunami hazards.
- Respondents who do have some knowledge are not confident about what they know.
- Residents do not intend to learn more about or become prepared for tsunamis.
- Significant pluralities of residents do not know the evacuation routes off the beaches.
- Majorities are ambivalent or negative about community/government leadership.
- Majorities of residents are very knowledgeable about hurricane hazards.
- Strong minorities who have evacuated for past hurricanes indicate that they evacuated unnecessarily or suffered more property damage than if they had not evacuated.

These findings are important and interesting because a resilient community is a knowledgeable, prepared and cooperative community. In the absence of knowledge, preparation and cooperation at the community level, government officials must have robust plans and approaches to implementation in case of an event. Despite the low levels of knowledge and interest in tsunami hazards, New Hanover county beach residents have stronger interest and levels of preparation for hurricanes. This highlights the importance of salience in hazard preparation from the perspective of the community. If the hazard is viewed as highly improbable then community members are unwilling to prepare. This means that local officials have a heavier planning and implementation burden.

Part 5: Key Findings

This section contains key findings for most questions in both phase 1 and phase 2. The exact percentages can be found in *Part 6: Data tables*.

Understanding Tsunami Risk

Residents of the New Hanover County beach communities have neither a strong understanding of the tsunami risk, nor a realistic perception of the moderately serious risk posed in the future by tsunamis. Importantly, there is a low level of confidence about the knowledge that they do have. For example when asked if New Hanover County beaches were “not” vulnerable to tsunamis 60% of respondents disagreed, 20% were neutral and 18% agreed. Residents were asked a series of factual questions about how much time they would have to prepare for a tsunami originating from the Puerto Rican Trench, the Canary Islands or the Continental Shelf 58%, 61% and 55% of respondents indicated that they did not know. Respondents also indicated strong uncertainty about the possible damage a tsunami originating from one of these locations could cause (*table 1.1a*), similarly only 10% of participants supported the view that tsunamis would be distant from their community and have little impact (*table 1.1b*). Finally 9 % of respondents felt that the likelihood of a major future tsunami had been exaggerated (*table 1.1c*).

A minority of residents expect a damaging tsunami sometime in the near future with 14.6% expecting a tsunami to occur within the next 100 years, 2% within the next 10 years and 2% within the next 12 months (*table 1.2a-d*). Overall, respondents had a clear understanding of the limited nature of the current and future tsunami risk and most residents had no specific knowledge about the timing of past damaging events although a significant minority (34%) indicated correctly that there had never been a damaging tsunami event in New Hanover County (*table 1.3*). Of those identifying a last date .5% chose 1700, .2 % 1964, .9 % 2004, and .2 % 1886 and 61% answered that they did not know.

Tsunami Processes and Knowledge

Interestingly, even in our low risk, low salience area the link between strong earthquakes and tsunamis was well understood as 91% of participants stated that earthquakes are most likely to cause tsunamis (*table 2.1*). Landslides were identified by 2% of respondents as the most frequent cause, 2% thought that a hurricane could cause a tsunami, 3% said they did not know and a very small group, less than 1%, reported high tide as a cause.

A majority of residents, 56%, understood that tsunami waves can appear as multiple waves (*table 2.2*) with 10% reporting that a tsunami is a single big wave, and 10% not knowing. Understanding of the expected time between multiple tsunami waves varied with 2% believing they will occur within 1-15 minutes, 8% 16-45 minutes, 24% over 45 minutes to 2 hours, 20% 2-4 hours, 16% over 4 hours and 28% indicating they did not know (*table 2.3*). Note that the time lapse between damaging waves can vary between a few minutes to over 30 minutes.

Natural Warnings and Environmental Cues

A set of questions explored peoples' understanding about natural warning signs for both local and distant tsunamis. A local tsunami is defined in this survey as any tsunami that is triggered off the coast of North Carolina, while a distant tsunami is triggered as far away as Puerto Rico or the Canary Islands. It is critical that people know what kind of warning they will receive for each type of tsunami. Participants are clearly uncertain about natural warnings. In this section our respondents failed to demonstrate a high understanding of the difference between tsunamis triggered locally and at a distance and the different natural warning signs that may be present.

Only 26% of participants reported that they will likely feel the ground shaking caused by an earthquake in a local setting (*table 3.1e*), however, 59% agreed that they would be unlikely to feel an earthquake that triggers a tsunami in a distant event (*table 3.2e*). Only 37% of respondents agreed or agreed strongly that they would be able to differentiate between ground shaking caused by a large, nearby earthquake from man-made causes of shaking (*table 3.3a*). Participants felt that they would be able to base the distinction on the fact that shaking from a large earthquake would both last longer (20% agreed and 14% strongly agreed) and be much stronger (26% agreed and 25% strongly agreed) than ground motion due to human causes (*table 3.3b,c*).

In contrast with their uncertainty about earthquakes, respondents possess a high level of knowledge of the normal ocean behavior and tides in New Hanover County. This is positive because abnormal wave and ocean surface conditions can provide a form of a natural warning for tsunamis. Strong majorities of respondents agreed (22%) or strongly agreed (66%) that they knew where the shoreline was during normal low tide. Moreover they said that they know what the seafloor looks like during normal low tide (26% agreed; 59% strongly agreed), and finally they know that tidal recession would be much faster than normal tidal waning, 26% agreed and 50% strongly agreed although in this section 19% of respondents also indicated some uncertainty when they selected "neutral" as their answer to this question (*table 3.3d-f*).

As respondents moved through the instrument it became clear that there is a high degree of variation in their knowledge of the other natural warnings that are specific to tsunamis. Approximately 50% of participants reported that the ocean will always recede before the arrival of a tsunami crest (25% agreed and 25% agreed strongly, *table 3.3g*). Sea level draw-down was expected by 63% for local and 40% for distant tsunami; unusual waves 52% local and 36% distant; unusual sounds 24% local and 16% distant (*table 3.1f-h, 3.2f-h*). A high percentage of participants (39% agreed; 35% agreed strongly), also knew that the shape of a tsunami wave near the coast can vary greatly from a wall of water, to a tide-like flood, or to a breaking wave (*table 3.3h*). Response was mixed on how a tsunami wave might look compare to other waves with 69% (37% agreed and 32% agreed strongly) reporting that over short distances the shape of tsunami waves near the coast can be much different (*table 3.3i*), and 31 % reporting that tsunami waves will always look much different than other waves (*table 3.3j*).

Warning Systems

Overall residents of the New Hanover County beach communities possess a high understanding of natural warning signs that are associated with their normal understanding of life at the coast, e.g., tidal shifts. Residents admit that they have limited knowledge of a tsunami specific warning system with (92.8% indicate they do not know about the Tsunami Warning System). However, residents generally expressed high levels of confidence in official warning systems. In some instances this confidence is clearly misplaced. For example, strong minorities of our population (over 35 %) felt confident that a tsunami event that was either local or distant will be preceded by a siren sounding (*table 3.1a, 3.2a*). Unfortunately a siren warning system does not exist in New Hanover County. People expressed strong degrees of confidence in local officials, 40% of respondents expected a loud speaker/Emergency Management/local police response in the case of a local tsunami and 46.5% expected that in the case of a distant tsunami local officials would activate a loud speaker (*table 3.1b, 3.2b*). Informal warnings from friends, relatives and neighbors were expected by 29 % for local and 44% for distant tsunami (*table 3.1d, 3.2d*). Residents were also confident in the local media with 60% expecting the radio or television to be broadcasting information for local and 70% for distant tsunami events (*table 3.1c, 3.1c*). In each case the response indicates the widespread confidence respondents have in the local level emergency preparedness efforts that local, county and state officials and political and policy leaders have invested in planning and working to mitigate our well understood and experienced vulnerability to hurricane hazards. Conversely this may be over

confidence in local level or national ability to actually detect and warn residents of oncoming tsunami in the case of a local tsunami. And obviously there is a certain level of ignorance that we are identifying from the respondents. Clearly their overall knowledge is spotty and vague and this reduces their confidence in answering questions about natural warning systems and enhances their tendency to identify man-made warning systems such as sirens that do not currently exist.

Value of Preparedness

A series of questions explored residents' views on the value of preparation for tsunamis. 66% of people in phase 1 and 65% in phase 2 believe that it is worth preparing (*table 4.1a*). A minority of residents, 36% in phase 1, 41% in phase 2, believe that a serious tsunami would not affect them: 14% in phase 1 and 16% in phase 2, reported that preparing for a tsunami is inconvenient, and 36% in phase 1 and 35% in phase 2 reported that it is difficult to prepare for a tsunami (*table 4.1*).

In both phase 1 and 2, about 26 % reported that preparing for a tsunami would reduce damage to an individual's home should one occur, while only 16 % in phase 1 and 9 % in phase 2 reported that preparing for tsunamis would improve their everyday living conditions (*table 4.1e,f*). When asked whether preparing for tsunamis would improve their ability to deal with disruption should one occur a majority of respondents in phase one (57%) agreed while in phase two this number decreased to 45%. A larger percentage, 79 % in phase 1 and 75 % in phase 2, feel that preparing for tsunamis will help save lives if one should occur. Tsunami preparedness does appear to be improving in New Hanover County: 12% of participants reported in phase 1 that they knew how to prepare for tsunami and this number expanded to 44% of respondents in phase 2 (*table 4.1i*).

Participants were asked to what degree they believed that various groups were in favor of adopting protective measures for tsunamis (*table 4.2*). The majority believed family, (61 %), or the general community (53%) followed by friends, (48 %), and co-workers (31%).

Tsunami Preparedness in the Community

In New Hanover County, as in other communities surveyed, respondents identified themselves as being more prepared than the broader community (16.7 % considered themselves prepared or very prepared (*table 4.5a*), whereas only 9.1 % consider their community equally well prepared (*table 4.5b*). This view, called optimization bias, can have detrimental effects on a

person's preparedness level as people may tend to wait for others in their community to catch up to their perceived preparedness level before they initiate action themselves.

