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Experiences with Flood and Perceptions of Flood Risk among Members of the Filipino American Community in Virginia Beach, Virginia

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EXPERIENCES WITH FLOODING AND PERCEPTIONS OF FLOOD RISK

AMONG MEMBERS OF THE FILIPINO AMERICAN COMMUNITY IN

VIRGINIA BEACH, VIRGINIA

by

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ABSTRACT

EXPERIENCES WITH FLOODING AND PERCEPTIONS OF
FLOOD RISK AMONG MEMBERS OF THE FILIPINO
AMERICAN COMMUNITY IN VIRGINIA BEACH, VIRGINIA

Anjelica Pascual Petsch
Old Dominion University, 2021
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The Filipino Americans living in Hampton Roads, Virginia have comprised of almost 2%
of the region's overall population, and 5.3% of the population in Virginia Beach, Virginia
(United States Census Bureau, 2019) (Greater Hampton Roads Connects, 2021). Filipino
Americans in Hampton Roads, like the rest of the population, are equally vulnerable to
experiencing flooding when commuting to and from work or simply traveling around town, but
previous research and surveys from the Hampton Roads Region have failed in their ability to
capture this cultural diversity within perception of flood risk. In this paper, a qualitative research
design was used to conduct a survey of Filipino American residents in Virginia Beach regarding
their flood risk perceptions and experiences. The results of the survey were then compared to
existing flood risk research and to results of previous surveys of Hampton Roads residents. The
results are useful for understanding the baseline perception of flooding within Virginia Beach's
Filipino American community and how they compare against the total Hampton Roads'
population. The results indicate that despite most survey results came from a younger age group
than previous research and not fully representative of the overall Filipino population, the
collected Filipino American's flood experiences and flood risk perceptions were generally
similar, with some varying differences, to existing survey collection in the Hampton Roads
region. Therefore, regardless of racial identity, the overall cultural experiences are based more

closely with shared geographic location and perceptions are developed by these experiences and

personal knowledge regarding causes and impacts of flooding in Virginia Beach, Virginia.

This thesis is dedicated to my guardian angels and
my cheerleaders from above: my maternal grandparents,
Rodolfo and Carmen Pascual, and my cat, Amii.

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CHAPTER I

INTRODUCTION AND BACKGROUND

This thesis investigates how Filipino Americans in Virginia Beach experience flooding and perceive flood risks differently than the general population of Virginia Beach and Hampton Roads, Virginia because of their cultural, socio-economic, and immigration background. The first question is: How have Filipino Americans living in Virginia Beach experienced flooding? The second question is: How do Filipino Americans living in Virginia Beach perceive the risks of flooding? These two questions will develop a baseline perception and experience level unique to the Filipino American community in Virginia Beach, Virginia that can then be used to answer my third and fourth research question regarding how the Filipino American community's experience and perception compare to those off residents in the Hampton Roads region of southeastern coastal Virginia within which Virginia Beach is located. Specifically, the third question asks: How are flood experiences of Filipino Americans different compared to other residents of Hampton Roads? The fourth question asks: How are flood risk perceptions of Filipino Americans different compared to other residents of Hampton Roads? These final two questions will be answered by comparing the Filipino American community's baseline of experience and flood risk perception among previous research produced within the City of Virginia Beach as well as the Hampton Roads region by various organizations.

FLOODING AND EXPERIENCES WITH FLOODING

Floods are the most frequent and costly type of natural hazard. Between 1998-2017 over 2 billion people were impacted producing destruction, loss of life, and damages to infrastructure. The most vulnerable to flooding are those who live within "floodplains or non-resistant

buildings, or lack warning systems and awareness of flooding" risk (WHO, 2021). Flood events can by categorized into three types. Minor or nuisance flooding results in smaller public impacts, whereas major flood events cause significant infrastructure inundation and damage, and loss of life. Extreme flood events involve massive damage to property and infrastructure, injury, and death (Moftakhari et al., 2017, p 214). 29.1% of the United States' population currently lives within coastal shoreline communities (Cohen, 2019) and although flooding is not unique to these areas, they have experienced the most impact from all types of flooding, from hurricanes to "sunny day flooding".

Extreme flood events are the most memorable and covered in the media as they often produce over $1 billion worth of damages (NOAA National Centers for Environmental Information (NCEI), 2021). However, nuisance, or "sunny day", flooding is created by the decreasing gap between tidal datum and flood stage (Moftakhari et al., 2017, p. 214) and occurs more frequently and disrupts day-to-day activities, such as driving to work or school, creates stressors on public infrastructure, and initiates undetected mold growth within low-lying areas of homes (Moftakhari et al., 2018; Allen & Allen 2019). These nuisance flooding events have only been exacerbated by sea level rise, and other natural changes, such as El Niño, seasonal variabilities, subsidence, and tides, waves, and winds, and are experienced more frequently (Sweet & Park, 2014, p. 592). Nuisance flooding presents significant challenges to densely population areas and their urban water resources (Moftakhari et al., 2018, p. 4219). Unresolved problems seen during these "sunny day flooding" events with a 0.68 m rise in mean sea level, by 2100, in low-lying coastal areas, can cause over $230 billion of future revenue through the United States (Moftakhari et al., 2017, p. 215). When compared to extreme flooding and disasters, nuisance flooding events and impacts are poorly understood as it is unclear what

exactly determines a nuisance flooding event (Moftakhari et al., 2018, p. 4219). Nuisance flooding along with disrupting everyday activities, also impacts the public health and safety through various disease vectors as flood waters create the perfect habitat for mosquitos (Moftakhari et al., 2018, p. 4220). Nuisance flooding also produces sewage system surcharges that often carry bacteria and other toxic contaminants (Moftakhari et al., 2018, p. 4220).

Currently under the Stafford Act, the Federal government is required to supply assistance for disaster impacts that exceed a municipality's ability to respond and recover (Moftakhari et al., 2018, p. 4223). Typically, individual nuisance flooding events do not produce enough damage to constitute receiving additional funding from the Federal government and the Federal Emergency Management Agency (FEMA) and therefore forces and incentives state and local governments to take on mitigation practices (Moftakhari et al., 2018, pp. 4223-4224). Similarly, because nuisance flooding events do not lead to government assistance, homeowners and businesses are impacted by enduring the weight of bearing large portions of recovery costs or lower resale property values (Moftakhari et al., 2018, p. 4224). Despite FEMA's National Flood Insurance Program (NFIP) prioritize assisting home and business owners protect against floods, the program's policies do not insure damages to vehicles, landscaping, septic systems, business interruptions, and property within basements (Moftakhari et al., 2018, p. 4224).

RISK PERCEPTION

In the context of hazards such as flooding, the term "risk perception" describes the "intuitive risk judgements" of citizens when considering a given hazard (Slovic, 2000, p. 220). Across disciplines, the understanding of and theories surrounding what is risk and how it is perceived also vary (O'Neill, p. 2159). Specifically for geographical research, "risk perception" pertains to the understanding of "human behavior in the face of natural hazards," and has since

expanded to include technological hazards (Slovic, 2000, p. 221). Social and cultural factors, such as religious beliefs, socioeconomic background, access and knowledge to mitigation tactics and others, can impact the perception and acceptance of risk among various communities (Slovic, 2000, p. 221).

Graham A. Tobin and Burrell E. Montz, in their book Natural Hazards: Explanation and Integration, categorize the main elements for risk perception as "cognitive factors" and "situation factors." Cognitive factors are the "combine[d] psychological variables with attitudinal characteristics" while the situation factors refer to an individual's proximity to a hazardous area, income, age, and other socioeconomic factors (Tobin, 1997, p. 135). The cognitive and situation factors of risk perception can work independently, together, or sequentially to initiate a person's response towards a hazard (Tobin, 1997, p. 135). Within Tobin and Montz's research, awareness and knowledge of a given risk is not a synonym for perception but instead are inputs guiding an individual's ultimate "risk perception".

WARRANT AND RESEARCH CONTRIBUTIONS

The City of Virginia Beach, government organizations across the Hampton Roads region, and various research groups such as those affiliated with Old Dominion University have undertaken research and data collection, including via surveys, investigate the residents' experiences and perceptions of flooding. Despite including all races, ages, genders, and other demographic data into these existing research projects, respondents were consistently and primarily older, white homeowners (Covi et al. 2019). This thesis developed and deployed a survey that builds on existing survey projects completed by researchers at Old Dominion University by utilizing the same survey questions. However, the survey was specifically distributed among Filipino American residents in Virginia Beach in hopes to capture more

diverse responses because of age group, cultural background, and socioeconomic status. This thesis seeks to fill this gap by utilizing survey responses to create a baseline of flood experience and perception of flood risk unique to the Filipino American community. The baseline was then compared to the overall flood experience and flood risk perception throughout the Hampton Roads region to determine how flood risk perceptions are impacted by specific cultures.

CHAPTER II

LITERATURE REVIEW

RISK PERCEPTION AND FLOODING EXPERIENCE

Risk can be defined as the probability of a physical, social, or financial loss cause by a hazard event. A perception of the probability of a risk occurring is impacted by an individual's judgement, experiences, and beliefs of the hazard (Renn, 2000, pp. 14-15). Research regarding risk perceptions falls primarily within sociological sciences, but also human and socio-economic geographies as they incorporate both economic and spatial components to the former (Lechowska, 2018, p. 1342). When it comes to flooding and determining one's risk perception, the spatial element of Tobin and Montz's (1997) situational elements includes the physical proximity to a hazard as well as the overall likely occurrence and/or reoccurrence of a flood, (Lechowska, p. 1347). Risk perception is also determined by an individual's knowledge and in turn influenced by previous experience and gained information with past events (Lechowska, p. 1351). Paul Slovic, in his book Perceptions of Risk, indicated that "risk perception" is "influenced by the memorability of past events and the imaginability of future events" (Slovic, 2000, p. 184). More frequent and minor nuisance flooding can create a daily occurrence that disrupts everyday activities, but do not produce the same level of flood risk perception, destruction, and memorability as major and extreme flooding events. Similarly, any lull in time between flooding occurrences can create a false sense of security to both longtime residents as they could forget previous flood events and new residents as new construction entices possible populations who have not experienced a flooding event, until the next one (Gaul, 2019, p. 115).

Flood risk perception was one of the first explorations of risk perception but still make up a small portion of the overall risk perception studies (Birkholz, 2014, p. 13). Early research, by Gilbert Fowler White, who chaired the U.S. Task Force on Federal Flood Control Policy (Gaul, 2019, p. 126), and others, sought to investigate the risk perceptions of communities living within floodplains. Initially these researchers applied a "conventional rationalist cost-benefit assessment" to predict risk perceptions of those living in high-risk flood prone areas (Birkholz, 2014, p. 13). Instead, a bounded rationality approach, where decision-makers and stakeholders are given options of alternative responses to best mitigate loss and disaster from a hazard, and protective measures, or self-preservation behavior, better described a sense of perception for these communities (Birkholz, 2014, p. 14). However, bounded rationality and protective motivation theory eventually entangled flood risk perceptions with flood management to broaden both risk perception research and flood risk management (Birkholz, 2014, p. 13). Bounded rationality comprises the characteristics of physical and biological systems whereas social influences (Birkholz, 2014, p. 14) and protective measures guide individuals by motivation and response as they adapt to flooding by enduring previous flooding events (Birkholz, 2014, p. 14). Developments of these theoretical frameworks has now expanded to include "two broad paradigms: a rationalist paradigm or a constructivist paradigm" (Birkholz, 2014, p. 15) which can assist in characterizing and modeling risk perception which in result develops more effective flood management strategies as well as increasing people's understandings surrounding flood events thus creating better prepared populations. The first paradigm approaches risk perception by encouraging stakeholders to make rational decision based on assessment and judgement, such as cost-benefit analysis, which frequently is influenced by one's evaluations of potential losses and gains" (Birkholz, 2014, p. 16). Ultimately, the rationalist approach creates a quantified rank

of perceived risk based on experiences and knowledge. However, the constructivist paradigm incorporates how one's social environment, such as culture, community, and socio-economic status, influences judgements and decision-making processes in the face of risk (Birkholz, 2014, p. 15). A constructivist approach typically views hazards as a social construct, begging for the answer for "why rebuild instead of relocate after a flood?"

Social amplification of risk impacts flood risk perception through media outlets and cultural backgrounds and upbringings. This social amplification on flood risk can downplay the minor, everyday hazards, like "sunny day flooding", as media coverage from hurricane and other flooding disasters from across the United States as well as globally (Birkholz, 2014, p. 17). Similarly, the cultural background of a population also creates variation in flood risk perception when compared to others in their shared neighborhood. Social amplification of risk is impacted by socio-economic status in the way one financially prepares for or recovers from a flooding event or unable to. Other culturally specific characteristics such as housing living situation, immigration lineage, and sense of place also affects an individual's perception of risk.

FILIPINO AMERICANS IN THE UNITED STATES

The Philippines is an archipelago of over 700 islands and 170 languages, located southeast of China (see Figure 1), and was first discovered and conquered in 1565 by Ferdinand Magellan, working for Spain, who named the island and its people after the Spanish king, King Philip II (Nadal, 2021 pp. 9-10). The Philippines, like most other Asian countries, has experienced multiple colonization. These include colonization by Spain from 1565 to 1898 and the United States in 1898 to 1946, interspersed with an occupation by Japan in 1942 to 1945. The Philippines also sees influences from China and other neighboring Asian and Pacific Island nations. The Philippines is also "one of the most disaster-prone countries in the world" (Gaillard,

2007) with disastrous typhoons causing power outages, flooded towns, and death. In November 2020, the archipelago of islands was severely impacted by Super Typhoon Goni, known as Rolly in the Philippines, on the first of the month and Typhoon Vamco, or Ulysses, ten days later. Both typhoons impacted Luzon, the northern most region of the Philippines, which also contains the nation's capital, Manila. Goni destroyed 281,000 homes, displaced another 31,000 people, and killed 25 and, over a week later, Ulysses' destruction included 144,000 homes destroyed, another 123,900 people displaced, and 73 dead (UN Office for the Coordination of Humanitarian Affairs, 2020).
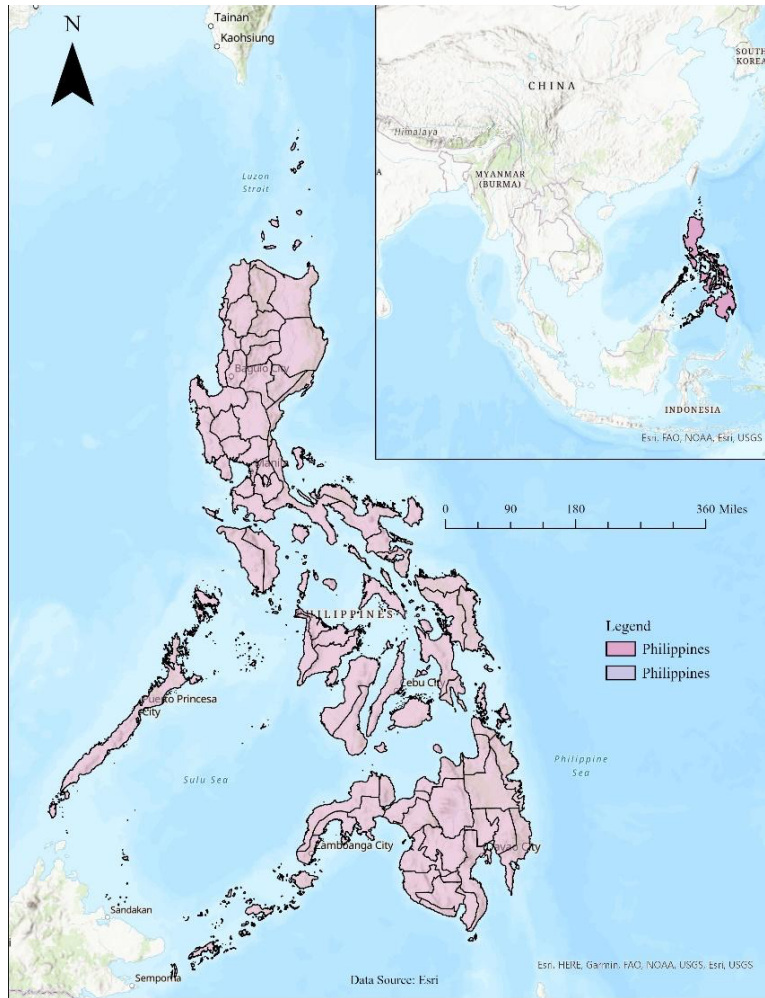
Figure 1: Map of the Philippines (Source: Created by the author)

