

# Public knowledge and perceptions of climate change in the Commonwealth of the Northern Mariana Islands

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An examination of the public's knowledge and perceptions of climate change and its impacts on the communities of Saipan, Tinian, and Rota in the Commonwealth of the Northern Mariana Islands

2014

***Abstract:** This study examines the public's knowledge and perceptions of climate change and its impacts in the Commonwealth of the Northern Mariana Islands (CNMI). A total of 419 surveys were conducted on the islands of Saipan, Tinian, and Rota. Respondents were asked a selection of questions designed to assess their basic knowledge of climate change, its causes and potential impacts, and their perception of vulnerability to climate change. The survey results suggest an overall lack of understanding of the causes and impacts of climate change among the general public, although respondents did display a moderate understanding of some specific topics.*

# **Public knowledge and perceptions of climate change in the Commonwealth of the Northern Mariana Islands**

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## Background

### 1.1 Project description

The Commonwealth of the Northern Mariana Islands (CNMI) is an island chain of thirteen islands located in the Western Pacific with a land mass of less than 185 square miles stretching over 375 miles north to south. CNMI has a total population of 53,883 permanent residents, which is concentrated on three southern-most islands - Saipan, Tinian, and Rota (U.S. Census Bureau 2010).

CNMI's Division of Coastal Resources Management (DCRM) was established by CNMI public law in 1983 and has jurisdiction over the CNMI's entire coastal zone, which covers all land in the Commonwealth. DCRM operates as an approved coastal zone management program under the United States Coastal Zone Management Act (CZMA) of 1972. The CZMA awards annual grants to US coastal states and territories that have approved coastal zone management programs. As part of this annual grant, DCRM receives funding under CZMA Section 309 for special projects that will develop or enhance the CNMI's coastal zone management program.

One of the major projects proposed under Section 309 Assessment and Strategy Report for 2011-2015 was the need to explore climate change impacts in CNMI. The Section 309 strategy developed under this effort had three components: to establish a multi-agency working group to initiate discussions on SLR and related climate topics; to conduct a community knowledge survey that would shape a public outreach campaign about climate impacts to CNMI; and to perform a risk and vulnerability assessment that would drive future coastal hazard planning in CNMI.

This public survey was completed to fulfill the second of the three components. Its results will help resource managers in CNMI to develop more appropriate education and outreach tools to help the CNMI public better understand and adapt to the changes they will face from climate change. This study will also help to inform the on-going effort by the inter-agency Climate Change Working Group to develop adaptation strategies for the communities of the CNMI.

### 1.2 Survey objectives & questions

Researchers identified four key objectives that we hoped to accomplish with this survey:

1. Identify any specific holes in knowledge, or any common misconceptions about climate change.
2. Identify any correlations between demographics and climate change knowledge.
3. Explore whether or not a better understanding of climate change will affect how “worried” people feel about climate change.
4. Identify where people are most likely to get information about climate change.

Based upon these key objectives, the survey was designed with four types of questions (please see Appendix 1: Survey Questionnaire for a copy of the survey):

1. Demographic information
2. Knowledge of climate change
3. Perception of climate change
4. Sources that people use to get information about climate change

# 1. Methodology

## 2.1 Sample size and survey locations

Researchers used the sample size equation published by Krejcie and Morgan to determine a necessary total CNMI sample size of 381 in order to achieve a 95% confidence level (Krejcie and Morgan 1970).

$$s = \frac{X^2 NP(1 - P)}{d^2 (N - 1) + X^2 P(1 - P)}$$

$s$  = required sample size

$X^2$  = the table value of chi-square for 1 degree of freedom at the desired confidence level ( $X^2 = 3.841$  for a 95% confidence level)

$N$  = given population size

$P$  = the population proportion (assumed to be .5)

$d$  = the degree of accuracy expressed as a proportion

The population of CNMI was divided into ten village groups that grouped the villages identified by the 2010 US Census based on population centers and geographic barriers: eight on Saipan, one for all of Tinian, and one for all of Rota (Figure 1, see Appendix 2: Saipan Village Groups for more details). A total of 419 surveys were completed: 382 on Saipan, 19 on Tinian, and 19 on Rota.

