Perceptions of Climate Change in Japan

Japan Project Center

October 11, 2019

Christopher Engel, Jackson Morse, Ryan Shaw and Rowena Sullivan
Sponsor: Professor Dr. Ingrid Shockey with climatestoriesproject.org

Perceptions of Climate Change in Japan

An Interactive Qualifying Project (IQP) Final Report
Submitted to the Faculty of
WORCESTER POLYTECHNIC INSTITUTE
in partial fulfillment of the requirements
for the Degree of Bachelor of Science

By
Christopher Engel
Jackson Morse
Ryan Shaw
Rowena Sullivan

October 11, 2019

Report Submitted to:

Professor Alex Sphar Ph.D.
Dean Gregory A. Snoddy Ed.D.
Kumiko Snoddy
Worcester Polytechnic Institute

This report represents work of WPI undergraduate students submitted to the faculty as evidence of a degree requirement. WPI routinely publishes these reports on its website without editorial or peer review. For more information about the projects program at WPI, see http://www.wpi.edu/Academics/Projects

Abstract

We intend to bolster the work of the Climate Stories Project by exploring the social understanding of climate change of Japanese residents. Through background research, we identified the quantifiable ramifications of the shifting climate in Japan. We then interviewed long-term residents to discover their perceptions of climate change, what they thought attributed to climate change, as well as actions they are taking to minimize their footprint. With these personal narratives, we produced multiple videos to post on Instagram and the Climate Stories Project's website to spread awareness of the issue. Supplementary studies within Japan should be conducted, especially in the Hokkaido and Fukuoka areas, due to their different climate and potential for different perspectives.

Executive Summary

Climate change's effect on the environment and society is rapidly becoming catastrophic. These catastrophic changes have occurred across Japan. As an example, Japan's surface temperature has increased at a rate of 1.19 °C (2.14°F) over the past 100 years and is expected to rise another .5 to 5.3 °C (0.9° to 9.54°F) over the next century (Ministry of the Environment, 2018). The coastline is also in grave danger, as a 1-meter rise in sea level would submerge more than 90% of the country's beaches (Case, 2008). The amount of harvestable seafood has declined since 1930, decreasing at a rate of 4.1% per year. Furthermore, an increase in both the magnitude and frequency of extreme weather events that have occurred, causing substantial shifts in plant bloomings and animal behaviors (SCMP Editorial, 2018).

These data points are just a few examples of how Japan is affected by climate change. What people fail to see when looking at these numbers are the people that are being affected because of these changes. Data collected by climate change scientists often fails to invoke understanding in people because it does not connect data with meaningful human interactions. Therefore, while in Japan, our team has documented the stories of Japanese residents to understand their experiences of climate change over the years.

Our project is significant in that people can talk about climate change from their own personal perspective, allowing individuals to understand and feel what they've experienced. This allows climate change to be talked about with empathy. This emotional connection allows people to better understand and connect with the stories about the effect of climate change on these lifelong residents of Japan. With these stories, our team produced multiple educational and engaging videos that showcased people's experiences with climate change.

This project is a continuation of an existing project. Professor Ingrid Shockey, a WPI professor, is working on collecting stories about people's perspective on climate change from around the world. This project has also been done by WPI students in India, Iceland and now Japan. Professor Shockey and climatestoriesproject.org have been collecting stories from around the world, documenting the effects of climate change, as seen in Figure 1 below. The goal of this project is to continue spreading awareness of climate change, allowing more people to become engaged and informed.

Figure 1. Countries that Professor Shockey has conducted or sponsored projects concerning climate change.

Our team interviewed 18 people from across Japan, from a variety of different sectors: agriculture, fishing, education, and local residents (Figure 2). Our goal for the interviews was to make them more like conversations, i.e. semi-structured interviews. Although we had questions prepared for the different groups, we deviated from them once people started talking about specific stories. Our questions were a way to get the interviewee comfortable with the situation and to open up about their experiences. Once they started talking about specific stories, we would ask for more details and ask them to explain more. It was important for us to have an open conversation about climate change rather than sticking to a script. The interviews lasted between 10 to 25 minutes end each varied, even though the information we gathered were similar.

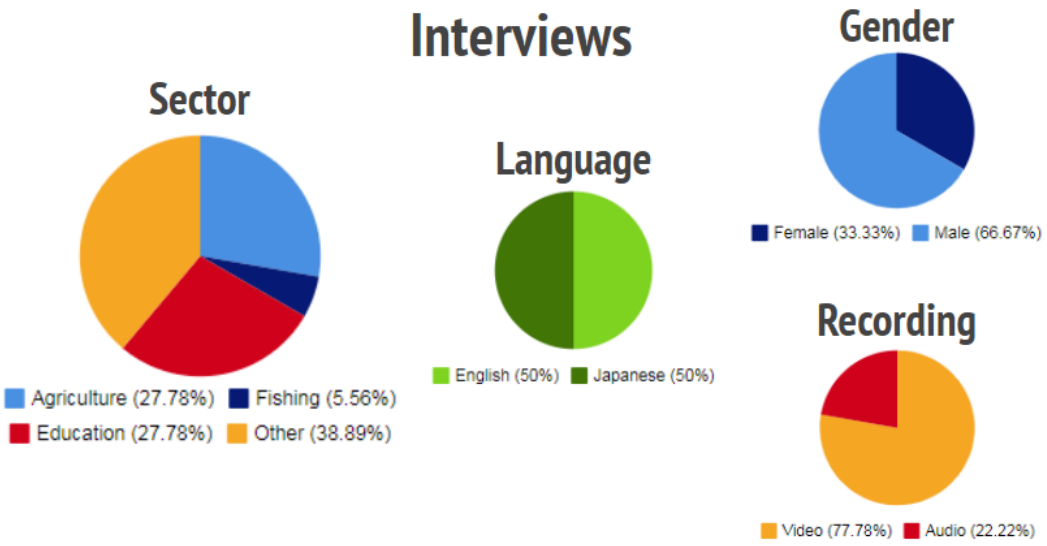

Figure 2. Results and statistics from our interviews.

Throughout our interviews, we heard many stories of how climate change has affected people's lives from various walks of life. As our research progressed, a pattern emerged in how people see and understand climate change. We heard stories of how the summer days are hotter and more frequent, as well as stories of the lack of snowfall. We even heard multiple people talking about how not using disposable wooden chopsticks would help reduce climate change, even if it was by a little bit. Although every person we talked to are from different backgrounds, they all managed to talk about similar topics and helped shine the light on how climate change has affected Japan.

After the interviews were edited, our team created short videos to post on our team's Instagram page (@CosmicClimateChange), as well as the website climatestoriesproject.org. It was our goal to make short, digestible videos so that people could watch one through to the end and still get the message we were trying to get across.

With the use of these stories, we are trying to make climate change a more personal issue. This project will be another stepping stone to making climate change a global issue that people care about and help them understand the perceptions of others. Climate change is a global issue impacting the entire world. With the increase of scientific research, it seems as though everyday people and their stories of climate change are left behind. It was our goal to help bring these stories to light in order to connect climate change with the data from scientists with the stories of real people, so that people could help foster a connection between themselves and the environment.

Acknowledgements

We would like to thank the following people for their support of this project:

Our sponsor, **Dr. Ingrid Shockey** for her guidance and constant feedback.

Our advisors, **Professor Alex Sphar Ph.D**, **Dean Gregory A. Snoddy Ed.D.**, and **Kumiko Snoddy** for their support and guidance.

Our **participants** for agreeing to talk to us and sharing their stories.

Team Contributions

Christopher Engel contributed to the introduction, wrote section 3.2, contributed to the conclusion, conducted the Japanese interviews, and translated/transcribed all Japanese interviews.

Jackson Morse contributed to the introduction, wrote sections 2.5, 2.6, 3.3, contributed to 4.3, edited the entire report, edited the interviews, created our final videos and wrote transcripts for English interviews.

