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Perceptions of Climate Change

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Perceptions of Climate Change

Abstract

With the help of students from Environmental & Natural Resource Economics course (EC 231), a survey was distributed to hundreds of respondents across the nation with the intention to study beliefs about climate change. More than 70 students from EC231 conducted 5-10 surveys while traveling for Spring Break. The questions included in the survey address each respondent's knowledge of climate change as well as the various influences that may alter ones beliefs as to how they are affected by climate change. This paper investigates all variables and looks for potential patterns in the survey data in the hope of finding significant and meaningful conclusion that can help to explain peoples' views on climate change. Two interesting results I find are that the exposure to severe weather increases the likelihood that respondents believe in climate change and that respondents believe that climate change will impact the work and the country more than their community or them individually.

Keywords

climate change, beliefs, perceptions, global warming

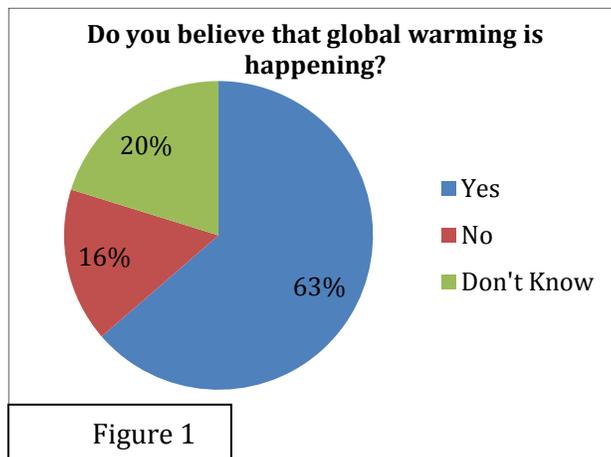
Cover Page Footnote

I thank the students in EC231 for conducting the survey and to Prof. Dissanayake for guidance during the data analysis.

1. Introduction

Is Earth's climate changing? This is a simple question that countless people are asking around the world today, yet the answer will likely vary depending on whom you consult. Much of the variability in beliefs regarding climate change can be attributed to the fact that the average person does not have a significant amount of knowledge surrounding the issue.¹ In a recent study from the Center for Climate Change Communication (CCCC) at George Mason University, scientists set out to understand Americans' beliefs regarding global warming in April, 2013. In their words, "Global warming refers to the idea that the world's average temperature has been increasing over the past 150 years, may be increasing more in the future, and that the world's climate may change as a result."² This definition does not relate any human activity as the cause for such rise in temperatures and

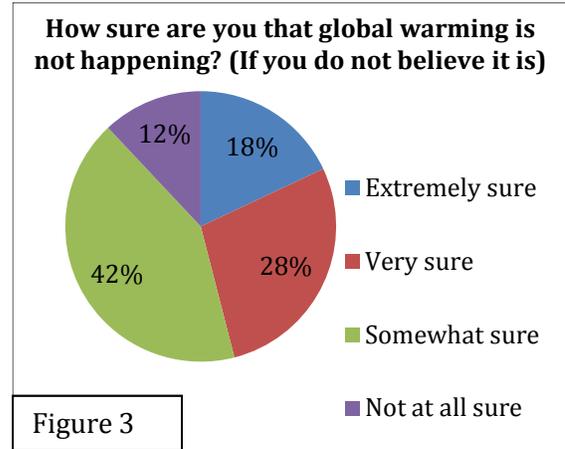
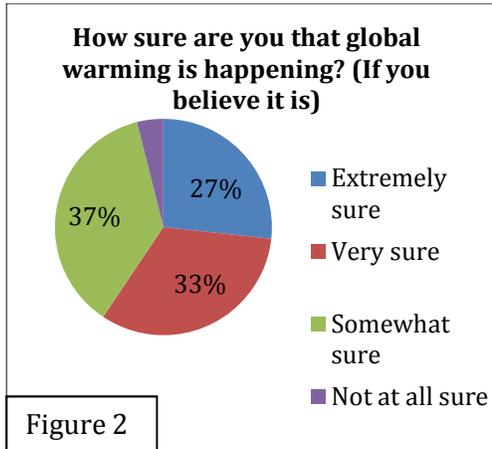
the percent of Americans who believe that global warming is happening can be seen in figure 1, to the right. Clearly, there is a strong majority of people who believe that global warming is happening, but when respondents are then questioned about the confidence of their beliefs, the numbers tend to tell a different story. As figures 2



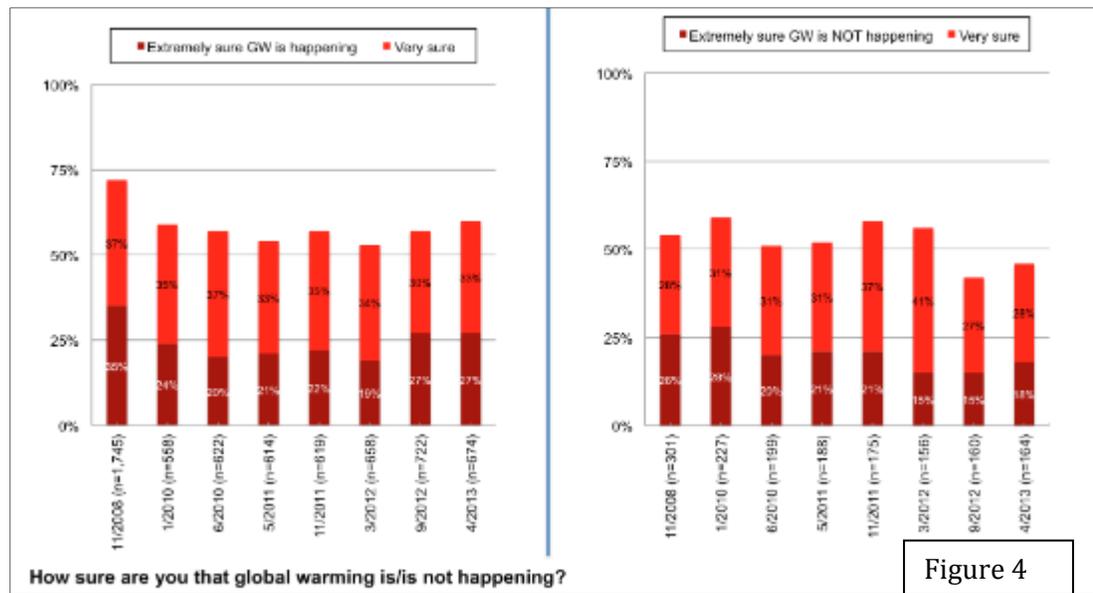
and 3 clearly depict, there is a large amount of variability in the confidence of people's beliefs, both for people who believe global warming is happening as well as for those who do not believe global warming is happening.

¹ Leiserowitz, Anthony, et al. "Climate change in the American mind: Americans' global warming beliefs and attitudes in April, 2013." *Yale University and George Mason University. Yale Project on Climate Change Communication, New Haven* (2013).

² Ibid.



However, the difference between the two groups is interesting: those who believe global warming is happening are more certain than those who do not.