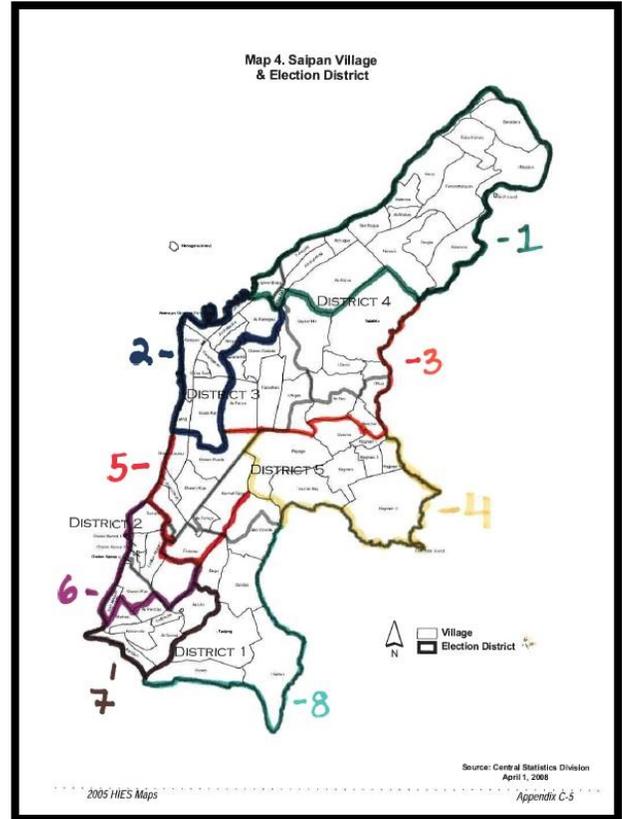


Figure 1: Eight village groups on Saipan

Respondents were surveyed using intercept interviews selected at random at various locations around the three islands. Locations were primarily in areas identified as having high foot traffic such as the post office, in front of banks, gas stations, supermarkets, and at popular weekend beach spots. In addition, surveys were conducted several times at the weekly Farmer’s Market (Tuesdays at Fishing Base), Street Market (Thursdays at Fishing Base), and Sabalu Market (Saturdays at the Civic Center).

Surveys were conducted on Saipan in September to November 2012, on Tinian in November 2012, and on Rota in January 2014. All efforts were made to conduct surveys on Rota at the same time as Saipan and Tinian; however researchers were unable to travel to Rota due to logistical obstacles. Researchers do not believe the data collected on Rota would have drastically changed during the year that separated the Saipan/Tinian surveys and the Rota surveys as there was no change in outreach and education efforts on Rota related to climate change during that time period.

## 2.2 Survey demographics

Before beginning the survey, respondents were first asked to verify that they had never completed this particular survey before, that they were residents of CNMI, and that they were 18 years or older. Throughout the data collection process, demographic data was monitored weekly and intercept interview sites were selected to ensure that the demographic composition of the survey respondents closely represented the demographic composition of the general public based upon data from the 2010 US

Census. While not exact, the demographics of the respondent population do resemble that of the broader CNMI population.

The following demographic data were used for this process: age, gender, and village group (Table 1).

For the age demographic, the population size for the 18-24 age group was determined by adding the totals of “15 to 19 years” and “20 to 24 years” from the 2010 US Census because no data for only 18 and over adults was available. However, only respondents 18 and over were asked to complete the survey. The “% of residents” for the age demographic was determined using the total population of 39,522, which excludes minors. Any instance where a “# of respondents” column does not add up to 419 (the total number of surveys analyzed) is due to a respondent not answering that particular demographic question.

**Table 1: Demographic data for the entire CNMI population versus the survey respondents**

	<b># of total residents</b>	<b>% of total residents</b>	<b># of respondents</b>	<b>% of respondent population</b>
<b>Village Group</b>				
Group 1	3,133	6%	23	5%
Group 2	10,690	20%	72	17%
Group 3	2,292	4%	23	5%
Group 4	4,897	9%	46	11%
Group 5	6,976	13%	36	9%
Group 6	8,159	15%	61	15%
Group 7	5,860	11%	51	12%
Group 8	6,207	12%	56	13%
Tinian	3,136	6%	22	5%
Rota	2,527	4%	21	5%
<b>Age</b>				
18-24	6,920	18%	111	26%
25-34	6,925	18%	107	25%
35-44	10,823	27%	101	24%
45-54	9,132	23%	58	13%
55+	5,722	14%	40	9%
Total	39,522			
<b>Gender</b>				
Male	27,746	52%	239	57%
Female	26,137	48%	170	40%

## 2. Results

The survey was divided into four sections. Each section was analyzed separately and is discussed below.

### 3.1. Have you heard of climate change/global warming?

Because the phenomenon now referred to as “climate change” was once described as “global warming”, researchers wanted to clarify any confusion in the terminology. Therefore, respondents were first asked if they had heard of “climate change”, if they had heard of “global warming”, and if they believed “climate change” and “global warming” were referring to the same phenomenon. The results for each question are listed below (Table 2 through Table 4).

**Table 2: Question #1a - Have you heard of climate change?**

	<b># of Respondents</b>	<b>% of Respondents</b>
Yes	333	79%
No	83	20%

**Table 3: Question #1b - Have you heard of global warming?**

	<b># of Respondents</b>	<b>% of Respondents</b>
Yes	390	93%
No	28	7%

**Table 4: Question #2 - Do you think they are the same thing?**

	<b># of Respondents</b>	<b>% of Respondents</b>
Yes	180	43%
No	110	26%
Don't know	129	31%