Ryan Shaw contributed to the introduction, wrote the abstract and sections 2.4, 2.7, contributed to 4.2 and 5.1, edited the entire report, helped transcribe and edit the English interviews, and was in charge of all of our filming equipment as well as filming all of the interviews.

Rowena Sullivan contributed to the introduction, wrote the executive summary and sections 2.1, 2.2, 2.3, 3.1, 4.1, 4.2, 4.3, 5.1, the conclusion, contributed to the abstract, edited the entire report, was in charge of communication and organization, and conducted the English interviews.

Table of Contents

List of Figures

Chapter 1: Introduction

The effects of climate change on the environment and society have rapidly become catastrophic, and include rising temperatures, sea levels, as well as extreme weather events. Japan, in particular, has experienced many changes. For example, Japan has experienced increased temperature changes as well as seafood shortages. Japan has also experienced more frequent weather events, like more frequent and powerful typhoons, and so much more.

Japan has an interesting history with climate change and attempts to combat it. The Kyoto Protocol is an international treaty that was created on December 11, 1997, following a meeting of the United Nations Framework Convention on Climate Change (UNFCCC), and it was finalized at a meeting in Kyoto. It aimed to reduce the emission of six different greenhouse gases that contribute to global warming. It was signed by 192 different countries whom all agreed to reduce greenhouse emissions. However, Encyclopedia Britannica points out that the Protocol has had virtually minimal effect on greenhouse gas emissions. After two years, it was clear that many nations wouldn't meet their emission targets. With no incentive to police it and with an array of uncertainties concerning climate change, it was difficult to tell whether the treaty was worth the cost. It failed to produce a detectable slowing in the rate of emissions growth (Encyclopaedia Britannica, 2019) and has been rejected by several developing countries as well as first world countries since its inception in 1997. It would seem as if the Kyoto Protocol has done little to deal with the problem of climate change.

There have also been many attempts to combat climate change effects in Japan, but most of them have been on a scientific or political level, and never on a personal level. For the last several years, Professor Ingrid Shockey, an environmental sociologist at Worcester Polytechnic Institute in the United States, has been exploring individual perceptions and reactions to climate change across the world. Professor Shockey has worked on multiple projects concerning climate change, including student-run story projects from Iceland, India and other countries, talking about the personal stories of climate change. This particular project will contribute to the archive of recorded climate change stories across the world documenting the experience of climate change in the Kyoto and broader area as perceived by long-term residents. We did this by interviewing locals about their perceptions of climate change, recorded their stories, and then used their stories to create engaging videos to share with the world.

Chapter 2: Background and Literature Review

2.1 Overview of Climate Change in Japan

Japan, like the rest of the world, is suffering from the effects of climate change, such as rising average temperatures, changing weather patterns, and plant and animal species being threatened by extinction (Stokes, 2016). Although all of these problems are occurring, there seems to be only a small percentage of people who care. Many people do not view climate change as a pressing issue in Japan (Stokes, 2016). That, and so much more, will be discussed in the following background chapter. In this background chapter, we discuss what climate change is, how it has been affecting Japan, what Japan has done about it, and why there is skepticism about this issue in Japan. Next, our team talks about how we introduced a different way to look at climate change, and encourage residents to do something about the issue. We conclude by exploring how narratives and social media have been used around the world to help educate and motivate people to act to address the effects of climate change.

2.2 What is Climate Change?

Climate change is “changes in the world’s weather” (Cambridge Dictionary, n.d.). Shaftel (2019) defines climate change as the more frequent, extreme weather events occurring, the increases in temperature and rise in sea levels, as well as the loss of ice mass and subsequent shifts in plant bloomings and animal behavior. Although some level of climate change has occurred since Earth’s inception, considering cycles of glacial advances and ice ages, the rate of that change is accelerating. One factor is the increase in the greenhouse effect. In the past century, more carbon dioxide has collected in the Earth’s atmosphere than ever before. NASA indicates that 97% of climate scientists agree that these climate-warming trends are due to human activity, primarily the increase of burning fossil fuels and deforestation.

2.3 The Main Cause of Climate Change

Climate change is caused by rising levels of CO2 in the atmosphere. Burning fossil fuels and deforestation are the main reason for rising CO2 levels. The burning of fossil fuels has caused major issues spanning from air pollution to water pollution. The unearthing of fossil fuels, it’s processing and the transportation of the oil and gas takes an enormous toll on the ecosystem. As a result, large wildlife habitats are destroyed. Deforestation also contributes to rising levels of CO2. Trees play a vital role in absorbing the excess carbon dioxide from the air, so with deforestation, more greenhouse gases are left in the atmosphere.

The burning of fossil fuels, deforestation and the increased levels of greenhouse gases have created a situation called the “greenhouse effect”. The “greenhouse effect,” according to NASA, is warming that is caused by the atmosphere trapping heat radiating from Earth to space. There are certain gases, including carbon dioxide and methane, in the atmosphere blocking and preventing heat from escaping. Without them, the Earth would lose so much heat that life could not exist. However, if the gas levels exceeds a certain limit, the atmosphere will start trapping too much of the sun’s energy and heat, which will then begin to upset the natural systems that regulate our climate (The Climate Reality Project, 2019). The temperature will continue to rise, which will exacerbate impacts, including extreme weather conditions. Even small changes in the Earth’s temperature can cause major and dangerous problems. One degree of temperature change can be the difference between ice and water.

Predictions that scientists have made in the past about rising sea levels are now occurring. This is due to the increase in heat waves hitting the globe. It is believed that temperatures will continue to rise. The Intergovernmental Panel on Climate Change (IPCC) believes that the temperature will rise between 1.4° to 5.5° Celsius (~2.5° to ~10° Fahrenheit) over the next century and the effects will continue to vary and intensify as the environment changes (Shaftel, 2019).

2.4 Japan Experiencing Climate Change

Japan, an island nation, is exceptionally susceptible and vulnerable to the effects of climate change. The average temperature over the last century in Japan has increased by 1°C (1.9°F) and is projected to rise another .5° to 5.3°C (.9° to 9.54°F) by the end of the 21st century, depending on elevation (Case, 2008). Furthermore, the number of days per year above 30°C (86°F) has increased by .2 days per 10 years over the last 85 years. Projections indicate that by the end of the 21st century, Japan will have 54 more days above 30°C (86°F) than it did at the end of the 20th century (Japan, 2009). Additionally, precipitation and snowfall patterns over the last half century have altered, both in terms of duration and magnitude. Heavy rain days are defined as 100mm/day and extreme precipitation events are defined as 50mm/hour. The Automated Meteorological Data Acquisition System has noted an increase in both heavy rain and extreme precipitation events. Likewise, the “maximum snow depth has decreased for the period between 1962 and 2016 on the Sea of Japan side of eastern Japan and on the Sea of Japan side of western Japan, at rates of 12.3% and 14.6% per decade, respectively” (Japan, 2009). Consequently, these changes have substantially impacted fishing, agriculture, and health in Japan.

Japan is home to an extensive marine ecosystem. However, more than 20% of amphibians, brackish and freshwater fish, and vascular plants face extinction (Case, 2008). Climate change will also affect freshwater lake composition. The increase in temperature will lead to a deterioration of water quality in freshwater systems and an

increase in chemical nutrients (Case, 2008), leading algae to proliferate and produce too much nitrogen for the ecosystem. This leads to a phenomenon called nutrient pollution, in which there is too much nitrogen in a source of water, which causes algal blooms. This enormous influx of algae leads to a decline in available oxygen in the water, which can cause the death of many forms of aquatic life. In the case of Japan, this leads to a decrease in available fish, thus harming the fishing industry.