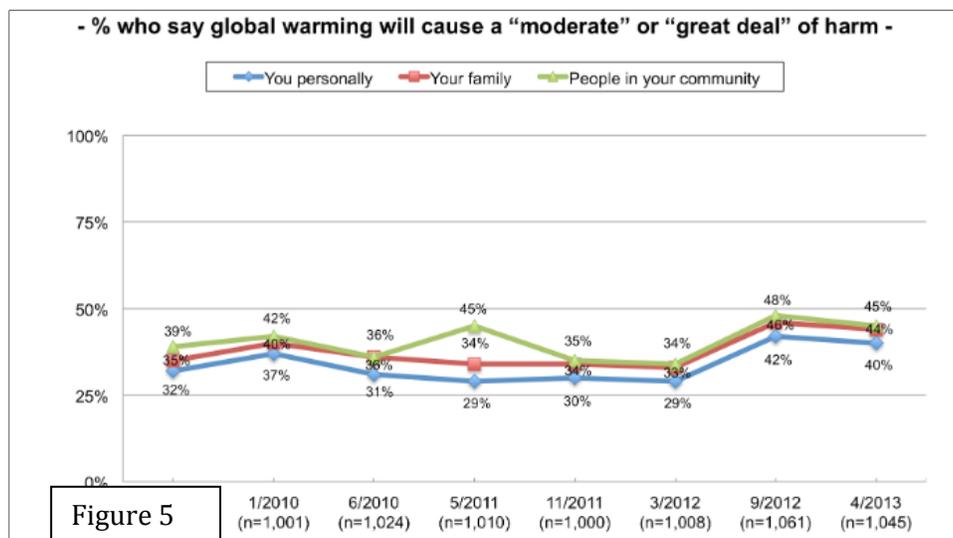
But why is it important that people understand the significance of the issue at hand? As NASA states on its Global Climate Change website, “The potential future effects of global climate change include more frequent wildfires, longer periods of drought in some regions and an increase in the number, duration and intensity of tropical storms.”³ Further, in November, 2006, the

³ "The Current and Future Consequences of Global Change." *Global Climate Change*. National Aeronautics and Space Administration, n.d. Web. 15 Apr. 2014.

British government presented a comprehensive study on the economic effects of climate change where they estimated:

If we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever...Our actions now and over the coming decades could create risks...on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century.⁴

Evidently, climate change is a very serious issue and for those who do believe in climate change, surely they would recognize the potential harm involved. However, when believers were asked if they perceive global warming as a threat to themselves, their families, and their local communities, an interesting trend arises. Although a significant portion of the American population finds global warming to be a serious threat to the world, the percentage decreases as the scale of consideration becomes more personal.

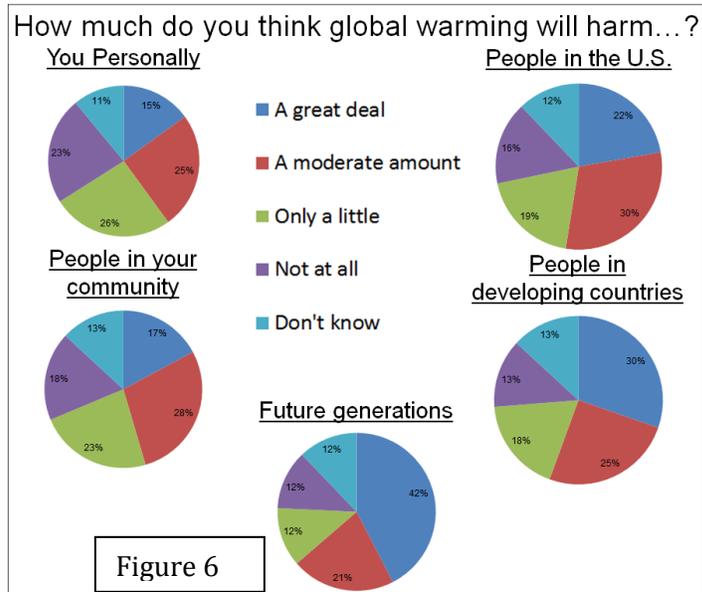


In other words, people find global warming to be less of a threat to them personally compared to people in their community, country, or world.

<<http://climate.nasa.gov/effects>>.

⁴ Stern, Nicholas, ed. *The economics of climate change: the Stern review*. Cambridge University press, 2007.

Furthermore, when the scale is expanded out in the charts in figure 6, we can see that the percent of Americans who think global warming will cause a great deal of harm to people in their community is far less than that of people in the U.S. This trend continues as Americans find global warming more serious for people in developing countries and finally, most serious for future generations. Clearly, Americans not only ignore the potential effects of global warming at the individual level, but they are also averse to dealing with the issue now. Even as the majority of Americans find that global warming will harm future generations a “great deal” or “moderate amount”, there seems to be a lack of initiative to mitigate current trends.



Despite the large amount of useful information gathered in the study from the Center for Climate Change Communication at George Mason University, I plan to use my research to supplement these findings and draw further conclusions regarding people’s beliefs surrounding our climate. In particular, I will look to further assess the notion of Americans’ personal disassociation with climate change by separating respondents’ views of potential harm (to them personally, their family, community, etc.) based on whether or not they believe in global warming as a whole. Additionally, I will also assess the relation between demographic characteristics and peoples’ view on the issue. In the end, my research will help to tell a more complete story regarding climate change and why people feel the way they do surrounding the issue.

2. Respondent Characteristics & Initial Findings

In my research, a similar survey was constructed with the intent to be distributed randomly to respondents around the United States. With the assistance of Professor Sahan Dissanayake and his Environmental and Natural Resource Economics students of Colby College, the survey was handed out to hundreds of respondents in the spring of 2014. A total of 409 survey responses were collected with the majority of respondents located in the United States (a small number of responses were collected in foreign countries). The survey was split into five different sections: the first section, titled “Beliefs on Climate Change”, discussed respondents’ basic views and familiarity with the issue; the second section, titled “Beliefs on Causes of, Impacts from and Solutions to Climate Change”, addressed respondents views on the issue in more detail; the third section, titled “Beliefs on Local and Severe Weather”, addressed respondents’ experiences and beliefs regarding droughts, very harsh winters, unusually severe snow/rain storms, flooding, etc.; the fourth section, titled “Risk and Time Preferences”, addressed respondents’ relative risk aversion; the fifth section, titled “Demographic Questions”, addressed respondents’ education, gender, age and household income. Similar to the CCCC study from George Mason University, this survey attempted to clarify the central meaning of the survey by displaying the following quote at the beginning of each section: “You should think of climate change as a change in the climate compared to historical trends which may or may not be caused by human action”.

Although the survey was not distributed using optimal randomness across respondents, we do see that those who completed the survey tend to represent a wide range of demographics. For all survey respondents, the average age was approximately 33.9 years with the majority of respondents skewed towards the low 20’s, as expected with college students distributing the survey. The gender of

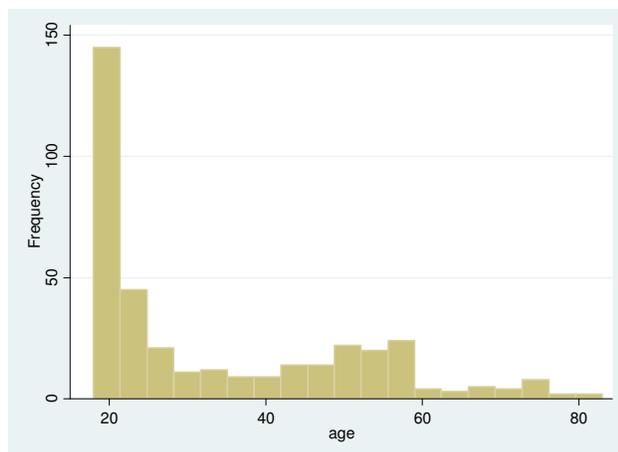


Figure 7

respondents was well distributed with 47.5% male and 52.5% female. Similarly, 53.4% of respondents had a college degree while 46.6% did not. As for household income levels, the majority of respondents came from households with a total income greater than \$100,000. Although this is clearly not representative of the general population, this was largely expected as Colby College students, who were distributing the survey, often come from more affluent backgrounds.