### 3.2 Knowledge of climate change

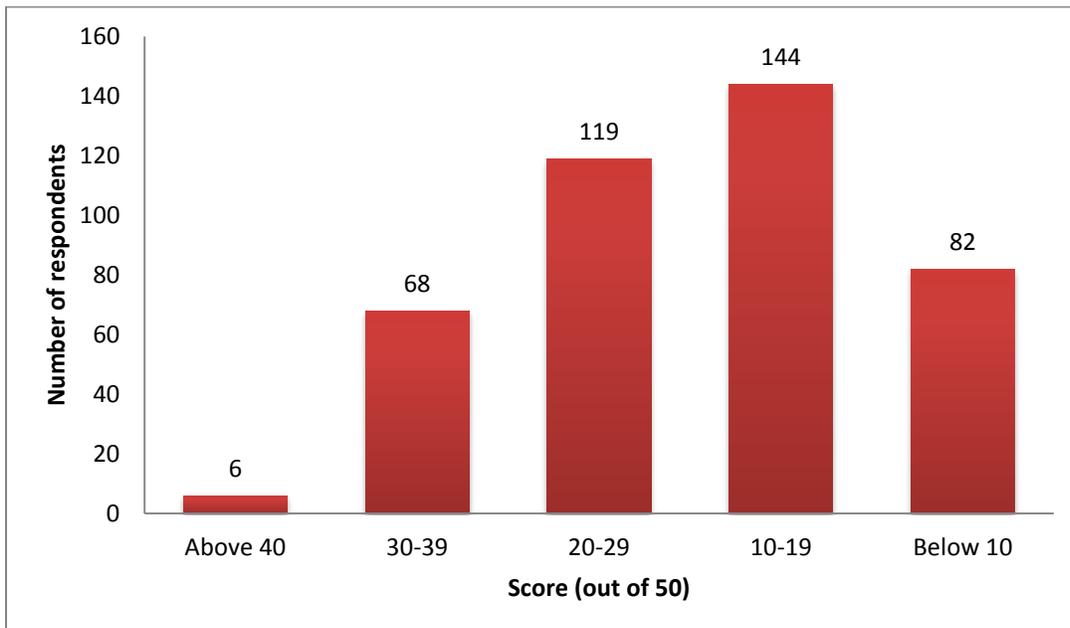
Respondents were asked a total of 17 “knowledge” questions that were designed to cover basic facts and misconceptions about climate change, its causes, and its potential impacts. These questions and their correct answers were developed based upon Yale University’s “Six Americas” survey (Leiserowitz and Smith 2010) with additional information pulled from the 2012 PIRCA report (Keener, et al. 2012) and then tested for clarity. These 17 knowledge questions were weighted and scored based on question type, with a total possible score of 50 points:

- 5 true/false or yes/no questions at 1 point each, with a possible total of 5 points
- 5 multiple choice or yes/no questions at 2 points each, with a possible total of 10 points
- 4 open ended questions asking for 7 open ended answers at 5 points each (2.5 points for “sort of” correct answers), with a possible total of 35 points

#### 3.2.1 Overall score

The score totals show an overall lack of understanding of the causes and impacts of climate change among the general public (Table 5).

**Table 5: Knowledge survey total scores**



### 3.2.2 True/False and Yes/No questions

Respondents were asked five true/false or yes/no questions that were worth one point each for a correct response, and zero points for an incorrect response or no response. The results for each question are listed below (Table 6 through Table 10), with the correct response in red.

**Table 6: Question #7 - Current climate change is caused mostly by humans**

	# of Respondents	% of Respondents
True	277	66%
False	81	19%
Don't Know	61	15%

**Table 7: Question #8. Did the Earth's climate ever change before the last one-hundred years?**

	# of Respondents	% of Respondents
Yes	298	71%
No	46	11%
Don't Know	75	18%

**Table 8: Question #9. Is there still a lot of disagreement among scientists about whether or not climate change is happening?**

	# of Respondents	% of Respondents
Yes	270	64%
No	78	19%
Don't Know	71	17%

**Table 9: Question #10. Is there still a lot of disagreement among scientists about whether or not climate change is caused by humans?**

	# of Respondents	% of Respondents
Yes	255	61%
No	94	22%
Don't Know	70	17%

**Table 10: Question #14. Greenhouse gases are always bad for people and the environment.**

	# of Respondents	% of Respondents
True	202	48%
False	140	33%
Don't Know	77	18%

### 3.2.3 Multiple choice questions

Respondents were asked four multiple choice questions that had one correct answer and three incorrect answers. A correct response was worth two points and an incorrect response or no response was worth zero points. The results for each question are listed below (Table 11 through Table 14) with the correct response in red.