Japan's most important crop, rice, is greatly affected by climate change. The uncertainty factor in rice, or the fact that farmers don't know how much rice yield they're going to get, is what makes climate change such an important issue when it comes to Japanese agriculture, as rice is an important staple in the Japanese diet. Rice is grown when the temperature is between 20 and 27°C (Chand, n.d.). However, climate change is causing water temperatures in the rice paddies to increase 2°C (35.6°F). This leads to a 40% decrease in rice yields (Case, 2008). Having this aspect of uncertainty of rice production across Japan can spell disaster for local rice farmers. Changes in precipitation and soil moisture will soon negate this increase, thus leading to an overall loss in rice production (Case, 2008).

The expected increases in both temperature and precipitation pose a threat to the health of Japan's residents. Between July of 2017 and 2018, fatal cases of heatstroke increased fourfold (Kyodo, 2018). "The mortality risk from heat stress is projected to increase in Japan by the mid-21st century (2050s) to about 1.8–2.2 times the average level from 1981 to 2000, and to about 2.1–3.7 times that level by the end of the century (2090s)" (Japan Meteorological Agency, 2008). Another important health risk is the rise of vector and water borne infectious diseases. An increase in temperatures provide better growth conditions for many diseases that are caused by organisms and parasites. As a survey by the National Institute of Infectious Diseases suggests, the habitat of mosquitoes in Japan is expanding, which could bring dengue fever to Hokkaido (Case, 2008). The increase in temperature has aided the Japanese Encephalitis Virus (JEV) to prosper because for incubation the JEV needs a "minimum temperature of 25–26 °C" (77°-78.8°F) (Impact, 2015). Diarrheal diseases were also exacerbated by flooding, standing water, and ambient heat. Furthermore, outbreaks of cholera, enterotoxigenic E. coli (ETEC), rotavirus, norovirus, and the Norwalk virus have also increased in all areas that are prone to flooding (Levy, 2016).

2.5 Climate Change Skepticism and Inaction in Japan

According to Stokes (2016), 68% of Japanese people believe that climate change is a big threat to their country, yet, counter-intuitively, the younger generation is less worried about climate change than the older generation. Stokes found that 75% of respondents age 50 and older said they thought that climate change is a major threat to the country, versus 59% of individuals ages 18 - 34.

Compared to many other countries, Japan has a smaller amount of people who believe that human activity is a large reason for climate change compared to other countries. As seen in the figure below, Japan has one of the lowest rates when it comes to people believing that climate change is a result of human activity. Below in Figure 3, you can see that Japan has the highest amount of people who disagree that climate change is the result of human activity. This level of denial is significant, since a lack of attention to the issue of climate change will only exacerbate its effects.

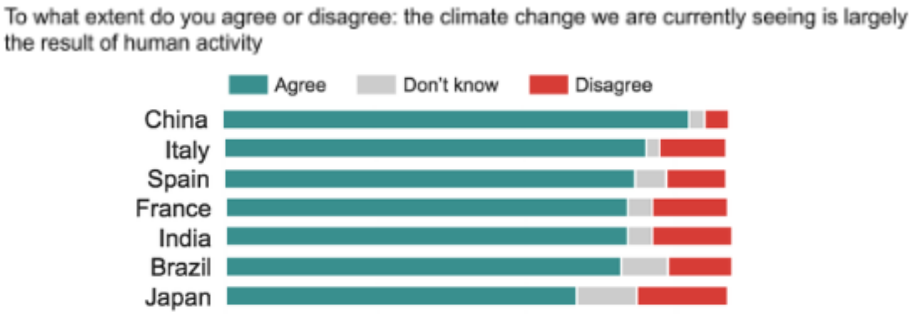

Figure 3. Results from a question about views on climate change from a 2014 global report (The New York Times, 2017)

On a global scale, it appears that climate change skepticism stems from a distrust or a lack of understanding of science. This causes people to not take climate change seriously. People may hold a higher respect to others personal stories than scientific findings. Using this premise, our goal is to bring to light that dissents exist, and hopefully with the sharing of personal oral history, it might cause people to reconsider their stance on what kind of an issue climate change presents on both a Japanese and global scale.

2.6 Climate Stories Project

Professor Ingrid Shockey's project is our project: to record the personal stories of people's experiences with climate change. As an environmental sociologist, she is interested in the stories from local residents about the changes in their environment that they attribute to climate change. She believes that sharing these narratives can inform or augment the science of climate change. Engaging with local stories can amplify awareness of all the small and large ways that climate change alters communities (Shockey, 2019).

Professor Shockey leverages WPI project center sites to create a series on "climate change stories" around the world. These sights can be seen below in Figure 4, where the red locations are places where climate change stories have been gathered and the yellow location is where climate change stories are currently being gathered. This is done by asking the same kinds of questions around the world, from Iceland to

India to, now, Japan. These stories are uploaded onto the collaborative and public platform, climatestoriesproject.org.

Figure 4. Countries that Professor Shockey has conducted or sponsored projects concerning climate change.

Instead of the numbers and graphs that scientists use to show climate change, more digestible media, such as videos of people speaking of their experience of climate change, and pictures of communities or locations affected by climate change will be shared.

2.7 The Importance of Instagram and Social Media

Social media captures the attention of people all over the globe and makes sharing information and stories extremely efficient. Professor Shockey expressed interest in our group producing short videos. This allowed us to post them on Instagram, one of the most popular social media sites, thus allowing these stories to reach a large audience. In turn, these personal climate change stories have the opportunity to influence the opinions of those that might not believe in climate change. We hope that if climate change deniers come across our videos of real people talking about their own experiences, and cause their perspective to change and lead them to reconsider and possibly acknowledge the issue of climate change.

With the knowledge of climate change and especially climate change in Japan, we were more suited to talk to people and discuss this topic with them. We will be able to have an idea of what people are talking about when doing interviews. In the next chapter, we will explain the process of gaining familiarity with locals, understanding locals' experiences with climate change, and producing an engaging and educational product.

Chapter 3: Methodology

Our project group's goal is to spread worldwide awareness of climate change through stories and first-hand reports of the impact on both a personal and community level. To do this, we interviewed people around the country of Japan who had stories to share about climate change. Through the presentation of these stories, it is our hope that new ideas and relationships can be forged that begin to alter individual opinions and behaviors associated with climate change.

To achieve our goal, we completed the following three objectives:

1. Gained familiarity with the local residents;
2. Listened to the local communities' perceptions and experiences associated with climate change;
3. Produced an engaging and educational visual and written product that supports the Climate Stories Project.

To accomplish these objectives, we identified key stakeholders and conducted interviews similarly as the previous projects.

3.1 Objective 1: Gain familiarity with the local residents

Prior to understanding local perspectives or making educational videos on climate change, we first needed to make contact with locals. This required us to "break the ice" and help people feel more relaxed and comfortable with us before we asked anyone for an interview (Cambridge University). In order for our team did not appear as rude or intruding on their day-to-day business, instead of simply walking into stores or restaurants and asking questions, we first spent some time in and around the local area and shops. This was in an effort to make our faces familiar in both the establishments and the communities, ideally to create a greater sense of ease with our presence.

Once our team established a presence in the area, we approached local shop owners and community members. We introduced ourselves, explained our project, and asked if they have any stories or comments about climate change. A major challenge we faced was that most of us only spoke English and we couldn't talk to many of the residents in Japan. Effective communication and conversation require the ability to speak the same language to truly see the world through their eyes. We were outsiders looking into the lives of people who are sharing personal stories about climate change (Sterns, 1999). We alleviated this concern, to the extent possible, through having one team member who is fluent in Japanese serve as the main conduit for these interviews and discussions.

3.2 Objective 2: Understand local perceptions and experiences of Climate Change

Having researched the effects of climate change in Japan, we then focused on face-to-face interviews to gain a greater understanding of the perceptions and experiences of climate change upon the local residents. Our teams' previous review of research studies suggested that there were significant adverse effects on four key constituent groups: individuals employed within the agriculture sector, fishing sector, educational sector, and lifelong residents. Interviewing people from within these groups helped ensure our portfolio of interviews, stories and perspectives are diverse and comprehensive.