In phase 1 less than one percent (0.7%) of participants reported that their neighborhood had a tsunami preparedness plan. In phase two this changed somewhat with 4.7 % of participants noting that their neighborhood had a tsunami preparedness plan (*table 5.1a*). We also saw similarly incremental increases in the number of respondents reporting that their place of employment had a tsunami preparedness plan with 2.3% of phase one respondents answering yes and 5.5% of phase two respondents answering yes (*table 5.1b*). The series of questions about attendance at school; workplace or community meetings on tsunami preparedness also fluctuated slightly and interestingly sometimes in a negative direction. In phase one only 1.2% of respondents reported attending a meeting about tsunami preparedness at their school and in phase two this percentage dropped to zero (*table 5.1c*). However workplace and community meeting attendance did increase from phase one to phase two with 1.6% of respondents having attended a workplace meeting in phase one versus 3.2% in phase two. And 1.6% had attended a community meeting in phase one and this number increased to 2.7% by phase two (*table 5.1c-e*). Tsunamis are not important topics for discussion. Again this finding points to the low salience of the tsunami risk and the low knowledge base about tsunami in New Hanover County. For example, when asked if they have discussed tsunami preparedness, 18.6 % (phase 1) and 25.5 % (phase 2) had discussed it with their families, 3.9% (phase 1) and 9.5 % (phase 2) with their neighbors, 3.1 % (phase 1) and 3.8% (phase 2) with their employer or employees, and 3.1 % (phase 1) and 1.6 % (phase 2) with official agencies (*table 5.1f-j*).

One troubling result came in phase 2 when respondents were asked if they had taken a selection of steps to prepare for tsunami since the time of phase 1 (*table 5.3*). In this series of questions only minorities of residents reported taking any steps at all to increase their preparedness. Only 26 % reported developing a family emergency response plan, 45 % reported storing food and water, 39 % prepared for tsunami in more places than their home, 36% had replaced their batteries in their NOAA radio, 21 % prepared a backpack with supplies, and, with respect to tsunami preparedness only 10% reported preparing for a tsunami in places other than their home and less than one percent (.5) reported having participated in a tsunami evacuation drill.

Tsunami Preparedness in Schools

Twenty-six percent of participants have dependent children living with them and a majority of those, 65 %, did not know if their child's school disaster plan includes tsunamis (*table 6.1*). Out of those who answered either yes or no to this question 31% felt that their school did not include tsunami in their disaster plan and only 3% said that yes tsunami was included. Parents with dependent children were asked if they would plan to pick up their child from school if a tsunami warning is issued. A slight majority, 56% indicated that they would not allow their child to remain in school (*table 6.2a*) and 75 % would go and get their child from school if a tsunami warning is issued (*table 6.2b*). This may be one of the most important findings for local beach community and New Hanover County policy makers as it indicates the possibility that residents would take to the streets to collect children when in fact their children are likely to be safest by sheltering in place at school given the Category two or smaller storm surge New Hanover County beaches would be expected to experience as a consequence of a tsunami. Consistent with the above information, 40% of parents also indicated (*table 6.2c*) that they did not believe that the tsunami preparedness plan at their school would protect their child and 28% answered that they did not know.

Evacuations

A set of questions asked respondents about their community's evacuation routes and sites, time needed to evacuate, belongings that they would take with them and their response to warnings of local vs distant tsunamis. New Hanover County residents and Emergency Managers have a high level of experience with evacuation routes and procedures in the case of hurricanes but comparatively little experience with how to evacuate appropriately in the case of tsunami. The lack of tsunami experience in the region and the relatively low risk also means that there are no inundation maps of the New Hanover County beaches available to either emergency managers or to the general public. This makes it very difficult for individuals to actually know where the inundation zone is for our beach communities. Nonetheless a significant minority of respondents assumed that living on the beach implies a degree of hazard vulnerability and 42.4% of them answered "Yes" to our question, "Do you live in a tsunami inundation (hazard or danger) zone?" A larger minority, 47.7% answered that they did not know and 9.9% said "No" they did not live in an inundation zone (*table 7.1*).

Evacuation: Routes

When asked about tsunami evacuation routes only 12.1% of respondents said they knew the routes; while 34.6% answered that they were not familiar with tsunami evacuation routes and a slim majority, 53.3% admitted that they did not know. In contrast, strong majorities of participants, 73% had evacuated for a hurricane and a plurality of residents 42% said that they had followed an official evacuation route as part of an official warning (tables 7.3, -7.5). These numbers are consistent with our populations who have lived in New Hanover County longer than ten years (the last time the beaches were evacuated was 1999 for Hurricane Floyd) and reflects the general lack of knowledge about tsunami hazards in this community.

In phase 2, participants were asked a more in-depth question regarding their familiarity with evacuation routes in New Hanover County (table 7.6). Most respondents, 74% reported that they had neither driven nor walked a *tsunami* evacuation route. Of those who had driven or walked the route, 32% reported doing so regularly as part of normal life. Some respondents, 18.7% reported that they already knew the route but had not driven it, 3% reported being physically unable to follow the evacuation route. Finally, a surprising 22.8 % reported not having ever followed an evacuation route and an additional 9.9% of respondents reported that they thought there were no official evacuation routes for their community while 39.4% said that they did not know if their community had an evacuation route. We think, again, that these responses reflect the turnover of population in the beach communities. Residents who have lived in these communities for ten years or less is currently at 30% of the total. This means that although 70% of residents have experienced hurricanes previously a significant cohort of residents are relatively new to the area and have never had to evacuate for any reason. This set of responses indicates that even hurricane preparedness and knowledge among residents has declined.

Thirty percent of participants in phase 1 reported testing their own non-official evacuation routes. 73 % of those who tested a non-official route also reported that they felt the official tsunami evacuation routes are not adequate.

Fifty-five percent of participants reported that they had visited a designated tsunami evacuation site. Of those, 94 % of participants that had visited a designated tsunami evacuation site did so by vehicle, 6 % used a combination of walking and driving, and less than 1 % reported only walking.

Evacuation: Time

Evacuation time for local and distant tsunami will be significantly different, typically minutes to tens of minutes for local tsunamis and several hours for distant tsunamis and this is poorly understood in New Hanover County. When asked to estimate the time that residents have to move to reach high ground for a local tsunami, 34 % reported that they would have less than 15 minutes, 23 % would have 15-45 minutes, 9 % reported 45 minutes to 2 hours, 2 % reported 2 - 4 hours and less than 1 % reported over 4 hours. Although this trend was positive (the respondents were answering correctly) a full 28% of respondents indicated that they did not know how much time they would have to respond to a local tsunami (*table 7.2a*). In the case of a distant tsunami this pattern repeated itself with respondents generally thinking that they would have more time while a significant minority (28%) again admitted that they did not know. Only 2% reported that they would have less than 15 minutes, 8 % thought they would have 15-45 minutes, 24 % reported 45 minutes to 2 hours, 20 % reported 2 - 4 hours and 16 % reported over 4 hours (*table 7.2b*). This indicates that, as expected, our respondents are generally uncertain about tsunami hazards.

Evacuation: Response to Warnings

Participants were asked to describe their response to both a local and distant tsunami warning (*table 7.11*). there was a large gap between the percentage of respondents reporting that their response would be to evacuate. In the case of a local warning, 80% of residents indicated that they would evacuate. This number dropped to 43% in the case of a distant warning. Respondents (18%) indicated that they would have more time during a distant tsunami. Only 5.6% and 2.7% indicated that they would stay home or stay put for either a local or distant tsunami. In the case of a local tsunami 16 % would gather belongings and/or secure their household and this increased to 31 % for a distant event. Some residents indicated that they would monitor a distant warning on television or radio (12%) and this number dropped to 1.3% in the case of a local tsunami, a reassuring sign. Small minorities of respondents indicated that they did not know what they would do in either case (2.2% local and 3.4% distant; see *table 7.11*).

Trust

Generally speaking residents of New Hanover County either trust or are ambivalent about their local government's commitment to meeting their needs. In phase one 33% of respondents trusted government and 35% were neutral while in phase two 27% of respondents trusted government and 41% were neutral (*table 8.1a*). The percent of respondents who were confident that government could be trusted to "do what was right for residents" was similar with 31% of phase one respondents agreeing and 37% remaining neutral while 25% of phase two respondents agreed with 39% remaining neutral. Community leaders inspired a similar reaction with 32 % and 29 % trusting community leaders and 39 % and 28 % trust the media. A much higher level of trust is seen in the "law to protect and maintain order" with 68 % and 69 % agreeing in phase 1 and phase 2 respectively.

This last question is a generic question that is intended to elicit a response about government in the abstract. The fact that specific office holders are not triggered means that we are gaining a more general view of local government effectiveness. The responses to this question are more positive and indicate that overall trust in the system is high. The questions about government, community leaders and the media are more specific and prompt respondents to think specifically about individuals in these positions whom respondents may or may not agree with on a day to day basis.

Future Activities – Intent

Participants were asked about their intent (in the next month) to prepare for a future tsunami which can be an indicator of a person's future actions (*table 9.2*). All things considered the residents of New Hanover County were very unlikely to take action to prepare for tsunamis and they were honest about it. When asked if they intended to improve their knowledge of tsunamis 34% of phase one respondents answered that they were not planning to improve their knowledge while 56% said that they would possibly work to improve their knowledge. These numbers shifted in phase two with 51% of respondents saying they would not work to improve their knowledge and 41% saying that they would possibly improve their knowledge. Similar patterns emerged when residents were asked about their intentions to increase their ability to respond to tsunamis with 48% of phase one and 41% of phase two stating possibly, 12 % of phase one and 5% of phase two stating definitely and 39% of phase one and 52% of phase two respondents saying that they would do nothing to increase their ability to respond to tsunamis. Only 3 % reported that they intended definitely to become involved with a local group to discuss

how to respond to tsunamis, while 29% and 18 % reported maybe while a strong majority 67% that increased to 79% in phase two saying that they had no intention of joining a discussion group. Between 6 and 16 % intended to either seek information on tsunami risk or on how to respond to tsunami, 46 – 47 % reported the possibility, and 53-61 % not intending.