**Table 11: Question #11. What does the term “greenhouse effect” mean?**

	# of Respondents	% of Respondents
a. How plants grow	68	16%
<b>b. Gases in the atmosphere that trap heat</b>	<b>185</b>	<b>44%</b>
c. The Earth's protective layer	109	26%
d. Don't know	57	14%

**Table 12: Question #12. How do greenhouse gases cause climate change?**

	# of Respondents	% of Respondents
a. Absorbing the water in the atmosphere	45	11%
b. Causing the atmosphere to catch fire	23	5%
<b>c. Absorbing and radiating heat from the sun's rays</b>	<b>278</b>	<b>66%</b>
d. Don't know	73	17%

**Table 13: Question #13. What is the main greenhouse gas that is made by human activity?**

	# of Respondents	% of Respondents
<b>a. Carbon dioxide</b>	<b>304</b>	<b>73%</b>
b. Methane	31	7%
c. Water vapor	27	6%
d. Don't know	57	14%

**Table 14: Question #16. How much of an impact does the hole in the ozone layer have on climate change?**

	# of Respondents	% of Respondents
<b>a. None at all</b>	<b>13</b>	<b>3%</b>
b. Somewhat of an impact	84	20%
c. A lot of an impact	284	68%
d. Don't know	38	9%

### 3.2.4 Questions about the causes and impacts of climate change

Respondents were asked one yes/no question and two open ended questions about the causes of climate change. Respondents were also asked two open ended questions about the potential impacts of climate change.

The yes/no question was worth two points for the correct response and zero for an incorrect response or no response. The open ended questions had many possible correct responses and many possible “partially correct” responses. Partially correct responses were identified using inductive coding and then verified by a second reader. These were awarded partial credit in order to account for respondents who had a partial understanding of climate change versus none at all. Partial credit also helped researchers acknowledge a basic understanding of climate change where possible language barriers might have prevented full answers.

Three of the four open ended questions prompted respondents to provide two answers, hence the total of seven open ended answer scores. On each survey, each individual response was scored separately and repeat responses within the same question were only scored once. Responses were awarded five points for each correct response, 2.5 points for each partially correct response, and zero points for an incorrect response, no response, or a repeat response.

The responses are summarized below (Table 15 through Table 19). Included in these tables are all correct or partially correct responses and any incorrect responses that were mentioned by at least 2% of the respondents (8 respondents). Correct responses are in red, partially correct responses are in blue, and incorrect responses are in black.

**Table 15: Question #15. Please name two possible causes of climate change.**

<b>Response</b>	<b># of Respondents</b>	<b>% of Respondents</b>
Pollution from people	129	31%
Fossil fuel emissions	67	16%
Deforestation	39	9%
Too much traffic	37	9%
Burning trash	29	7%
Trash/marine debris	27	6%
Emissions from transportation	26	6%
Human Activity	20	5%
Changes in weather	18	4%
Ozone layer depletion	16	4%
Emissions of CFCs	13	3%
Climate change is natural	12	3%
Emissions from industry/energy production	11	2%
Deforestation by burning	11	2%
Water pollution/sewage	9	2%
Livestock production/transportation	3	1%
Don't know (did not give any response)	97	23%

**Table 16: Question #17a. Do cows and livestock contribute to climate change?**

	<b># of Respondents</b>	<b>% of Respondents</b>
Yes	175	42%
No	143	34%
Don't Know	101	24%

If the respondent answered “Yes” to the previous question (Table 16) then a follow-up question was asked (Table 17). Of the 419 surveys administered, 175 respondents were asked the follow-up question.

**Table 17: Question #17b. How [do cows and livestock contribute to climate change]?**

<b>Response</b>	<b># of Respondents</b>	<b>% of Respondents</b> (who answered "yes" to 17a)	<b>% of Total Respondents</b>
Methane gas	41	23%	10%
Manure/waste	40	23%	10%
“enteric fermentation” aka flatulence	18	10%	4%
Eating grass	10	6%	2%
Deforestation for pasture/feedcrop land	4	2%	1%
Animals die & decompose	4	2%	1%
Daily activities/How they’re being cared for	4	2%	1%
Livestock transportation	1	>1%	>1%
Don't know	41	23%	10%

**Table 18: Question #18. Please name two possible results that may happen because of climate change.**

<b>Response</b>	<b># of Respondents</b>	<b>% of Respondents</b>
Higher temperatures	89	21%
Sea level rise	75	18%
Changing weather patterns	51	12%
Ice caps melting	48	11%
Flooding	32	8%
More/stronger typhoons	24	6%
Declining food resources	22	5%
Drought	21	5%
People getting sick/dying	21	5%
Natural disasters	16	4%
More rain	15	4%
Non-climate natural disasters	15	4%
End of the world	15	4%
Ozone layer depletion	13	3%
Beach erosion	11	3%
Natural environmental depletion	10	2%
Pollution	10	2%
Snow in the CNMI	8	2%
Coral bleaching	6	1%
Economic impacts	4	1%
Fires	3	1%
Rising sea surface temperature	2	>1%
Salt water inundation	2	>1%
Loss of infrastructure	1	>1%
Population migration	1	>1%
Don't know	100	24%

**Table 19: Question #19. Please name two reasons global sea level may rise.**

<b>Response</b>	<b># of Respondents</b>	<b>% of Respondents</b>
Melting glaciers & ice caps	205	49%
Climate change	41	10%
Pollution/trash in the ocean	20	5%
Earthquake	22	5%
It's natural/tides	20	5%
Too much rain	19	5%
Erosion	18	4%
Tsunami	16	4%
Higher temperatures	16	4%
Ozone depletion	12	3%
Increasing Ocean Temperature	3	1%
Don't know	108	26%

### 3.3 Perception of climate change

At the beginning of the survey respondents were asked (a) if they agreed that climate change and/or global warming was happening; and (b) how important the issue was to CNMI on a scale of 1 to 5, where 1 is “not at all important” and 5 is “extremely important” (Table 20 and Table 21).