Within the agricultural constituent group, a great source of interesting stories included small farms such as Midori Farm, and local small grocery stores. The different perspectives on agriculture from a produce and a wholesaler side bolstered our understanding of the problems Japan's food production faces and hardships that workers experience due to climate change.

To investigate the effects of climate change on the fishing industry, we interviewed local fish sellers. A type of story we hoped to yield was where they compared the number of fish they are selling now to the number from previous years. We also wanted them to describe the differences in the number, health, type, etc of the fish they are selling. We also hoped to gain information on the seasonality of different fish species as well as changes in the weather that affected fishing.

To gain an understanding of how climate change is seen in the Japenese academic world, we requested permission to conduct interviews within universities and schools. Those interviews yielded stories from professors and students who have experienced climate change through their studies. These perspectives could be highly valuable and pertinent to our study.

To complement the interviews above, we interviewed local residents, who have reached at least 20 years of age, this being the legal age of adulthood in Japan. We visited coffee shops, parks, and other areas where individuals might spend leisure time. This strategy yielded some informal and unstructured interviews that brought forth perspectives not originally noted in the background research. These people provided insight into climate change from a different perspective. Instead of being directly tied to climate change through their job, they experienced aspects of climate change through their daily life.

Once we fully identified the types of individuals and locations we wanted to focus on, we recruited subjects by approaching them and asking if they would be willing to participate in an interview on the topic of climate change and their thoughts on it. We explained that we would need their consent for this interview (as per the consent form in Appendix A) before we began any questions. In the instances where we had structured and formally planned out interviews, we gave the interviewees the interview questions

beforehand and scheduled the interview at a location that was comfortable with them. For other interviews, like for the shop and restaurant owners, we were told to come back later in the week. During these instances, the interviewees did not have time to look over the questions, but were instead given a few minutes beforehand to look them over and think about what they wanted to say. We also gave the interviewee an option to opt-out of being filmed. When they opted for that, we solely recorded audio. We offered this to ensure that the interviewee was as comfortable as possible while talking. For all cases, interviews lasted for a maximum of 15 minutes, where the interviewer would ask a few of the questions specific to the interviewee's positions and then end the interview asking for specific stories relating to climate change.

3.3 Objective 3: Produce an engaging and educational product

The best method to producing an educational product that people will want to watch is making it engaging and captivating. We decided to make short videos to both be able to post them on Instagram, which only allows videos up to a couple minutes, but also because studies show that videos lasting more than 2 minutes loses 60% of viewers (Ahmad, 2019). We wanted to produce videos that were short enough to keep people interested, but also full of information to educate people on climate change in Japan.

The initial step involved translating any interviews done in Japanese and writing an English transcript for them. Then, the videos were edited and subtitles were put in. After that, the next step involved creating the one-minute videos to post on our project's Instagram page, @cosmicclimatechange, and on the website climatestoriesproject.org. We edited these interviews into around one to three minute posts using the software DaVinci Resolve 16. Our plan when editing these videos was to make the opening seconds count by trying to capture sound bites and images that are compelling. According to Digiday, nearly 85% of videos on Facebook are played with no sound, so we anticipate that the videos will be played muted. Therefore, using subtitles or infographics that allow viewers to follow the storyline have been added.

The final step in editing was to combine relevant interviews to address a common theme or answer a particular question. Here it was our vision to combine different people with similar stories together in one video to further bring home any point that they had while sharing their experiences. If an interview happened to be solely audio, we used B-roll, or background footage, pictures or videos that our group either took while traveling around Japan, or royalty free images that others have taken. Having B-roll creates that extra element of engagement, so the audience is not subjected to simply a blank screen with subtitles.

Once these videos were put together, the final step was to post our product on our Instagram page and climatestoriesproject.org website. To gather followers for our page, we reached out to friends to share our page's username. We also posted pictures

of our interviewing process as well as eye-catching experiences our group had while in Japan. These strategies will increase interest and following of our page, and will lead to a larger audience for our videos. Furthermore, to get our content in front of people who view similar material, we used keywords and hashtags such as #climatechange, #environment, and #climate. We anticipate that this will help increase the likelihood of our videos being put into people's feeds who watch similar material. The entire transcript of each interview are also linked in the description of the post in case a certain part of the video catches the interest of someone in our audience.

Chapter 4: Results and Discussion

This project proved to be highly successful. Our team spoke to a wide variety of people across Japan. In this chapter, we discuss how we gained familiarity with the local residents, which allowed us to explore local perceptions and experiences of climate change. Finally, we describe what we hope our videos will accomplish as they get shared across the globe.

4.1 Gaining familiarity with local residents

To persuade locals into joining us for an interviews, we engaged in business transactions such as buying a bonsai tree or lunch at their respective establishment. This allowed us to avoid being intrusive and cold calling shop owners or residents. Therefore, when we returned to inquire about the possibility of an interview, we were recognizable faces. This resulted in business owners feeling a greater level of comfort with us and willing to be interviewed. Furthermore, doing audio-only interviews was another way to create a comfortable environment for the interviewee. Many who had stories to tell were willing to share them. People who didn't have stories apologized for not being able to help, but either pointed us to someone who possibly could help us or pointed us to an area they knew has been affected by climate change so we could scope out that area.

Despite the language barrier, one of our team members was able to introduce us to the local residents and ease any tensions or concerns they may have had when they saw a group of young Westerners approaching them. While the language barrier was a challenge for our team, it did allow us to extend this project past interviewing only English speakers.

Fortunately, we did manage to conduct many interviews in English. This was extremely beneficial for everyone on the team, as it permitted a different team member to be the lead interviewer and allowed our whole group to understand what was being said during the interview. From a team perspective, it is a better experience to be able to actually understand what is being said during the interviews and have everyone on the team interact with the interviewee rather than most of us just listening without comprehending. Having an English language based interview also made the process of transcribing the text and subtitles much quicker. Overall, the greatest benefit to conducting English language interviews was that every team member could listen and understand

Other than the challenges associated with the language barrier, this method worked rather well. Everyone we talked to was friendly and willing to help in whatever ways they could. There were a few instances where people didn't have any stories to share with us.

We believe that showing our faces to potential interviewees greatly helped our project and allowed conversations between us and the local residents go as smoothly as possible. By having a familiar presence, we had gained a sense of acceptance when going to different locations.

4.2 Understanding local perceptions and experiences of Climate Change

Our goal was to talk to different groups of people and discover their stories of climate change. We wanted to talk to people in the farming industry, the fishing industry, the education industry and regular everyday locals. Once we found people who worked in these areas, we were able to talk to them and have a conversation about their experiences with climate change.

We were able to talk to people from all different walks of life, although our sample size is relatively small. Below in Table 5, we identify the individuals we interviewed for our project, including occupations, types of interviews, and what language was used.

Sector	Interviewee Name	Profession/Occupation	Video/Audio	Language
Agriculture	Mitsuo	Rice Shop Owner	Audio	Japanese
	Katsumi	Bonsai Shop Owner	Video	Japanese
	Eguchi	Vegetable Shop Owner	Video	Japanese
	Yugi	Flower Shop Owner	Video	Japanese
	Chuck	Organic Farmer	Video	English
Education	Naoki	Professor	Video	Englsih
	Yuki	University Student	Video	English
	Kotomi	University Student	Video	English
	Yu	University Student	Video	Japanese
	Kouji	Principal	Video	Japanese
Fishing	Akihiro	Fish Shop Owner	Video	Japanese
Local residents	Aileen	Exec Dir of Green Action*	Video	English
	Haratsuyoshi	Kiko Network**	Video	Japanese
	Kenrou	Kiko Network**	Video	English
	Hiroko	Udon Restaurant Owner	Audio	Japanese
	Robert	Potter	Video	English
	Michiko	Retired Housewife	Audio	English
	Yuriko	Coffee Shop Assistance	Audio	English

	Robert	Potter	Video	English
	Michiko	Retired Housewife	Audio	English
	Yuriko	Coffee Shop Assistance	Audio	English

Figure 5. Interviewee information from Japan interviews.