Although the Philippines are no longer a colony of the United States, America's cultural presence is still prevalent. The Philippines have experienced four major "waves" of Filipino immigration to the United States (Rodriquez, 2016, p. 34). The "first wave" of Filipino immigration began during the American colonial period was created by the need to "fill new forms of racialized labor demand in the United States and its territories" and in the introduction of "Benevolent Assimilation" through the implementation of western education and public health

(Rodriguez, 2016, pp. 34-36). The end of the Second World War marked not only the "second wave" of immigration but also the Philippine independence and end of American colonization, therefore quickly shifting the acceptance of Filipino immigrants from "American colonial subjects" to "aliens" as based on by the Tydings-McDuffie Act of 1934 (Rodriguez, 2016, p. 35). The 1934 Act slowed Filipino immigration to only permitting Filipino World War II veterans as well as their families and war-brides of American soldiers who served within the Pacific theater and the Philippines (Rodriguez, 2016, p. 36). After the 1965 Immigration Act, the "third wave" of Filipino immigration resulted from skilled professionals, family reunification, and America dropping the national origins quotas. Most of the Filipino immigrants during this "wave" were highly trained medical professionals and settled in regions around California and Hawaii, which were traditionally homes to Filipino immigrants from earlier "waves" (Rodriguez, 2016, p. 36). Finally, the "fourth wave" of Filipino immigration stems from family unification from those coming over from the previous "wave" and any other continued "occupational immigration", such as those serving in the United States Armed Forces, medical professions, and others (Ocampo, 2019). Despite previous American colonization, creating a new life in the United State was not done so easily and without enduring racism and discrimination, underemployment, and humiliation. Through the trials and tribulations of assimilating to a new home in the United States, most Filipinos from this third wave of immigration are thankful to "God because he allowed [them] to come to the States and [they] have a better life with [their] children than if [they] were in the Philippines" (The Hampton Roads Chapter of the Filipino American National Historical Society, 2004).

Within the United States, Filipinos and Filipino Americans made up the third largest Asian origin group in 2019 with 4.2 million people. In California and Virginia, Filipinos and

Filipino Americans were the second largest Asian origin group in 2019 making up 24% and 16%
of the overall Asian population, respectively and the largest Asian origin group in nine other
states, such as Hawaii and Nevada (Budiman, 2021). Within these states, many large populations
of Filipinos live within Metropolitan Statistical Areas (MSA) that are close the coast, such as the
New York-Newark-Jersey City, NY-NJ-PA, Los Angeles-Long Beach-Anaheim, CA, and San
Francisco-Oakland-Berkeley, CA (see Figure 2) (Gallardo, 2020). Overall, "U.S.-born Asians are
far younger, on average, than their foreign-born counterparts," (Budiman, 2021) and among
U.S.-born Filipinos the median age is 21 versus the national average of 36 years old. The median
age for Foreign-born Filipinos, however, is 50 and 45 for all immigrants in America, showing
that mass immigration from the Philippines has slowed immensely and there are now large
populations of first-, second-, third-, and so forth generation Filipino Americans living in
America (Budiman, 2021). The difference between the ages of Filipinos born in America and
those that immigrated also points out a subculture of younger Filipinos being more westernized,
or more American, and more active in the public sphere, than their older family members that
have immigrated from the Philippines, who tend to be more reserved in nature. In the
Philippines, plural generations and family units live in a singular home to compile incomes and
assist in taking care of older generations. This living arrangement carried over to America
resulting in 34% of Filipino American households are multigenerational, where "at least two
adult generations or grandparents and grandchildren younger than 25" live in a household, versus
the national average of 19% (Budiman, 2021). Economically, the median annual household
income for Filipino Americans across America ($90k) is larger than that of all households in the
United States ($62k) and 7% of the Filipino population live in poverty (Budiman, 2021).

Educationally, more (48%) or Filipino Americans also have at least a bachelor's degree than all Americans (33%).
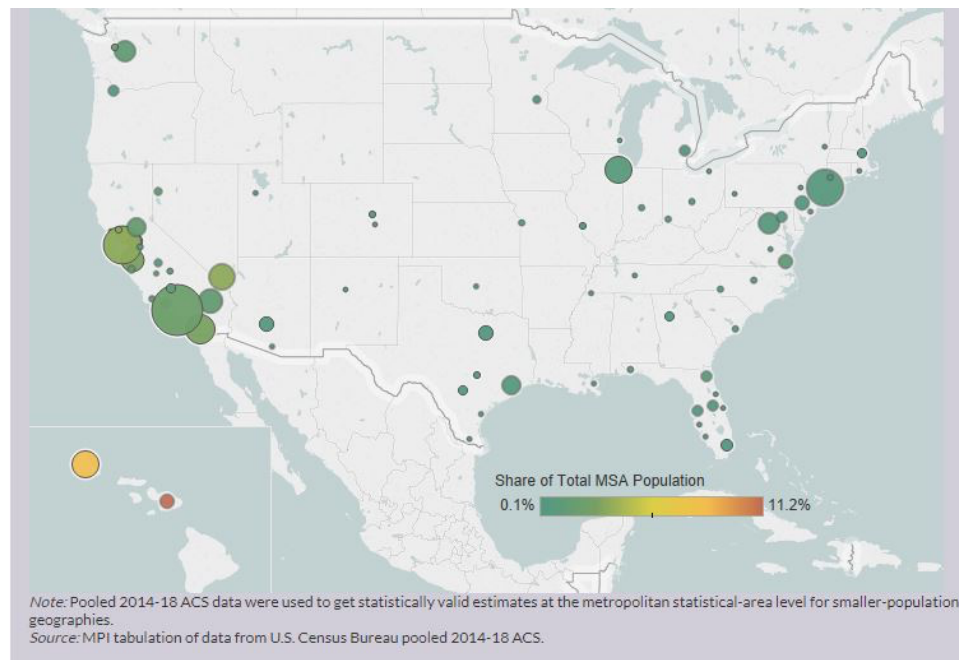
Figure 2: Top metropolitan statistical areas of residence for Filipino Americans in the US 2014-2018 (Source: Gallardo, 2020)

Despite a long history of influence of and immigration to America, the study of Filipino American in academia only recently began at the turn of the new millennia. This can be attributed to several challenges. First, scholars that focus on the study of Filipinos in American were not able to agree to a label for Filipino American studies (Toribio, 2005, p. 167), and today can also be found using an abbreviated "Fil-Am" nomenclature. Second, due to a domineering Chinese American and Japanese American field of study, within the Asian American discipline

Filipino American studies historically holds a marginalized existence. Lastly, because of a neocolonial influence America has on the Philippines, there is an impact of "how Filipino Americans, particularly immigrants, view and are viewed by mainstream America" (Toribio, 2005, p. 167). As a result, Filipino American studies among today's second-, third-, and other generations as well as multiracial and multiethnic Filipino Americans are dedicated to the reconnection of Filipino culture through continued student and community organizations similar to those created by the Filipino immigrants to create a sense of home (Nadal, 2021, p. 136).

FLOODING IN HAMPTON ROADS AND VIRGINIA BEACH, VIRGINIA

Hampton Roads is a metropolitan region in southeast coastal Virginia and encompasses 10 independent cities and five incorporated towns and counties, over 1.7 million people, and a large military presence (see Figure 3). In the Virginia Beach–Norfolk–Newport News, VA–NC, Metropolitan Statistical Area (MSA), there are nine major military installations spread across the region, including the only permanent NATO Headquarters outside of Europe, the largest naval base in the world (Norfolk Naval Station), and others (Virginia Beach Economic Development, 2021). The immense economic impact of the United States Military in Hampton Roads provides "meaningful employment for uniformed personnel and civilians while also supporting private business" (WAVY, 2020).

As a coastal region with predominantly low elevation levels, Hampton Roads and its population is highly susceptible to coastal hazards as waterways surround and intersect the region with the Atlantic Ocean, Chesapeake Bay, and many rivers and inlets. These conditions as well as the increasing long-term sea-level rise creates more frequent recurrent flooding occurrences and exacerbates storm surge. The primarily urban and suburban region is also vulnerable to areal and flash flooding caused by impervious surfaces and older stormwater drains

(Office of Governor Ralph S. Northam, 2020, p. 39). There are millions of dollar values of various buildings in Hampton Roads that are located within the 100-year Floodplain, $6 million in Virginia Beach, $4 million in Portsmouth, and just over $3 million in Norfolk (Hampton Roads Planning District Committee, 2019). With millions of dollars of infrastructure within the 100-year Floodplain, the experience of almost one foot of sea level rise and frequently compounded with other flooding events to create extreme flooding hazards, makes Virginia Beach and Norfolk most vulnerable to flooding as they are also the two most populous cities in Hampton Roads (Virginia Beach, 2020). The City of Norfolk is expected to see two to four feet rise in global sea level by 2100 (City of Norfolk, 2014, p. 3) with a 4.7 mm/yr relative sea level rise rate (Sweet & Park, 2014, p.584). The Virginia Coastal Resilience Master Planning Framework, initiated by Governor Ralph Northam's Executive Order Number 24, with the 2021 Grant Manual for the Virginia Community Flood Preparedness Fund both formulates approaches to coastal mitigation and adaption in idea to make more resilient coastal communities and economies (Office of Governor Ralph S. Northam, 2020, p. 2). From both reports, the State of Virginia and numerous localities have been approved for grants totaling millions of dollars for flood-control and sea level rise projects, such as the City of Virginia Beach's Comprehensive Flooding Response Plan, Sea-Level Wise.
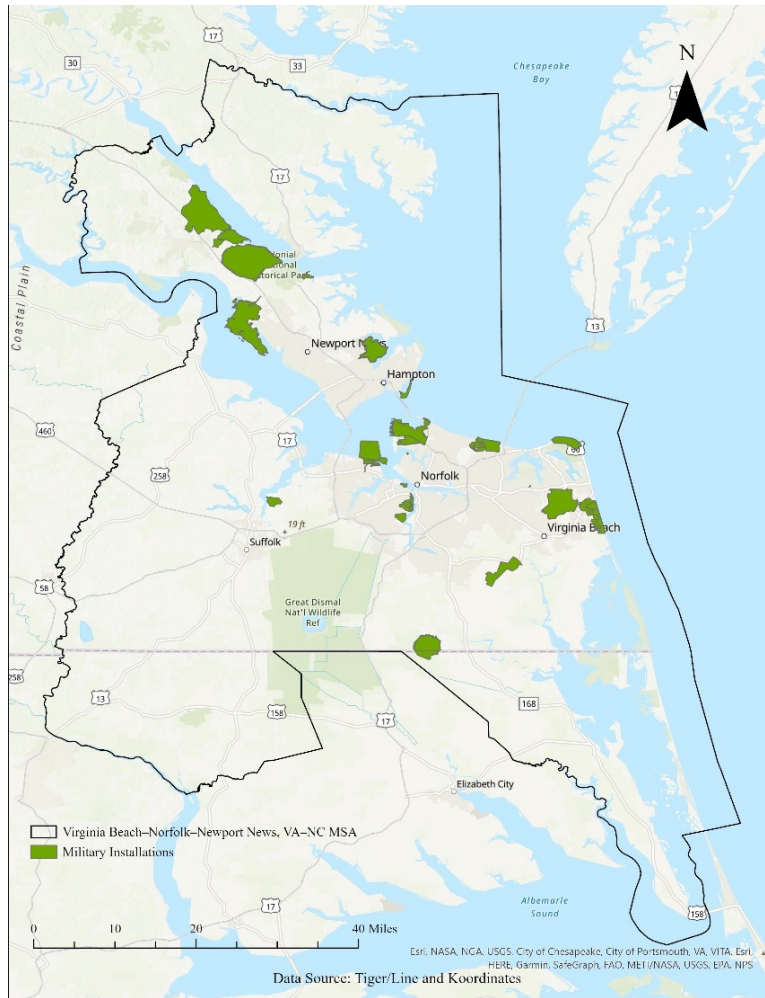
Figure 3: Map of military installations in the VA-NC MSA (Source: Created by the author)

RESEARCH ON FLOOD RISK PERCEPTION IN HAMPTON ROADS AND VIRGINIA
BEACH, VIRGINIA

Old Dominion University (ODU) researchers have been extensively involved in studying
and assessing flood risk perceptions across Hampton Roads. Selected research is discussed in
this section to illustrate what is known and highlight why Filipino Americans should be studied.
First, the 2019 "ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow)

Community Outreach for the Virginia Beach Comprehensive Flooding Response Plan (Sea-Level Wise)" project worked alongside the City of Virginia Beach to host six community meetings and presentations for the City's "Sea-Level Wise" strategy. The ASERT community meetings provided researchers the opportunity to collect data on a baseline perception of risk among Hampton Roads residents. The community outreach program also gave city residents the ability to share feedback regarding the City's plans within the "Sea-Level Wise" comprehensive plan. In turn, residents also received more flood knowledge by partaking in these community meets and interacting with City officials and other planning professionals (Covi et al., 2019, pp. 37-38). The project resulted in 186 community meeting participants and 59 online participants that resided in or owned businesses or property in Virginia Beach (Covi et al., 2019, p. 9). The majority, 44.4%, of the participants were 45-64 years old (Covi et al., 2019, p. 10) and predominantly (89.7%) white (Covi et al., 2019, p. 11). Among questionnaire responses there were no participants reported being of Asian descent, although 2.1% of participants described themselves as "Multiracial" and 4.1% as "Other" (Covi et al., 2019, p. 11). The "Sea-Level Wise" community outreach project collected other demographic data regarding "highest level of education completed", "annual household income", and "home ownership". Limitations for the "Community Outreach for the Virginia Beach Comprehensive Flooding Response Plan (Sea-Level Wise)" project was that although the survey welcomed all residents of Hampton Roads, Virginia to participate, the 245 responses were predominantly white and at least 45 years old. Similarly, 77% of the participants also held a bachelor's and graduate degree of some kind (p. 11) which when combined with the knowledge about the community outreach events could have resulted in the heightened knowledge and awareness of flood risk that is seen in the "rating of

personal vulnerability" responses, where 38.1% responded "extremely high" and 30.3% "somewhat high" (p. 13).