These changes are strong evidence for a learning effect from the survey itself and from the educational materials sent to participants in the period between phase one and phase two. Clearly the majority of residents have some reasonable expectation that a tsunami is very unlikely to occur. Thus planning to be prepared for such an event is not a pragmatic use of time or resources. These findings in New Hanover are reinforced by the findings from Kaua'i where residents feel that the risk of tsunami is high and that preparing for tsunamis is important and relatively easy (Larin et. al..

Sense of Community

Overall, New Hanover county beach residents tend to have a sense of wellbeing and liking for their community and where they live (*table 10.4a-e*). This is important in many ways. A strong sense of enjoyment in their community may lead to a sense of pride and ownership which will increase their desire to prepare and reduce effects of future hazards. This sense of community well being is clearly part of the broader picture of preparedness however because although respondents are knowledgeable and prepared for hurricanes, they are not as knowledgeable and prepared for tsunamis because the regional risk is low. This again brings in the salience factor – when the probability of a particular type of hazard event is low, a positive community environment does not matter; residents will pragmatically choose not to prepare for an unlikely event.

Part 6: Data Tables

This section contains raw data for both phase 1 and 2 in percentage of responses. The N for each question represents the number of people who responded to a question – persons who left a question blank are not included in the sample percentage. Some questions were asked in both phase 1 and phase 2. For these questions the top percentage represents phase 1 and phase 2 is the bold percentage on the bottom.

Section 1: Understanding Tsunami Risk

1.1 Please indicate the extent to which you agree or disagree with each of the following statements about future tsunamis in New Hanover County.			Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	N						
a. There may be tsunamis, but they won't be that bad	438	15.1 %	22.6 %	37.4 %	15.8 %	9.1 %	
b. The location of the tsunamis will be far away from here and have little impact on me	438	15.8 %	26 %	29.7 %	17.8%	10.7 %	
c. The likelihood that major tsunamis will occur here has been greatly exaggerated	440	12.0 %	23.2 %	38.0 %	17.3%	9.5%	

1.2 How likely or unlikely is a damaging tsunami to occur along New Hanover County Beaches during the following time periods?			Very Unlikely	Unlikely	Neutral	Likely	Very Likely
	N						
a. Less than 12 months?	422	52.1 %	22.3 %	21.3 %	2.1 %	2.1 %	
b. Less than 10 years?	424	22.9 %	29.2 %	35.4 %	10.1 %	2.4 %	
c. Less than 100 years?	425	7.8%	12.5 %	38.4 %	26.8 %	14.6 %	
d. Less than 500 years?	419	4.8 %	7.6 %	26.3 %	24.3 %	37.0 %	

1.3	N	1700	1964	2004	1886	Never	Don't Know
When was the last damaging tsunami in your community?	437	.5 %	.2 %	.9 %	.2 %	35.0 %	63.2 %

Section 2: Tsunami Processes and Knowledge

2.1	N	Landslide	High Tide	Hurricane or storm	Earthquake	Don't Know
What is the most frequent cause of tsunami?	437	2.5 %	.5 %	2.5 %	91.3 %	3.2 %
2.2	N	One big wave	Multiple Big waves	Multiple big waves and multiple small waves	Don't know	
Tsunami waves can occur as which of the following	437	10.8%	22.0 %	56.9 %	10.3 %	
2.3 During a tsunami, how much time can there be between one tsunami wave and the next tsunami wave?	N	1-15 Minutes	16-30 Minutes	Over 30 minutes	All of the Above	Don't Know
	440	27.5 %	5.9 %	1.4 %	28.0 %	37.3 %

Section 3: Natural and Official Warning

3.1 The following is a list of signs that might alert you of an arriving local tsunami	N	Unlikely	Maybe	Likely
a. Siren sounding	439	27.3 %	37.1 %	35.5 %
b. Loudspeaker/ bullhorn from Emergency Management/ Police	440	17.5 %	41.6 %	40.9 %
c. TV or radio broadcast	437	9.4 %	30.7 %	60.0 %
d. Relative, friend, or neighbor	436	27.1 %	43.8 %	29.1 %
e. Ground shaking from an earthquake	438	30.4 %	43.4 %	26.3 %
f. Sea-level drawdown (receding ocean)	432	9.5 %	27.1 %	63.4 %
g. Unusual waves (wall of water, rising tide-like flood, breaking wave, etc)	435	11.0 %	36.8 %	52.2 %
h. Unusual sounds	435	33.8 %	42.1 %	24.1 %

3.2 Rate how unlikely or likely each sign will occur for an arriving distant tsunami.	N	Unlikely	Maybe	Likely
a. Siren sounding	432	30.1 %	34.0 %	35.9 %
b. Loudspeaker/ bullhorn from Emergency Management/ Police	439	20.3 %	33.3 %	46.5 %
c. TV or radio broadcast	438	5.9 %	23.5 %	70.5 %
d. Relative, friend, or neighbor	437	17.8 %	38.0 %	44.2 %
e. Ground shaking from earthquake	433	59.6 %	26.3 %	14.1 %
f. Sea-level drawdown (receding ocean)	438	22.1 %	37.9 %	40.0 %
g. Unusual waves (wall of water, rising tide-like flood, breaking wave, etc)	438	22.4 %	40.9 %	36.8 %
h. Unusual sounds	436	49.3 %	34.6 %	16.1 %

3.3 Please indicate the extent to which you agree or disagree with each of the following statements.	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Earthquakes: I can easily distinguish ground shaking caused by a <u>large, nearby</u> earthquake from man-made causes of shaking	193	13.0 %	20.2 %	29.5 %	19.2 %	18.1 %
b. ground shaking caused by a <u>large, nearby</u> earthquake will last much <u>longer</u> than ground shaking due to human causes	184	13.0 %	17.9 %	34.8 %	20.1 %	14.1 %
c. ground shaking caused by a <u>large, nearby</u> earthquake will be much <u>stronger</u> than ground shaking due to human causes	188	4.8 %	13.3 %	29.8 %	26.6 %	25.5 %
d. Shoreline recession and	193	3.1 %	2.6 %	5.2 %	22.8 %	66.3 %

3.3 Please indicate the extent to which you agree or disagree with each of the following statements.	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
tides: I know where the shoreline is located during a normal low tide						
e. I am familiar with what the seafloor looks like during a normal low tide — such as exposed rocks and reef	191	4.7 %	2.6 %	6.8 %	26.2 %	59.7 %
f. when the shoreline recedes during a tsunami it will recede much <u>faster</u> than during a normal receding tide	192	2.6 %	1.6 %	19.8 %	26.0 %	50.0 %
g. during a tsunami the shoreline will always recede before the first tsunami wave reaches the beach	190	5.3 %	6.8 %	37.4 %	25.3 %	25.3 %
h. Tsunami waves: the shape of a tsunami wave near the coast could be a wall of water, a tide-like flood, or a breaking wave.	188	3.7 %	3.2 %	18.1 %	39.4 %	35.6 %
i. over short distances (1-2 miles), the shape of tsunami waves near the coast can be much different	183	1.6 %	3.8 %	37.2 %	32.2 %	25.1 %
j. tsunami waves will always look much different than other waves	185	7.6 %	21.1 %	39.5 %	18.9 %	13.0 %

Section 4: Value of Preparedness

4.1 Please indicate the extent to which you agree or disagree with each of the following statements about preparing for tsunamis .	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
a. Tsunamis are too destructive to bother preparing for	437 191	46.5 % 40.8 %	20.8 % 25.1 %	17.2 % 22.5 %	9.6% 8.4 %	5.9 % 3.1 %	
b. A serious tsunami is unlikely to affect me in the future	441 194	12.5 % 13.4 %	17.5 % 14.4 %	33.3 % 30.4 %	22.9 % 23.7 %	13.8 % 18.0 %	
c. Preparing for tsunamis is inconvenient for me	436 189	35.1 % 26.5 %	26.6 % 26.5 %	23.4 % 30.7 %	9.2 % 11.1 %	5.7 % 5.3 %	
d. It is difficult to prepare for tsunamis	438 185	13.7 % 14.6 %	15.8 % 16.8 %	24.7 % 33.5 %	26.3 % 20.5 %	19.6 % 14.6 %	
e. Preparing for tsunamis will reduce damage to my home should one occur	440 190	26.4 % 27.4 %	23.2 % 23.7 %	23.6 % 23.2 %	13.6 % 14.2 %	13.2 % 11.6 %	
f. Preparing for tsunamis will improve my everyday living condition	439 187	28.5 % 27.3 %	25.1 % 32.1 %	29.8 % 31.0 %	11.6 % 5.9 %	5.0 % 3.7 %	
g. Preparing for tsunamis will improve my ability to deal with disruption to family/community life should one occur	441 189	8.4 % 11.1 %	10.0 % 13.2 %	24.3 % 30.2 %	32.4 % 26.5 %	24.9 % 19.0 %	
h. Preparing for tsunamis will help save lives should one occur	441 190	4.3 % 5.3 %	4.8 % 3.7 %	11.3% 15.3 %	30.2 % 39.5 %	49.4 % 36.3 %	
i. I do not know how I can prepare for tsunamis	439 191	5.7 % 12.6 %	6.4 % 17.3 %	20.0 % 25.7 %	23.5 % 21.5 %	44.4 % 23.0 %	
4.2 How likely is it that the following groups would <u>favor</u> adopting tsunami protective measures (practicing preparedness)?	N	Very Unlikely	Unlikely	Neutral	Likely	Very Likely	Does not Apply
a. Your family	428	11.0 %	8.9 %	14.5 %	24.5 %	37.1 %	4.0 %
b. Your friends	426	12.0 %	12.7 %	24.9 %	24.2 %	24.4 %	1.9 %
c. Your co-workers	416	9.6 %	12.3 %	16.1 %	14.4 %	16.8 %	30.8 %
d. Your general community	427	8.4 %	11.5 %	25.8 %	26.0 %	27.6 %	0.7 %

4.3 How likely is it that the following groups would think that something could be done to prevent injury and damage in the event of a tsunami?