Beyond the general characteristics of the respondents, the vast majority (about 97%) identified as familiar with the issue of climate change before taking the survey. Of those who were familiar, about 2% identified as having “expert” familiarity with climate change, while 38% were “very familiar”, 50% were “somewhat familiar”, and 9% were “not very familiar”. Most importantly though, about 88% of respondents believe that the climate is changing (regardless of cause), with 8% not sure, and 4% said they did not believe the climate was changing.

The number of respondents who believe that the climate is changing is obviously much higher than the national average obtained by the CCCC study. This can again be attributed to the influence of Colby College students distributing the survey, as Colby, being a liberal arts institution focused on natural sciences, has a largely green-biased student body. In other words, Colby students who distributed the survey were participating in an environmental economics course and could therefore have given the results a potential bias favoring the belief that the climate is in fact changing.

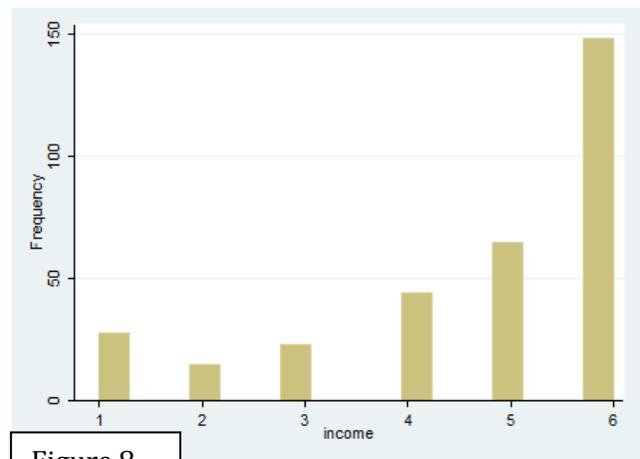
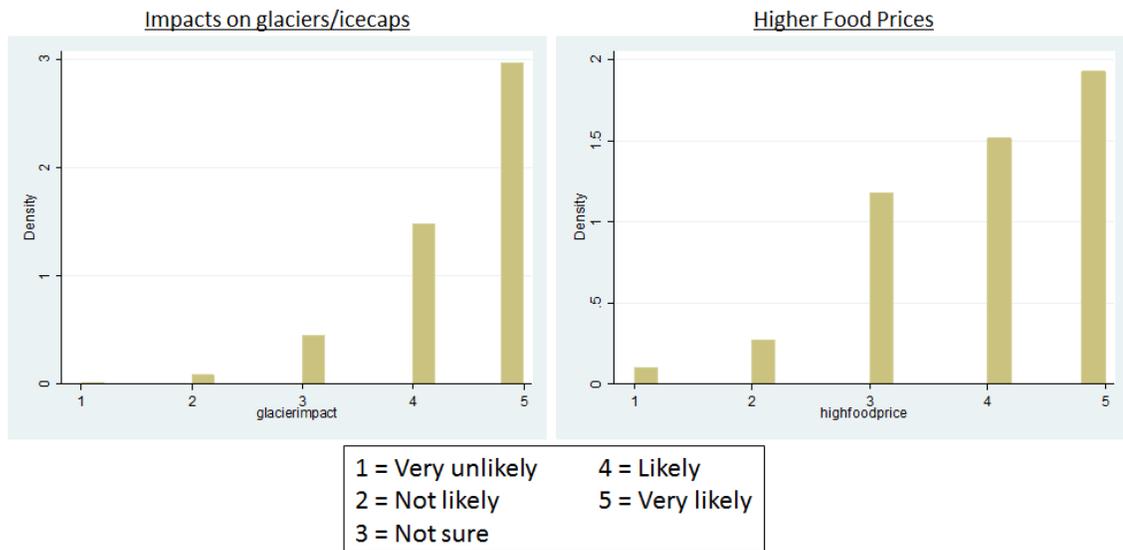


Figure 8

1 = Less than \$25,000	4 = \$50,000 to \$74,999
2 = \$25,000 to \$34,999	5 = \$75,000 to \$99,999
3 = \$35,000 to \$49,999	6 = \$100,000 +