Dr. Nicole S. Hutton and Dr. Thomas R. Allen's 2020 "Blue Line Project" sought to investigate flood risk perceptions as they are impacted by visual media, like photographs and maps in Norfolk, Virginia. The project utilized a survey component to capture a baseline perception based on previous experience or knowledge. Then the survey incorporated photographs of flooding events in Norfolk and maps depicting future sea level rise extents to see how much those media can help convey risk and therefore produce an increased awareness to flooding and sea level rise as a hazard in Norfolk, Virginia. The forty-four-question survey encompassed the initial knowledge and perception and reactions to in-person, photograph, and map interaction (Hutton & Allen, 2020, p. 5). The "Blue Line Project" was designed to coincide with the third annual "Catch the King flood mapping event" (Hutton & Allen, 2020, p. 6) to encourage participation. The survey link was publicly displayed on signs along the King Tide's event shoreline markings for anyone to see regardless of initial participation with the survey or project. The project was also advertised over local news outlets and other social media pages (Hutton & Allen, 2020, p. 6) to spark not only an invitation to the survey and research but to also (re)introduce flood risk to the new viewing population. The survey found that, at 39.2%, most participants lived in Hampton Roads and had residential tenure of 6 years or more. Pre-existing awareness of sea level rise also was high among participants, as 86.5% agreed that the problem with sea level rise is increasing in Norfolk, Virginia. "The Blue Line Project" research found that across both electronic and in-situ viewing of the project, photos and maps were successful in increasing the risk perception of sea level risk in Norfolk (Hutton & Allen, 2020, p. 8), this contributes to creating flood risk perception baselines that are more consistent in a specific origin

of flooding, such as nuisance, rather than a broad understanding and memory of any and all flooding events.

Dr. Nicole S. Hutton and Dr. Michael J. Allen's "Flood Hazard Awareness at Old Dominion University: Assessment and Opportunity" 2019 project investigated the overall perception and pre-existing knowledge of flood risk among Old Dominion University students in Norfolk, Virginia. The research was accompanied by a 28 multiple choice and open-ended questionnaire that was delivered to participants electronically between November 12th and December 12th, 2019, the end of hurricane season for the region (Hutton & Allen, 2021, p. 22). Many questions used in the survey were based on existing research surrounding community specific flood hazards and student flood perceptions (Hutton & Allen, 2021, p. 22). Most of the students reported previous zip codes within Hampton Roads, 62.89%, and were studying in the College of Arts and Letters, 31.40% (Hutton & Allen, 2021, p. 25), which includes the geography department for which the two researchers belong to. 60.8% of participants having "had a class canceled or were unable to attend a class as a result of flooding" (Hutton & Allen, 2021, p. 24). Overall perceptions regarding flooding in general and within Norfolk, Virginia were high among the student population, possibly as result to the University sending "ODU Alerts" via email about closures, evacuations, coastal flood advisory, and other warnings (Hutton & Allen, 2021, p. 25). 80.9% of the student body agreed that "Norfolk has a high flood risk" as well as rain, storm surge, and sea level rise were the top three "factors causing flooding" with 29.13%, 24.60%, and 19.42%, respectfully (Hutton & Allen, 2021, p. 26).

Old Dominion University's Social Science Research Center conducts annual Life in Hampton Roads surveys. The 2018 Life in Hampton Roads survey collected perceptions and information regarding: quality of life, politics, social issues and police, economics, health and

health care, transportation, and sea level rise and flooding. The survey collected 687 interviews from residents across the Hampton Roads region (Parker et al., 2018, p. 3). Similar to the ASERT framework and research, most of the Life in Hampton Roads participants were white (52.5%), but also saw a better representation of Black or African American residents with 30.4%, and 1% of Asian involvement in 2018. The average age of participants was 53.2 years-old (Parker et al., 2018, p. 5). Of the questions pertaining to perception and knowledge regarding sea level rise, flooding, and flood risks included whether recurrent flooding was an issue in the participant's neighborhood, whether they believed flooding had increased, decreased, or remained the same in the last 30 years in Hampton Roads, and others.

Results of the 2018 survey found that 63% of participants believed that "flooding [had] increased in Hampton Roads over the past 30 years", a 2.6% increase from the 2017 survey (Parker et al., 2018, p. 58). Similarly, the majority of responses from the 2018 survey (71.1%) are at least somewhat concerned "with flooding in Hampton Roads" (Parker et al., 2018, p. 58). Despite 63% of respondents believing that flooding has increased over the last 30 years in the region, 65.1% also states that recurrent flooding is not a problem in their neighborhood (Parker et al., 2018, p. 59). The survey identified a 2.4% increase in responses stating recurring flooding is a problem within their neighbor from the year prior (Parker et al., 2018, p. 59). When the responses were filtered by reporting city, the survey found that the top three cities where respondents claimed recurrent flooding was a problem in their neighborhood was Norfolk with 58.8% of residents, Portsmouth with 56.5% of residents, and Virginia Beach with 34.6% of residents (Parker et al., 2018, p. 60). Finally, the survey asked participants three questions to identify the region's risk perception to a catastrophic hurricane impacting Hampton Roads" and their home by flooding and wind in the next ten years by giving a percent chance of probability

between 0 and 100. The averaged answer by region's participants "was a 57.8% chance of a catastrophic hurricane striking the Hampton Roads region" (Parker et al., 2018, pp. 63-64). From there, the respondents averaged percent likelihood that their homes would be impacted by floodwaters or wind by a catastrophic hurricane was 39.1% and 56.6%, respectively (Parker et al., 2018, p. 64). These last three questions contributed a unique angle to flood risk perception as participants were tasked with connecting their experiences with and knowledge of flooding personally and regionally to judge the likelihood of catastrophic hurricane would impact the area.

Previous surveys provide flood experience and risk perception across the city of Virginia Beach and the Hampton Roads region independent from racial and cultural ties despite most collecting information regarding race. The existing research investigate the experiences and perceptions from impacts of flooding events ranging from nuisance flooding, or high tide flooding (Hutton & Allen, 2020), sea level rise (Covi et al., 2019; Parker et al., 2018), and hurricanes (Hutton & Allen, 2021) within the Hampton Roads region in Virginia. All four of the previous surveys collected responses from the overall population to create a regional or city-wide flood experience and flood risk perception unique to the cities of Norfolk and Virginia Beach and the Hampton Roads region, but not considering the impacts of cultural background and socioeconomic status within flood research. Hutton and Allen's "Flood Hazard Awareness at Old Dominion University: Assessment and Opportunity" 2019 project was the most successful of the other regional studies in terms of collecting responses from younger age group, as its participants were Old Dominion University students. The ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) research (Covi et al., 2019) and Old Dominion University's 2018 "Life in Hampton Roads report" (Parker et al., 2018) collected flood experience and flood risk perception from primarily white residents, 89.7% and 52.5%, respectively, with other racial

groups seeing low representation with zero percent and 1%, respectively, reporting from Asian residents in Hampton Roads (Covi et al., 2019; Parker et al., 2018). With Hampton Roads experiencing primarily nuisance flooding, exacerbated by increasing sea levels, previous research participants, and Hampton Roads residents, expressed having a high rating of personal vulnerability to the impacts of flooding and sea level rise (Covi et al., 2019, p. 13) and that they acknowledge flooding has increased in the region over the last thirty years (Parker et al., 2018, p. 57). Overall, the Hampton Roads surveyed residents' flood experience impacts their perception of flood risk throughout the region and individual cities, such as Norfolk, Virginia, to have a high flood risk (Hutton & Allen, 2021, p. 26). However, it is unknown how unique cultural ties and socioeconomic statuses of the previous research participants influence both flood experiences and flood risk perceptions.

CHAPTER III

METHODOLOGY

STUDY AREA: VIRGINIA BEACH, VIRGINIA

The City of Virginia Beach is home to 449,974 people, a diverse population, consisting of white (66.3%), Black and African American (19%), Hispanic or Latino (8.2%), Asian (6.7%) residents (Census QuickFacts, 2019), sprawled across its 258.7 square miles of land, with 38 square miles of shoreline along the Atlantic Ocean and the Chesapeake Bay (see Figure 4). The City also consists of 51.3 square miles of water and is one of the cities that comprise Hampton Roads, Virginia. When compared to the national average, Virginia Beach has a higher median household income at $76,610 ($13,767 above the nation's), larger percent of high school graduates (93.5%) and college graduates with a bachelor's degree or higher (36%), as well as a higher percentage of veteran residents (12.6%) (Census QuickFacts, 2019). The average household cost, in Virginia Beach, is also higher than the national average at $280,800 (Census QuickFacts, 2019). On average, Virginia Beach's elevation is 12 feet above sea level (City of Virginia Beach, 2017) creating a perfect environment to frequently experience flooding caused by immense rain creating flash floods, impervious surfaces, or coastal flooding and erosion. The City is also impacted by land subsidence which occurs when the ground surface is lowered due to geologic changes over time or removal of groundwater. Land subsidence increases flood risk and damage as it alters or blocks drainage patterns (City of Virginia Beach, 2017). Virginia Beach's residents predominantly live within FEMA's flood zone classification "X" which is characterized to be of an "area of minimal flood hazard" (FEMA NFHL, 2021) (see Figure 5). However, because of increasing sea level and nuisance flooding events across Hampton Roads,

the "areas of minimal flood hazard" are impacted by nuisance flooding by disrupting day-to-day events, compromising and overflowing sewage and septic systems, and creating minor property damage.
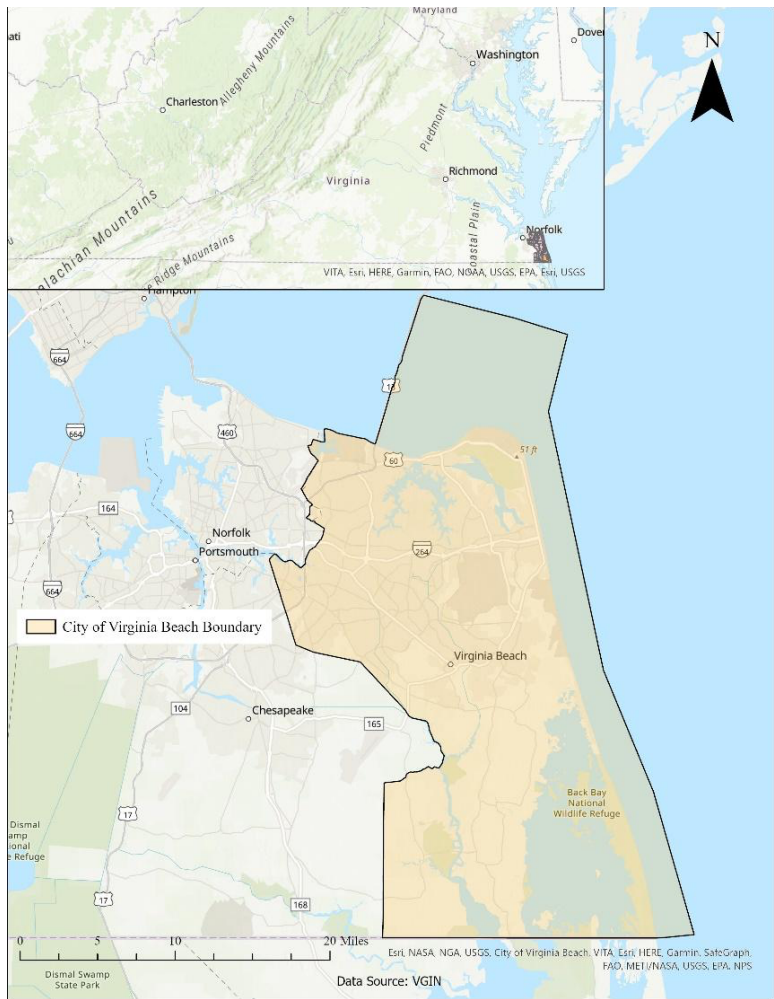
Figure 4: Map of Virginia Beach, Virginia (Source: Created by the author)
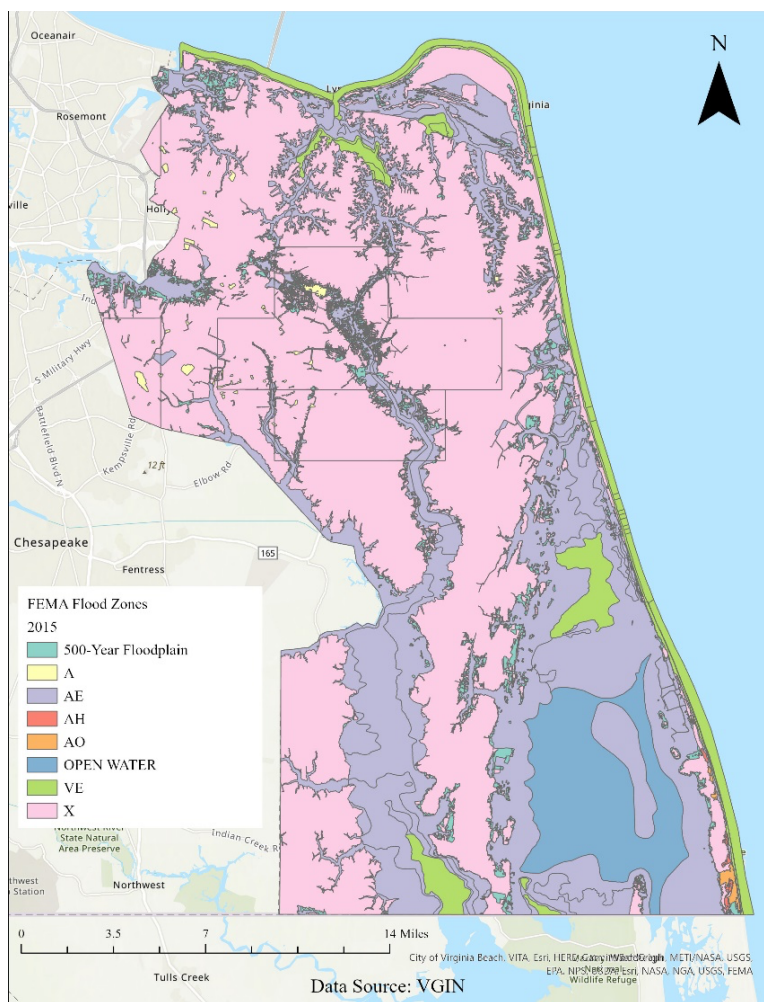
Figure 5: Map of FEMA flood zones in Virginia Beach, Virginia (Source: Created by the author)

Virginia Beach, Virginia, like the Hampton Roads region, sees a more transient

population created by the large influence of the military, but also through the tourism economy

brought on by the appeal of the Virginia Beach Oceanfront. Although the smallest of the City's

four major watersheds, the Oceanfront Watershed is "densely developed and provides invaluable

economic growth from the tourism industry" (City of Virginia Beach, 2020, p. xiii). The

Oceanfront as well as Virginia Beach's other natural areas and waterways, such as First Landing

State Park, Back Bay National Wildlife Refuge, and other city parks and facilities, lend

themselves to the City's touristic appeal and the more than 15 million visitors (City of Virginia

Beach, 2020, p. 58).