**Table 20: Question #5 - Climate change is the idea that the world's average temperature has been increasing over the past 100 years, may be increasing more in the future, and that the world's climate may change as a result.**

**Do you agree that climate change is happening?**

	<b># of Respondents</b>	<b>% of Respondents</b>
Yes	368	88%
No	13	3%
Don't know	38	9%

**Table 21: Question #6 - On a scale of 1 to 5, with 1 being not at all important and 5 being extremely important, how important is the issue of climate change to CNMI?**

	<b># of Respondents</b>	<b>% of Respondents</b>
1 (not at all important)	7	2%
2	12	3%
3	45	11%
4	83	20%
5 (extremely important)	241	58%

At the conclusion of the survey respondents were asked how worried they were about climate change (again on a scale of 1 to 5) and why.

**Table 22: Question #21 - On a scale of 1 to 5, with 1 being not at all worried and 5 being very worried, how worried are you about climate change?**

	<b># of Respondents</b>	<b>% of Respondents</b>
1 (not at all worried)	20	5%
2	24	6%
3	78	19%
4	74	18%
5 (extremely worried)	199	47%

### 3.3.1 Question #22 – Why or why not [are you worried about climate change]?

The “why” question was open ended. The responses were coded using inductive coding and verified by a second reader. A total of 20 codes were identified from themes within the survey responses. Many respondents provided answers that covered more than one theme, and therefore their response was coded with more than one code. These twenty themes and the number of responses that included each theme are depicted in Table 23 below. The red themes signify themes that were predominantly from people who were not worried about climate change, and the blue themes were predominantly from people who were worried about climate change.

As Table 23 shows, the most common concerns from people who were worried about climate change were the following:

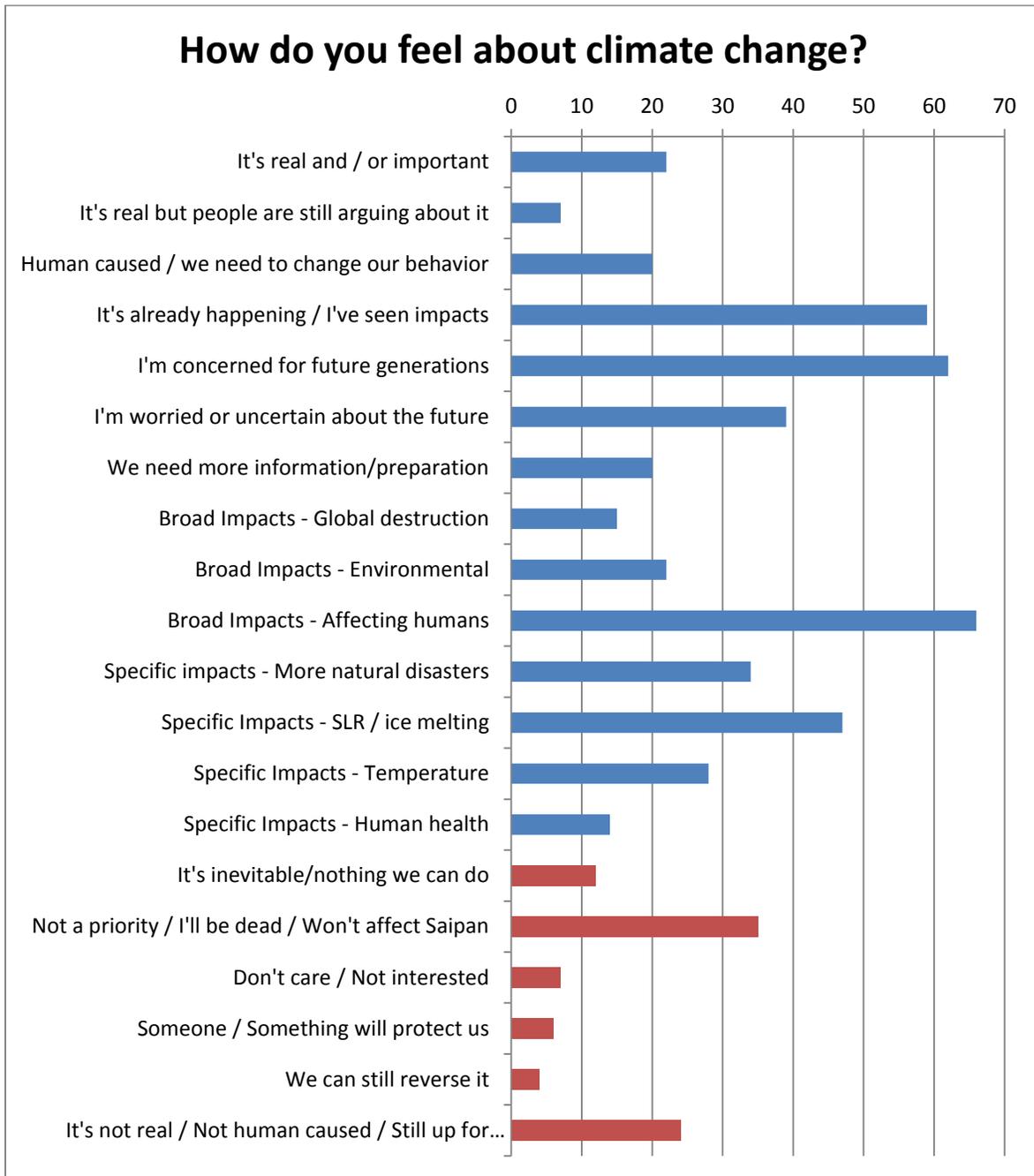
- That climate change would generally impact humans (n=66, 16%)
- That climate change would impact future generations (n=62, 15%)
- That people have already witnessed changes in the climate or weather patterns (n= 59, 14%)
- That sea level rise would impact Saipan or other Pacific islands (n=47, 11%)