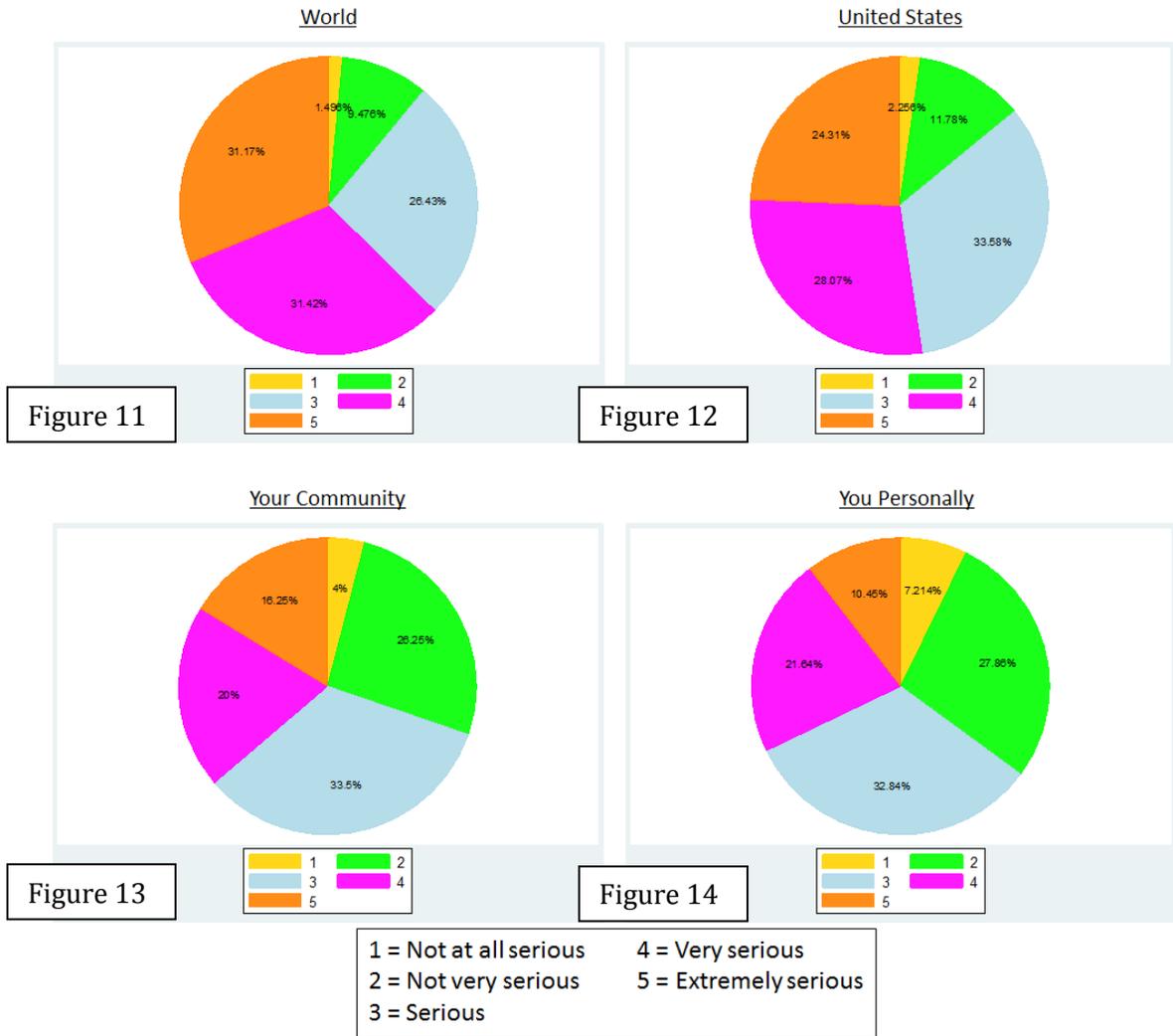
3. Data Trends & Further Results

Initially, some interesting results among the respondent data were found in the second section regarding beliefs on causes of, impacts from, and solutions to climate change. When respondents were asked “how likely do you believe climate change will cause the following...?” the vast majority found climate

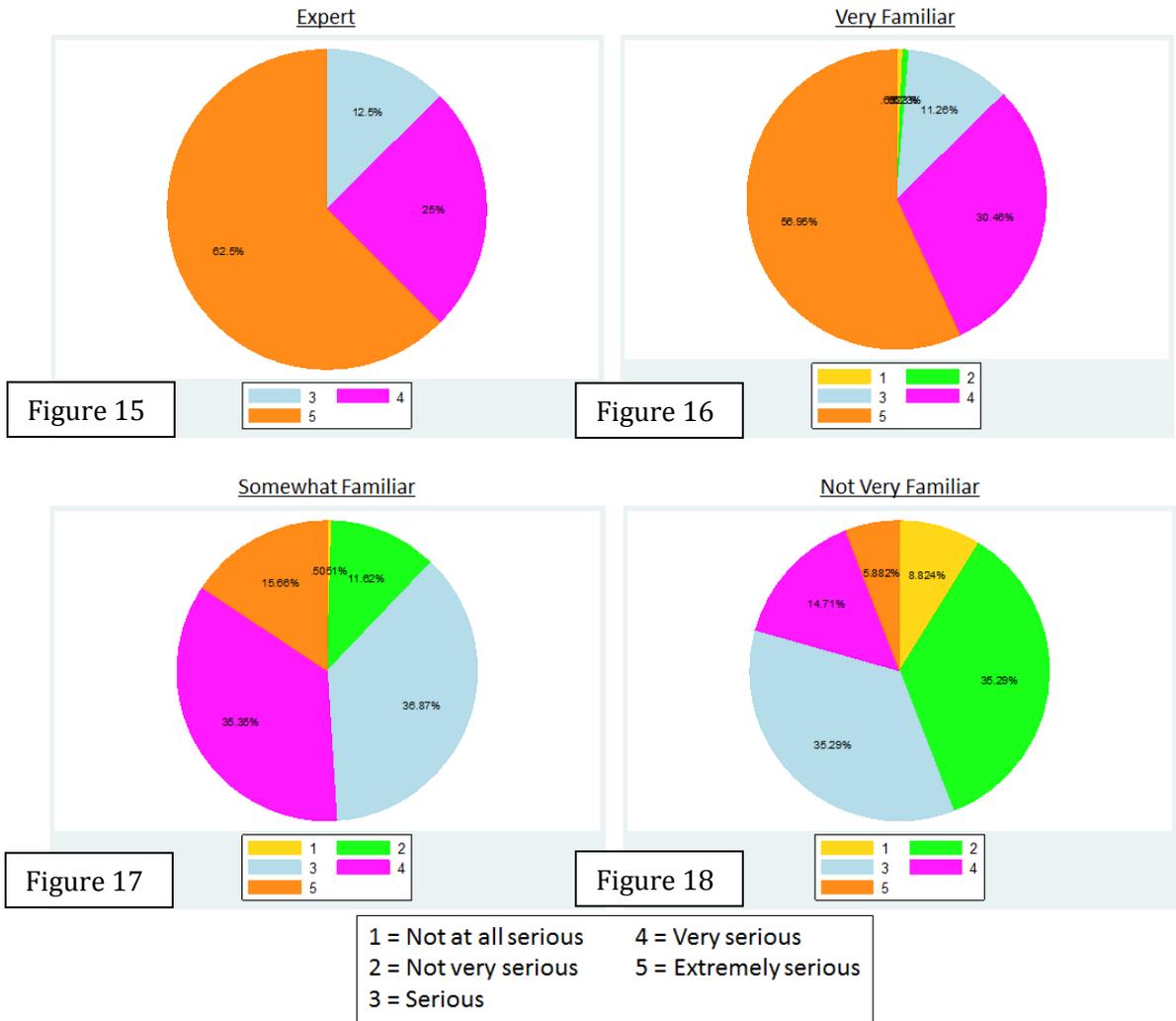


change to have a very likely impact on glaciers/icecaps, whereas respondents did not as clearly see climate change causing higher food prices. The fact that many respondents did not as clearly see the connection between climate change and higher food prices again returns to the point that people may believe in climate change, but not be able to see how they’re directly affected by it.

Next I wanted to expand upon the CCCC’s study and their finding that people tend to view climate change as an issue important for the world rather than themselves personally. Figures 10 and 11 illustrate how serious respondents believe climate change is for the world, the U.S., their community, and them personally.



Analogous to the CCCC study, we can clearly see that the seriousness of climate change quickly decreases as we move from a worldwide view to a personal view. Interestingly, there is a telling trend within this data regarding the respondents' familiarity with the issue of climate change. Keeping the view consistently *worldwide* (how serious do you believe climate change is for the world?), we can compare the views of respondents who identify as expert, very familiar, somewhat familiar, or not very familiar with climate change in figures 15-18:



As we can see in figures 17 and 18 above, as familiarity with climate change decreases, respondents find climate change to be less serious of an issue for the world. This result is consistent if we were to focus on respondents' views for the U.S., their communities, as well as themselves personally.

Additionally, if respondents believe that the climate is changing, we should explore respondents' beliefs regarding the causes of climate change. For the entire population of respondents, the following chart (figure 19) represents their corresponding views:

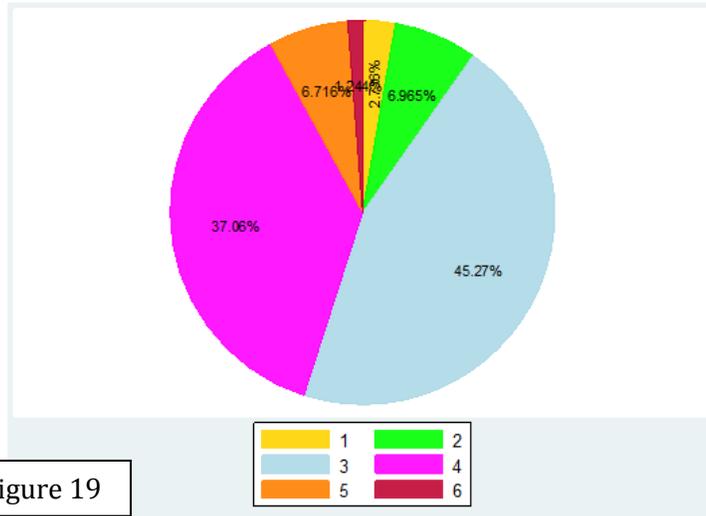


Figure 19

1 = Entirely caused by natural processes	4 = Mainly caused by human activity
2 = Mainly caused by natural processes	5 = Entirely caused by human activity
3 = Partly natural processes & partly human activity	6 = No unusual changes in climate