	N	Very Unlikely	Unlikely	Neutral	Likely	Very Likely	Does not apply
a. Your family	427	10.1 %	9.8 %	17.1 %	22.5 %	37.2 %	3.3 %
b. Your friends	427	8.4 %	12.6 %	24.1 %	22.5 %	30.7 %	1.6 %
c. Your co-workers	420	7.9 %	9.0 %	19.3 %	16.2 %	17.9 %	29.8 %
d. Your general community	428	7.2 %	12.6 %	25.5 %	24.1 %	29.4 %	1.2 %

4.4 How strongly do the views of the following groups influence your decisions:

	N	Not at all	A little bit	Neutral	Strongly	Very Strongly	Does not apply
a. Your family	422	1.7 %	3.3 %	7.8 %	24.2 %	63.0 %	0.0 %
b. Your friends	437	1.8 %	6.4 %	30.4 %	40.7 %	19.7 %	0.9 %
c. Your co-workers	429	7.7 %	14.5 %	23.5 %	17.0 %	7.0 %	30.3 %
d. Your general community	437	7.6 %	18.5 %	44.4 %	19.7 %	8.2 %	1.6 %

4.5 Please rate from “not at all prepared” to “very prepared” the extent to which you perceive each of the following is prepared to deal with a major tsunami.

	N	Not at all Prepared	Somewhat prepared	Neutral	Prepared	Very Prepared
a. You	192	26.6 %	30.7 %	26.0 %	11.5 %	5.2 %
b. Your community	196	27.6 %	34.2 %	27.6 %	7.1 %	2.0 %

Section 5: Tsunami Preparedness in the Community

5.1	N	Yes	No	Don't Know	Not applicable
a. Does your <u>neighborhood</u> have a tsunami preparedness plan?	433 192	0.7 % 4.7 %	40.6 % 42.2 %	58.0 % 53.1 %	.7 % ---
b. Does your <u>place of employment</u> have a tsunami preparedness plan?	427 182	2.3 % 5.5 %	48.2 % 47.8 %	19.7 % 11.0 %	29.7 % ?.? %

Have you been involved in meetings on tsunami preparedness:

c. At school?	431 182	1.2% 0.0%	84.0 % 81.8 %	2.5 % 1.1 %	12.3 % 17.1 %
d. In your workplace?	427 187	1.6 % 3.2 %	81.3 % 73.8 %	2.6 % 1.1 %	14.5 % 21.9 %
e. In the local community?	432 188	1.6 % 2.7 %	92.4 % 92.6 %	4.2 % 3.2 %	1.9 % 1.6 %

Have you discussed the need for tsunami preparedness with:

f. Your family?	435 192	18.6 % 25.5 %	78.6 % 69.3 %	1.4 % 1.6 %	1.4 % 3.6 %
g. Your neighbors?	433 190	3.9 % 9.5 %	93.8 % 86.8 %	1.6 % 1.6 %	.7 % 2.1 %
h. Employer/employees?	425 185	3.1 % 3.8 %	81.6% 75.7 %	1.4 % 0.5 %	13.9 % 20.0 %
i. Official agencies?	426 185	3.1 % 1.6 %	92.3 % 94.1 %	1.6 % 1.1 %	3.1 % 3.2 %

5.2 With regard to what happens in your community, how often do you

	N	Never	Rarely	A Few Times a Year	Once a Month	A Few Times a Month
a. Think about tsunami issues as they relate to your community	195	25.6 %	51.3%	19.5 %	2.6 %	1.0 %
b. Talk about tsunami issues and problems with others in your community	195	48.7 %	41.0%	8.7 %	.5 %	1.0 %

5.3 Since last year when you completed our questionnaire, have you taken any of the following steps?

	N	No	Yes	Not Applicable
a. Developed a family emergency response plan	190	70.5 %	26.8 %	2.6 %
b. Stored 3-day supply non-perishable food/ water	192	54.2 %	45.8 %	0.0 %
c. Prepared a backpack with supplies ready to take	192	78.6 %	21.4 %	0.0 %
d. Replaced the batteries in my Weather Radio	189	57.1 %	36.5 %	6.3 %
e. Prepared to respond to tsunamis in more places than my home	192	88.0 %	10.4 %	1.6 %
f. Participated in a tsunami evacuation drill	192	98.4 %	.5 %	1.0 %

Section 6: Tsunami Preparedness in Schools

6.1 Does your child's school have a disaster preparedness plan that includes tsunamis?	N	Yes	No	Don't know
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Percentages ONLY include those who reported having school age children:	96	3.1 %	31.3 %	65.6 %
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6.2 Percentages in this table include only those who responded (have school aged children).	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply
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a. I will allow my child to remain at school when a tsunami warning is issued	114	50.0 %	6.1 %	10.5 %	0.9 %	5.3%	27.2%
b. I will go and get my child from school when a tsunami warning is issued	111	9.9 %	0.9 %	8.1 %	5.4%	50.5 %	25.2%
c. I trust that the tsunami preparedness plan at my child's school will protect my child during a tsunami event	116	29.3 %	11.2 %	19.0 %	6.9%	5.2 %	28.4%

Section 7: Evacuations

7.1 Do you live in a tsunami inundation (hazard or danger) zone?	N	Yes	No	Don't know
	436	42.4 %	9.9 %	47.7 %

Local tsunami is defined as off the coast of North Carolina, a distant tsunami refers to a tsunami from Puerto Rico or the Canary Islands.

7.2 What is the estimated time that you will have to reach high ground in New Hanover County?	N	Less than 15 minutes	About 15-45 Minutes	About 45 minutes to 2 hours	About 2-4 Hours	Over 4 hours	Don't Know
a. For a local tsunami	439	34.2 %	23.7 %	9.8 %	2.7 %	.9 %	28.7 %
b. For a distant tsunami	436	2.3 %	8.0 %	24.8 %	20.2 %	16.1 %	28.7 %

7.3 Are there official tsunami evacuation routes for your community?	N	Yes	No	Don't Know
	439	12.1 %	34.6%	53.3 %

7.4 If you have ever followed an official evacuation route, was it:	N	During an official warning?	As part of an official exercise or drill?	Motivated by personal curiosity?	Does not apply
	400	42.0 %	.4 %	4.0 %	12.6 %

7.5 Have you ever evacuated your residence for a hurricane?	N	Yes	No
	439	73.0%	25.6 %

7.6 Now we want to ask about your experience with tsunami evacuation routes . Please read each statement and <u>mark all that apply</u> .	N	Yes	No
a. I have driven or walked an evacuation route to an area safe from tsunamis	193	25.9 %	74.1 %
b. I drive or walk a tsunami evacuation route regularly as part of normal life	193	32.1 %	67.9 %
c. I already know the evacuation route but have not physically driven it	193	18.7 %	81.3 %
d. I am physically unable to follow an evacuation route	193	3.1 %	96.9 %
e. I have not followed an evacuation route	193	22.8 %	77.2 %
f. There are no official evacuation routes for my community	192	9.9 %	90.1 %
g. I do not know if my community has an evacuation route	193	39.4 %	60.6 %

7.7 Looking back at your decision to evacuate, would you do anything differently in the same situation?	N	Yes	No	Don't Know
	404	18.9 %	67.5 %	4.3 %

7.11	Local warning	Distant Warning
How would you respond to a warning of a local tsunami? How would you respond to a distant tsunami?		

I would have more time to do something	-----	18.7 %
Evacuate	80 %	43.4 %
Stay home or stay put	5.6 %	2.7 %
Gather important belongings or secure household	16.4 %	31.2 %
Monitor progress on TV, Radio. Listen to the information provided and make decisions based on that	1.3 %	12.6 %
Do nothing	2.2 %	-----
Call family or friends, or notify neighbors	2.7%	3.4 %
Other	2.9%	1.3 %
Don't Know	2.2%	3.4 %

Section 8: Trust

8.1 With regard to your feelings about leadership and the media in your community , please indicate the extent to which you agree or disagree with the following statements:	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. I trust my local government to meet the needs of residents	440 193	11.6 % 9.3 %	20.2 % 21.8 %	35.2 % 41.5 %	27.3 % 22.8 %	5.7 % 4.7 %
b. I trust the community leaders in my community	438 192	12.6 % 9.4 %	17.8 % 21.9 %	37.7 % 39.1 %	25.6 % 25.5 %	6.4 % 4.2 %
c. I trust the local media (newspapers, TV, radio) to report fairly	440 193	9.8 % 16.1 %	14.5 % 20.7 %	36.4 % 34.7 %	30.9 % 23.8 %	8.4 % 4.7 %
d. I trust my local government to do what is right for the people they represent	440 192	11.1 % 7.8 %	20.0 % 27.6 %	37.3 % 39.6 %	25.2 % 22.4 %	6.4 % 2.6 %
e. I have confidence in the law to protect and maintain order in my community	438 194	3.0 % 5.2 %	7.3 % 7.7 %	21.5 % 17.5 %	42.9 % 49.5 %	25.3 % 20.1 %

Section 9: Future activities – Intent

9.1 <u>In the next month</u> or so, do you intend to do any of the following:	N	No	Possibly	Definitely
a. Improve your knowledge of tsunamis	414 192	34.5 % 51.6 %	56.3 % 41.1 %	9.2 % 7.3 %
b. Increase your ability to respond to tsunamis	413 194	39.5 % 52.6 %	48.4 % 41.8 %	12.1 % 5.7 %
c. Become involved with a local group/neighborhood to discuss how to respond to tsunamis	414 194	67.1 % 78.9 %	29.2 % 18.6 %	3.6 % 2.6 %
d. Seek information on tsunami risks	414 194	36.7 % 61.9 %	46.6 % 31.4 %	16.7 % 6.7 %
e. Seek information on things to do to respond to tsunamis	414 194	35.0 % 53.6 %	47.3 % 38.1 %	17.6 % 8.2 %

