

**INVESTIGATING DISASTER PREPAREDNESS WITHIN A TRANSITORY  
COMMUNITY: A CASE STUDY OF STUDENT ATTITUDES AT THE  
EVERGREEN STATE COLLEGE**

by

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## ABSTRACT

### Investigating Disaster Preparedness within a Transitory Community: A Case Study of Student Attitudes at The Evergreen State College

Fiona J. Edwards

The Evergreen State College (Evergreen) has a responsibility to protect its community from natural disasters. State and federal mandates require Evergreen to have a Comprehensive Emergency Management Plan (CEMP) as an all-encompassing response to any type of emergency. The research question of this document focuses on how well Evergreen students are for disasters. Very little research on college student preparedness exists. Not much is known about students' sense of place with regard to connection to preparedness. This study included a survey with 113 participants and interviews with 30 participants about their backgrounds and their perceptions of sense of place, hazard awareness, disaster and preparedness. Students with a well-developed sense of place are more likely to be aware of local hazards and to be prepared. However, most students are unprepared for disasters. Many students claimed that they were interested in better access to information regarding resiliency. Students do not understand the reality of local hazards and the potential social and physical dangers involved with being unprepared. Incorporating a sense of place into campus disaster management protocols and outreach would better prepare students for potential local natural disasters.

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## **Chapter One: Introduction**

The research in this thesis aims to illustrate disaster awareness and preparedness as experienced by a community of students who are in a transitional period in their lives. Students at The Evergreen State College (Evergreen) are primarily young and, for many, it is their first time living independently in a new place. Home becomes a root of meaning and memory and college signifies a change in sense of place and place identity. Through time and social interaction, feelings of dislocation, homesickness, and nostalgia may be replaced with a tie to their new environment (Chow & Healey, 2008). Through an exploration of sense of place and how individuals' conceptualize their natural and socially constructed environment, this research delves into issues of disaster preparedness.

The question is posed - are Evergreen students prepared for disasters? This topic requires further investigation into how students' perceive nature and the threat of hazards. Are disasters dismissed because there is a belief in the status quo of nature as a non-threatening entity? Where does this denial of the awesome power of Earth's forces stem? With the increase in frequency and intensity of storms, the impact of capitalism on shaping individuals' sense of place is becoming more and more apparent. Not only does capitalism implore the unfettered use of nature's resources, it presses the workforce to mobilize towards areas of industry (Katz, 2001). The need to move signifies the need to create a new sense of place with each new location (Tuan, 1977). However, the rise of chain businesses and stripmall dominated towns suggests that no matter where a person moves they are essentially in the same place - an unplace (Katz, 2001). This voids the need to feel homesick or to create a new communal identity (Chow & Healey, 2008).

Furthermore, this research proposes that it allows people to ignore their environment and to deny the hazards of their new locale.

In disaster capitalism, there is a reshaping of an area post-disaster. Buildings and homes are retrofitted to withstand future disasters. Safeguards are put in place to protect historic areas (Godschalk, 2003). There are also instances when the concept of rebuilding is used to disenfranchise certain marginalized groups (Klein, 2008). The poor will be removed from an area of coastal property in order for a business to construct a hotel on prized beachfront property, as was the case after the 2004 Indian Ocean earthquake and tsunami (Klein, 2008). School systems will be reconstructed to segregate different classes and races, as was the case in New Orleans after Hurricane Katrina (Klein, 2008; Adams, Hattum, & English, 2009). This idea of building from a blank surface denies the history of the people and culture in a location and seeks to erase that memory with a new commodity retrofitted against future disasters (Klein, 2008). This socially unjust reconstruction and the privatisation of federal aid through the Federal Emergency Management Agency (FEMA), must be recognized as a sign of the importance of keeping recovery local and in the hands of the people of the affected community (Klein, 2008; Aldrich, 2012).