* Green Action is a NGO organization working towards a nuclear-power-free Japan

** Kiko network is an organization working to prevent life-threatening climate change and to build a sustainable global society

We were only able to interview people from a small radius around Kyoto, Japan, due to our limitations with time and travel funds, so our sample does not fully represent that profession/occupation across Japan. It is only a small sample of what certain types of people have experienced. We were able to talk to a lot of local shop owners, ranging from rice sellers to flower sellers to fish sellers. We were unable to talk to any actual fishermen unfortunately due to the fact that fishing docks were filled with fish salesmen rather than actual fishermen. We were able to talk to a few people in the academic field, including a Professor at a Tokyo university, a principle of an elementary school, and two university students. We only had time to talk to one farmer, an organic farmer located north of Kyoto.

This problem was worsened by the before mentioned “language barrier”. Because three out of the four members of our group were not fluent in Japanese, our communication was limited and placed solely on the shoulders of one of our team members. The language challenge certainly limited the kinds of stories that we were able to obtain. However, in the end, we were able to collect meaningful stories to showcase what people think about climate change and its effects in Japan. Some of these stories included people talking about the joys of playing in the snow during the winter when they were younger and, now that they’re older, seeing how much less snow they’re getting. Stories like that hit close to home for us, because we are able to relate and sympathize with that. Our team from throughout the U.S. is also experiencing similar problems, so hearing that it’s happening in Japan as well made us realize how much of a problem climate change truly is.

4.3 Producing an engaging and educational product

Once all the stories were collected, we produced multiple short (approximately 60-120 second) videos showcasing the stories of Japanese residents. Our hope with these videos is to take the stories of the everyday person and get them to a place where they can be seen and heard. Using Instagram as our platform makes sharing our content simple and straightforward, and this opportunity has allowed light to be shed on the residents of Japan. Even with talking to some local residents, including ones we haven’t been using for our interviews, we learned that Instagram is a really popular social media site in Japan. Having that media commonality between the United States and Japan will help us broaden our audience.

Using this link between countries, we can make sure that these stories we're collecting can reach whoever might want to see them. In some cases, it's hard to listen to people talk about how climate change has impacted their lives. Some of the stories they tell can be charged with emotions, and we understand that it might be difficult for people to open up about how much their life has been impacted due to climate change. For instance, it can be difficult to now know how organic farmers are suffering from droughts and then being swamped by two straight weeks of heavy storms. It's surprising to hear that summers are getting hotter to the point where it's causing adverse health effects. It's heartbreaking to find out that towns are getting washed away from giant floods due to heavy rainfall. This suggests that the climate of the world is changing for the worse.

However, this storytelling opportunity allows the people of Japan to talk about these impacts, because it tells the world that Japan is also experiencing the effects of climate change. Our videos will let people know that it's not just happening in our hometown, state, or country, but that these changes are happening globally, and that something needs to be done about it.

Chapter 5: Recommendations and Conclusion

If our team had more time and resources, we would have traveled all across Japan, collecting stories from across the country from people of all different walks of life. If this project were to be repeated, we would recommend focusing on the northern and southern parts of Japan, such as Hokkaido and Fukuoka, because of their vastly different climates. We believe that the people in these areas would have some insight and stories to tell about climate change and why they believe these weather events are happening.

5.1 Recommendations

Our project encountered multiple challenges during our 7 weeks in Japan. Some of these problems were experiences that previous teams had warned about, but we still encountered due to different situations. Some of these problems were issues we faced due to the lack of knowledge with either the culture or even just the equipment we were using. In any case, what follows are important recommendations for future teams to consider and think about when they conduct a similar climate change project.

The most important recommendation we can offer is to make contacts and to reach out to people early in the project. Many of our interviews were people who were family friends or other project sponsors. These people were very valuable because not only were they willing to help us in our project, they were also willing to give us other contacts who might be interested in doing interviews. If you are sending emails or trying to contact officials, send out the emails earlier than opposed to later. More often than not, you won't get responses. You need to send these emails early so that when you don't get a response from a certain group you want to interview, you know you need to find other options. Yes, going up to local shop owners worked for us, but it only resulted in a couple interviews. We were turned down multiple times. Having connections, a set of desired locations and some communication before the interviews started really helped us get some of our better interviews. Having more details planned out will result in better interviews.

One of the biggest problems that we encountered was not informing people of our intentions to conduct a video interview before meeting with them in person. On multiple occasions, we either didn't make it clear or forgot to mention that we wanted to record our interview with a camera. This surprised many people when we finally mentioned it and had people on edge before the interview even started. Once we realized our mistakes, we did ask for permission to audio or video record the interview early in the introductory process. However, more often than not, people were still surprised when we took out our recording equipment. Our team encourages future teams to make sure that when you're asking people for an interview, explain your desire to record it and make sure they understand what you mean by that. Possibly there was

a miscommunication error at play as well, so definitely make sure your interviewee knows that you want to record them earlier than 5 minutes before the interview begins. This can be accomplished by trying to pre-schedule interviews.

During interviews, there should always be someone taking notes of what is being said, as well as important topics and memorable quotes. We only did this for some interviews due to the fact that either some interviews were conducted in a language we didn't understand or there just weren't enough people present at the interview to take notes. However, it is important for someone to take notes. We conducted a Skype interview with an Organic Farmer and he was one of the most interesting and useful individuals we spoke to. Since it was through Skype, we set up 2 different recording devices to record the interview. However, both methods failed and we lost everything from the interview. Luckily, we had notes on the different topics he talked about, so when we were able to interview him again a few weeks later, we were able to ask him about the stories he had previously given us. We successfully recorded all of his stories, plus a few extra he had originally forgotten to mention. If we had not taken notes during that first interview, we would've lost many valuable stories and a fantastic conversation.

Know how to record and conduct an interview. The importance of knowing how to conduct an interview can not be overstated. Knowing how to control lighting and outside noise is essential to conducting a good interview, so that when your team reviews the video footage, you are not surprised by the darkness or brightness of the footage, or background noise. Luckily for our group, every outside interview we did was filmed on a cloudy day, so we had no issues dealing with lighting.

Another issue we faced was dealing with the uncertainties of the camera equipment. Unexpectedly, a battery pack would die, the camera wouldn't be rolling or the microphone wouldn't be synced to the right frequency. All of our equipment was double or even triple checked before the start of the interview, but it still managed to go awry as the interview was occurring. It would prove wise to have someone constantly checking battery life and sound quality as the interview proceeds. In addition, bring extra batteries and microphones for just these types of issues.

Be sure that all team members know how to work any and all the equipment you have. Also, the first time you turn on the camera should not be 5 minutes before your first interview. If someone is sick or isn't feeling well and can't make it to the interview, someone else needs to be able to pick up the slack and take over. Thankfully, this never happened to us, but we all learned how to do different aspects of everyone's job just in case something happened.

Furthermore, in addition to the go-pro, handycam, and microphones, our team highly recommends that future teams bring a light diffuser and a rain hood for the camera. The light diffuser will come in handy during sunny days and allow you to create even lighting on your subject. The rain hood will prevent rain from getting on the lens and allow you to film in a drizzle. Another troublesome area was the boom mic. Due to

the configuration of the mount, the microphone can wander into the field of view and negatively impact the quality of the recording. Additionally, create a Standard Operating Procedure (SOP) for all footage and have it stored on a hard drive (1 TB), with an additional backup copy stored on another drive.