As we can see, roughly 45% of respondents find climate change is caused partly by natural processes and partly by human activity, followed by 37% of respondents who believe that climate change is mainly caused by human activity. To better understand peoples' views, we should also look at beliefs about the causes of climate change based on different levels of familiarity with climate change, which can be seen in figures 20-23, below:

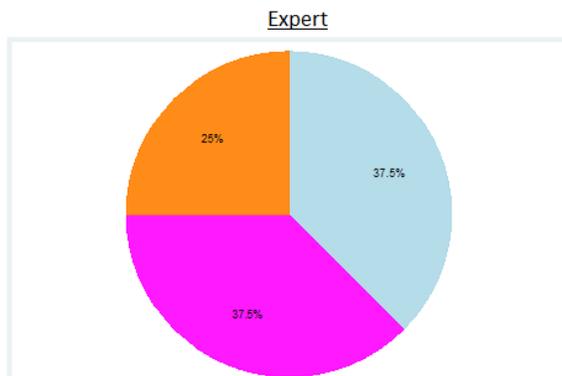


Figure 20

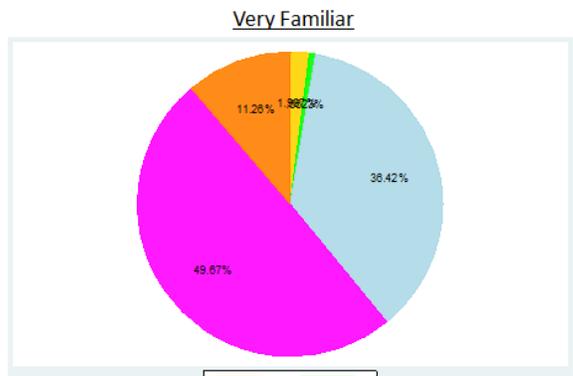
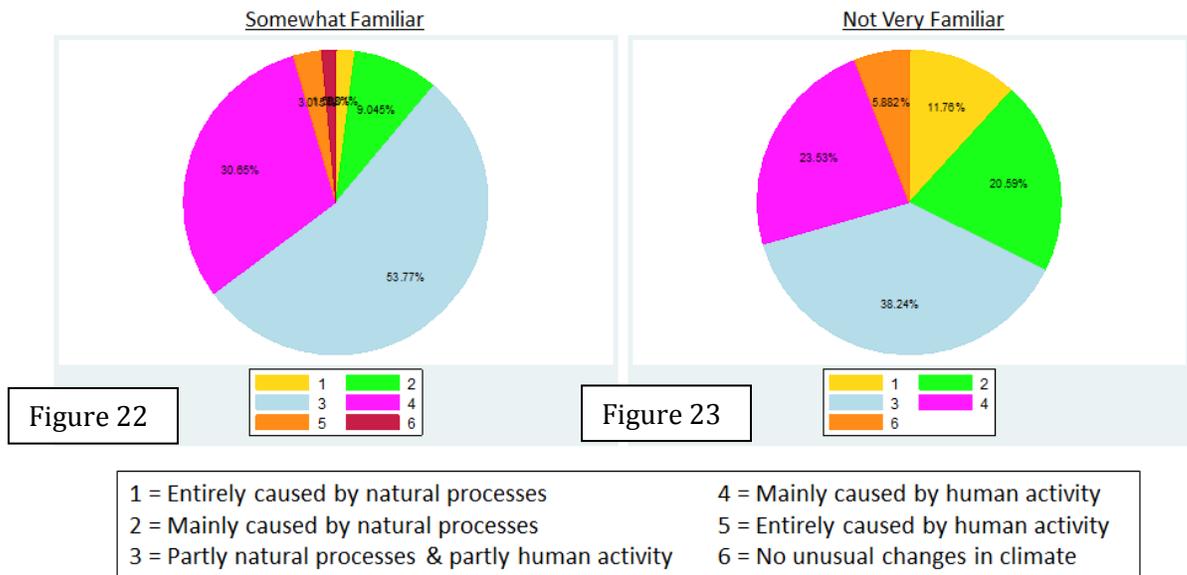


Figure 21



From figures 20-23, there is a clear relationship between familiarity on climate change and views about the causes of climate change. Specifically, those who are most familiar (experts), are almost evenly split between entirely caused by human activity, mainly caused by human activity, as well as partly natural processes & partly human activity. As the level of familiarity with climate change decreases, the beliefs about the causes of climate change start to move away from human activity, and grow in favor of natural processes. In particular, 21% of those respondents who are not very familiar with climate change believe that climate change is mainly caused by natural processes, whereas no respondents who identified as an expert believe that climate change is caused by natural processes.

Next, we look to section three of the survey which addresses respondent's potential contact with severe weather. As mentioned previously, NASA states that the potential future effects of global climate change include an increase in the number, duration and intensity of storms and droughts. Thus, it is important that we explore the impact of severe weather on respondents' views of climate change, which can be seen in figures 24-35 (where 1 = yes, climate is changing; 2 = not sure if the climate is changing; 3 = no, the climate is not changing):

Have you been affected by severe weather in the **last month**?...Do you believe that the climate is changing?

Yes, I have been affected by severe weather

No, I have not been affected by severe weather

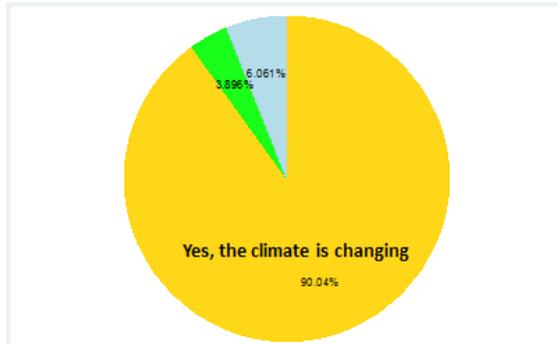


Figure 24

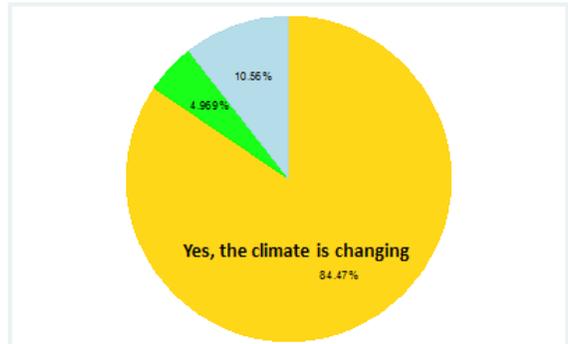
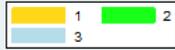
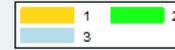


Figure 25



1 = Yes 2 = No 3 = Not sure

Have you been affected by severe weather in the **last 2-6 months**?...Do you believe that the climate is changing?