### **Research Question**

My research focuses on whether students at Evergreen are aware of and respond to natural hazards that could jeopardize life and health support systems at the campus. Simply stated, my question examines how well prepared Evergreen students are for natural disasters. I formulated this question after learning about the concept of sense of place and how an individual's sense of place may inform their awareness of local

hazards. At the beginning of this study, I predicted that students who spend more time on campus and/or in the area will have a better understanding of hazards and sense of place. I predicted that people with a better sense of place are more likely to be prepared. Finally, I predicted that certain people will be prepared no matter where they live. Varied degrees of preparedness may be rooted in the individual's experience with disasters, background in fields such as environmental studies, geography, geology, history, ecology, interest in disasters, strong sense of self or sense of independence, and having a family or others to look after and protect.

Student knowledge of disasters is based on a mixed-methods approach. I created a survey of 21 questions and an interview of five questions focused on an understanding of student attitudes on hazard awareness and disaster preparedness. Most students at Evergreen are unprepared for disasters and they are unaware of Evergreen's responsibility to provide them with information to keep them safe. I found that students with a better sense of place were more likely to be aware of hazards and to be ready for disasters. It may be the case that students' are uninterested in preparing, as the college updates its students on where they can find information regarding Evergreen's hazards. It also suggests a denial of the reality of disasters and the threat nature poses. It will be useful to incorporate sense of place into disaster management practices in order to encourage stronger student engagement.

I met with Evergreen's emergency management planner, Bruce Sutherland and was given a copy of Evergreen's Comprehensive Emergency Management Plan (CEMP). Sutherland informed me that there is a lack of engagement from the student community. Even though there is a section on Evergreen's website focused on emergencies, as well as

periodic emails regarding campus hazards and plans, students are uninformed. This information prompted a desire to engage with my campus community and to conduct pragmatic research. I will share this research with Evergreen with the hope that they will be better suited to prepare their students.

My research led to a number of contradictions to these predictions. My results suggest that students have an understanding of preparedness, but for the most part have not taken steps to prepare themselves for disasters. The emergency management planner sends out reminders to the campus community about where it can find resources on preparedness, but many students claimed they did not have access to information. This suggests a lack of interest in preparedness and a denial of the existence of disasters. Many of the students I interviewed and surveyed were not aware of Evergreen's emergency plan. This is alarming because it is the college administration's duty to keep its students and community informed of hazard mitigation plans. Many students suggested that they were unaware of local hazards because they were new to the region. Incorporating sense of place into campus disaster preparedness may prove a critical tool for engagement.

### **Philosophical Worldview**

This research is grounded in a pragmatic worldview. Pragmatism is the belief that knowledge is best suited for practical application. It focuses on solutions to problems, rather than theorizing different courses of action. The pragmatist perspective is grounded in the understanding that research occurs in social, political, and historical contexts and, therefore, seeks to incorporate social justice into the research's practical application (Creswell, 2014). Pragmatic research seeks to effect change by presenting well-grounded, interdisciplinary findings.

Because I believe preparedness is a complex issue with no one approach or answer, I designed my research to include a qualitative interview and a descriptive survey. I gathered data with a mixed methods approach in order to improve my chances of understanding student preparedness. I located an issue at Evergreen and decided to investigate with the intention of offering practical information to the college's emergency management planner, in order to create change. I acknowledge that student awareness at Evergreen will change over time, but my findings may be applicable to Evergreen until certain changes are enacted. Furthermore, this research adds to a larger field focused on student engagement and sense of place on American college campuses.

This research is interdisciplinary because it involves an understanding of the physical geography of disasters, the psychology of preparedness, the economic aspects of disaster recovery, and the geographical conception of place. This thesis examines a community's relationship to their environment through the lens of disasters. It seeks to explore how our interactions with our social network affect our ability to respond to hazards.

College students are in a learning environment that encourages them to challenge themselves. They are focused on building their identities and beliefs. Sense of place is part of an individual's identity. If college emergency planners can target this aspect and incorporate it into their outreach methods, they may have a better response from students. Explaining to students the importance of including a sense of place into their regional identity may spark their attention. The reality of disasters may become more pressing when it involves personal and community belief structures.