Concerning background noise, having the cameraman plugged into the camera and listening to the interview as it's being done will help you know if other noises are being picked up by the microphone. This requires high quality headphones, preferable with noise cancellation. Luckily, having interviewees use a lapel microphone allowed only their voices to be heard during interviews. However, there were some instances where cars zooming by in the background were caught in the recording. Know how to prevent this from happening, either by choosing locations carefully or adjusting the equipment to be less sensitive.

Our team strongly recommends that future project teams keep all of your files neat and organized. Make sure to name all of the video files so that they're easy to locate and keep interviews in a separate folder from any B-roll footage you take. Being able to quickly locate the files you want help speed up the editing process tremendously. Also having back ups of all videos and files is essential in case someone's computer crashes. Having at least 2 team members have access to all the files is important. It would be a complete shame if multiple finished videos were lost because someone's computer broke.

Seeing how this project relies heavily on the cooperation of other people, be conscious of the needs of the interviewees and be able to adapt on the fly. Our team was shocked when people didn't want to be filmed on camera. We weren't sure what we were going to do with just the audio. We were nervous about the end result of our project because we had little actual footage of interviews. We decided to film a lot of B-roll film for the visual component of our audio interviews. Having your own B-roll to use for the project will be useful because if at any point any videos and visuals you record are corrupted, you have back up film. And, once we realized that some people would be more interested in doing only an audio interview, it was something that we started to suggest to people as an option for our interviews. This made people more comfortable and relaxed for the interviews. Allowing people the option to not record their faces made them less nervous, which is really important for conducting an interview.

Another important thing to note is the importance of consent forms. When writing your consent form, make sure it follows both WPI's standard for consent forms as well as the IRB. We would suggest that you always have consent forms with you. If there is the slightest chance that you are going to interact with people and potentially get an interview with someone, having a consent form on hand will be beneficial. Having to return to a location or track down an interviewee wastes a lot of time and can be easily prevented by just bring a large amount of consent forms where you go.

5.2 Conclusion

With the use of stories, we can help make climate change a more personal issue. This project will be another stepping block to making climate change a global issue that people actually care about. With the stories we've collected from across Japan, we will help people understand the perceptions of the residents.

Climate change is a global issue changing the entire world. With the increase of scientific research, it seems as though everyday people and their stories of climate change are left behind. It was our goal to help bring these stories to light in order to connect climate change with the data from scientists and with the stories of real people. Our objective to share these stories on Instagram and climatestoriesproject.com will be a huge step in making them easily accessed and viewed by a large number of people. Because in the end, if these stories aren’t shared, they’re being washed away with the rising tide.

References

About StoryCorps. (n.d.). Retrieved from https://storycorps.org/about/

Ahmad, I. (2019, January 14). *40+ Video Marketing Statistics for 2019 [Infographic]*. Retrieved from https://www.socialmediatoday.com/news/40-video-marketing-statistics-for-2019-infographic/545887/?fbclid=IwAR2uiWIgaO5LSd7U9d_gQA3MIxssBHIRiO69T_kgstmeD0NiuLJWNTVArJs

American Physical Society (2019). *Climate Change*. Retrieved from https://www.aps.org/policy/reports/popa-reports/energy/climate.cfm

Barrett, B. F. & Lim, A. (2009, June 30). *Japan to Suffer Huge Climate Costs*. Retrieved March 21, 2019 from https://ourworld.unu.edu/en/japan-examines-costs-of-climate-change

Berg, B. and Lune, H. (2017). *Qualitative research methods for the social sciences*. 9th ed. New York: Pearson Education, pp. 53-59 and 156

Bergeron, T., Padir, A., Singh, R., Singh, S. K., Soni, U. (2018). *Perceptions of a Changing Climate, Exposure, and Vulnerability in Himachal Pradesh* (Undergraduate Interactive Qualifying Project No. E-project 043018-001720). Retrieved from Worcester Polytechnic Institute Electronic Project Collection: https://web.wpi.edu/Pubs/E-project/Available/E-project-043018-001720/unrestricted/Climate_WPI_Submission.pdf

Cambridge Dictionary. (n.d.). *Break the ice*. Retrieved from https://dictionary.cambridge.org/dictionary/english/break-the-ice

Carle, J., Stokes, B., and Wike, R. (2015, November 5). *Global Concern about Climate Change, Broad Support for Limiting Emissions*. Retrieved from https://www.pewglobal.org/2015/11/05/global-concern-about-climate-change-broad-support-for-limiting-emissions/

Carlton, E. J., Goldstein, R. S., Levy, K., & Woster, A. P. (2016, May 17). *Untangling the Impacts of Climate Change on Waterborne Diseases: A Systematic Review of Relationships between Diarrheal Diseases and Temperature, Rainfall, Flooding, and Drought*. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5468171/

Case, M., Tidwell, A. (2008, January 1), *Nippon Changes, Climate impacts threatening Japan and tomorrow.* Retrieved from https://www.wwf.or.jp/activities/lib/pdf_climate/environment/WWF_NipponChanges_lores.pdf

Chand, S. (n.d.) *Cultivation of Rice: Suitable Conditions Required for the Cultivation of Rice (6 Conditions)* Retrieved from http://www.yourarticlelibrary.com/cultivation/cultivation-of-rice-suitable-conditions-required-for-the-cultivation-of-rice-6-conditions/25491

Chen, L., Lu, Y., Wu. X., Xu, B., & Zhou, S. (2015, October 18) *Impact of climate change on human infectious diseases: Empirical evidence and human Adaptation*. Retrieved from https://www.sciencedirect.com/science/article/pii/S0160412015300489

The Climate Reality Project (2019, February 1). *How Do We Know Humans Are Causing Climate Change?* Retrieved from https://www.climaterealityproject.org/blog/how-do-we-know-humans-are-causing-climate-change-0

The Climate Reality Project (2018, July 30). *What Is The Greenhouse Effect?*. Retrieved from https://www.climaterealityproject.org/blog/what-greenhouse-effect

Cole, B., and King, A. (2008). *World Map - Political*. Retrieved from https://geology.com/world/world-map.shtml

Cook, J. (2019). *Why it's urgent we act now on climate change*. Retrieved from https://www.skepticalscience.com/global-warming-not-urgent.htm

Denchak, M. (2018, June 29). *Fossil Fuels: The Dirty Facts. Mining, drilling, and burning dirty energy are harming the environment and our health. Here's everything you need to know about fossil fuels, and why we need to embrace a clean energy future.* Retrieved from https://www.nrdc.org/stories/fossil-fuels-dirty-facts#sec-whatis

Dublin, U. (2014, April 24). Retrieved April 08, 2019, from https://www.youtube.com/watch?v=KPxzIGPrM3A

Encyclopaedia Britannica Online (2019, February 13). *Kyoto Protocol*. Retrieved from

https://www.britannica.com/event/Kyoto-Protocol

Glanz, K. (2016). Social and Behavioral Theories. Retrieved April 16, 2019, from https://obssr.od.nih.gov/wp-content/uploads/2016/05/Social-and-Behavioral-Theories.pdf

Japan Meteorological Agency, Ministry of Education, Culture, Sports, Science and Technology, Ministry of the Environment (2009, October). *Climate Change and Its Impacts in Japan*. Retrieved from http://www.env.go.jp/en/earth/cc/report_impacts.pdf

The Japan Times (2018, July 1). *Deaths from heatstroke in Tokyo up fourfold from July last year*. Retrieved from https://www.japantimes.co.jp/news/2018/08/01/national/deaths-heatstroke-quadruple-96-people-july-tokyo/#.XKoO4lVKiM-

The Japan Times (2018, July 10). *Despite precautions, geographic vulnerabilities raise risks for Japan during deadly downpours*. Retrieved from https://www.japantimes.co.jp/news/2018/07/10/national/vulnerable-geography-seen-keeping-well-prepared-japan-prone-deadly-downpours/

JMA, MEXT, MOE (2009, October). *Climate Change and Its Impacts in Japan*. Retrieved from http://www.env.go.jp/en/earth/cc/report_impacts.pdf