Section 10: Sense of Community

10.1 I have . . .	N	Never	Rarely	Sometimes	Often
a. Worked with others on something to improve my neighborhood	435 194	17.7 % 6.2 %	22.5 % 25.8 %	41.8 % 45.9 %	17.9 % 22.2 %
b. Participated in local activities or events (for example, festivals, fairs)	439 195	16.2 % 9.7 %	14.8 % 22.1 %	44.4 % 41.5 %	24.6 % 26.7 %
c. Contributed money, food, or clothing to local causes, charities, or others in my community	438 194	2.7 % 1.5 %	3.2 % 1.5 %	40.2 % 42.8 %	53.9 % 54.1 %
d. Attended a public meeting on a community issue	431 190	16.5 % 15.8 %	20.9 % 25.8 %	42.5 % 39.5 %	20.2 % 18.9 %
e. Been involved in volunteer activities intended to benefit my community (for example, fundraising)	439 195	14.6 % 11.8 %	22.3 % 26.7 %	37.8 % 36.9 %	25.3 % 24.6 %

10.2 Your community's ability to . . .	N	Very Low	Low	Neutral	High	Very High
a. Quickly start community-wide action.	193	10.4 %	14.5 %	40.9 %	27.5 %	6.7 %
b. Organize how specific demands facing the community will be addressed across the community.	186	10.2 %	22.0 %	38.7 %	25.3 %	3.8 %
c. Delegate responsibility to the most appropriate individuals to meet crisis demands.	187	8.0 %	15.0 %	39.0 %	27.8 %	10.2 %
d. Identify and respond to individuals in greatest need.	185	7.6 %	16.2 %	42.7 %	23.8 %	9.7 %
e. Recognize the need for outside support.	186	7.5 %	10.8 %	31.7 %	38.7 %	11.3 %
f. Effectively utilize of outside resources (physical labor, money, food) that are offered.	183	7.1 %	15.8 %	33.9 %	33.9 %	9.3 %
g. Adequately solve conflicts within the community.	189	14.8 %	16.9 %	47.6 %	15.3%	5.3 %
h. Successfully respond to a future disaster.	186	4.8 %	8.1 %	32.8 %	38.7 %	15.6 %
i. Identify appropriate individuals within the community to lead recovery efforts.	186	6.5 %	11.3 %	31.7 %	37.1 %	13.4 %
j. Deal with emotional responses that are part of a disaster.	182	10.4 %	19.2 %	46.7 %	19.2 %	4.4 %
k. Ability for me to work effectively with others in the community.	192	3.1 %	8.3 %	33.3 %	41.1 %	14.1 %
l. Ability of others within the community to work effectively with me.	192	2.1 %	7.8 %	35.4 %	41.1 %	14.1 %

10.3 I believe that . . .	N	Not at All	Not Very Much	Sometimes	A Great Deal	Always
a. I can influence what happens in my community	437 192	4.6 % 3.1 %	24.3% 30.7 %	60.0 % 51.0 %	9.8 % 14.1 %	1.4 % 1.0 %
b. I see <u>positive</u> results from my participation in <u>community</u> activities	434 192	8.8 % 8.9 %	22.4% 23.4%	52.3 % 45.8 %	14.5 % 19.3 %	2.1 % 2.6 %
c. I have an active part in keeping this community going	433 192	12.7 % 13.0 %	40.6 % 38.0 %	32.1 % 37.5 %	12.5 % 9.4 %	2.1 % 2.1 %
d. Elected representatives seriously consider my opinions	435 193	19.5 % 16.6 %	30.1 % 28.0 %	38.6 % 43.5 %	10.1 % 8.3 %	1.6 % 3.6 %

10.4 In <u>general</u> , and with regard to your <u>feelings</u> about living in your <u>community</u> , please indicate the extent to which you agree or disagree with each of the following statements.	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. This community is a great place to live	438	—	2.3%	11.2 %	36.8 %	49.8 %
b. This community has just about everything that is needed for a happy life	440	1.1%	2.7 %	16.1 %	41.4 %	38.6 %
c. This community is a safe place to live	440	1.6%	2.3 %	14.8 %	42.5 %	38.9 %
d. This community is a good place to raise children	434	2.1%	5.8 %	20.0 %	35.3 %	36.9 %
e. Residents of this community get along well with each other	438	1.1%	5.0 %	30.6 %	41.6 %	21.7 %
f. There are few dependable ties between people anymore	431	11.1%	27.4 %	32.5 %	20.6 %	8.4 %
g. Residents of this community look for new solutions rather than being satisfied with the way things are	440	5.0%	15.7 %	42.5 %	30.7 %	6.1 %
h. People want to work together to get things done in this community	440	3.6%	12.7 %	42.3 %	34.3 %	7.0 %
i. The future of this community looks bright	439	3.0%	5.5%	22.3 %	44.2 %	25.1 %
j. People who live around here are quite helpful	438	2.1%	7.1 %	27.6 %	44.5 %	18.7 %

10.5 When deciding on a particular course of action, to what extent do you agree or disagree that the opinions of the following groups are important to you?

	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does not apply
a. Your family	435	1.8 %	.9 %	6.9 %	21.1 %	66.0 %	3.2 %
b. Your friends	435	.7 %	3.9 %	26.0 %	43.4 %	24.4 %	1.6 %
c. Your co-workers	427	5.6 %	12.6 %	24.6 %	16.6 %	8.0 %	32.6 %
d. Your general community	433	8.3 %	17.1 %	40.0 %	22.2 %	9.9 %	2.5 %

10.6 With regard to how you normally deal with problems in your life, please describe the extent to which you agree or disagree with each of the following statements.

	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. I try to come up with a strategy about what to do	194	1.0 %	5.1 %	15.4 %	43.1 %	35.4 %
b. I make a plan of action	194	0.5 %	6.2 %	17.0 %	42.3 %	34.0 %
c. I think hard about what steps to take	195	1.0 %	5.1 %	15.4 %	43.1 %	35.4 %
d. I think about how I might best handle the problem	194	0.5 %	3.1 %	13.4 %	42.8 %	40.2 %

Section 11: Other Questions

11.1 If you have evacuated your residence for a hurricane how likely are you to evacuate for future hurricanes?

	N	Likely	Somewhat Likely	Neutral	Somewhat Unlikely	Unlikely
Evacuation in case of a Category 1 hurricane						
Evacuation in case of a Category 2 hurricane						
Evacuation in case of a Category 3 hurricane						
Evacuation in case of a Category 4 hurricane						
Evacuation in case of a Category 5 hurricane						

Table 11.2: The data presented in the table below is in response to the same question as 7.11. It provides an in depth examination of how participants would change their actions depending on a local or distant tsunami warning. The table shows the number of people who responded and multiple responses were allowed.

		Distant Tsunami Warning								
Local Tsunami Warning	New Hanover County, North Carolina	Evacuate	Stay put, Stay or go home	Gather important belongings or secure household	Monitor progress on TV, Radio, Internet	Do nothing	Call family & friends or notify/help neighbors	more time	Other	Don't know
	Evacuate	265	7	125	53	0	13	68	5	1
	Stay put, Stay or go home	120	17	50	13	0	6	16	2	0
	Gather important belongings or secure household	77	2	99	25	0	4	21	3	0
	Monitor progress on TV, Radio, Internet	18	1	8	17	0	3	5	1	0
	Do nothing	8	0	1	0	2	0	2	1	0
	Call family & friends or notify/help neighbors	9	1	5	1	0	11	2	1	0
	Other	20	0	8	2	0	4	6	14	0
Don't know	2	0	1	1	0	0	1	0	1	

Appendix A: Phase 1 Survey

UNITED STATES COMMUNITY SURVEY – NEW HANOVER COUNTY BEACHES

SECTION I – BACKGROUND

1. How long have you lived in the following places:

- a. North Carolina? _____ years
- b. New Hanover County? _____ years
- c. Your place of residence? _____ years

SECTION II – ATTITUDES & BELIEFS ABOUT TSUNAMIS

1. Please indicate the extent to which you agree or disagree with each of the following statements about **future tsunamis along the New Hanover County Beaches**. (Mark one per line)

	Strongly Disagree	↔			Strongly Agree
a. There may be tsunamis, but they won't be that bad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The location of the tsunamis will be far away from here and have little impact on me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. The likelihood that major tsunamis will occur here has been greatly exaggerated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How likely or unlikely is a **damaging tsunami** along the New Hanover County Beaches during the following time periods: (Mark one per line)

	Very Unlikely	↔			Very Likely
a. Less than 12 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Less than 10 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Less than 100 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Less than 500 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION III – TSUNAMI AWARENESS

1. What is the most frequent cause of tsunamis? (Mark one)

- Landslide Hurricane/storm Don't Know
- High tide Earthquake

2. When was the last damaging tsunami in your community? (Mark one)

- | | | |
|-------------------------------|--------------------------------|-------------------------------------|
| <input type="checkbox"/> 1700 | <input type="checkbox"/> 2004 | <input type="checkbox"/> 1886 |
| <input type="checkbox"/> 1964 | <input type="checkbox"/> Never | <input type="checkbox"/> Don't Know |

3. Tsunami waves can occur as which of the following: (Mark one)

- | | |
|---|--|
| <input type="checkbox"/> One big wave | <input type="checkbox"/> Multiple big waves and multiple small waves |
| <input type="checkbox"/> Multiple big waves | <input type="checkbox"/> Don't know |

4. When a **local tsunami** originates off the coast of North Carolina what is the estimated time you will have to reach high ground in Carolina, Kure or Wrightsville Beach? (Mark one)

- | | | |
|---|--|---------------------------------------|
| <input type="checkbox"/> Less than 15 minutes | <input type="checkbox"/> About 45 minutes to 2 hours | <input type="checkbox"/> Over 4 hours |
| <input type="checkbox"/> About 15 to 45 minutes | <input type="checkbox"/> About 2-4 hours | <input type="checkbox"/> Don't Know |

5. In contrast, what is the estimated time you will have to reach high ground in Carolina, Kure or Wrightsville Beach when a **distant tsunami** originates in the Puerto Rican Trench? (Mark one)

- | | | |
|---|--|---------------------------------------|
| <input type="checkbox"/> Less than 15 minutes | <input type="checkbox"/> 45 minutes to 2 hours | <input type="checkbox"/> Over 4 hours |
| <input type="checkbox"/> 15 to 45 minutes | <input type="checkbox"/> 2 to 4 hours | <input type="checkbox"/> Don't Know |