## **Chapter Two: Literature Review**

### **Introduction**

This literature review covers themes of resiliency, social capital, sense of place, disaster capitalism, and college student preparedness. Much of the literature on disaster planning suggests that sustainable design is conducive with resiliency. Resilient places are only as strong as their communities. When people interact and form bonds with their communities, they create social capital. Social capital has been found to increase a city's ability to recover in a timely manner. Social capital is connected to sense of place in that when communities are tightly-knit it suggests that the community members have a stronger sense of place. Sense of place comes about through physical and social interactions with one's environment. People who have a strong sense of place and place identity are more likely to be aware of local hazards. If they are more aware of hazards, people are more likely to be prepared for disasters. There is not much research on college student preparedness and even less is known about how their sense of place as a transitory community impacts their understanding of disaster preparedness.

### **Resiliency**

Resiliency has been the focus of a substantial portion of natural disaster and hazard research. Much attention has been focused on creating and sustaining cities and communities that can withstand the impact of storms and other natural processes (Hess, Malilay & Parkinson, 2008; Godschalk, 2003). Resilience can be used to describe places and groups of people. There are levels of resiliency and debate about methods of becoming resilient (Godschalk, 2003; Mileti, 1999). Godschalk (2003) likens the physical

structures of a city to a body and the human communities to a brain: both need to be able to cope and learn from extreme stress or they are considered vulnerable and can collapse (p. 137).

Many studies suggest that resilient cities are sustainable cities (Godschalk, 2003; Hess, Malilay & Parkinson, 2008). A place may be considered resilient if it is up to par with building code standards, populated by prepared individuals and governmental groups, or is sustainably developed (Godschalk, 2003; Mileti, 1999). There are different theories on what constitutes sustainable development. It is most basically conceptualized as a place that is designed to weather disasters without incurring enough damage to require outside support (Godschalk, 2003; Mileti, 1999).

Hurricane Sandy called attention to natural landscapes as storm shields. Natural barriers are effective against intensive storms (Hess, Malilay & Parkinson, 2008). For example, wetlands protect shorelines from hurricanes and when they are removed and developed they can no longer offer that buffer zone. Some researchers claim that replacing the wetlands with shoreline armoring is an effective solution, while others argue that armoring causes more erosion and damage, and then some argue for a mixture of armoring and natural buffering (Kittinger & Ayers, 2010; Griggs, 1998; Gedan, Kirwan, Wolanski, Barbier, & Silliman, 2011).

Because many disasters can partly be attributed to human impact on the environment, it would make sense that living sustainably would reduce risk (Godschalk, 2003). A well-planned community (physical and social) with a mostly unaltered environment would account for hazards and refrain from disrupting vulnerable areas (Gedan, Kirwan, Wolanski, Barbier, & Silliman, 2011). However, even the most resilient



areas are not exempt from disaster. The actions of one community can impact those of another, especially in a globalized sphere. The effects of climate change will not be dispersed uniformly. The groups most likely to suffer are the poor and the socially isolated (Hess, Malilay & Parkinson, 2008; Aldrich, 2012). Pollution from industrialized, unsustainable areas can dramatically harm communities that are unprepared and unable to respond (Elliott, 2012). Groups without means to adapt may be forced to migrate, such as coastal dwelling communities. On the other end of the spectrum, urban areas flush with economic and social investments may continue to create short-term solutions to environmental change in order to avoid moving, thereby increasing community vulnerability to hazards (Hess, Malilay & Parkinson, 2008; LaLone, 2013).

Economic losses from natural hazards are immense. It is estimated that US\$2 trillion was lost from 2000 to 2013 (UNISDR, 2013). This number is approximately 50 percent higher than previously projected and only accounts for losses that were insured and reported (UNISDR, 2013). Uninsured losses and losses that occurred during small-scale disaster events are not represented in this figure. That number is huge and will continue to grow with more people moving into urban areas, climate change increasing storms and powerful weather events, and the adoption of short-term rather than sustainable resiliency plans (UNISDR, 2013; Hess, Malilay & Parkinson, 2008). It is necessary to create more resilient cities in order to protect natural resources, human lives, and critical infrastructure.