Yes, I have been affected by severe weather

No, I have not been affected by severe weather

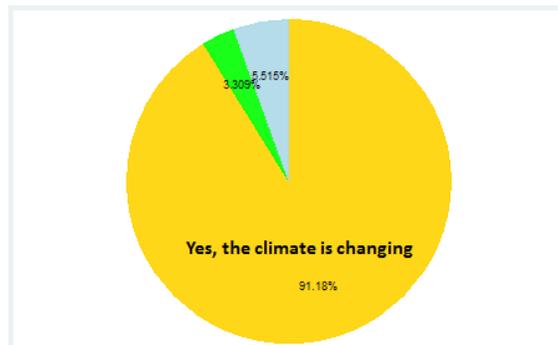


Figure 26

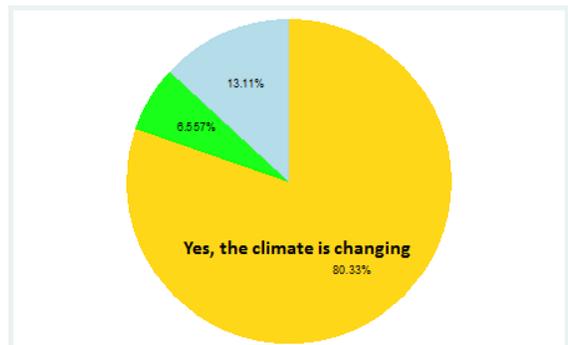
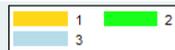
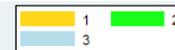


Figure 27



Have you been affected by severe weather in the **last 6 months to 1 year**?...Do you believe that the climate is changing?

Yes, I have been affected by severe weather

No, I have not been affected by severe weather

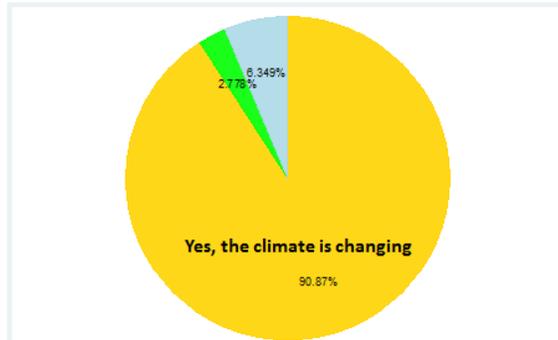


Figure 28

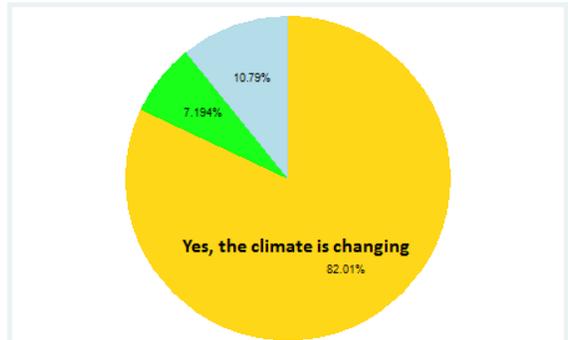
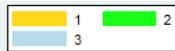
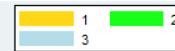


Figure 29



Have you been affected by severe weather in the **last 1-2 years**?...Do you believe that the climate is changing?

Yes, I have been affected by severe weather

No, I have not been affected by severe weather

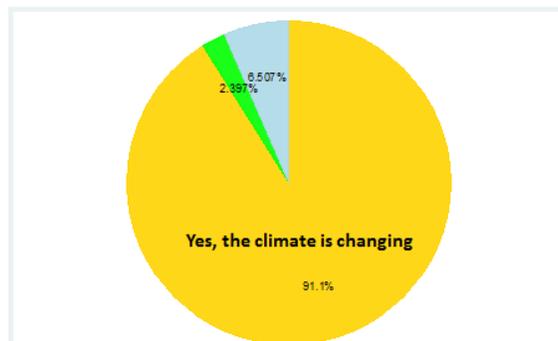


Figure 30

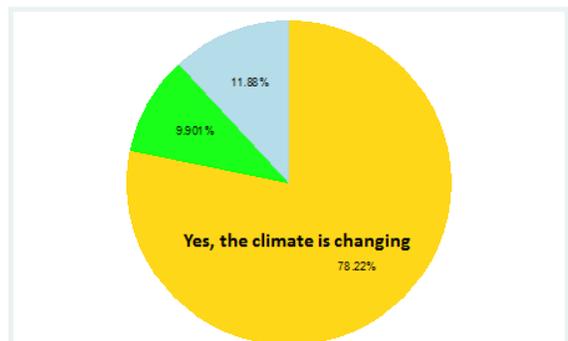
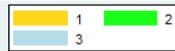
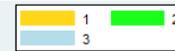


Figure 31



Have you been affected by severe weather in the **last 2-5 years**?...Do you believe that the climate is changing?

Yes, I have been affected by severe weather

No, I have not been affected by severe weather

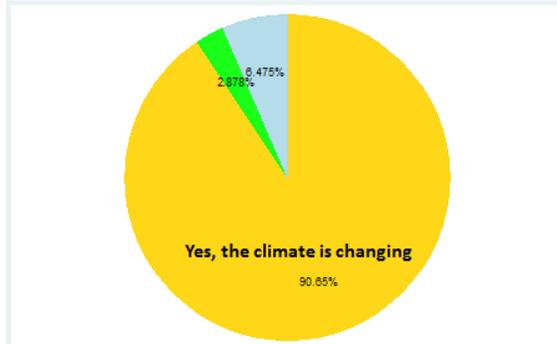


Figure 32

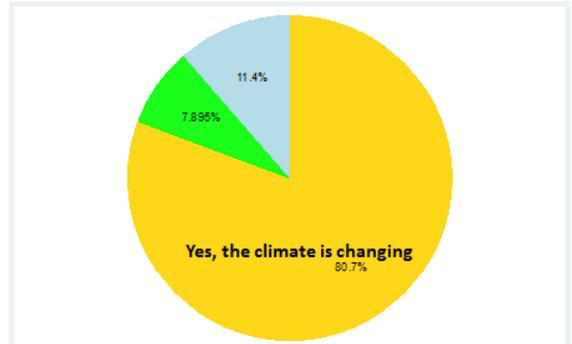
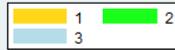
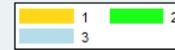


Figure 33



Have you been affected by severe weather in the **last 5-10 years**?...Do you believe that the climate is changing?

Yes, I have been affected by severe weather

No, I have not been affected by severe weather

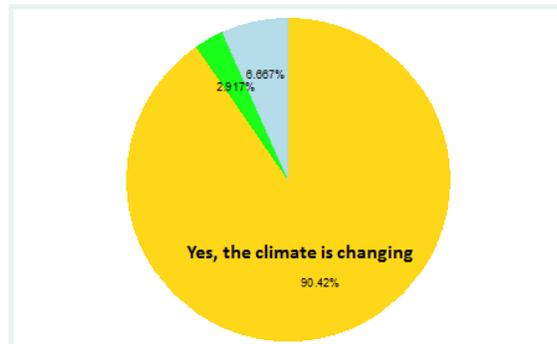


Figure 34

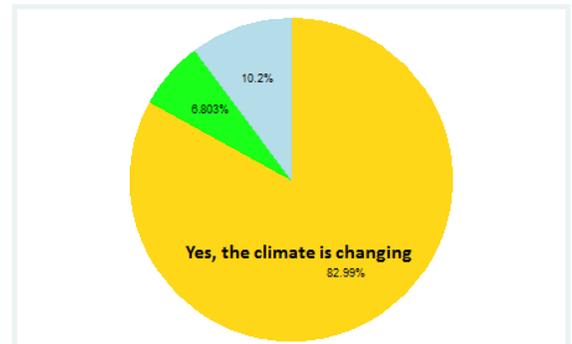
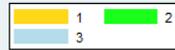
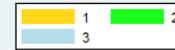