6. During a tsunami, how much time can there be between one tsunami wave and the next tsunami wave? (Mark one)

- | | | |
|--|---|-------------------------------------|
| <input type="checkbox"/> 1-15 minutes | <input type="checkbox"/> Over 30 minutes | <input type="checkbox"/> Don't Know |
| <input type="checkbox"/> 16-30 minutes | <input type="checkbox"/> All of the above | |

7. The following is a list of signs that might alert you of an arriving **local** tsunami? Rate how unlikely or likely each sign will occur. (Mark one per line)

Sign	Unlikely	Maybe	Likely
a. Siren sounding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Loudspeaker/ bullhorn from Emergency Management/ Police	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. TV or Radio broadcast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Relative, friend, or neighbor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Ground shaking from an earthquake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Sea-level draw down (receding ocean)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Unusual waves (wall of water, rising tide-like flood, breaking wave, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Unusual sounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Now, consider the same signs as above, but rate how unlikely or likely each sign will occur for an arriving **distant** tsunami. (Mark one per line)

Sign	Unlikely	Maybe	Likely
a. Siren sounding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Loudspeaker/ bullhorn from Emergency Management/ Police	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. TV or Radio broadcast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Relative, friend, or neighbor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Ground shaking from earthquake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

f. Sea-level draw down (receding ocean)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Unusual waves (wall of water, rising tide-like flood, breaking wave, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Unusual sounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION IV – BECOMING TSUNAMI READY

1. Please indicate the extent to which you agree or disagree with each of the following statements about **becoming “Tsunami Ready.”** (Mark one per line)

	Strongly Disagree	↔	↔	Strongly Agree
a. Tsunamis are too destructive to bother preparing for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. A serious tsunami is unlikely to affect me in the future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Preparing for tsunamis is inconvenient for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. It is difficult to prepare for tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Preparing for tsunamis will reduce damage to my home should one occur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Preparing for tsunamis will improve my everyday living condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Preparing for tsunamis will improve my ability to deal with disruption to family/community life should one occur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Preparing for tsunamis will help save lives should one occur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. I do not know how I can prepare for a tsunami	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Describe how you would respond to a warning of a **local** tsunami.

3. Describe how your response to a warning of a **distant** tsunami (originating from the Puerto Rican Trench, etc.) would differ from your response to a local tsunami.

4. Do you live in a tsunami inundation (hazard or danger) zone? Yes No Don't Know

5. Are there official **tsunami** evacuation routes for your community? Yes No Don't Know

6. Are you **currently** taking steps to becoming more “Tsunami Ready”?

Yes No Don't Know

If you answered NO skip to QUESTION 8 on the next page

7. If you answered YES to QUESTION 6 on the previous page, which of the following steps have you taken or are you taking?

	No	Yes	Does not apply
a. Developing a family emergency response plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Have a 3-day supply of non-perishable food and water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Have a back pack filled with supplies that is ready to take with me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Have a NOAA Weather Radio and working batteries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Prepared to respond to tsunamis in more places than my home (e.g., workplace, church, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Participated in a tsunami evacuation drill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. In the next month or so, do you **intend** to do any of the following: (Mark one per line)

	No	Possibly	Definitely
a. Improve your knowledge of how to respond to tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Increase your ability to respond to tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Become involved with a local group/neighborhood to discuss how to respond to tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Seek information on tsunami risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Seek information on things to do to respond to tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. In the past few months have you learned about becoming "Tsunami Ready" from any of the following sources? (Mark all that apply)

	No	Yes	Does not apply
a. Tsunami warning signs on the beach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Tsunami presentation at a public meeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Tsunami presentation at a civic group meeting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. TV or radio broadcasts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Newspaper articles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Pamphlets on becoming "Tsunami Ready"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

g. Internet information on tsunamis

h. Other _____

SECTION V – TSUNAMI PREPAREDNESS IN YOUR COMMUNITY

We are interested in your views concerning the tsunami warning system and evacuation planning.

1. Please list the components of your community's tsunami warning system? (Please be specific)

- I do not know if my community has a tsunami warning system.
- My community has a tsunami warning system, but I do not know the components of it.

2. What do emergency managers advise you to do during a **tsunami evacuation**? (Please be specific)

- I do not know what they advise.

3. What are the major problems or limitations of your community's tsunami warning system and evacuation plan? (Please be specific)

4. Please answer the following questions concerning tsunami preparedness. (Mark one per line)

	Yes	No	Don't Know	Not applicable
a. Does your <u>neighborhood</u> have a tsunami preparedness plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Does your <u>place of employment</u> have a tsunami preparedness plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Have you been involved in meetings on tsunami preparedness:				
1. At school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. In your workplace?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. In the local community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Have you discussed the need for tsunami preparedness with:				
1. Your family?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Your neighbors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Employer/employees?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Official agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Others? (Specify): _____

5. If you do not have a school aged child or children (grades K-12) then skip to QUESTION 7. Otherwise, does your child's school have a disaster preparedness plan that includes tsunamis?
 Yes No Don't know

6. Please indicate the extent to which you agree or disagree with each of the following statements:

	Strongly Disagree		↔		Strongly Agree		Does not Apply
a. I will allow my child to remain at school when a tsunami warning is issued	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I will go and get my child from school when a tsunami warning is issued	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I trust that the tsunami preparedness plan at my child's school will protect my child during a tsunami event	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Now we want to ask you some questions about you and your community.

7. How likely is it that the following groups would **favor** adopting tsunami protective measures (practicing preparedness)? (Mark one per line)

	Very Unlikely		↔		Very Likely		Does not Apply
a. Your family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Your friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Your co-workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Your general community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. How likely is it that the following groups would think that something could be done to prevent injury and damage in the event of a tsunami? (Mark one per line)

	Very Unlikely		↔		Very Likely		Does not Apply
a. Your family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Your friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Your co-workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Your general community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION VI – HURRICANE AWARENESS AND PREPAREDNESS

1. How likely or unlikely is a **Category 4 or 5 Hurricane** along the New Hanover County Beaches during the following time periods: (Mark one per line)

	Very Unlikely		↔		Very Likely
a. Less than 12 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Less than 10 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Less than 100 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Less than 500 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How likely or unlikely is a **Category 2 or 3 Hurricane** along the New Hanover County beaches during the following time periods: (Mark one per line)

	Very Unlikely		↔		Very Likely
a. Less than 12 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Less than 10 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Less than 100 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Less than 500 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. How likely or unlikely is a **Category 1 Hurricane** along the New Hanover County Beaches during the following time periods: (Mark one per line)

	Very Unlikely		↔		Very Likely
a. Less than 12 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Less than 10 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Less than 100 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Less than 500 years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Do you live in an area that is predicted to flood in a Category 2 Hurricane?

- Yes No Don't Know

5. Are you **currently** taking steps to becoming more prepared for the next **Hurricane**?

- Yes No Don't Know

If you answered NO skip to QUESTION 8 on the next page.

6. If you answered YES to QUESTION 5, which of the following steps have you taken or are you taking?

	No	Yes	Does not apply
a. Developing a family emergency response plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Have a 3-day supply of non-perishable food and water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Have a back pack filled with supplies that is ready to take with me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Have a NOAA Weather Radio and working batteries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Prepared to respond to hurricanes in more places than my home (e.g., workplace, church, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Became familiar with hurricane evacuation routes/signage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Please indicate how much you agree or disagree that the following sources of hurricane information influenced your willingness to prepare. (Mark one per line)

	Strongly Disagree		↔	Strongly Agree	
a. Public educational meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. World events such as Hurricane Katrina	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Attendance at a hurricane expo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. School programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. City newsletters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Television coverage (Weather Channel, local news, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. In the next month or so, do you **intend** to do any of the following: (Mark one per line)

	No	Possibly	Definitely
a. Improve your knowledge of how to respond to hurricanes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Increase your ability to respond to hurricanes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Become involved with a local group/neighborhood to discuss how to respond to hurricanes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Seek information on hurricane risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Seek information on things to do to respond to hurricanes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Are there official **hurricane** evacuation routes for your community? Yes No Don't Know

10. If you have ever followed an official **hurricane** evacuation route, was it: (Mark all that apply)

- During an official warning?
- As part of an official exercise or drill?
- Motivated by personal curiosity?
- Does not apply (I have not followed an official hurricane evacuation route)

11. Have you ever evacuated your residence for a hurricane? Yes No Don't Know

12. Looking back at your decision to evacuate for that hurricane, would you do anything differently in the same situation again? Yes No Don't Know

13. If YES, what is it that you would do differently? _____

14. How likely or unlikely are you to evacuate your residence for a hurricane that is predicted to make landfall within 15 miles of the New Hanover County Beaches. (Mark one per line)

	Unlikely to Evacuate		↔	Likely to Evacuate	
a. Category 1 Hurricane (winds 74-95 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Category 2 Hurricane (winds 96-110 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Category 3 Hurricane (winds 111-130 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Category 4 Hurricane (winds 131-155 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Category 5 Hurricane (winds greater than 155 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


SECTION VII – LIFE IN YOUR COMMUNITY

The next questions will help us better understand how your community may prepare for future events.