McClung, J., Jalbert, M., Seibert, B., Yeung, P. (2018). *Perceptions of Climate Change in Iceland* (Undergraduate Interactive Qualifying Project No. E-project 101118-090259). Retrieved from Worcester Polytechnic Institute Electronic Project Collection: https://web.wpi.edu/Pubs/E-project/Available/E-project-101118-090259/unrestricted/Climate_Perceptions_A18.pdf

McKibbin, W. J., & Wilcoxen, P. J. (2002, March 1). *Climate Change after Kyoto: A Blueprint for a Realistic Approach*. Retrieved from https://www.brookings.edu/articles/climate-change-after-kyoto-a-blueprint-for-a-realistic-approach/

Ministry of the Environment (2018, February). *Climate Change in Japan and Its Impacts*. Retrieved from http://www.env.go.jp/earth/tekiou/pamph2018_full_Eng.pdf

Ministry of Foreign Affair of Japan. (n.d.). *Climate Change*. Retrieved from https://www.mofa.go.jp/policy/environment/warm/cop/index.html

Osumi, M. (2017, August 8). Spike in life-threatening tick-borne diseases raises alarm in Japan. Retrieved from https://www.japantimes.co.jp/news/2017/08/08/national/science-health/spike-life-threatening-tick-borne-diseases-raises-alarm-japan/#.XKq0AVVKiM-

Pierre-Louis, K. (2019, February 28). *The World Is Losing Fish to Eat as Oceans Warm, Study Finds*. Retrieved from https://www.nytimes.com/2019/02/28/climate/fish-climate-change.html

Pro-Change Behavior System (2018). *The Transtheoretical Model*. Retrieved from https://www.prochange.com/transtheoretical-model-of-behavior-change

Quinn-Szcesuil, Julia (2018, December 6). *Global Lab Welcomes Fellows-in-Residence*. Retrieved from https://www.wpi.edu/news/global-lab-welcomes-fellows-residence

SCMP Editorial (2018, September 7). *Japan shows climate change is a real threat*. Retrieved from https://www.scmp.com/comment/insight-opinion/asia/article/2163288/japan-shows-climate-change-real-threat

Shaftel, H. (2019, April 2). *Climate change: How do we know?*. Retrieved from https://climate.nasa.gov/evidence/

Shaftel, H. (2019, April 2). *How climate is changing*. Retrieved from https://climate.nasa.gov/effects/

Shaftel, H. (2019, April 2). *Frequently Asked Questions*. Retrieved from https://climate.nasa.gov/faq/

Shaftel, H. (2019, April 2). *Scientific consensus: Earth's climate is warming*. Retrieved from https://climate.nasa.gov/scientific-consensus/

Shaftel, H. (2019, April 2). *What's in a name? Weather, global warming and climate change*. Retrieved from https://climate.nasa.gov/resources/global-warming/

Shockey, I. (n.d.) *Ishockey*. Retrieved from https://www.wpi.edu/people/faculty/ishockey

Shockey, I. (2019, April 12). Email Interview.

Stearns, M. (1999). *Talking to Strangers: Improving American Diplomacy at Home and*

Abroad. pp 127

Stokes, B. (2016, October 31). *Japanese Back Global Engagement Despite Concern About Domestic Economy*. Retrieved from https://www.pewglobal.org/2016/10/31/japanese-back-global-engagement-despite-concern-about-domestic-economy/

Taylor, A. (2018, February 22). The Power of Listening: An Interview with Humans of New York's Brandon Stanton. Retrieved from https://www.picturesandstories.com/news/2018/2/22/the-power-of-listening-an-interview-with-humans-of-new-yorks-brandon-stanton

The New York Times (2017). *The Road to a Paris Climate Deal*. Retrieved from https://www.nytimes.com/interactive/projects/cp/climate/2015-paris-climate-talks

United Nations Climate Change. (2018, October 22). *What is the Paris Agreement?* Retrieved from https://unfccc.int/process-and-meetings/the-paris-agreement/what-is-the-paris-agreement

Appendices

Appendix A: Consent for Interviews

Informed Consent Agreement for Participation

Principle Investigator: J. Alex Sphar

Co-Investigator: Gergory Snoddy

Student Investigators: Christopher Engel, Jackson Morse, Ryan Shaw and Rowena Sullivan

Contact Information:

Email: gr-Kyo19WPI@wpi.edu

Facility Advisors: jasphar@wpi.edu or gsnoddy@wpi.edu or ksnoddy2@wpi.edu

Title of Research Study: Storying Climate Change

Sponsor: Professor Ingrid Shockey with climatestoriesproject.org

Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor or its designee and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data that identify you by name. Any publication or presentation of the data will not identify you unless you have given prior express consent to be identified.

We are a group of students from Worcester Polytechnic Institute in the United States. We are conducting interviews and collecting stories from residents regarding the effects of changes in weather patterns that have occurred in Japan over the years and how this has affected you, your work and your thoughts about the future. We are very interested in any stories and thoughts you have. We are doing this to add to the collection of stories on the website climatestoriesproject.org, where each story is about climate change and are being collected around the world. The interview will take a short amount of time.

We would like to interview you to help us spread awareness about the impacts of climate change on a personal level. Your participation in this interview is completely voluntary, and you may withdraw at any time for any reason. Your answers will be recorded on a video camera with your face included. The interview should take no more than 20 minutes. If any question is unclear, please ask for clarification, and know that you can opt out of the interview anytime you feel.

Do we have your permission to include your name and other specific identifying information?	Yes		Initials	
Do we have your permission to take notes, and publicly quote you, with your pre-approval for each quote, in this interview?	Yes		Initials	
Do we have your permission to record this interview?	Yes		Initials	
Do we have your permission to use this recording and present your views on the publicly available website climatestoriesproject.org?	Yes		Initials	

Print Full Name (Interviewee):

Signature:

Print Full Name (Interviewer):

Signature:

Date:

You may contact us via email at gr-Kyo19WPI@wpi.edu. You may also contact our faculty advisors from Worcester Polytechnic Institute (WPI) at jasphar@wpi.edu or gsnoddy@wpi.edu or ksnoddy2@wpi.edu. You may also contact the chair of the WPI Institutional Review Board (Prof. Kent Rissmiller) at Tel.: +1-508-831-5019 and email kjr@wpi.edu, or the Human Protection Administrator (Gabriel Johnson) at Tel.: +1-508-831-4989 and email gjohnson@wpi.edu.

Appendix B: Questions for Residents

Questions:

General Questions:

- What is your name?
- How long have you lived here?
- What do you do for a living?
    - How long have you been doing that?

Detailed Questions:

- Some people have reported many changes in the temperature, weather and local sea conditions in Japan in recent years. Some believe these changes have impacted people's lives and work. Have you noticed any changes?
    - What have you noticed?
- How have you handled these changes?
- Is there anything you do differently?
- What do you think has caused these changes?
- How do you feel about these changes?
- Have they impacted you, the town and/or your family?
- Do you have a story about how climate change, and how it may have impacted you?
- What do you think you can do to prevent further climate change?
- What do you think people locally should try to do to slow down climate change?

Appendix C: Additional questions specific for Agriculture

General Questions:

- What is your name?
- How long have you lived here?
- What do you do for a living?
    - How long have you been doing that?
- What types of crops do you grow?
- How has your production changed over the years?

Detailed Questions:

- Some people have reported many changes in the temperature, weather and local sea conditions in Japan in recent years. Some believe these changes have impacted people's lives and work. Have you noticed any changes?
    - What have you noticed?
- How have you handled these changes?
- Is there anything you do differently?
- What do you think has caused these changes?
- How do you feel about these?
- Have they impacted you, the town and/or your family?
- Do you have a story about climate change that you could share?
- What do you think you can do to prevent further climate change?
- What do you think people locally should try to do to slow down climate change?