### **Social Capital**

Social capital consists of the features of the social structures which foster collective action and civic engagement among participating individuals (Lochner et al.,

1999). Voluntary activities, such as community outreach groups, sports groups, hobby groups, and unions, are a manner for creating social capital. Social capital is associated with health rates, mortality rates, interpersonal trust, and crime rates (Lochner et al., 1999). In areas with higher levels of social capital, the violent crime rate is lower than in areas with lower levels of social capital (Lochner et al., 1999). However, social capital is a broad term that encompasses many different aspects of community structures. Further investigation into social capital's relationship with public health would benefit the field (Lochner et al., 1999).

It may be difficult to measure social capital because it seeks to explain community behavior, rather than individual behavior. Researchers must focus on the bigger picture of how communities act and engage (Lochner et al., 1999). Individuals may behave differently depending on their environment. For example, a person who does not exhibit hostile traits may become hostile if she lives in a place where she feels threatened. This connects social capital with the idea of sense of place or sense of community. Furthermore, social capital may be hard to pin down because people experience social organizations in less of a geographical sense and do not depend on their residential neighborhoods for social engagement (Lochner et al., 1999).

Social capital is a complex theory that highlights the dynamics of individuals, groups, and structures (Bourdieu, 1984). It attempts to explain the meaning and power encompassed within and created by social interaction. Communities are comprised of structures: social, political, economic, etc (Bourdieu, 1984). These structures are created and given meaning by human beings and, therefore, are constantly changing through time and space. There are aspects of a social space that are ingrained in the form of cultural

practices and behaviors, or dispositions (Bourdieu, 1984). These dispositions are created or adopted by the dominant groups or classes and are therefore believed to be universal or natural. Power is given to the dispositions of the dominant. These dispositions enter the human conscience and inform desires and beliefs (Bourdieu, 1984). A person may believe they can change their position and status, but because this desire was ingrained by the structure, it reinforces the power dynamic that keeps the individual desiring to remain in some way part of the structure or community (Bourdieu, 1984).

Building social capital requires individuals to interact within their communities (Aldrich, 2012). This may allow them to learn the cultural and environmental geography of their residence. Understanding one's location may help improve awareness of hazards (Tuan, 2013). This is not to say that this awareness results in preparedness. However, individuals may know how to react to disasters more efficiently if they know where to go and how to engage with the people they encounter (Dynes, 2002).

Social capital can improve one's standing when a disaster strikes (Aldrich, 2012). Certain groups may be able to bond together to help injured neighbors, rebuild, and assess and voice community needs (Dynes, 2002). Individuals without social capital may be left behind during disasters (Aldrich, 2012). Furthermore, groups with social capital can work to isolate and exclude individuals or groups with lower social standing from receiving help (Aldrich, 2012).

While governments and public institutions use top-down approaches to disaster recovery, it may be useful for communities to use a bottom-up approach (Aldrich, 2012). If individuals in the community know one another, they will know how to help each other better than a government response team (Aldrich, 2012). After Hurricane Katrina, it was

mostly neighbors who helped each other, not than the government (Aldrich, 2012). Also, people who are involved in the rebuilding process are more likely to stay and help if they are able to participate in and agree with the decisions that are being made about recovery (Aldrich, 2012). This allows a community's interests to remain core to the rebuilt environment, rather than interests imposed by outside parties. Many factors contribute to whether community members stay in their neighborhoods after a disaster, but a key component is sense of place.

### **Sense of Place**

Sense of place is an intricate concept that focuses on how individuals perceive and relate to their social and physical environment (Tuan, 1977). There are many different terms for sense of place, including place-making (Fincher & Shaw, 2007), sense of community (Sarason, 1974), place attachment (Hidalgo & Hernández, 2001), place identity (Proshansky, 1978), and place dependence (Stokols & Shumaker, 1981). The inconsistency in the terminology used to describe sense of place has disrupted the cohesion of the field and makes researching the subject difficult (Hidalgo & Hernández, 2001). Following the lead of one of the foremost researchers in this field, Yi-Fu Tuan, this research uses the term sense of place.