The most common reasons that people were not very worried about climate change were the following:

- There are more pressing matters, or it won't affect them (n=35, 8%)
- It's not real, not human caused, or there is still debate about it (n=24, 6%)

A further breakdown of each response in comparison to how worried each respondent ranked themselves can be found in Appendix 3: Full breakdown of how worried people are about climate change.

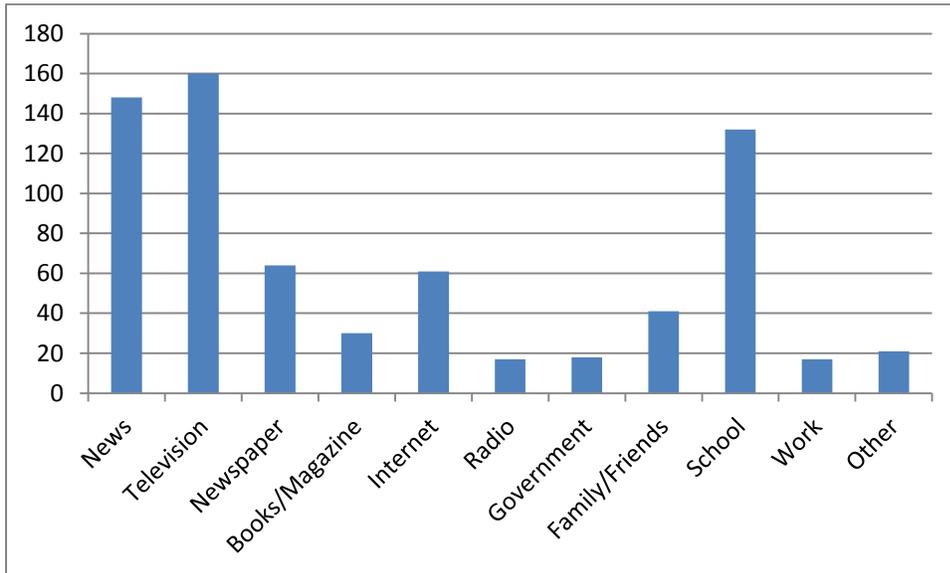
Table 23: Question #22 - Themes about how people feel about climate change



### 3.4 Sources for information about climate change and/or global warming

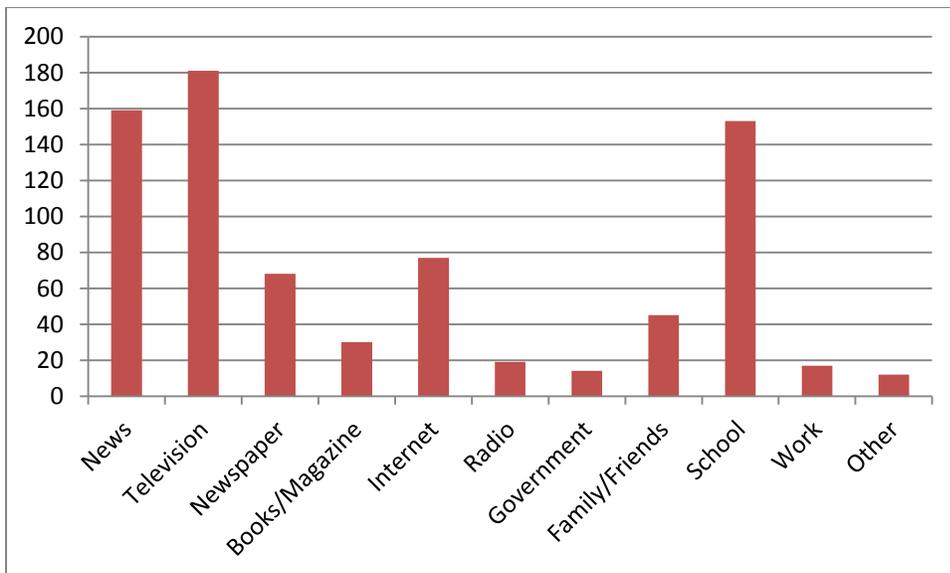
Respondents were initially asked where they had heard about climate change and/or global warming. At the end of the survey, respondents were then asked where they would be most likely to get additional information about climate change. Respondents were not prompted for answers and were allowed to list however many sources they felt necessary. The results are displayed below (Table 24 through Table 26).