1. With regard to participating in **this community**, please indicate how often you undertake each of the following activities. (Mark one per line)

<i>I have . . .</i>	Never	Rarely	Sometimes	Often
a. Worked with others on something to improve my neighborhood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Participated in local activities or events (for example, festivals, fairs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Contributed money, food, or clothing to local causes, charities, or others in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Attended a public meeting on a community issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Been involved in volunteer activities intended to benefit my community (e.g., fundraising)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. In general, and with regard to your **feelings** about **living in your community**, please indicate the extent to which you agree or disagree with each of the following statements. (Mark one per line)

	Strongly Disagree				Strongly Agree
a. What a community talks about depends on what residents are interested in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Struggles always occur to determine what issues this community should focus on	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Community perceptions depend on the quality of the individuals in that community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. How people think about community problems controls what is done about those problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. In **general**, and with regard to what happens **in your community**, to what extent do you or do you not believe each of the following statements. (Mark one per line)

<i>I believe that . . .</i>	Not at All	Not Very Much	Sometimes	A Great Deal	Always
a. I can influence what happens in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I see <u>positive</u> results from my participation in <u>community</u> activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I have an active part in keeping this community going	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Elected representatives seriously consider my opinions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. In **general**, and with regard to your **feelings** about leadership and the media **in your community**, please indicate the extent to which you agree or disagree with the following statements: (Mark one per line)

	Strongly Disagree	↔			Strongly Agree
a. I trust my local government to meet the needs of residents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I trust the community leaders in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I trust the local media (newspapers, TV, radio) to report fairly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I trust my local government to do what is right for the people they represent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I have confidence in the law to protect and maintain order in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. In **general**, and with regard to your **feelings** about living **in your community**, please indicate the extent to which you agree or disagree with each of the following statements. (Mark one per line)

	Strongly Disagree	↔			Strongly Agree
a. This community is a great place to live	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. This community has just about everything that is needed for a happy life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. This community is a safe place to live	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. This community is a good place to raise children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Residents of this community get along well with each other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. There are few dependable ties between people anymore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Residents of this community look for new solutions rather than being satisfied with the way things are	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. People want to work together to get things done in this community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. The future of this community looks bright	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. People who live around here are quite helpful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION VIII – GENERAL APPROACHES TO MAKING DECISIONS

1. How strongly do the views of the following groups influence your decisions? (Mark one per line)

	Not at All		↔	Very Strongly		Does not Apply
a. Your family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Your friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Your co-workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Your general community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. When deciding on a particular course of action, to what extent do you agree or disagree that the opinions of following groups are important to you? (Mark one per line)

	Strongly Disagree		↔	Strongly Agree		Does not Apply
a. Your family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Your friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Your co-workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Your general community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION IX – PERSONAL INFORMATION

Please provide the following information about yourself. Remember, all information is confidential. We only collect this information to compare the participants to the community.

1. In what year were you born? 19_____
2. What is your gender? Male Female
3. Which of the following best describes your marital status?

<input type="checkbox"/> Never married	<input type="checkbox"/> Married	<input type="checkbox"/> Living with a partner
<input type="checkbox"/> Separated	<input type="checkbox"/> Divorced	<input type="checkbox"/> Widowed
4. How many people live in your household (including yourself)? _____
5. How many dependent children live in your household (under 18 years)?

6. Do you own or rent your home? Own it Rent it Other _____

7. Where on the beach is your residence located?

- Oceanfront Second row back More than 3 rows back
 First row back Third row back Don't know

8. Which one of the following best describes your residency in this community?

- Full time Part time Visitor

9. Which of the following best describes your race? (Mark all that apply)

- White (Caucasian) Filipino Guamanian or Chamorro
 Black or African American Vietnamese Alaska Native
 American Indian Native Hawaiian Chinese
 Korean Other Pacific Islander Asian Indian
 Japanese Samoan
 Other Asian (Specify): _____

10. Check the box that best describes whether your descent is Spanish/Hispanic/Latino. Check the "no" box if your descent is not Spanish/Hispanic/Latino.

- No**, not Spanish/Hispanic/Latino Yes, Puerto Rican
 Yes, Mexican, Mexican American, Chicano Yes, Cuban
 Yes, other Spanish/Hispanic/Latino (Specify): _____

11. Which of the following best describes your yearly household income before taxes? (Mark one only)

- | | |
|---|---|
| <input type="checkbox"/> Less than \$10,000 | <input type="checkbox"/> \$100,000 to \$149,999 |
| <input type="checkbox"/> \$10,000 to \$14,999 | <input type="checkbox"/> \$150,000 to \$199,999 |
| <input type="checkbox"/> \$15,000 to \$24,999 | <input type="checkbox"/> \$200,000 to \$249,999 |
| <input type="checkbox"/> \$25,000 to \$34,999 | <input type="checkbox"/> \$250,000 to \$299,999 |
| <input type="checkbox"/> \$35,000 to \$49,999 | <input type="checkbox"/> \$300,000 to \$349,999 |
| <input type="checkbox"/> \$50,000 to \$74,999 | <input type="checkbox"/> \$350,000 to \$399,999 |
| <input type="checkbox"/> \$75,000 to \$99,999 | <input type="checkbox"/> \$400,000 or more |

12. Which best reflects the highest level of education that you completed? (Mark one only)

- | | |
|---|--|
| <input type="checkbox"/> <u>Less</u> than 9 th grade | <input type="checkbox"/> Associate degree |
| <input type="checkbox"/> 9 th to 12 th grade (no diploma) | <input type="checkbox"/> Bachelor's degree |
| <input type="checkbox"/> High school graduate (includes GED equivalency) | <input type="checkbox"/> Graduate or professional degree |

Some college, no degree

13. If you received this questionnaire through a Post Office Box, please provide your street address. Street _____ City _____
_Zip_____

14. In the event that we need to follow up on a few questions, would you be willing to participate in a telephone interview? Yes No. If yes, please provide your telephone number: _____

Thank you for your opinions. Remember, all of your information is confidential.

Appendix B: Phase 2 Survey

U.S. TSUNAMI AWARENESS SURVEY

NEW HANOVER COUNTY

If you completed a survey for us several months ago, you answered a number of questions similar or identical to those in this survey. We need your responses to these questions to measure how your beliefs about tsunami issues may or may not have changed.

SECTION I – LIFE IN YOUR COMMUNITY


In this section we ask about life in your community. This will help us better understand how aspects of your community may influence preparedness for tsunamis.

1. With regard to participating **in your community**, please indicate how often you undertake each of the following activities. (Mark one per line.)

<i>I have . . .</i>	Never	Rarely	Sometimes	Often
a. Worked with others on something to improve my neighborhood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Participated in local activities or events (for example, festivals, fairs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Contributed money, food, or clothing to local causes, charities, or others in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Attended a public meeting on a community issue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Been involved in volunteer activities intended to benefit my community (for example, fundraising)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Please rate the following abilities of your community. (Mark one per line.)


Your community's ability to . . .	<u>Very Low</u>		↔		<u>Very High</u>
a. Quickly start community-wide action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Organize how specific demands facing the community will be addressed across the community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Delegate responsibility to the most appropriate individuals to meet crisis demands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Identify and respond to individuals in greatest need	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Recognize the need for outside support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Effectively utilize outside resources (physical labor, money, food) that are offered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Adequately solve conflicts within the community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Successfully respond to a future disaster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Identify appropriate individuals within the community to lead recovery efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Deal with emotional responses that are part of a disaster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Now, please rate the following:	<u>Very Low</u>				<u>Very High</u>
k. Ability for me to work effectively with others in the community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Ability of others within the community to work effectively with me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. In **general**, and with regard to what happens **in your community**, to what extent do you or do you not believe each of the following statements? (Mark one per line.)

<i>I believe that . . .</i>	Not at All	Not Very Much	Sometimes	A Great Deal	Always
a. I can influence what happens in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I see <u>positive</u> results from my participation in <u>community</u> activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I have an active part in keeping this community going	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Elected representatives seriously consider my opinions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. With regard to your **feelings** about leadership and the media **in your community**, please indicate the extent to which you agree or disagree with the following statements. (Mark one per line.)

	Strongly Disagree				Strongly Agree
a. I trust my local government to meet the needs of residents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I trust the community leaders in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I trust the local media (newspapers, TV, radio) to report fairly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I trust my local government to do what is right for the people they represent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I have confidence in the law to protect and maintain order in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. With regard to what happens **in your community**, how often do you . . . (Mark one per line.)

	Never	Rarely	A Few Times a Year	Once a Month	A Few Times a Month	Once a Week or More
a. Think about tsunami issues as they relate to your community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Talk about tsunami issues and problems with others in your community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. With regard to how you normally deal with **problems in your life**, please describe the extent to which you agree or disagree with each of the following statements. (Mark one per line.)

	Strongly Disagree		↔	Strongly Agree	
a. I try to come up with a strategy about what to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I make a plan of action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I think hard about what steps to take	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I think about how I might best handle the problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Please rate from “not at all prepared” to “very prepared” the extent to which you perceive each of the following is prepared to deal with a major tsunami. (Mark one per line.)

	Not at all Prepared		↔	Very Prepared	
a. You	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Your community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION II – PREPARING FOR TSUNAMIS

1. In the next month or so, do you **intend** to do any of the following? (Mark one per line.)

	No	Possibly	Definitely
a. Improve your knowledge of tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Increase your ability to respond to tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Become involved with a local group/neighborhood to discuss how to respond to tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Seek information on tsunami risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Seek information on things to do to respond to tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Please answer the following questions concerning **tsunami preparedness**. (Mark one per line.)

	No	Yes	Don't Know	Not Applicable
a. Does your <u>neighborhood</u> have a tsunami preparedness plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Does your <u>place of employment</u> have a tsunami preparedness plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have you been involved in meetings on tsunami preparedness:				
c. At school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. In your workplace?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. In the local community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have you discussed the need for tsunami preparedness with:				
f. Your family?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Your neighbors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Employer/employees?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Official agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Others? (Specify): _____				

3. **Since last year** when you completed our questionnaire, have you taken any of the following steps?

	No	Yes	Not Applicable
a. Developed a family emergency response plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Stored a 3-day supply of non-perishable food and water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Prepared a backpack filled with supplies that is ready to take with me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Replaced the batteries in my NOAA Weather Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Prepared to respond to tsunamis in more places than my home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Participated in a tsunami evacuation drill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Now we want to ask about your experience with **tsunami evacuation routes**. Please read each statement and **mark all that apply**.

a. I have driven or walked an evacuation route to an area safe from tsunamis	<input type="checkbox"/>
b. I drive or walk a tsunami evacuation route regularly as part of normal life	<input type="checkbox"/>
c. I already know the evacuation route but have not physically driven it	<input type="checkbox"/>
d. I am physically unable to follow an evacuation route	<input type="checkbox"/>
e. I have not followed an evacuation route	<input type="checkbox"/>
f. There are no official evacuation routes for my community	<input type="checkbox"/>
g. I do not know if my community has an evacuation route	<input type="checkbox"/>

5. Please indicate the extent to which you agree or disagree with each of the following statements about **preparing for tsunamis**. (Mark one per line.)