An individual's relationship to her space is known as sense of place (Tuan, 1977). Human beings form bonds with their environments. We see this when cities and towns are referred to as communities and neighborhoods, hometown pride, or in the modern debate regarding the superiority of the east coast versus the west coast (Cuba & Hummon, 1993). Much research on sense of place focuses on place at the neighborhood level (Cuba & Hummon, 1993). However, it is possible for people to form a sense of

place with a house, a street, a city, a state, or a nation (Hidalgo & Hernández, 2001). One study proposed that individuals feel most attached to their homes and cities, followed by attachment to their neighborhoods (Hidalgo & Hernández, 2001). Furthermore, they feel both socially and physically attached to these places, but overall there is a stronger tendency towards social attachment to places (Hidalgo & Hernández, 2001). Sense of place can be disrupted by a change in landscape, as often occurs with disasters (Brown & Perkins, 1992).

Connecting with a location can increase the desire to protect that area from harmful alteration (Chamlee-Wright & Storr, 2009). Furthermore, sustainable practices may be adopted in order to ensure the continued existence of the space (Godschalk, 2003). Sustainable practices are linked to resilience (Godschalk, 2003; Mileti, 1999). Sense of place allows the possibility of an informed understanding of a location's geography. This understanding may come in the form of memorizing the layout of a city, or knowing that soil is fertile because it exists within a floodplain. Being familiar with a location suggests an awareness of its risks (Norris, 2008; Cutter, 2008). A resident of New Orleans cannot avoid the presence of hurricane season, just as someone who works on a volcanic mountain must understand the associated hazards. People who experience more hurricanes may become immune to their perceived susceptibility to harm (Elder et al., 2007). "Hurricane riders," as they are called, may feel that they are experienced enough to survive a hurricane without retreating to shelters or accepting government aid (Elder et al., 2007). On the other hand, people who do not experience hurricanes regularly may be just as vulnerable. Dealing with hurricanes on an annual basis may teach an individual what supplies to keep in stock, when to retreat, how to board-up one's home,

etc. However, it may also desensitize an individual to the devastation that different levels of hurricanes can cause (Elder et al., 2007). The individual may get into a routine that they believe contributes to their survival. If they are warned to take further action, they may not be inclined to change their strategy, which may have harmful consequences. For example, hurricane riders may not feel the need to leave their homes if they have always remained during hurricanes, even when evacuations are mandatory. This perceived immunity from disaster makes these individuals vulnerable in a way that could be avoided (Elder et al., 2007).

Living through disasters may equip individuals with the experience to prepare and cope for such events. It is possible, of course, to learn how to safely react to a disaster without ever experiencing one, but individuals will not know their situational reaction until the event occurs (Ripley, 2009). Disaster's may affect one location in a different manner than another. Earthquakes, for example, have many factors that influence its energy dispersal including type of tectonic movement, design and size of buildings, the vicinity of the epicenter to a coastline, etc. (Abbott, 2013). An individual may experience an earthquake in Los Angeles and believe they are prepared to respond to an earthquake in Seattle. This may not be the case if they are oblivious to evacuation strategies and the cultural response in the novel area.

There is debate among urban planners about whether a place should be built with certain inhabitants in mind or if design should be universally beneficial (Fincher & Shaw, 2007). There have been efforts by the United Nations to create child-friendly and senior-friendly cities, but others argue that cities should be friendly to people of all ages (UNICEF, 2009; Fincher & Shaw, 2007). When creating a sense of place, or place-

making, individuals take into account their physical setting and, therefore, should be taken into account by urban planners when they create or rebuild spaces (Fincher & Shaw, 2007). This may prove difficult because towns and cities have many different groups and it may require effort on the planners' part to respect past community members, as well as to seek out marginalized groups (Fincher & Shaw, 2007). This may be especially relevant for student populations, as they are often in transitional periods and may not be included as an important voice or members of a community that they may only live in for a short period of time. However, their presence is valuable and they are a viable part of their community, as they offer many qualities through participation in research, host and partake in community events, provide a source of revenue, and represent a potential workforce (FEMA, 2003).