The City of Virginia Beach is frequently impacted by various sources of minor and

coastal flooding, which include high tide flooding, wind tide flooding, storm surge flooding,

rainfall flooding, and groundwater flooding. These flooding types currently impact the City's

low-lying areas, but with rising sea levels the spatial extent impacted will increase by one-and-a-

half times around 2040 and doubled around 2070 (City of Virginia Beach, 2020, p. x). With

Virginia Beach projected to experience another one to four-and-a-half feet over the next eighty

years, the city is one of the top ten cities threatened by sea level rise and ranked 19th among the

cities of the world for assets at risk to coastal flooding by the 2070s (City of Virginia Beach,

2020, p. 4). Hot spots of flooding events occurring between 2001 and 2017 and reported to the

city by residents through a hotline and emails can be seen in Figure 6.
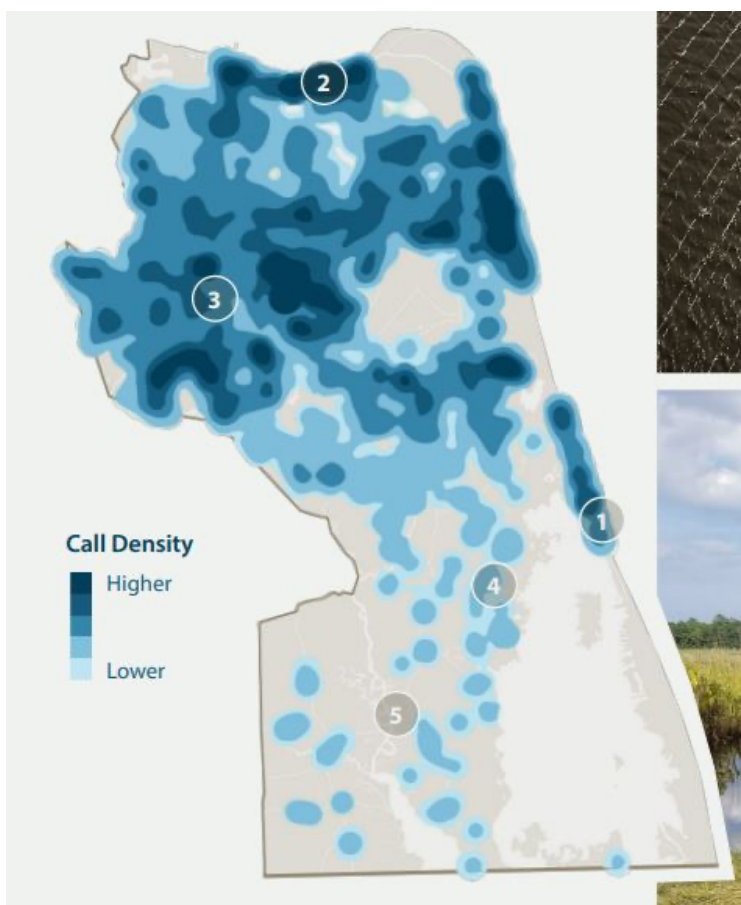
Figure 6: City of Virginia Beach current flooding "hot spots"

(Source: City of Virginia Beach, 2020, p. 6)

Due to the forecasted impacts and costs of rising sea level and increased flooding throughout Virginia Beach, the city has become one of the first municipalities in Hampton Roads to comprehensively study and plan for sea level rise while producing their "Virginia Beach Sea Level Wise Adaptation Strategy" (City of Virginia Beach, 2020, p. 8). Virginia Beach's City Council knew that to produce information and strategies that created long-term resilience efforts against sea level rise and recurrent flooding, they were required to understand flood risk and the projected changes and develop policy and engineering strategies for short- and long-term

impacts. They also involved created plans involving the entire city and its various watershed as well as encouraged residents to share opinions and become more informed all to increase resilience initiatives at the personal and city level (City of Virginia Beach, 2020, p. 8). The "Sea Level Wise Adaptation Strategy" document, released March 2020, involves four phases: impact assessment, adaptation research, strategy development, and implementation all to "protect vulnerable neighborhoods and industries" across the city (City of Virginia Beach, 2020, p. 11). The City's Adaptation Strategy was designed to be "a proactive, long-term approach to enable the City of Virginia Beach to adapt to changing environmental conditions" (City of Virginia Beach, 2020, p. 1). In combination with the "Sea Level Wise Adaptation Strategy", Virginia Beach is adding a "Flood Protection Program Bond Referendum" to the 2021 November ballots to decide whether the real estate tax will be increased to assist funding for the flood protection projects within the "Sea Level Wise Adaptation Strategy" and a new "Ripple Effect" Phase 1 programs (Public Works, 2021). The City's residents, despite perceiving varying magnitude, all experience flooding and by passing the "Flood Protection Program Bond Referendum" city-wide projects can mitigate the impacts in a timely manner to the infrastructure, citizens, and economy ahead of the increasing sea level rise.

FILIPINO AMERICANS IN VIRGINIA BEACH, VIRGINIA

With a steady tradition of serving in the United States Armed Forces since 1903 and working within the medical field in America as early as 1966 (Koch, et al., 2007), the original Filipino communities sprouted around military housing complexes in Virginia Beach and Norfolk as they were affordable and close to the military bases. Within these Filipino communities, families were able to grow friendships surrounding "the burden of long deployments" (Hampton Roads Chapter of the Filipino American National Historical Society,

2004, p. 109). Resulting in heavy recruitment by the U.S. Navy in the Philippines, between 1902 and 1992, and because Naval Station Norfolk is the largest naval base in the world, many Filipinos began their military careers in Hampton Roads. Initially, enlisted Filipino men worked primarily as stewards in mess halls cooking and serving for officers, admirals, and eventually presidents. At this time, Filipino women were also being "recruited by the United States as nurses and other health care professionals" (Hampton Roads Chapter of the Filipino American National Historical Society, 2004, pp. 109-110). Today, the Hampton Roads region's second- and third-generation Filipino Americans are no longer specifically employed as service members or medical professionals, but instead also working in manufacturing, retail, entertainment, and other industries (Koch, 2007, p. 55).

Over time the Filipino immigrant community in Hampton Roads were able to create a sphere of social organizations ranging from Fiestas with over 60 Philippine provincial associations, balls at local Veterans of Foreign War (VWF) halls, Novenas, which are nine successive services of prayers after a death, at San Lorenzo spiritual center or other catholic churches, and other events (Hampton Roads Chapter of the Filipino American National Historical Society, 2004, pp. 112, 116). However, within the younger generations, despite involvement in the Filipino American community through youth activities and other events sponsored by their parents' and grandparents' organizations, primarily feel more American than Filipino. The younger generations are utilizing school organizations, like the Filipino American Student Association at Old Dominion University, to share and reconnect with their Filipino heritage. Over the years, the Filipino and Filipino American community, of all generations, in Virginia Beach, alone, has blossomed into what can now be informally called a "Little Manila" district with various restaurants, markets, and a large concentration of the City's estimated

23,960 Filipino American population (Koch, 2007, p. 55; American Community Survey, 2019) as shown in Figure 7 in the darker blue areas for population and the unique symbols for businesses within western Virginia Beach. Of this population, it is estimated from the 2017 through 2019 American Community Survey 1-Year estimates that the average age of Filipino Americans is 43 years old and there are more females (55.7%) to males (44.3%) (Ruggles, et al., 2021). Figure 8 then shows the location of the Filipino business as they relate to FEMA's flood zone designations to indicate a level of risk the residents or business infrastructure as it relates to the flood zones.
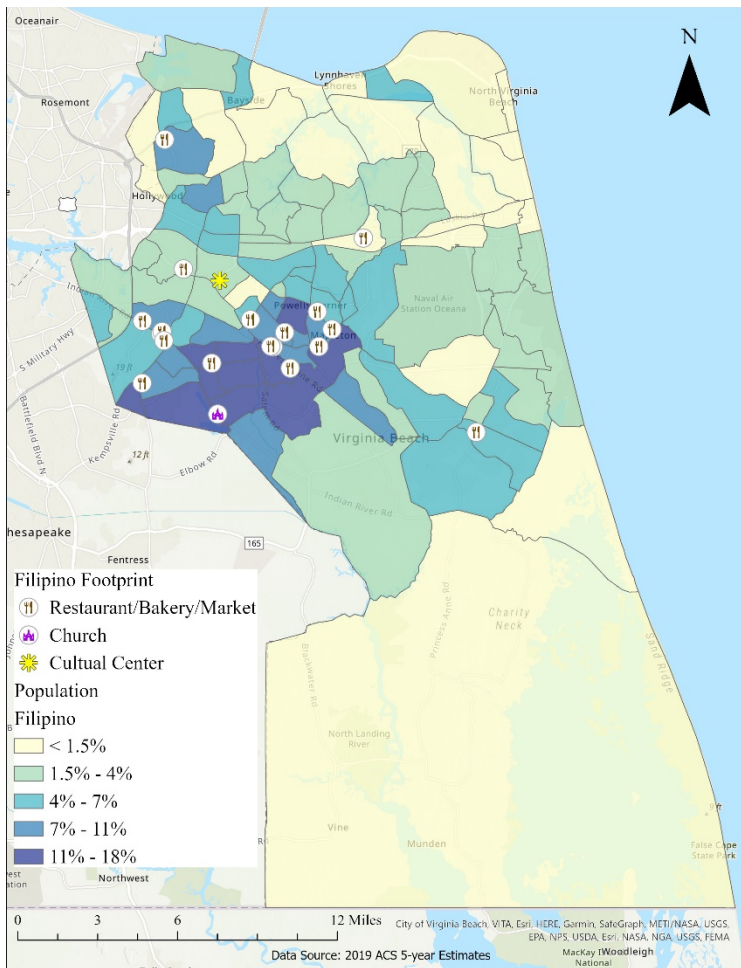
Figure 7: Filipino business footprint in Virginia Beach, Virginia (Source: Created by the author)
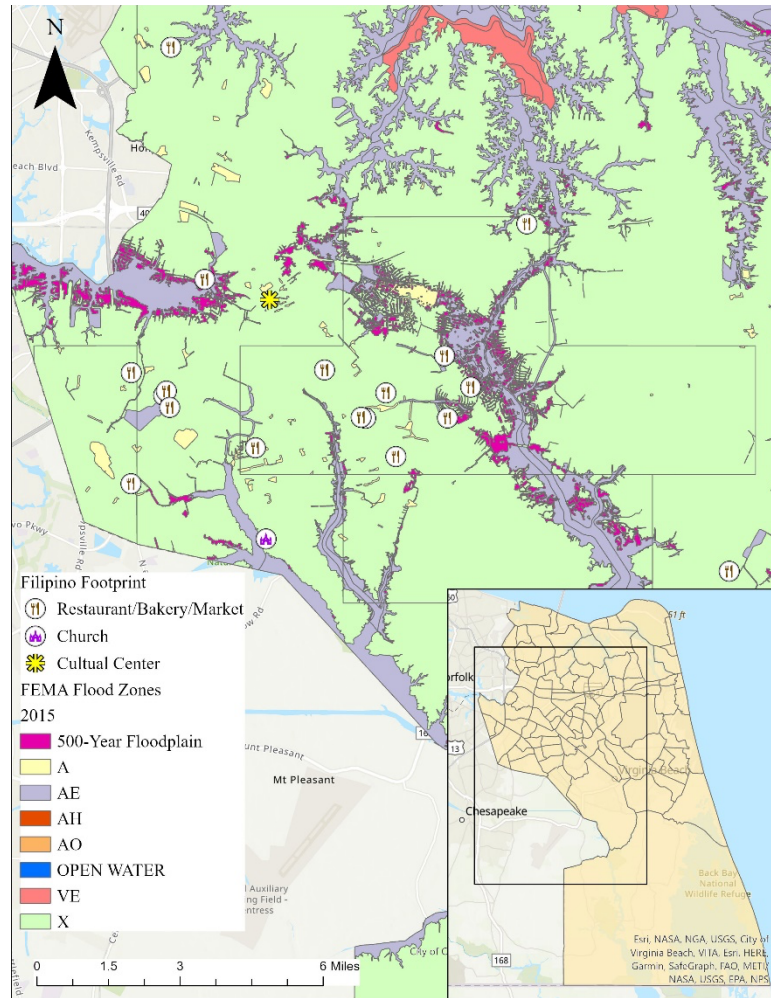
Figure 8: Filipino business footprint in Virginia Beach and location to FEMA flood zones

(Source: Created by the author)

SURVEY

A survey was used to assist in collecting information regarding how Filipino Americans have experienced flooding in Virginia Beach as well as how they perceive their risk to flooding. To investigate how Virginia Beach's Filipino American community's flood experiences and flood risk perceptions compare to the overall Hampton Roads population, the survey was

constructed with questions stemming from or based on the surveys used in the Community Outreach for the Virginia Beach Comprehensive Flooding Response Plan (Sea-Level Wise), the Realizing the Future Reality of Sea Level Rise and Tidal Flooding: Blue Line Project, Flood Hazard Awareness at Old Dominion University, and the Life in Hampton Roads Survey: Sea Level Rise and Flooding 2017 and 2018 projects. The survey was created in Esri's ArcGIS Survey123. All survey and distribution materials (Table 1), as well as a Human Subjects Research Exempt Application Form, which detailed the survey methods, were submitted to the Old Dominion University College of Arts and Letters Human Subjects Review Committee to receive Institutional Review Board (IRB) approval. The survey was declared not human subjects research (Appendix C). The survey was open from July 11th, 2021, through September 15th, 2021, during the second summer of the COVID-19 pandemic. Participants answered questions pertaining to consent to participate, demographics, and experience and perception of flooding (Appendix A). The survey requested no identifying information and allowed multiple submissions from the same browser/IP address for plural entries from a household. The survey was also translated with Google Translate into Tagalog, the national language of the Philippines, to be better accessible to all members of the Filipino American community living in Virginia Beach, Virginia. The translated survey was verified by two bilingual friends, with a suggestion of adding, "Pasenya na po kayo, di po ako marunong na mag Tagalog", which means "I am sorry, I am not good in Tagalog", and is provided in Appendix B.

Table 1: Survey questions and sources

Survey question	Source
What is your age?	ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) 2019 Community Meetings
How long have you lived (in years) in Virginia Beach?	ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) 2019 Community Meetings
Do you plan to still live in Virginia Beach five years from now?	ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) 2019 Community Meetings
How well informed do you feel about increasing flooding in Hampton Roads and its causes?	ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) 2019 Community Meetings
Do you believe flooding has increased, decreased, or remained the same in Virginia Beach over the past 30 years?	Life in Hampton Roads Survey (2018)
How often have you had to change your route to work/school/activities due to flooding?	ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) 2019 Community Meetings
Is recurrent flooding a problem in your neighborhood?	Life in Hampton Roads Survey (2018)
Have you experienced damage to your residence or other property as a result of flooding in the time you have been a student at ODU?	Flood Hazard Awareness at Old Dominion University
How often have you experienced flooding in the past year?	Flood Hazard Awareness at Old Dominion University
Increased flooding due to sea level rise is likely to negatively impact me personally in the future.	Life in Hampton Roads Survey (2017)

RESEARCH PARTICIPANTS

Due to wide societal and familial circles prevalent in the Filipino American community, the survey utilized snowball and convenience sampling methods (Stratton, 2021, p. 373). Participants accessed the survey via a Survey123 QR code and weblink shared mainly by posts and direct messages through Facebook and Instagram (Appendix F). A brief explanation of the research and the researcher were provided to better establish the researcher as a member of the Filipino American community. The posts made on Facebook were also shared on various Facebook Group pages, such as Old Dominion University's Filipino American Student Association (FASA), Virginia Beach Volleyball: VBvb, and the Filipino American Community Action Group (FIL-AM CAG), as well as many Facebook friends' personal profile. In addition to social media posts, survey flyers were printed, in both English (Appendix D) and Tagalog (Appendix E), and dropped off at multiple Filipino restaurants and bakeries, and other businesses such as Sally's Bakery and Grocery, Felynn Oriental Restaurant, and Maymar Cuisine, to be displayed for customers to encourage participation. Flyers were also handed out during Volleyball Open Gym at the Virginia Beach Fieldhouse among Filipino American participants ranging between 16-40 years old. The survey also relied heavily on word of mouth sharing among friends and familial groups past my initial communication and social media post, it was desired that survey respondents would share the survey with parents, lolas and lolos (grandparents), ninangs and ninongs (godparents), friends, etc. around the time of initial completion.