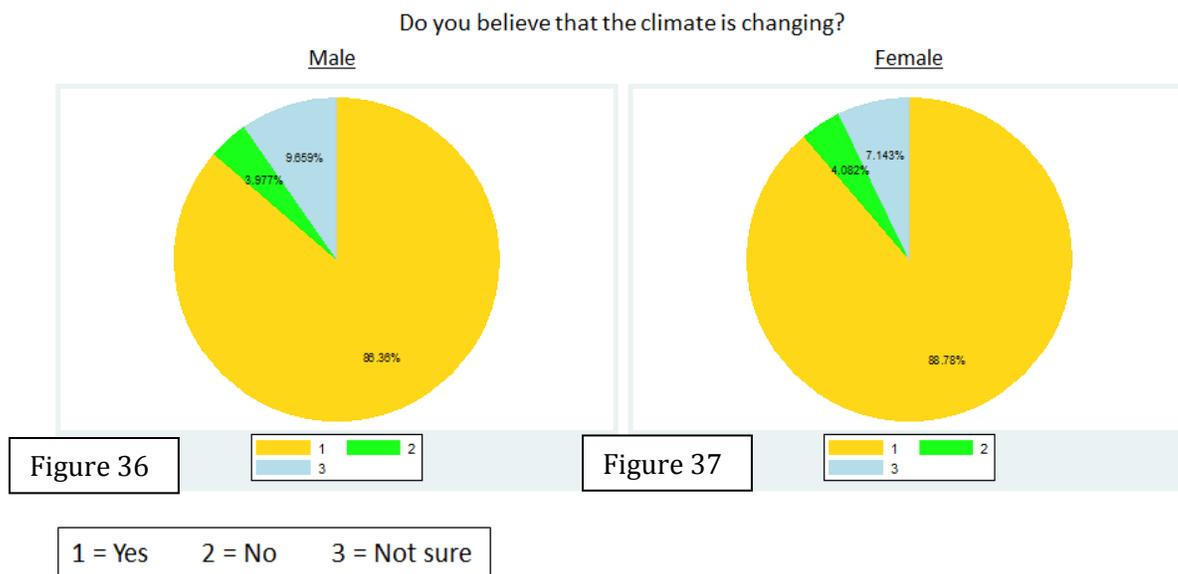
Figure 35



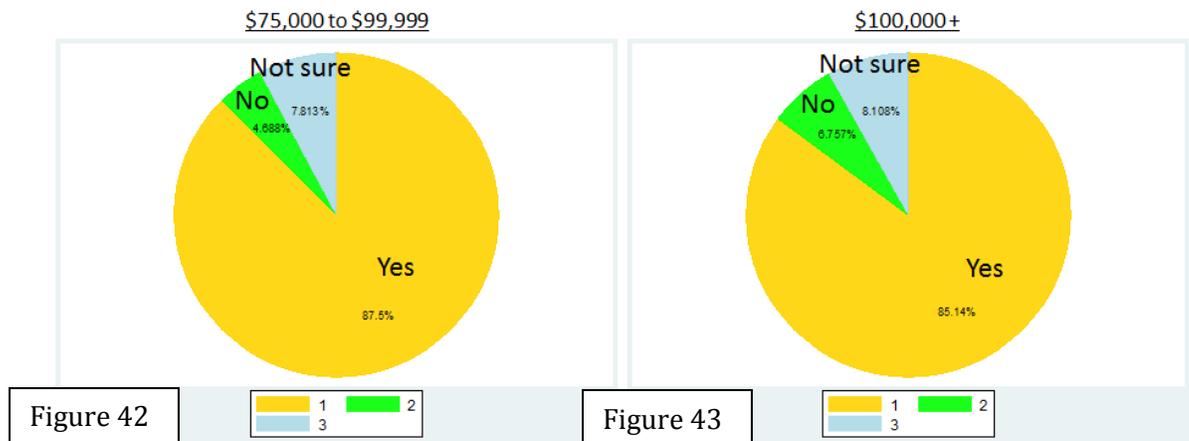
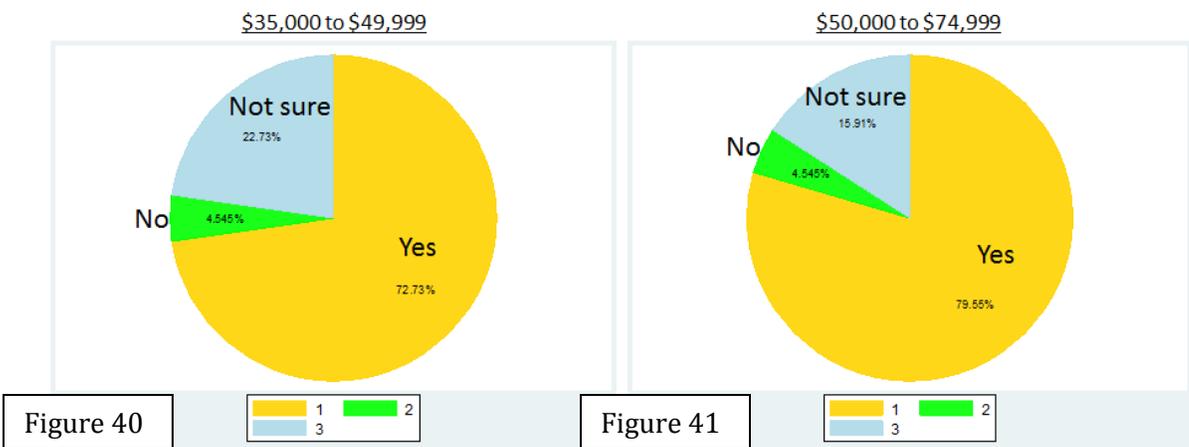
From the charts above (figures 24-35), severe weather clearly has an impact on respondents' beliefs regarding climate change. Specifically, for respondents that have been affected by severe weather in the past, they have consistently higher percentages of those who believe that the climate is changing (compared to respondents who have not been affected by severe weather in the past). However, the time period in which respondents were affected by severe weather does not appear to significantly change the percent of respondents that believe in climate change. Meaning, respondents who were affected by severe weather within the last month have very similar, if not the same, percentage distribution versus those who were affected by severe weather in the last 5-10 years.