Appendix D: Additional questions specific for Fishing

General Questions:

- What is your name?
- How long have you lived here?
- What do you do for a living?
    - How long have you been doing that?
- What type of fish do you catch?
- What is your typical haul on a daily basis?
- How has your fishing changed?

Detailed Questions:

- Some people have reported many changes in the temperature, weather and local sea conditions in Japan in recent years. Some believe these changes have impacted people's lives and work. Have you noticed any changes?
    - What have you noticed?
- How have you handled these changes?
- Is there anything you do differently?
- What do you think has caused these changes?
- How do you feel about these changes?
- Have they impacted you, the town and/or your family?
- Do you have a story about climate change that you could share?
- What do you think you can do to prevent further climate change?
- What do you think people locally should try to do to slow down climate change?

Appendix E: Additional questions specific for Education

- What is your name?
- How long have you lived here?
- What do you do for a living?
    - How long have you been doing that?
- Does your school talk about climate change in any ways?
- Is there a difference in attitude towards climate change between faculty and students?

Detailed Questions:

- Some people have reported many changes in the temperature, weather and local sea conditions in Japan in recent years. Some believe these changes have impacted people's lives and work. Have you noticed any changes?
    - If yes, What have you noticed?
- How have you handled these changes?
- Is there anything you do differently?
- What do you think has caused these changes?
- How do you feel about these?
- Have they impacted you, the town and/or your family?
- Do you have a story about climate change that you could share?
- What do you think you can do to prevent further climate change?
- What do you think people locally should try to do to slow down climate change?

Appendix F: Translated consent form and questions

私たちはアメリカのウースター工科大学の学生のグループです。気候変動に関する調査プロジェクトのために来日しています。

長年にわたり日本で発生してきた気象パターンの変化の影響と、それが皆さんの生活、仕事、将来に対する思いに、どのように影響したかについて、各地でインタビューを行い、住民の方々からのご意見を集めています。今回の調査は、世界中で集められた気候変動についての事例報告に日本のデータを追加することを目的としています。民間レベルで、気候変動の影響についての認識を広めるための私たちの活動にぜひともご協力いただけますよう、お願い申し上げます。

インタビューには少々お時間をいただきます。どんなことでも結構ですので、ぜひお聞かせください。インタビューへの参加は、あくまでも任意であり、いかなる理由においてもただちに中止することができます。なお、インタビューの模様をビデオカメラで撮影し、映像として記録することをご理解ください。ご不明な点等ございましたら、何なりとおたずねください。

お名前、居住地域、職業等の情報を使用することを許可していただけますか？	Yes はい		Initials ご署名	
このインタビューを撮影して映像として記録することを許可していただけますか？	Yes はい		Initials ご署名	
インタビューにおける発言を引用することを許可していただけますか？	Yes はい		Initials ご署名	

署名:_____

日付:　　/　　/ 2019

質問：

- 一般的な質問
- お名前を教えていただけますか？
- ここにどれくらい住んでいますか？
- ご職業は何ですか？
- 何年ぐらいそのお仕事をされていますか？

詳細な質問

- 近年、日本の気温、天気、周辺の海の状況が大きく変動しているという報告があります。また、これらの変化が人々の生活や仕事に影響を及ぼしていると考える人もいます。何か変化に気づいたことがありますか？
- あなたはどのような事に気付きましたか？
- これらの変化にどのように対応しましたか？
- それらの影響により、仕事面で変更を余儀なくされたことがありましたか。
- あなたは何がこれらの変化を引き起こしたと思いますか？
- それらについてどう思いますか？
- それはあなた、住んでいる地域、そしてあなたの家族に影響を与えましたか？
- 気候変動についての身近な事例があったらお聞かせください。
- さらなる気候変動を防ぐためにあなたは何ができると思いますか？
- あなたは地域の人々が気候変動を減速させるために何をすべきだと思いますか？

農業に関する質問

- お名前を教えていただけますか？
- ここにどれくらい住んでいますか？
- ご職業は何ですか？
- 何年ぐらいそのお仕事をされていますか？

- どんな種類の農作物を栽培していますか？
- 生産状況はここ数年で変化してきていますか。

漁業に関する質問

- お名前を教えていただけますか？
- ここにどれくらい住んでいますか？
- ご職業は何ですか？
- 何年ぐらいそのお仕事をされていますか？
- どんな種類の魚を捕っていますか？
- 通常、漁獲量はどれぐらいですか？
- 漁の状況に何か変化はありますか。

医療関係者に対する質問

- お名前を教えていただけますか？
- ここにどれくらい住んでいますか？
- ご職業は何ですか？
- 何年ぐらいそのお仕事をされていますか？
- 熱中症等、暑さに関連した疾患は増加していますか？
- 以前に比べ、その数はどのくらい増えましたか？

大気の状態の変化が人々の健康に悪影響を与えているというような問題は見られますか？

Appendix G: Sponsor Description

Unlike most IQP projects, no department or organization sponsors the Storying Climate Change project. This project is sponsored by WPI Professor Ingrid Shockey, an environmental sociologist who focuses on natural literacy and the interplay of human-wilderness boundaries and the interactions between people and nature and how they affect each other. Her research interests include environmental sociology, interdisciplinary studies, political ecology, and ethnography. (Shockey) This particular project will contribute to the archive of IQPs recording climate change stories across different WPI project sites such as New Zealand, India, Iceland and now Japan. The project team's assignment is to record stories that reflect the experience of climate change in communities and profiling long-term residents to describe the changes they attribute to climate change that they've observed over time. Professor Shockey has worked on multiple projects concerning climate change, including sponsoring the same IQP project in Iceland, and her professional research projects and publications focuses on climate change stories. Conveying peoples experiences and stories from around the world, with the help of her students, her projects map global climate stories using a thorough understanding of the ethics behind documenting another's story (Quinn-Szcesuil, 2018).

There are a few reasons as to why Professor Shockey finds this kind of work important. She believes that the voices of ordinary people are never represented by government policies or in any kind of official narratives about climate change. We only hear about climate change in broad terms, in the context of politics or in policy decisions. We hear about some parts of the world being affected more than other parts, but this is not a clear representation of what everyday, regular people are experiencing in their lives. Professor Shockey wants to hear about what people have seen, felt or experienced during the course of their lives. Professor Shockey has learned that these stories reveal climate change implications that scientists haven't discovered or even considered yet. They don't only help scientists discover new things, but can also give a voice to the people that are affected by climate change. They can participate in the climate discussion with emotional stories because they have been more deeply affected than others might have expected. The collection of stories that people report in their villages or in large cities is a kind of citizen science, which allows us to notice patterns in areas that had been before only generalized about (Shockey, 2019).

Climate change is obviously not an issue that affects only Japan. Professor Shockey has even made efforts on a global scale with her climate work in Iceland, India and New Zealand. The way she has chosen to go about it is rather intuitive, in that she is taking all these documented experiences concerning climate change in all these places and creating a global web of interconnected stories about the issue. She is making an effort to collect real stories from local residents across the world, rather than hearing routine and possibly unscientific facts from the government or scientists. Using

the website entitled “climatestoriesproject.org”, Professor Shockey uses this site to host and archive her climate change stories. Having people from different cultures and backgrounds around the world tell us their stories about climate change makes the issue reach a much wider sphere of influence than if this project had only taken place in one specific country. Furthermore, it connects the global community in the shared experience in a more personal way because it allows the community to bond over their own personal experiences.

This particular project is another significant step towards the goal of providing insights from an island country that climate change could adversely affect. Professor Shockey’s goal to spread awareness of the problem to reach a personal level through awareness and accessibility. She wants stories of climate change to be personal in a way that it will connect with more people. From past studies, it is clear that Japan has seen the negative effects of climate change in multiple regions of the country. With the help of Professor Shockey, we can find out exactly, on a personal level, what changes have occurred in everyday life over the years due to climate change, and hopefully, something positive can come out of it.