ANALYSIS

To create a baseline of flood experience and flood risk perception among the Filipino American community in Virginia Beach, additional data cleaning steps, following data

collection, were required. Any survey results where the individual did not consent, indicated they were younger than 18, included zip codes outside of Virginia Beach, and those that responded "not of Filipino Descent" were excluded from analysis. In total there were 86 survey responses that met the criteria of living in Virginia Beach and being of Filipino descent between the surveys presented in English (85) and Tagalog (1). To merge the survey responses from the English and Tagalog surveys, each data was exported from Survey123 as excel files. The Tagalog response was added to the English excel sheet by hand; shorthand data column names were also created at this step to streamline the excel sheet and be compatible in ArcGIS Pro to make various maps (Appendix G). Various pivot tables were then made to conduct initial analyses using descriptive statistics, such as counts and percentages. From this analysis, each question's responses (frequencies and percentages) were compared to the corresponding results of previous surveys conducted in Hampton Roads. Excel pivot tables also provided breakdown of specific survey questions based on gender and age to analyze how subgroups of the respondents' answers.

In addition to descriptive analysis comparison to existing research, Excel pivot tables and ESRI's ArcGIS Pro provided spatial analysis of survey responses based on zip code to analyze whether the data was representative of the Filipino American Population in Virginia Beach when compared to initial census tract demographic research. To complete this analysis, first, centroid points for the census tracts were created. Then a spatial join operation was used with the new point file of the census information with the shapefile containing Virginia Beach zip codes. Once the spatial join was completed, one Esri ArcGIS Pro ModelBuilder model was created to make new shapefiles per each zip code (see Figure 9), and another was used to run field statistics to calculate the sum of the Filipino American population per each zip code (see Figure 10). The

population statistics for each zip code were entered, by hand, back into excel containing the

count of survey responses by zip code. Then, two fields were created in excel to produce the

ratio and percentage of survey responses to total Filipino American population to determine

whether the results produced a representative evaluation of the Filipino American population.

Finally, this excel sheet, with zip codes, population total, and survey response total and

percentage, was exported as a comma delimited (CSV) file and added into ArcGIS Pro to
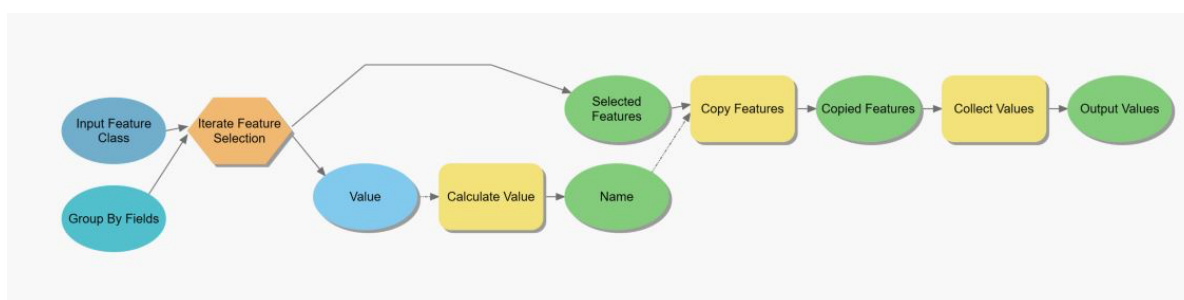
visualize the results spatially.

Figure 9: Iterate feature selection by zip code (Source: Created by the author)
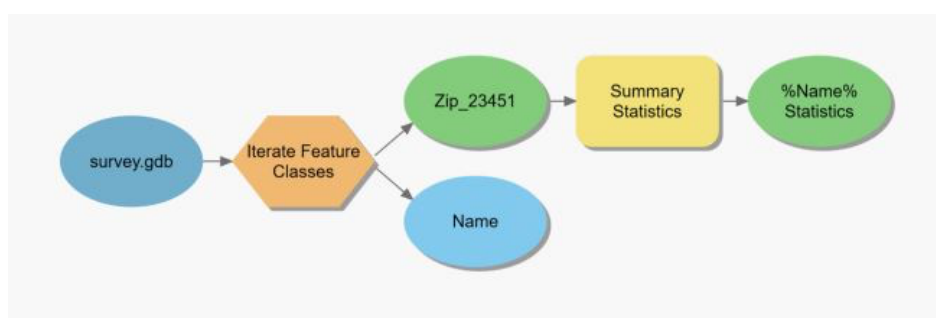
Figure 10: Iterate feature class to perform summary statistics (Source: Created by the author)

CHAPTER IV

FINDINGS

PARTICIPANT CHARACTERISTICS

      The survey resulted in 86 responses of Virginia Beach, Filipino American residents. More than half (55.81%) were female and 41.86% were male. Most responses came from residents aged 25-44 years old (see Table 2) and, because of the snowball and convenience sampling methods, were predominantly college students or graduates. The survey responses were also mainly from the 23464 Virginia Beach zip code (see Figure 11). The 86 survey results came from eight of the City's fourteen zip codes (see Figure 11). Because the survey utilized snowball and convenience sampling methods, to determine a value of success of survey response rates and the validity of community representation, the maximum possible number of responses would be the total Filipino American population in Virginia Beach. It can be seen in Table 3, that the two zip codes with the highest total of responses, 23464 and 23456, also have the two largest populations of Filipino American residents, 6,388 and 4,635, respectively. However, because of the convenience sampling through Facebook among college students and graduates within the Old Dominion University Filipino American Student Association (FASA) and VBvb: Virginia Beach Volleyball groups, most of the survey responses reported from the 25–44-year-old demographic. Although the average age of Filipino Americans in Virginia Beach is estimated to be 43, the survey primarily collected responses from residents in their mid-thirties or younger, and therefore this data is not representative of the overall Virginia Beach Filipino American population.

Table 2: Survey response by age category

Age Category	Percent
18 - 24	6.98%
25 - 44	59.30%
45 - 64	20.93%
65+	10.47%
N/A	2.33%
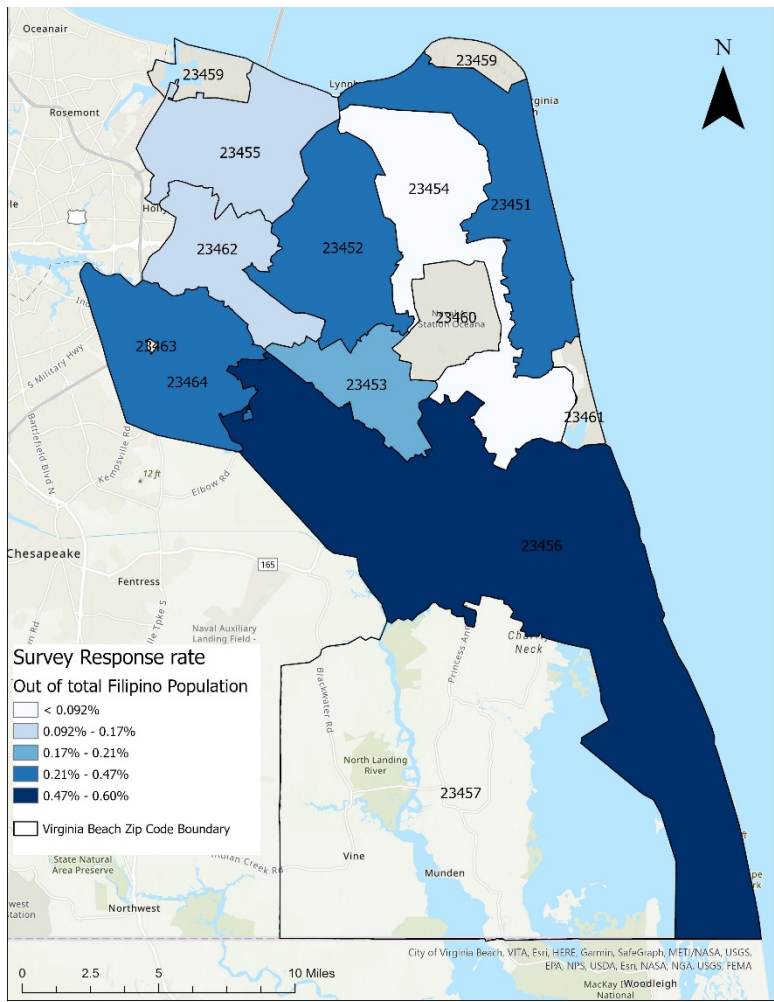
Figure 11: Map of survey results based on total zip code Filipino American population

(Source: Created by the author)

Table 3: Survey responses by zip code

Zip Code	Survey Responses	Filipino American Population	Percent Responses to Filipino American Population
23451	3	691	0.434
23452	8	2,358	0.34
23453	8	3,858	0.21
23454	1	1,087	0.092
23455	3	1,781	0.17
23456	28	4,635	0.60
23462	5	2,880	0.17
23464	30	6,388	0.47

Questions collecting participant characteristics were borrowed from and compared to the ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) framework that worked in conjunction with Virginia Beach's "Sea-Level Wise" community meetings. For the ASERT research, most responses were 45-64 years old (44.4%); however, because of the snowball method participants aged 25-44 years old were the easiest targeted (59.30%) although all age groups were desired (Table 4). 56.98% of Filipino American respondents stated they had lived in Virginia Beach for at least 25 years (see Table 4). Regardless of reporting age group, this extensive residential tenure in Virginia Beach shows how significant the Filipino American community is in the City despite the community comprising of only 5% of Virginia Beach's population.

Table 4: Comparison of participant characteristics

Age Category					
	18-24	**25-44**	**45-64**	**65+**	**Did not Supply Age**
Thesis Survey	6.98%	59.30%	20.93%	10.47%	2.33%
ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow)	1.3%	14.7%	44.4%	36.6%	X
Gender (Does not include "Other" or "Prefer not to Disclose" category. Totals do not add up to 100%.)					
	Male			**Female**	
Thesis Survey	44.86%			55.81%	
ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow)	49.4%			48.6%	
Residential Tenure					
	1-5 Years	**6-10 Years**	**11-20 Years**	**20+ Years**	**Did not Supply Answer**
Thesis Survey	4.65%	6.98%	25.58%	56.98%	5.81%
ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow)	7.3%	5.2%	87.5%		X

FLOOD EXPERIENCE

The survey then asked participants various flood experience questions. Participants submitted their answers whether recurrent flooding was an issue in their neighborhood. The Filipino American participants expressed that they have experienced flooding, but 65.12% stated that recurrent flooding was not an issue within their neighborhood (Table 5). This surveyed population consisting of primarily 25- to 44-year-olds, who more than likely commute to either college and/or work regularly as well as extracurricular activities, shared that they are forced to change driving routes once or twice a year (43.02%) or occasionally (30.23%), as shown in Table 6. This does not however prove that recurrent flooding is indeed not an issue within their

neighborhood and along routes to day-to-day activities but could pose a new problem regarding

flood risk perception if this Filipino American population chooses more often to drive through

floodwaters rather than changing routes. Flooded roads can cause road closures, but when

dealing with nuisance and sunny day flooding that dissipates quicker than flooding brought on by

larger storms, the City is not able to reroute traffic but instead it is up to the individual to choose

whether to take a different path (Figure 12).
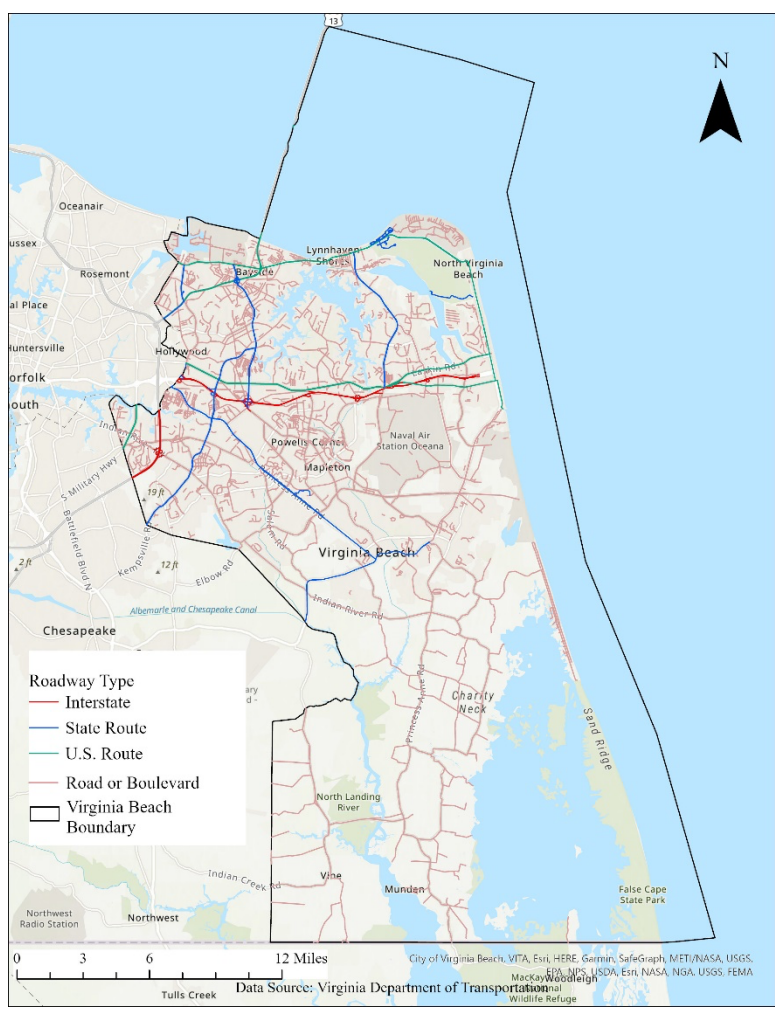
Figure 12: Virginia Beach roadways (Source: Created by the author)

The flood experience of Filipino Americans in Virginia Beach was found to be almost identical to those reported in the 2018 Life in Hampton Roads survey. 34.88% of the Filipino American participants reported that flooding was an issue in their neighborhood and 33.4% of Hampton Roads (Table 5) and 34.6% of Virginia Beach residents that responded to the Life in Hampton Roads survey also agreed to have a problem with flooding within their neighborhoods (Parker et al., 2018), as shown in Figure 13. The Life in Hampton Roads survey did not compile

spatial data at a smaller level than the city a participant lives in, whereas the thesis collected this

data at the zip code level. For this thesis research, most Filipino American respondents that

reported flooding as a problem in their neighborhood (13.95%) listed their zip code as 23456

(see Figure 14). This zip code has the largest footprint of the 12, in the City, with two areas of

significantly densely packed neighborhoods, around the Salem/Landstown and Nimmo areas (see

Figure 15) and the remaining areas more rural in nature. Because the survey did not ask

participants to list their neighborhood names or adjacency to largest intersections, it is difficult to

locate whether responses were in areas of minimal flood, or X flood plain or closer to inlets of

Stumpy Lake and West Neck Creek Natural Area that are classified as AE floodplain, or areas

subject to inundation by 1-percent-annual-chance flooding events (see Figure 15) (Appendix H).

Table 5: Is recurrent flooding a problem in your neighborhood?