4. Demographic Trends

In order to further build upon past studies on the issue of climate change, I also wanted to assess how various respondent demographic characteristics could influence their beliefs and potentially explain why people feel the way they do. I will continue look at the percent of respondents who believe that the climate is changing, and the charts below (figures 36 & 37) show the difference in respondent view by gender:

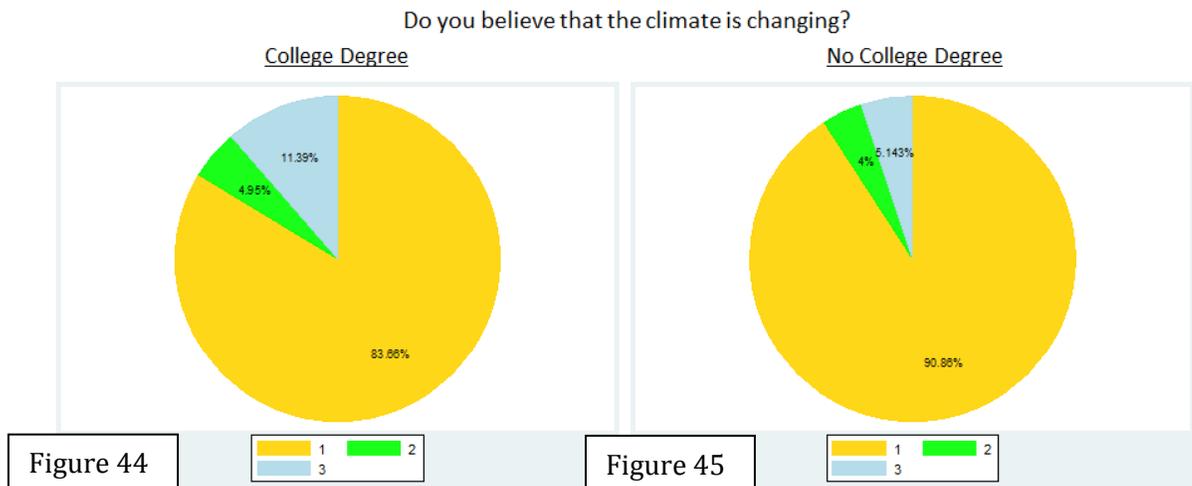


There appears to be no real significant difference in beliefs in climate change between male and female respondents. Figures 38-43 illustrate respondents' beliefs on climate change based on income level:



Figures 38-43, depicting whether or not respondents believe the climate is changing (for different income levels), yield some very interesting results. Mainly, 100% of respondents that have a household income of less than \$35,000 believe that the climate is changing. For income levels \$35,000-\$49,999, 73% of respondents believe the climate is changing while 23% are not sure and 5% do not. With income levels greater than \$50,000 there are similar results, with increasing percentages of people who believe the climate is changing as income increases.

We should also consider any difference in beliefs about climate change for various education levels. For simplification, respondents were identified as college graduates or non-college graduates. Climate change beliefs based on college education are as follows in figures 44 and 45:



Based on the charts above (figures 44 & 45), 84% of respondents with a college degree believe that the climate is changing. On the other hand, 90% of respondents without a college degree believe that the climate is changing.

5. Conclusion

The results obtained from the survey show many significant findings, many of which support previous studies such as the aforementioned study by the Center for Climate Change Communication at George Mason University. In particular, the results have determined that there is a clear reluctance for people to confront and mitigate climate change even though a significant majority of respondents acknowledge the serious implications climate change will have in

the future. Further, respondents clearly find that climate change is a serious issue for the world, but when confronted about the potential effects to them personally, far fewer respondents find this to be a serious issue.

In addition, the demographic trends among respondents reveal similar results to a previous study conducted by Christopher Borick and Barry Rabe regarding a national survey of American public opinions on climate change. They found that 60% of Americans with a college degree believe that the climate is changing, while 27% do not. For Americans without a college degree, they found that 66% believe that the climate is changing, while 24% do not.⁵ Although the results from my survey have a higher overall percentage of people who believe that the climate is changing (84% of respondents with a college degree believe that the climate is changing and 90% of respondents without a college degree believe that the climate is changing), this is likely due to the fact that the survey was distributed by Colby students participating in an environmental economics course. Nonetheless, as Borick and Rabe point out, "traditional demographic categories such as gender, race and educational attainment offer little in the way of providing cues about an individual's standing on [climate change]."⁶ As is evident in the results of my survey, there also does not appear to be a significant change in views based on education.

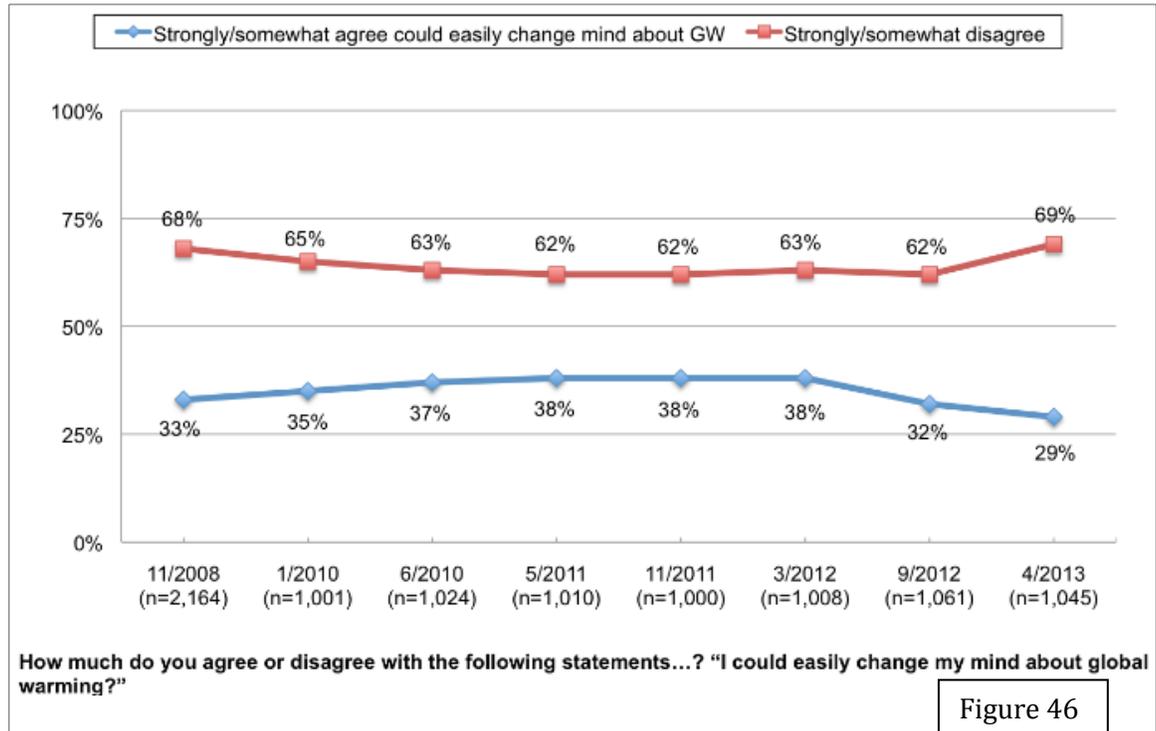
On the other hand, an interesting trend resulted from my analysis of different levels of income and the associated beliefs on climate change. As discussed earlier, for lower levels of income (less than \$35,000), 100% of respondents believe that the climate is changing. Only until respondents' income levels exceed \$35,000 do we see any proportion of people who believe that the climate is changing.

Lastly, one of the most interesting findings in this study surrounds the level of familiarity each respondent has with climate change. For both the causes of and degree of seriousness resulting from climate change, there were telling patterns regarding respondents' level of familiarity. Particularly, respondents who were more familiar with the issue found climate change to be a more serious matter than those who were not. Similarly, those who more familiar with the issue also found the causes of climate change to be more directly related to human activity rather than just natural causes.

⁵ Rabe, B. G., and C. P. Borick. "Fall 2011 national survey of American public opinion on climate change, Issues in Governance Studies." *Brookings Institution, Washington, DC* (2012).

⁶ *Ibid.*

In conclusion, I have found that people have greatly differing levels of knowledge regarding climate change. In the study conducted by the CCCC, they produced the following chart (figure 46):



Clearly, with such a high percentage of Americans that doubt their own views, there should be a greater emphasis to learn about this issue in order to have a more educated opinion about climate change. With more resources made available to the general public, the overall view of such an important issue will surely have a significant change.

6. Works Cited

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