	Strongly Disagree		Strongly Agree
a. Tsunamis are too destructive to bother preparing for	<input type="checkbox"/>	↔	<input type="checkbox"/>
b. A serious tsunami is unlikely to affect me in the future	<input type="checkbox"/>	↔	<input type="checkbox"/>
c. Preparing for tsunamis is inconvenient for me	<input type="checkbox"/>	↔	<input type="checkbox"/>
d. It is difficult to prepare for tsunamis	<input type="checkbox"/>	↔	<input type="checkbox"/>
e. Preparing for tsunamis will reduce damage to my home should one occur	<input type="checkbox"/>	↔	<input type="checkbox"/>
f. Preparing for tsunamis will improve my everyday living condition	<input type="checkbox"/>	↔	<input type="checkbox"/>
g. Preparing for tsunamis will improve my ability to deal with disruption to family/community life should one occur	<input type="checkbox"/>	↔	<input type="checkbox"/>
h. Preparing for tsunamis will help save lives should one occur	<input type="checkbox"/>	↔	<input type="checkbox"/>
i. I do not know how I can prepare for tsunamis	<input type="checkbox"/>	↔	<input type="checkbox"/>

SECTION III – NATURAL SIGNS OF TSUNAMIS

1. Please indicate the extent to which you agree or disagree with each of the following statements.

	Strongly Disagree		↔	Strongly Agree	
a. Earthquakes: I can easily distinguish ground shaking caused by a <u>large, nearby</u> earthquake from man-made causes of shaking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. ground shaking caused by a <u>large, nearby</u> earthquake will last much <u>longer</u> than ground shaking due to human causes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. ground shaking caused by a <u>large, nearby</u> earthquake will be much <u>stronger</u> than ground shaking due to human causes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Shoreline recession and tides: I know where the shoreline is located during a normal low tide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. I am familiar with what the seafloor looks like during a normal low tide — such as exposed rocks and reef	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. when the shoreline recedes during a tsunami it will recede much <u>faster</u> than during a normal receding tide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. during a tsunami the shoreline will always recede before the first tsunami wave reaches the beach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Tsunami waves: the shape of a tsunami wave near the coast could be a wall of water, a tide-like flood, or a breaking wave.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. over short distances (1-2 miles), the shape of tsunami waves near the coast can be much different	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. tsunami waves will always look much different than other waves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION IV – TSUNAMIS AND NEW HANOVER COUNTY

1. Please indicate the extent to which you agree or disagree with each of the following statements about **tsunami risk to New Hanover County beaches**. (Mark one per line.)

	Strongly Disagree		↔	Strongly Agree	
a. New Hanover County beaches are not vulnerable to tsunamis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. New Hanover County beaches are vulnerable to a tsunami generated near the Puerto Rican Trench	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. New Hanover County beaches are vulnerable to a tsunami generated near the Canary Islands/Cumbre Vieja Volcano	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. New Hanover County beaches are vulnerable to a tsunami generated near the continental shelf	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Please indicate the extent to which you agree or disagree with each of the following statements about likely damage to New Hanover County beaches generated from a tsunami near the **Puerto Rican Trench**. (Mark one per line.)

New Hanover County beaches will experience...	Strongly Disagree			Strongly Agree		
	↔					
a. little to no damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. considerable damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. severe damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Please indicate the extent to which you agree or disagree with each of the following statements about likely damage to New Hanover County beaches generated from a tsunami near the **Canary Islands/Cumbre Vieja Volcano**. (Mark one per line.)

New Hanover County beaches will experience...	Strongly Disagree			Strongly Agree		
	↔					
a. little to no damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. considerable damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. severe damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Please indicate the extent to which you agree or disagree with each of the following statements about likely damage to New Hanover County beaches generated from a tsunami near the **continental shelf**. (Mark one per line.)

New Hanover County beaches will experience...	Strongly Disagree			Strongly Agree		
	↔					
a. little to no damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. considerable damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. severe damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Does a **tsunami evacuation zone** exist for New Hanover County Beaches?

No

Yes Don't Know

6. Which of the following determines the location and size of the evacuation zone (Mark only one).

a. Distance back from the beach front along the ocean	<input type="checkbox"/>
b. Distance up from land/ground	<input type="checkbox"/>
c. Both distance back from the beach front and distance up from land/ground	<input type="checkbox"/>
d. Don't Know	<input type="checkbox"/>

7. If a tsunami warning is issued for New Hanover County and you are asked to leave the tsunami evacuation zone, will you be asked to: (Mark only one).

- a. Leave the island
- b. Leave only the beach front along the ocean
- c. Leave the beach front and/or go up from land/ground (for example second floor or higher)
- d. Don't Know

8. What is the estimated time you will have to prepare when a distant tsunami originates near the Puerto Rican Trench? (Mark one)

- | | | |
|---|--|---------------------------------------|
| <input type="checkbox"/> Less than 15 minutes | <input type="checkbox"/> About 45 minutes to 2 hours | <input type="checkbox"/> Over 4 hours |
| <input type="checkbox"/> About 15 to 45 minutes | <input type="checkbox"/> About 2-4 hours | <input type="checkbox"/> Don't Know |

9. What is the estimated time you will have to prepare when a distant tsunami originates near the Canary Islands/Cumbre Vieja Volcano? (Mark one)

- | | | |
|---|--|---------------------------------------|
| <input type="checkbox"/> Less than 15 minutes | <input type="checkbox"/> About 45 minutes to 2 hours | <input type="checkbox"/> Over 4 hours |
| <input type="checkbox"/> About 15 to 45 minutes | <input type="checkbox"/> About 2-4 hours | <input type="checkbox"/> Don't Know |

10. What is the estimated time you will have to prepare when a distant tsunami originates near the continental shelf? (Mark one)

- | | | |
|---|--|---------------------------------------|
| <input type="checkbox"/> Less than 15 minutes | <input type="checkbox"/> About 45 minutes to 2 hours | <input type="checkbox"/> Over 4 hours |
| <input type="checkbox"/> About 15 to 45 minutes | <input type="checkbox"/> About 2-4 hours | <input type="checkbox"/> Don't Know |

11. Since the previous survey, which of the following steps have you taken?

	No	Yes
a. Attended an information session on tsunami preparedness	<input type="checkbox"/>	<input type="checkbox"/>
b. Watched a tsunami preparedness DVD	<input type="checkbox"/>	<input type="checkbox"/>
c. Reviewed a tsunami preparedness flyer	<input type="checkbox"/>	<input type="checkbox"/>
d. Sought out information about tsunamis on the Internet	<input type="checkbox"/>	<input type="checkbox"/>

- e. Sought out information about tsunamis from friends/neighbors
- f. Sought out information about tsunamis from public officials
- g. Obtained a NOAA Weather Radio and working batteries

12. Please answer the following questions concerning tsunami preparedness in New Hanover County.
(Mark one per line)

	No	Yes	Don't Know
a. Have you ever heard of the designation Tsunami Ready Community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>b. If YES to a.</u>			
Is New Hanover County a Tsunami Ready Community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Does New Hanover County have a tsunami warning system?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION IV – NEW HANOVER COUNTY AND COASTAL HAZARDS

1. Please indicate the extent to which you agree or disagree with each of the following statements about **New Hanover County beaches and coastal hazards**. (Mark one per line.)

	Strongly Disagree	↔		Strongly Agree
a. New Hanover County beaches are vulnerable to <u>tsunamis</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. New Hanover County beaches are vulnerable to <u>hurricanes</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. New Hanover County beaches are vulnerable to <u>coastal flooding</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. New Hanover County beaches are vulnerable to <u>rip currents</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Is the roof of your house connected to the walls with hurricane clips and/or metal straps?

No

Yes Don't Know

3. Do you have any of the following hurricane protection devices?

	No	Yes
	<input type="checkbox"/>	<input type="checkbox"/>

a. Commercial storm shutters (non plywood)

b. Plywood storm shutters

4. How likely or unlikely are you to evacuate your residence for a hurricane that is predicted to make landfall within 15 miles of the New Hanover County Beaches. (Mark one per line)

	Unlikely to Evacuate		↔	Likely to Evacuate	
a. Category 1 Hurricane (winds 74-95 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Category 2 Hurricane (winds 96-110 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Category 3 Hurricane (winds 111-130 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Category 4 Hurricane (winds 131-155 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Category 5 Hurricane (winds greater than 155 mph)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Which of the following statements about rip currents are true (Mark all that apply).

- a. Rip currents exist along the New Hanover County beaches
- b. Rip currents are channelized currents of water flowing away from shore at surf beaches
- c. Rip currents typically form at breaks in sandbars and also near structures such as jetties and piers
- d. Rip currents are quite common and can be found on many surf beaches every day

6. What would you do if you were caught in a rip current? (Mark all that apply).

- a. Stay calm
- b. Don't fight the current
- c. Escape the current by swimming in a direction following the shoreline (parallel to the shoreline). When free of the current, swim at an angle—away from the current—toward shore.
- d. If you are unable to escape by swimming, float or tread water. When the current weakens, swim at an angle away from the current toward shore
- e. If at any time you feel you will be unable to reach shore, draw attention to yourself: face the shore, call or wave for help
- f. I would do nothing at all

7. Are you the same person who completed the tsunami survey we conducted last year? Yes No

8. In what year were you born? 19_____

9. What is your gender? Male Female

*Thank you for your feedback. All of the information you provide is confidential.
Please return the questionnaire to us in the postage-paid envelope provided.*

Appendix C: Tsunami Preparedness Brochure

Web link to educational brochure:

<http://wcatwc.arh.noaa.gov/tsunamiready/trbrochure.pdf>

Appendix D: Tsunami Preparedness DVD description

National Weather Service Wilmington, NC office Tsunami preparedness web page:

<http://www.erh.noaa.gov/er/ilm/tsunami/>

Web link to power point presentation:

http://www.tsunamiready.noaa.gov/resources/TsunamiReady_%202006.ppt