	Thesis Survey	Life in Hampton Roads Survey (2018)
Yes	31.40%	33.4%
No	65.12%	65.1%
Don't know/Refused	3.49%	1.5%

% Responding that Recurrent Flooding is a Problem in Your Neighborhood

10.6%

28.1%

58.8%

56.5%

34.6%

16.7%

24.1%

**p<.000 statistically significant, 2-tailed test
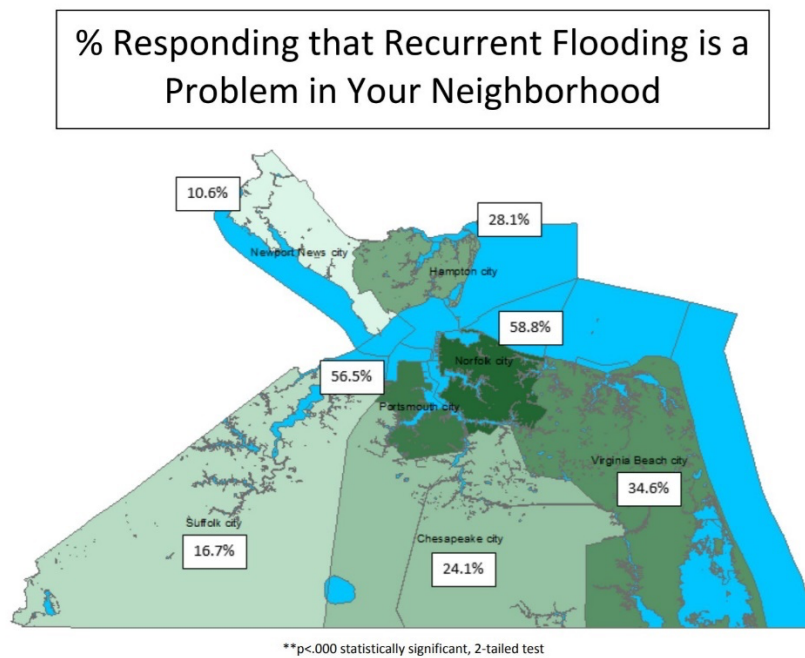
Figure 13: Percent responding that recurrent flooding is a problem in one's neighborhood

(Source: Old Dominion University Social Science Research Center, 2018)
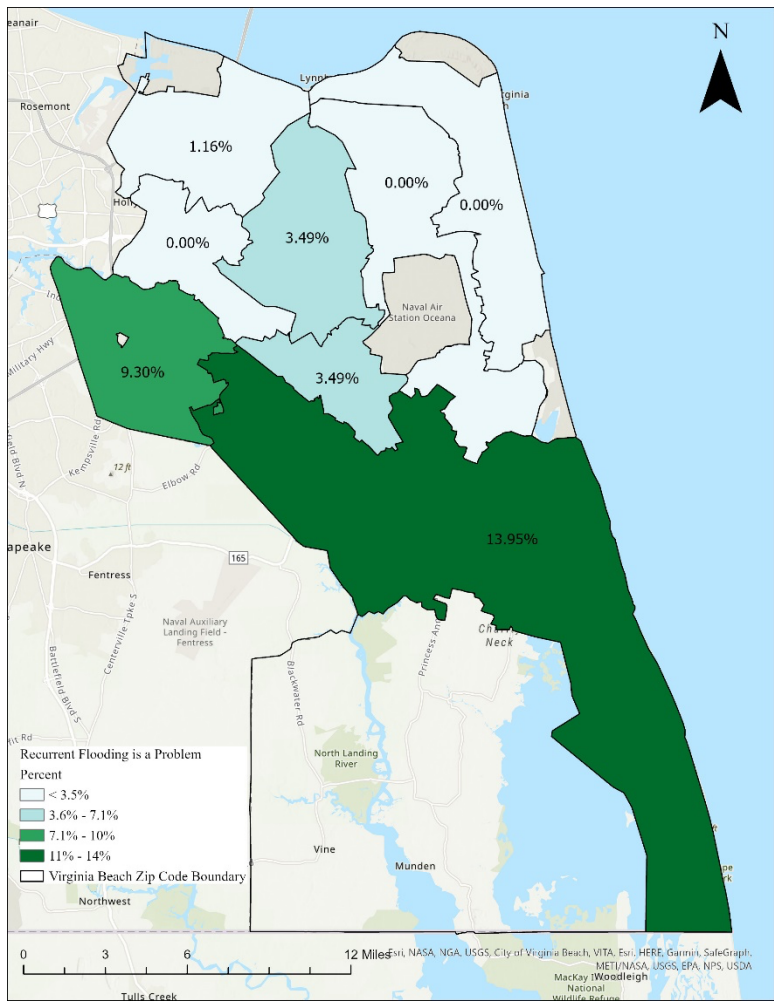
Figure 14: Percent responding that recurrent flooding is a problem in one's neighborhood among

Filipino American survey respondents (Source: Created by the author)
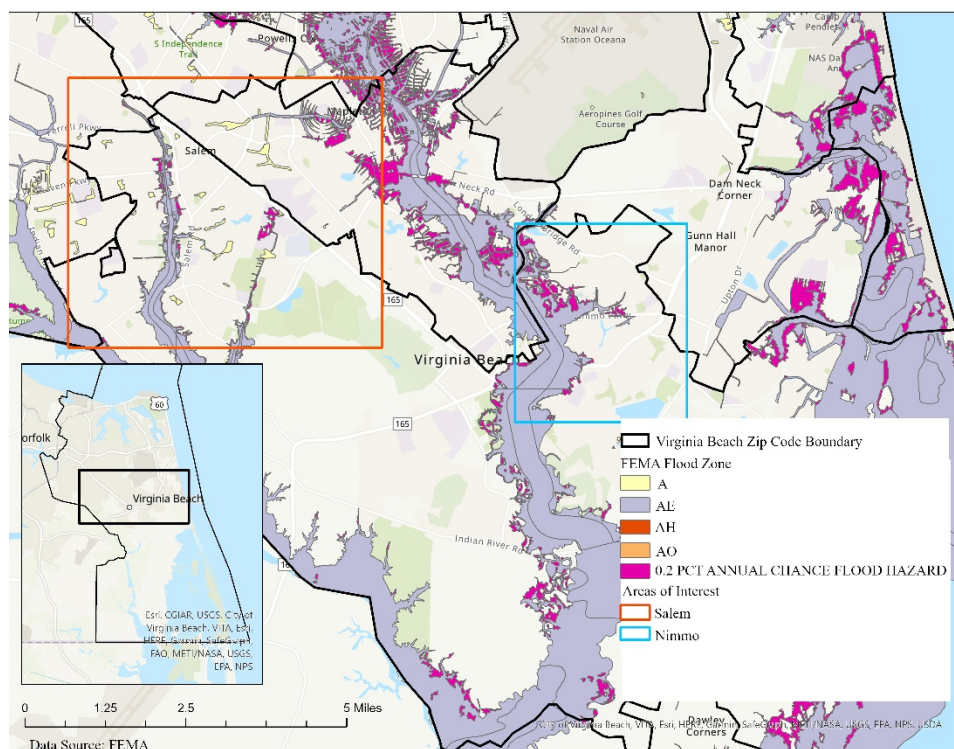
Figure 15: Salem and Nimmo flood zone areas of interest in Virginia Beach

(Source: Created by the author)

Once again, despite most of the survey participants indicating that recurrent flooding is not a problem in their neighborhood, 43.02% and 30.23% of Filipino American residents expressed that once or twice a year and occasionally, respectively, they were forced to change their routes to work, school, or activities due to flooding (Table 6). Similarly, within the ASERT research, more (38.1%) of all Virginia Beach residents shared they occasionally are required to change routes and 32% states only once or twice a year (Table 6). It is unknown whether the participants with the ASERT 2019 Community Meetings live or frequent areas where recurrent flooding is more of an issue than the Filipino American respondents.

Table 6: Have had to change routes to work/school/activities due to flooding

	Thesis Survey	ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) 2019 Community Meetings
Never	11.63%	11.5%
Once or Twice a year	43.02%	32.0%
Occasionally	30.23%	38.1%
Frequently	13.95%	18.4%

FLOOD RISK PERCEPTION

To collect a baseline of flood risk perception among the Filipino American residents in

Virginia Beach, the survey asked participants' level of knowledge regarding increasing flooding

and their causes on a 5-point Likert scale ranging from not at all informed (1) to very well

informed (5). As shown in Table 7, many of the Filipino American respondents either answered

they were "well informed" (31.40%) or "not well informed" (27.91%) regarding increasing

flooding and its causes. However, when divided into age groups (see Figure 16 and Table 7), by

a small margin, more 25- to 44-year-old respondents (19.77%) said they were "not well

informed" than any other answer, 10.74% of 45-64 years old residents responded "well

informed", and 4.65% of anyone 65 and older with "not at all informed". Because most of the

participants were between the ages of 25 and 44, this breakdown was used to see if flood risk

perception differed by age within the Filipino American community. However, it is inconclusive

to know how the older Filipino American population perceives their level of flood risk because

of the low responses from those older than 65-years old. It would also require more investigation

to determine how other cultural, socio-economic, and educational aspects effects how well

informed someone within the Filipino American community is regarding increasing flooding and its causes.
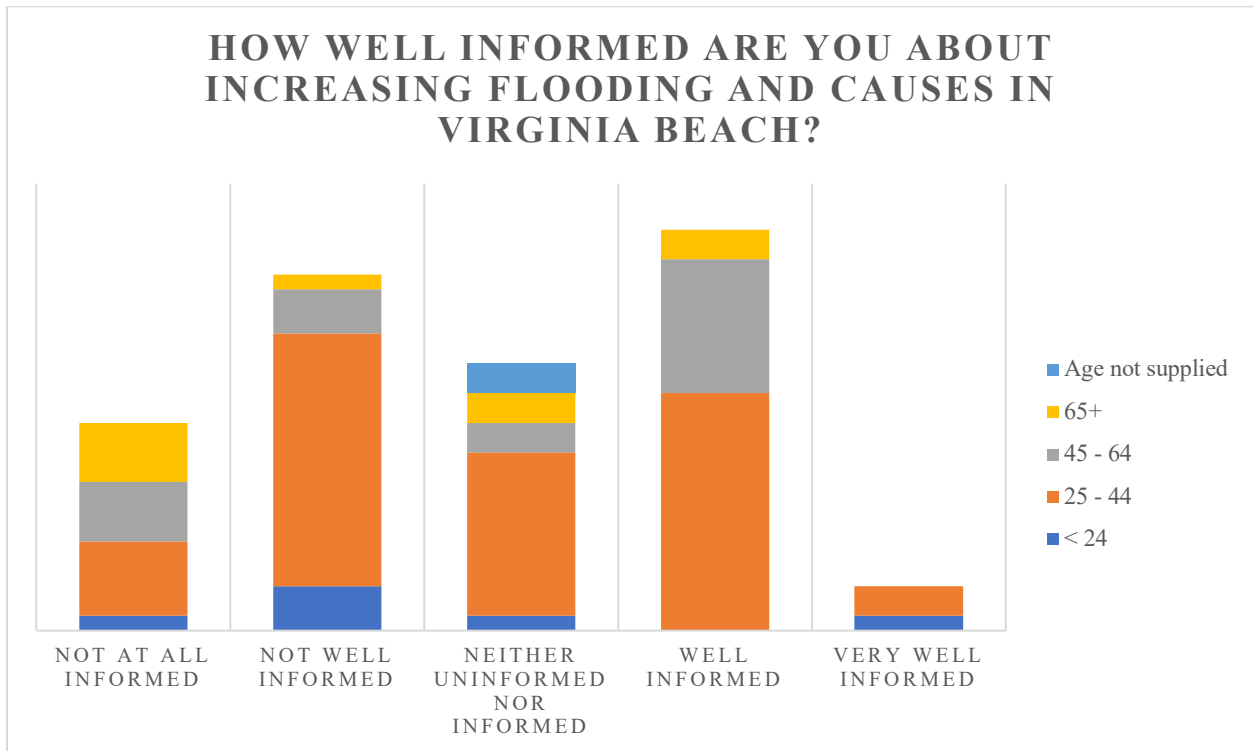
Figure 16: Knowledge of increasing flooding and causes in Virginia Beach by age category

Table 7: Knowledge of increasing flooding and causes in Virginia Beach by age category

	< 24 years	25 – 44 years	45 – 64 years	65+ years	Age not supplied	Grand Total
Not at all Informed	1.16%	5.81%	4.65%	4.65%	0.00%	16.28%
Not well Informed	3.49%	19.77%	3.49%	1.16%	0.00%	27.91%
Neither Uninformed nor Informed	1.16%	12.79%	2.33%	2.33%	2.33%	20.93%
Well Informed	0.00%	18.60%	10.47%	2.33%	0.00%	31.40%
Very Well Informed	1.16%	2.33%	0.00%	0.00%	0.00%	3.49%

Overall, there is a very close divide within the Filipino American participants sharing they are either "well informed" (31.40%) and "not well informed" (27.91%). Whereas among the Virginia Beach population that participated in the "Sea Level Wise" community outreach meetings and the ASERT research, most (45.3%) claimed to be "not well informed" (Table 8). The two surveys did, however, return similar percentages, around 16%, for "not at all informed" and the least number of responses claiming to be "very well informed" (Table 8).

Table 8: How well informed about increasing flooding and causes in

Virginia Beach (Hampton Roads)

	Thesis Survey	**ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow)**
Not at all informed	16.28%	16.8%
Not well informed	27.91%	45.3%
Neither uninformed nor informed	20.93%	13.8%
Well informed	31.40%	22.7%
Very well informed	3.49%	2.2%

Survey participants were also asked if they believed flooding in Virginia Beach had increased, remained the same, or decreased, as previously questioned in the Life in Hampton Roads Survey, produced by Old Dominion University's Social Science Research Center. With most of the Filipino American participants aged at least 25-years-old and generally living in the City for at least 20 years, most (61.63%) believed that flooding in Virginia Beach has increased over the last 30 years (see Figure 17 and Table 9). Although the participants expressed that recurrent

flooding is not an issue within their neighborhood, they have perceived more flooding over the past 30 years while living in Virginia Beach. This flood risk perception is shared among the participants of the Life in Hampton Roads survey, which did not limit their survey extent to Virginia Beach but all the Hampton Roads cities. The majority (63%) of the Hampton Roads respondents also believed that flooding has increased within the last 30 years throughout the region. (Table 9). It was also seen that the second largest group of responses claimed flooding had decreased, and very few believe flooding had remained the same.
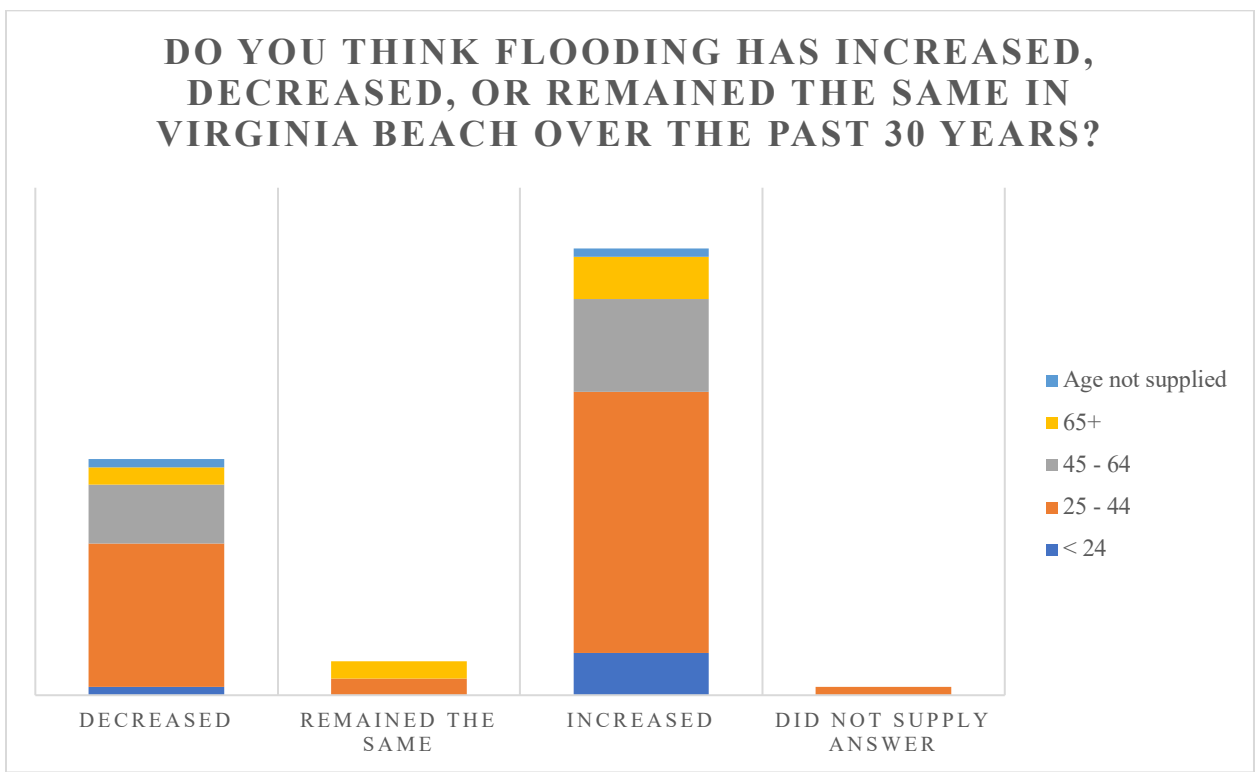

Figure 17: Do you think flooding has increased, decreased, or remained the same in Virginia Beach over the past 30 years?