**Table 24: Question #3. Where have you learned about climate change?**



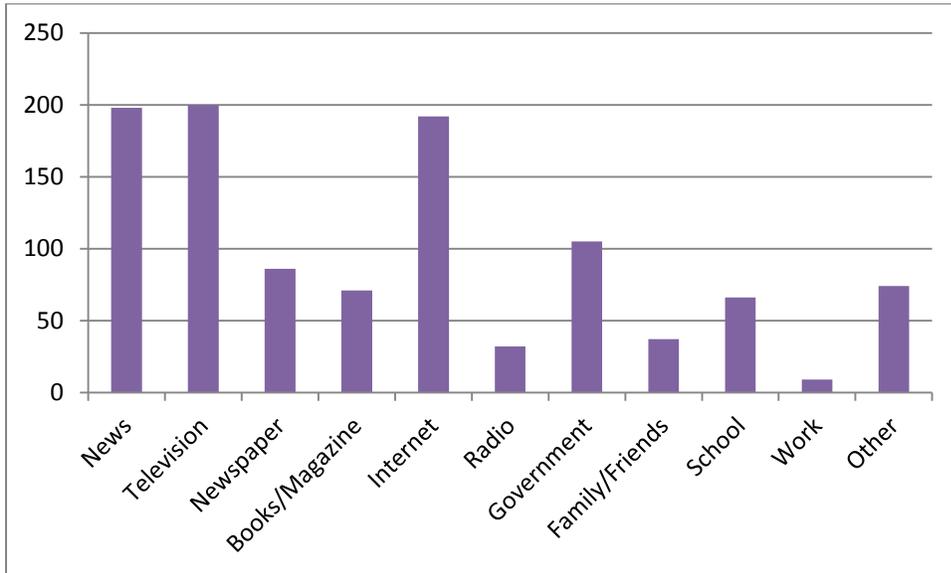
Of the 21 respondents whose response included an “other”, eight mentioned “personal observation”, three mentioned “Al Gore”, and three mentioned “movies” such as *2012* and *The Day After Tomorrow*.

**Table 25: Question #4. Where have you learned about global warming?**



Of the twelve respondents that mentioned an “other” response, two said “personal observation”, two said “word of mouth”, one said “Al Gore”, and one said “movies”.

**Table 26: Question #20. Please name three sources of information that you would trust to tell you more about climate change.**



Of the 74 people who included an “other”, 48 mentioned “scientists” or “scientific research/publications”. Six mentioned “Al Gore”, four mentioned “personal observation”, and four mentioned “God” or “the Bible”.

## 4. Conclusions and Next Steps

Climate change is an intangible and complex topic, and it is clear from the results of this survey that there is still a large amount of confusion or uncertainty among the CNMI public surrounding climate change. It will be important for resource managers to incorporate education campaigns into broader climate adaptation work in order to ensure community buy in and support for adaptation projects. It will be especially important to utilize the education tools at hand to combat the misinformation or confusion that is still prevalent in mainstream media.

Despite the confusion and uncertainty among most of the CNMI public about the causes and impacts of climate change, a few themes emerged as areas with higher levels of understanding. For example, many people seemed to have at least a basic understanding of the connection between climate change and sea level rise (18%), and were concerned about the “disappearing islands”. Floods and typhoons also were a common concern among survey respondents, which could in part be due to the severe floods that impacted Manila in August 2012 just a few months before these surveys were administered in Saipan and Tinian. Given the large number of people in the CNMI with relatives in the Manila and Luzon area, it is not surprising that floods and typhoons were at the front of many people’s minds. This could also demonstrate the importance of making any education or outreach campaigns relevant to current events.

### Recommendations:

- This survey was only administered to residents of CNMI aged 18 years or older. Based on the personal observation and experience of the researchers at outreach events such as the annual Environmental Expo, there seems to be a growing understanding of climate change and its causes and impacts among the school-aged children of the CNMI. However, there does seem to be a large discrepancy in levels of understanding among children between different schools. An interesting and important next step for this research would be to administer an age-sensitive version of this survey to different school groups to understand levels of understanding and identify geographic or school-based discrepancies.
- The survey was only administered in English, which researchers believe may have prevented a full response from many non-native English speakers and therefore possibly skewed the results. There are many survey responses where the respondents scored less than 5 points out of 50 where a lack of English comprehension was most likely a factor. It is unclear how different the results would have been had these respondents had the option of partaking in the survey in their native language. This was especially apparent for respondents of Korean, Chinese, or Japanese descent.