Table 9: Do you think flooding has increased, decreased, or remained the same in Virginia Beach

(Hampton Roads) over the past 30 years?

	Thesis Survey	**Life in Hampton Roads Survey (2018)**
Decreased	32.56%	23.9%
Remained the same	4.65%	3.9%
Increased	61.63%	63%
Don't know/Refused	1.16%	9.2%

Flood risk perceptions were also collected from a level of agreement on a Likert scale, strongly disagree (1) to strongly agree (6) for the survey question "increased flooding due to sea level rise is likely to negatively impact me personally in the future". More (31.40%) of Filipino American participants agreed that they would be negatively impacted by sea level rise in the future (Figure 18). This question could have been interpreted to collect a level of flood risk perception based on the level of and access to financial and social mitigation tactics an individual would have in the future when impacted by increased flooding, or the general idea that as flooding increases it would become prevalent and therefore more of an issue to the individual. Once again, the Filipino American participants shared similar flood risk perceptions to those shared in the Life in Hampton Roads survey, where (45.7%) also agreed that flooding would negatively impact them in the coming years (Table 10). Between these two surveyed populations, the next popular answer among Filipino Americans was "strongly agree" where the Hampton Roads residents went the opposite way and "disagreed" that they would be negatively impacted by increased sea level induced flooding in the future. The difference in the second most common answer between the Filipino Americans and the total population of Hampton Roads could be in result of varying socio-economic status or averaged age of participant between the two groups and therefore how

they perceive their ability to adapt and mitigate the impacts of sea level rise and increased

flooding personally.

INCREASED FLOODING DUE TO SEA LEVEL RISE IS LIKELY TO NEGATIVELY IMPACT ME PERSONALLY IN THE FUTURE

31.40%

24.42%

20.93%

11.63%

8.14%

3.49%

- Don't know
- Strongly Disagree
- Disagree
- Neither Disagree nor Agree
- Agree
- Strongly Agree

TOTAL
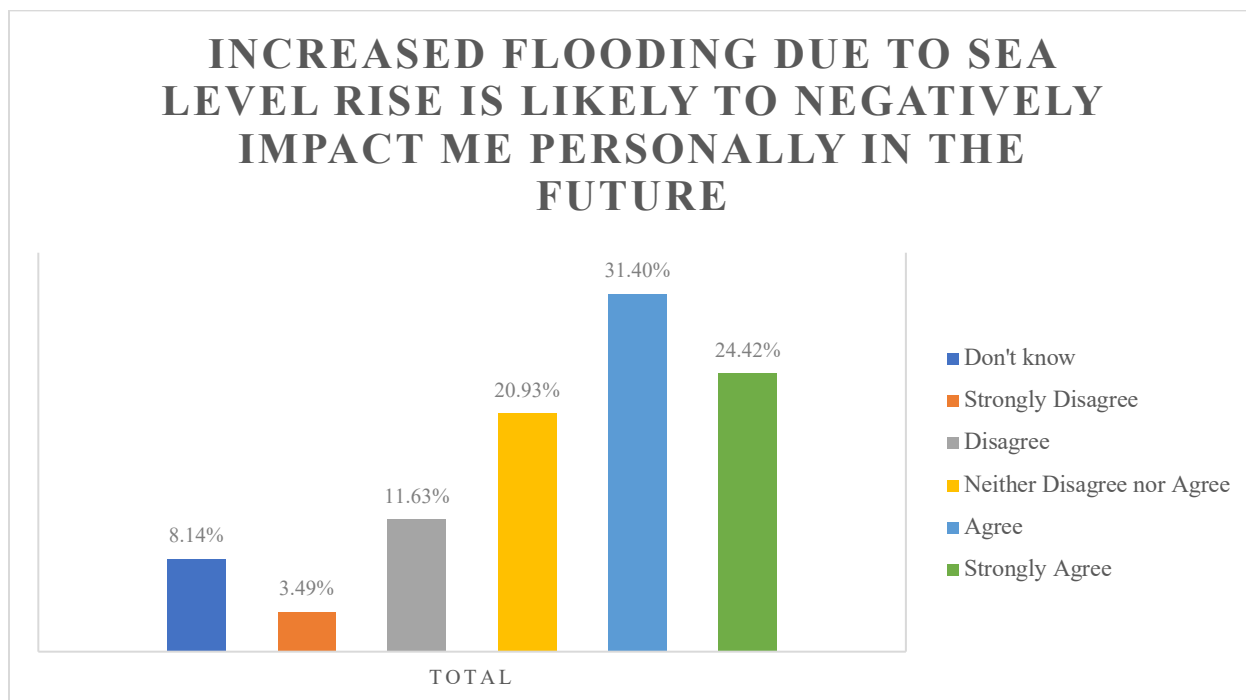
Figure 18: Increased flooding due to sea level rise is likely to negatively impact me personally in

the future by age category

Table 10: Increased flooding due to sea level rise is likely to negatively impact me

personally in the future

	Thesis Survey	Life in Hampton Roads Survey (2017)
Strongly Disagree	3.49%	6.0%
Disagree	11.63%	28.4%
Neither Disagree nor Agree	20.93%	(Classification was not used)
Agree	31.40%	45.7%
Strongly Agree	24.42%	16.1%
Don't know	8.14%	4.0%

CHAPTER V

CONCLUSION

OVERVIEW OF FINDINGS

Because of a high number of responses from the 25 to 44-year-old population created by the convenience sampling, the survey was not able to represent the overall Filipino American population in Virginia Beach, as the survey was not well accepted and accessed by older Filipino residents aged 65 and older. This inability to connect with the older Filipino American population poses a challenge in collecting a baseline experience to flooding and perception of flood risk among all members of the Filipino American community in Virginia Beach. To collect this baseline, it would require investigation into establishing the researcher as an authority figure to gain acceptance into this older and more established subgroup that primarily includes the majority of the Filipino immigrants within the community to examine how having a cultural background and experience to flooding in the Philippines impacts their perception of flood risk now in Virginia Beach.

Of the 25- to 44-year-old demographic, this survey and survey methods were also most successful in encouraging participation from those in their mid-thirties and younger because of the use of Old Dominion University's Filipino American Student Association and VBvb: Virginia Beach Volleyball Facebook groups consisting of this younger Filipino American population. However, the responding Filipino American residents' flood experiences were found to be like the previous research and surveys that were disseminated throughout the Hampton Roads region. The similarity between the thesis and existing research shows that flooding is apparent throughout the city of Virginia Beach regardless of cultural and community ties. The

perceptions of the responding Filipino American population were also similar to that of the Hampton Roads population from past research. However, the age demographics sharing these perceptions are that of the younger (25-44-year-olds) Filipino American population and the older (45+), white residents in Hampton Roads. This similarities in perceptions extends the idea that the younger Filipino American residents living in Virginia Beach culturally align themselves with a more westernized mentality, where they are more publicly active and are more receptive of these survey-based research.

RESEARCH IMPLICATIONS

This research implies that there are shared flood experiences and risk perceptions are similar between the Filipino American survey respondents and the total population in Virginia Beach and the Hampton Roads region. However, this thesis saw a greater success in collecting these flood experiences and flood risk perceptions among 25- to 44-year-olds, than previous research that collected responses from Hampton Roads residents, on average, around 50-years old. The 25- to 44-year-old demographic primarily consists of Filipino Americans with first- and second- generation Filipino lineage, which aligns them with more American traditions and mindsets than those of the older Filipino immigrants in Virginia Beach. Therefore, it is still unknown the flood experience and perceptions for Filipino Americans that are at least 65 and are Filipino immigrants to investigate how flood risks in Virginia Beach are perceived since emigrating from the Philippines. In order to develop a baseline flood experience and flood risk perception for Filipino American residents aged 45 and older, future survey work must develop unique strategies to gain the trust to collect information for all ages and cultural background. From this research and the ability to better connect with the older Filipino American population,

future research and survey work can better develop a baseline flood experience and flood risk perception that encompasses the diversity of Hampton Roads, Virginia and beyond.

RESEARCH LIMITATIONS

Survey distribution was limited to snowball and convenience sampling; future surveys should utilize mixed-mode survey distributions by including mailers, phone calls, and emails in hopes to reach more of the Filipino American population. Mixed-mode distribution would also assist in collecting response data to determine the success of surveying this population as well as produce a more representative dataset from the survey responses. Survey distribution was also conducted during the second summer of the COVID-19 pandemic. At that time, the City of Virginia Beach had reopened almost completely, but still creating stressors between work and family-life that completing a survey was very low in priority to the community.

Future surveys should also revisit question selection and phrasing to not only use different questions such as, "How concerned are you with flooding in Hampton Roads" from Old Dominion University Social Science Research Center 2018 survey, but also establish how the research defines flooding to assist in the production of the flood risk perception. Without formally introducing nuisance flooding to the participants, they were free to perceive their flood risk based on experiences from all flooding events, which could have resulted in more concise and similarly shared experiences and perceptions within the Filipino community and against the overall population of Hampton Roads. Future research should also determine how to develop the spatial data regarding survey responses at a larger scale, which could include proximity to major intersection or neighborhood subdivision instead of zip codes that was utilized in this research. This change in scale could help to better position participants within FEMA's flood zones to better evaluate flood risk perceptions based on flood experience.

Once again, the researcher's inability to establish oneself as or connect with a legitimate authority within the Filipino American community proposed difficulty when moving from convenience to snowball sampling. Although documented on the survey distribution materials as a second-generation Filipino American with the names of grandparents offered limited authority within the vast Filipino American population in the City. The ability to better establish legitimate authority within the community would possibly also assist in connecting to the 65+ and older Filipino American residents directly, instead of relying on their children and grandchildren, to receive possibly more diverse experiences and perceptions between the age classifications. A better comparison to the ASERT (Action-oriented Stakeholder Engagement for a Resilient Tomorrow) framework and "Sea-Level Wise" community outreach, which saw a large percentage of respondents 45+ years old, could have been made by having this having a higher response rate from both the 45 to 64 and 65+ Filipino American residents.

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APPENDIX A

SURVEY IN ENGLISH

Perceptions of Flood Risk among Members of the Filipino American Community in

Virginia Beach, Virginia

Participant Information

Thank you for your interest in the "Perceptions of Flood Risk among Members of the Filipino

American Community in Virginia Beach, Virginia" an Old Dominion University Graduate

Thesis Project.

It should require approximately 10 minutes to take the survey. All questions will be multiple

choice with one fill in the blank. Questions will collect consent to participate and demographic

information, as well as perception of and experience with flooding while residing in Virginia

Beach, VA.

Your participation is voluntary. You may choose not to fill-out the questionnaire, skip any

question in the questionnaire, or stop the questionnaire at any time with no consequence. If you

choose to participate, please only take the survey once, but please feel free to share the survey

with any friends or family members. No identifying information is requested.

Responses will be used within a graduate thesis paper to identify how the Filipino American

Community in Virginia Beach, VA's flood risk perception differs from other cultural

communities in Virginia Beach as captured in previous surveys around Hampton Roads.

Responses will only be viewed by the Graduate Student and Investigator, Anjelica Petsch, and

Principal Investigator Dr. Nicole Hutton.

If you have any questions or concerns, please contact Anjelica Petsch (Investigator) at apets001@odu.edu, Dr. Nicole Hutton (Principal Investigator) at nhuttons@odu.edu, or Dr. Randy Gainey (Chair of the Arts and Letters Human Subjects Review Committee) at rgainey@odu.edu.

Survey Questions

Introductory Questions

1. Do you understand the participant information? (select one)

    a. Yes

    b. No

2. Do you consent to participate in the survey? (select one)

    a. Yes

    b. No

3. Are you 18 or older? (select one)

    a. Yes

    b. No

4. Are you of Filipino Descent? (select one)

    a. Yes

    b. No

5. Age Category (please select from the drop down the age category that best describes you)

    a. 18-24

    b. 25-44

    c. 45-64

    d. 65+

6. Gender (select one)

    a. Female

    b. Male

    c. Nonbinary

    d. Prefer not to disclose

7. Zip Code (please provide your zip code)

8. Residential Tenure in Virginia Beach (Please select from the drop down the length in years you have lived in Virginia Beach)

    a. Less than a year

    b. 1-5 years

    c. 6-10 years

    d. 11-20 years

    e. 20+ years

9. Do you plan to still live in Virginia Beach five (5) years from now? (select one)

    a. Yes

    b. No

    c. Don't know

Experience and Perception Questions

10. Based on personal resources such as income, access to family or community, and others are you able to adapt or cope with flooding? (select one)

    a. Yes

    b. No

    c. Don't know

11. How well informed are you about increasing flooding and causes in Virginia Beach? (select one)

    a. Not at all informed

    b. Not well informed

    c. Neither uninformed nor informed

    d. Well informed

    e. Very well informed

12. Do you believe flooding has increased, decreased, or remained the same in Virginia Beach over the past 30 years? (select one)

    a. Increased

    b. Remained the same

    c. Decreased

13. Have you had to change routes to work/school/other activities due to flooding? (select one)

    a. Never

    b. Once or twice a year

    c. Occasionally

    d. Frequently

14. Is recurrent flooding a problem in your neighborhood? (select one)

    a. Yes

    b. No

    c. Don't know

15. How often have you experienced flooding in the past year in Virginia Beach? (select one)

a. Never

b. Once a year

c. Multiple times a year

d. Monthly

e. Weekly

f. Daily

g. Multiple times each day

16. Have you experienced loss or damage to property due to flooding? (select one)

a. Yes

b. No

c. Don't know

17. How often have you experienced loss or damage to property due to flooding? (select one)

a. Once ever throughout the years

b. Multiple times over the years

c. Multiple times in a year

d. Frequently

e. N/A

18. Increased flooding due to sea level rise is likely to negatively impact me personally in the

future. (select one)

a. Strongly disagree

b. Disagree

c. Neither disagree nor agree

d. Agree

e. Strongly agree

f. Don't know

APPENDIX B

SURVEY IN TAGALOG

Ang mga pananaw sa Panganib sa Baha sa mga Miyembro ng Filipino American

Community sa Virginia Beach, Virginia

Impormasyon ng Kalahok

Pasenya na po kayo, di po ako marunong na mag Tagalog.