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# Appendices

## Appendix 1: Survey Questionnaire

Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Location: \_\_\_\_\_

Interview name: \_\_\_\_\_  
Note-taker name: \_\_\_\_\_

Hi, my name is \_\_\_\_\_ from Coastal Resources Management Office. I am doing a public survey of people who live in CNMI. The results will be used to help create better education material for CNMI residents. Would you mind answering some questions for me?

(If necessary) Do you live here in CNMI? Are you 18 years old or older?

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### Demographics

1. Gender: M F
2. Age: 18-24 25-34 35-44 45-54 55+
3. Village where you live? \_\_\_\_\_
4. Were you raised in CNMI? Yes No  
If "No" - Where? \_\_\_\_\_  
If "yes" - Have you ever lived somewhere other than CNMI? Yes No  
Where? \_\_\_\_\_
5. Ethnicity:  
Chamorro Carolinian Other Pacific Islander: \_\_\_\_\_  
Filipino Korean Japanese Chinese Other Asian: \_\_\_\_\_  
Caucasian Other: \_\_\_\_\_
6. Household income bracket:  
Below \$10,000 \$10,000-\$14,999 \$15,000-\$24,999 \$25,000-\$34,999  
\$35,000-\$49,999 \$50,000-\$74,999 \$75,000 and up
7. Highest level of education attained:  
Less than high school diploma High school graduate/GED  
Some college, no degree Vocational/Associate  
Bachelor's degree Graduate or professional degree



11. This question is multiple choice. What does the term "greenhouse effect" mean?
- a. How plants grow
  - b. Gases in the atmosphere that trap heat
  - c. The Earth's protective ozone layer
  - d. Don't know
12. How do greenhouse gases cause *climate change/global warming*?
- a. Absorbing the water in the atmosphere
  - b. Causing the atmosphere to catch fire.
  - c. Absorbing and radiating heat from the sun's rays
  - d. Don't know
13. What is the main greenhouse gas that is made by human activity?
- a. Carbon dioxide
  - b. Methane
  - c. Water vapor
  - d. Don't know
14. True or False: Greenhouse gases in the atmosphere are always bad for people and the environment? Unsure
15. Please name two possible causes of *climate change/global warming*?
- a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. Don't know
16. How much of an impact does the hole in the ozone layer have on *climate change/global warming*?
- a. None at all
  - b. Somewhat of an impact
  - c. A lot of an impact
  - d. Don't know
17. Do cows and livestock contribute to *climate change/global warming*? Y N Unsure
- (If yes) How? \_\_\_\_\_
- \_\_\_\_\_

18. Please name two possible results that may happen because of *climate change/global warming*.

a. \_\_\_\_\_

b. \_\_\_\_\_

c. Don't know

19. Please name two reasons global sea level may rise:

a. \_\_\_\_\_

b. \_\_\_\_\_

c. Don't know

20. Please name three sources of information that you would trust to tell you more about *climate change/global warming*?

News                  Television                  Newspaper                  Books/Magazines                  Internet

Radio                  Government                  Family/Friends                  School                  Work

Other: \_\_\_\_\_

21. On a scale of 1 to 5, with 1 being not at all worried and 5 being very worried, how worried are you about *climate change/global warming*?

1                          2                          3                          4                          5

Not at all

Extremely

22. Why?

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## Appendix 2: Saipan Village Groups

### **Group 1: 3,133 people, 6% of the population**

As Akina  
Achugao  
As Mahetog  
Lower Base  
Tanapag  
San Roque  
Nanasu  
Sadog Tasi  
As Matuis  
Matansa  
Marpi

### **Group 2: 10,690 people, 20% of the population**

As Rabagau  
As Palacios  
Navy Hill  
Garapan  
China Town  
Gualo Rai  
Fananganan  
I Li yang

### **Group 3: 2,292 people, 4% of the population**

Chalan Galaide  
Halai Hai  
I Pilot  
I Denni  
Capitol Hill  
As Teo  
I Akgak  
Tapochao  
Maturana Hill

### **Group 4: 4,897 people, 9% of the population**

Kagman  
Kagman I  
Kagman II  
Kagman III  
Kagman IV  
Laolao Bay  
Papago  
Chacha

### **Group 5: 6,976 people, 13% of the population**

Kannat Tabla  
As Terlaje  
Chalan Rueda  
Chalan Laolao  
Chalan Kiya  
Fina Sisu  
San Jose

### **Group 6: 8,159 people, 15% of the population**

Susupe  
Chalan Piao  
San Antonio  
Chalan Kanoa I  
Chalan Kanoa II  
Chalan Kanoa III  
Chalan Kanoa IV

### **Group 7: 5,860 people, 11% of the population**

As Lito  
As Perdido  
As Gonna  
Agingan  
Afetnas  
Koblerville  
Tottotville

### **Group 8: 6,207 people, 12% of the population**

San Vicente  
Dandan  
Obyan  
I Naftan  
Dagu

### **Group “Tinian”: 3,136 people, 6% of the population**

### **Group “Rota”: 2,527 people, 4% of the population**

### Appendix 3: Full breakdown of how worried people are about climate change and why