Salamat sa iyong interes sa "Ang mga pananaw sa Panganib sa Baha sa mga Miyembro ng

Filipino American Community sa Virginia Beach, Virginia" isang Lumang Dominion University

Graduate Tesis Project.

Dapat itong mangailangan ng humigit-kumulang 10 minuto upang gawin ang survey. Ang lahat

ng mga katanungan ay maraming pagpipilian na may isang punan ang blangko. Mangolekta ng

mga pahintulot ang mga katanungan upang lumahok at impormasyong demograpiko, pati na rin

ang pang-unawa at karanasan sa pagbaha habang naninirahan sa Virginia Beach, VA.

Ang iyong pakikilahok ay kusang-loob. Maaari mong piliing hindi punan ang talatanungan,

laktawan ang anumang tanong sa talatanungan, o ihinto ang palatanungan sa anumang oras nang

walang kahihinatnan. Kung pinili mong lumahok, mangyaring gawin lamang ang survey nang

isang beses, ngunit mangyaring huwag mag-atubiling ibahagi ang survey sa anumang mga

kaibigan o miyembro ng pamilya. Walang hiniling na impormasyon sa pagkilala.

Gagamitin ang mga tugon sa loob ng isang nagtapos na thesis paper upang makilala kung paano

ang Filipino American Community sa Virginia Beach, ang pang-unawa ng panganib sa baha ng

VA ay naiiba sa iba pang mga pamayanang pangkulturang sa Virginia Beach na nakuha sa mga

nakaraang survey sa paligid ng Hampton Roads. Ang mga tugon ay titingnan lamang ng

Graduate Student and Investigator, Anjelica Petsch, at Principal Investigator na si Dr. Nicole Hutton.

Kung mayroon kang anumang mga katanungan o alalahanin, mangyaring makipag-ugnay sa Anjelica Petsch (Imbestigador) sa apets001@odu.edu, Dr. Nicole Hutton (Principal Investigator) sa nhuttons@odu.edu, o Dr. Randy Gainey (Tagapangulo ng Arts and Letters Human Mga Komite sa Review ng Mga Paksa) sa rgainey@odu.edu.

Mga Katanungan sa Sarbey

Panimulang Tanong

1. Naiintindihan mo ba ang impormasyon ng kalahok? (Mamili ng isa)

    a. Oo

    b. Hindi

2. Pumayag ka ba na lumahok sa survey? (Mamili ng isa)

    a. Oo

    b. Hindi

3. Ikaw ay 18 o mas matanda? (Mamili ng isa)

    a. Oo

    b. Hindi

4. Ikaw ay may lahing Pilipino? (Mamili ng isa)

    a. Oo

    b. Hindi

5. Kategoryang Edad (mangyaring pumili mula sa drop down na kategorya ng edad na pinakamahusay na naglalarawan sa iyo)

    a. 18-24

b. 25-44

c. 45-64

d. 65+

6. Kasarian (Mamili ng isa)

a. Babae

b. Lalaki

c. Nonbinary

d. Mas gusto na hindi isiwalat

7. Zip Code (mangyaring ibigay ang iyong zip code)

8. Panunungkulan sa Paninirahan sa Virginia Beach (Mangyaring pumili mula sa drop down ng haba sa mga taon na nakatira ka sa Virginia Beach)

a. Mas mababa sa isang taon

b. 1-5 taon

c. 6-10 taon

d. 11-20 taon

e. 20+ taon

9. Plano mo bang manirahan pa rin sa Virginia Beach limang (5) taon mula ngayon? (Mamili ng isa)

a. Oo

b. Hindi

c. Hindi alam

Karanasan at Mga Tanong ng Pang-unawa

10. Batay sa mga personal na mapagkukunan tulad ng kita, pag-access sa pamilya o pamayanan, at iba pa ay nagagawa mong umangkop o makaya ang pagbaha? (Mamili ng isa)

    a. Oo

    b. Hindi

    c. Hindi alam

11. Gaano ka kahusay malaman tungkol sa pagdaragdag ng pagbaha at mga sanhi sa Virginia Beach? (Mamili ng isa)

    a. Hindi man alam

    b. Hindi mahusay na kaalaman

    c. Ni walang impormasyon o napapaalam

    d. Alam na alam

    e. Napakahusay na kaalaman

12. Naniniwala ba kayo na ang pagbaha ay tumaas, nabawasan, o nanatiling pareho sa Virginia Beach sa nakaraang 30 taon? (Mamili ng isa)

    a. Nadagdagan

    b. Nanatili ang pareho

    c. Nabawasan

13. Kailangan mo bang baguhin ang mga ruta sa trabaho / paaralan / iba pang mga aktibidad dahil sa pagbaha? (Mamili ng isa)

    a. hindi kailanman

    b. Minsan o dalawang beses sa isang taon

    c. Paminsan-minsan

    d. Madalas

14. Ang paulit-ulit na pagbaha ay isang problema sa iyong kapitbahayan? (Mamili ng isa)

    a. Oo

    b. Hindi

    c. Hindi alam

15. Gaano kadalas mo naranasan ang pagbaha sa nakaraang taon sa Virginia Beach? (Mamili ng isa)

    a. Hindi kailanman

    b. Isang beses sa isang taon

    c. Maramihang beses sa isang taon

    d. Buwanang

    e. Lingguhan

    f. Araw-araw

    g. Maramihang beses bawat araw

16. Naranasan mo ba ang pagkawala o pinsala sa pag-aari dahil sa pagbaha? (Mamili ng isa)

    a. Oo

    b. Hindi

    c. Hindi alam

17. Gaano kadalas mo naranasan ang pagkawala o pinsala sa pag-aari dahil sa pagbaha? (Mamili ng isa)

    a. Minsan sa buong taon

    b. Maramihang beses sa paglipas ng mga taon

    c. Maramihang beses sa isang taon

    d. Madalas

e. Hindi maaari

18. Ang pagtaas ng pagbaha dahil sa pagtaas ng antas ng dagat ay malamang na negatibong makaapekto sa akin nang personal sa hinaharap. (Mamili ng isa)

a. Malakas na hindi sumasang-ayon

b. Hindi sang-ayon

c. Ni hindi sumasang-ayon o sumasang-ayon

d. Sang-ayon

e. Matindi ang pagsang-ayon

f. Hindi alam

APPENDIX C

OLD DOMINION UNIVERSITY ARTS & LETTERS HUMAN SUBJECTS REVIEW

COMMITTEE APPROVAL LETTER

10/5/21, 8:25 PM   Old Dominion University Mail - IRBNet Board Action

OLD DOMINION
UNIVERSITY
IDEA FUSION

ANJELICA PETSCH <apets001@odu.edu>

IRBNet Board Action

Randy Gainey <no-reply@irbnet.org>   Fri, Jul 2, 2021 at 11:02 AM
Reply-To: Randy Gainey <rgainey@odu.edu>
To: Nicole Hutton Shannon <nhuttons@odu.edu>, Anjelica Petsch <apets001@odu.edu>

Please note that Old Dominion University Arts & Letters Human Subjects Review Committee has taken the following action on IRBNet:

Project Title: [1771154-1] Virginia Beach, Virginia's Filipino American Community's Perception of Flood Risk
Principal Investigator: Anjelica Petsch

Submission Type: New Project
Date Submitted: June 22, 2021

Action: EXEMPT
Effective Date: July 2, 2021
Review Type: Exempt Review

Should you have any questions you may contact Randy Gainey at rgainey@odu.edu.

Thank you,
The IRBNet Support Team

www.irbnet.org

https://mail.google.com/mail/u/0?ik=2b8f57279e&view=pt&search=all&permmsgid=msg-f%3A1704185690291763924&simpl=msg-f%3A17041856902…   1/1

APPENDIX D

SURVEY FLYER

Perceptions of Flood Risk among Members of the Filipino American Community in Virginia Beach, Virginia

Please consider lending about 10-minutes of your time to complete a voluntary survey about your perception and experience when it comes to adapting and coping with flooding in Virginia Beach, VA. The questions are almost all multiple choice and ask no identifying information.

We ask that if you do complete a survey you:
- Take the survey only once per person
- Be 18 years old or older
- Be of Filipino Descent
- Reside in Virginia Beach, VA.

https://arcg.is/vPzbe

Scan QR Code with Mobile Device

Hello, my name is Anjelica Petsch, and I am the youngest granddaughter of the late Rodolfo and Carmen Pascual who immigrated from Parañaque, Philippines after Rodolfo joined the U.S. Navy. Currently, I am a graduate student at Old Dominion University studying Human and Cultural Geography in the Institute for the Humanities. I am most interested in mitigating impacts from flood and other coastal hazards by coupling Geographic Information Science (GIS) and aspects from both public administration and humanities; to do so I aspire to work in a municipal government or a planning firm after receiving my Master of Arts this winter.

Survey results will be used within Anjelica Petsch's graduate Thesis paper to identify how the Filipino American Community in Virginia Beach, VA's flood risk perception differs from other cultural communities in Virginia Beach as captured in previous surveys around Hampton Roads. Survey responses will also be password protected and only viewed by Investigator, Anjelica Petsch, and Principal Investigator, Dr. Nicole Hutton.

If you have any questions or concerns, please contact Anjelica Petsch (Investigator) at apets001@odu.edu, Dr. Nicole Hutton (Principal Investigator) at nhuttons@odu.edu, or Dr. Randy Gainey (Chair of the Arts and Letters Human Subjects Review Committee) at rgainey@odu.edu.

APPENDIX E

SURVEY FLYER IN TAGALOG

Ang mga pananaw sa Panganib sa Baha sa mga Miyembro ng Filipino American Community sa Virginia Beach, Virginia

Kumusta, ang pangalan ko ay Anjelica Petsch, at ako ang bunsong apong babae ng yumaong Rodolfo at Carmen Pascual na lumipat mula sa Parañaque, Pilipinas matapos na sumali si Rodolfo sa U.S. Navy. Sa kasalukuyan, ako ay isang nagtapos na mag-aaral sa Old Dominion University na nag-aaral ng Human at Cultural Geography sa Institute for the Humanities. Ako ay pinaka-interesado sa pagpapagaan ng mga epekto mula sa baha at iba pang mga mapanganib na baybayin sa pamamagitan ng pagkabit ng Geographic Information Science (GIS) at mga aspeto mula sa parehong administrasyong pampubliko at humanities; upang gawin ito hinahangad kong magtrabaho sa isang pamahalaang munisipal o isang kumpanya ng pagpaplano pagkatapos matanggap ang aking Master of Arts ngayong taglamig.

Mangyaring isaalang-alang ang pagpapautang tungkol sa 10-minuto ng iyong oras upang makumpleto ang isang kusang-loob na survey tungkol sa iyong pang-unawa at karanasan pagdating sa pag-aangkop at pagkaya sa pagbaha sa Virginia Beach, VA. Ang mga katanungan ay halos lahat ng maramihang mga pagpipilian at magtanong walang pagkilala sa impormasyon.

Hinihiling namin na kung makumpleto mo ang isang survey sa iyo:
- Dalhin lamang ang survey nang isang beses bawat tao
- Maging 18 taong gulang pataas
- Maging ng Likhang Pilipino
- Manirahan sa Virginia Beach, VA.

https://arcg.is/SyOqj

I-scan ang QR Code gamit ang Mobile Device

Gagamitin ang mga resulta sa survey sa loob ng gagamit na papel ng Tesis na nagtapos sa Anjelica Petsch upang makilala kung paano ang Filipino American Community sa Virginia Beach, ang pang-unawa ng panganib sa baha ng VA ay naiiba sa iba pang mga pamayanang pangkulturang nasa Virginia Beach tulad ng nakunan sa mga nakaraang survey sa paligid ng Hampton Roads. Ang mga tugon sa survey ay protektado rin ng password at titingnan lamang ng Imbestigador, Anjelica Petsch, at Punong Imbestigador, Dr. Nicole Hutton.

Kung mayroon kang anumang mga katanungan o alalahanin, mangyaring makipag-ugnay sa Anjelica Petsch (Imbestigador) sa apets001@odu.edu, Dr. Nicole Hutton (Principal Investigator) sa nhuttons@odu.edu, o Dr. Randy Gainey (Tagapangulo ng Arts and Letters Human Mga Komite sa Review ng Mga Paksa) sa rgainey@odu.edu.

APPENDIX F

SOCIAL MEDIA SURVEY FLYER
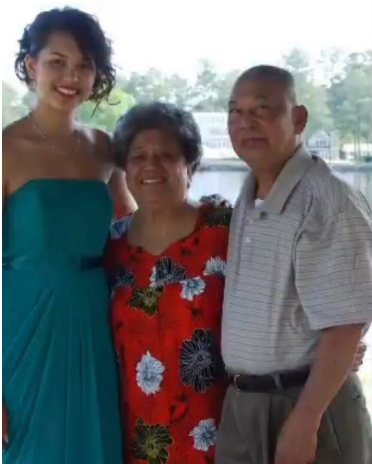
APPENDIX G

EXCEL SHORTHAND COLUMN LABELS FOR SURVEY QUESTIONS

Survey Question	Excel Shorthand
Do you understand the participant information?	prtpt_info
Do you confirm you are over the age of 18 and consent to participate in the survey?	18_ovr
Are you of Filipino Descent?	Filipino
Age Category	Age
Gender	Gender
Zip Code	Zip_Code
Residential Tenure in Virginia Beach	ResTenure
Do you plan to still live in Virginia Beach five (5)	liveinVB_5yrs
Based on personal resources such as income, access to family or community, and others are you able to adapt or cope with flooding?	Adapt_fld
How well informed are you about increasing flooding and causes in Virginia Beach?	Infrmd_Incr_fld
Do you believe flooding has increased, decreased, or remained the same in Virginia Beach over the past 30 years?	Fld_past30yrs
Have you had to change routes to work/school/other activities due to flooding?	chng_routes
Is recurrent flooding a problem in your neighborhood?	Recurrent_Fld
How often have you experienced flooding in the past year in Virginia Beach?	exprc_fld
Have you experienced loss or damage to property due to flooding?	fld_loss
How often have you experienced loss or damage to property due to flooding?	frq_fld_loss
Increased flooding due to sea level rise is likely to negatively impact me personally in the future.	SLR_ngtv_affect

APPENDIX H

FEMA FLOOD ZONE DEFINITIONS

Legend Color	Flood Zone	Description (As defined by	Total Square Miles
	500 Year Floodplain	"Areas with 1% annual chance of flooding"	17.208
	A	"Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies",	1.985
	AE	"Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown."	155.236
	AH	"Areas subject to inundations by1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown."	0.325
	AO	"Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown."	0.623
	Open Water	Areas of open water	30.411
	VE	"Areas subject to inundations by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown."	26.668
	X	"Areas of minimal flood hazard"	258.445

(Source: Definitions of FEMA Flood Zone Designations. (2010, March 19).

Retrieved September 17, 2021)

VITA

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EDUCATION

December 2021
Old Dominion University, Norfolk, VA
M.A. Humanities−Human and Cultural Geography Concentration

December 2017
Old Dominion University, Norfolk, VA
Bachelor of Science, Geography−Environment and Resources Concentration

PROFESSIONAL EXPERIENCE

November 2021-Present
Seasonal Athlete
Nike Factory Store
Norfolk, Virginia

September 2020-November 2020
NASA DEVELOP Team Member
NASA DEVELOP Langley Node
Hampton, Virginia

November 2013-November 2021
Merchandise Leader
American Eagle Outfitters
Norfolk, Virginia