Sense of place is complex not only because it is rooted in psychology, but also because it is susceptible to change (Chow & Healey, 2008). It must be examined from the perspective that people's understanding and attachment to place is altered at irregular intervals and cannot be completely understood (Brown & Perkins, 1998; Chow & Healey, 2008). This can be seen when college students transition from their homes to their new college location (Chow & Healey, 2008; McAndrew, 1998). Students enter into a new cultural and social environment when they enter into a college. Home is experienced as a root of meaning and memory for individuals. College signifies a shift of place and identity (Chow & Healey, 2008; McAndrew, 1998). The sense of place associated with home is not lost as students transition into college, but their perception of home and their understanding of place is transformed. Furthermore, sense of place is altered by social attachments. Physical spaces are shaped by the social experiences of individuals (Chow

& Healey, 2008). Without social engagement, places do not garner much meaning for students (Chow & Healey, 2008).

The transition from home to college can inspire in some students a sense of dislocation (Dixon & Durrheim, 2004). This is expressed in feelings of nostalgia, homesickness, and displacement. Students may experience a feeling of disorientation because when their place changes, so does their identity (Chow & Healey, 2008). It is only through social interaction and engagement that students begin to adopt a new sense of place (Chow & Healey, 2008). This furthers the complexity of sense of place as it incorporates the temporal.

### **Disaster Capitalism**

The practice of taking economic advantage of places affected by disasters has recently been deemed disaster capitalism by author Naomi Klein (Klein, 2008). Klein connects the rise of Milton Friedman's free market economic policies to the exploitation of certain nations by the United States government. By creating upheaval and crises in places like Chile, governments are able to pass measures while most citizens are still trying to recover, which creates a rift between the powerful rich and the poor (Klein, 2008). An example is the privatization of the public school system in New Orleans after Hurricane Katrina, which occurred while most of the economically marginalized community members were still displaced from their homes (Klein, 2008; Adams, Hattum, & English, 2009).

Businesses take advantage of the "clean slate" provided by a disaster (Klein, 2008). The federal government is often unable to provide the necessary resources to individuals after a disaster and, therefore, contract out to the private, for-profit sector.



This comes with a price tag, as the wealthy are able to purchase the best help possible while the poor are left to struggle while waiting for assistance, if it comes at all (Klein, 2008). Furthermore, during reconstruction the poor may be unable to afford rebuilding and may be forced to relocate. Businesses can then take their property and invest in cheap land (Adams, Hattum, & English, 2009).

Before Hurricane Katrina, the government failed to heed warnings of impending levy failure (Adams, Hattum, & English, 2009). In fact, President George W. Bush worked to downgrade FEMA and contract many of its crucial functions to private companies (Klein, 2008). During Hurricane Katrina, President Bush would not allow emergency funds to pay for public employee salaries, but he did contract out to big corporations to clean up the city (Klein, 2008; Adams, Hattum, & English, 2009). A critical act of these corporations and the Louisiana governor was to displace the poor by not investing in the rebuilding of public housing (Adams, Hattum, & English, 2009). The displacement of New Orleans citizens still affects the city today, as it completely altered the physical, social, financial, structural, and cultural aspects of the city (Klein, 2008; Adams, Hattum, & English, 2009; Layton, 2014). The long-term effects of disaster capitalism can prove devastating to those communities and individuals it disrupts (Klein, 2008; Adams, Hattum, & English, 2009).

### **College Campus Preparedness**

There is limited literature on college campus preparedness. The little that is available focuses on non-essential variables of disaster preparedness, including how different genders react to disasters, fear, and risk (Lovekamp & McMahon, 2011).

Another focal point is that college students are a transient population that occupy a high-

density area, which puts them at risk of being unaware of local hazards, a fatalistic mentality that they will not be harmed, and the belief that their college does not have the means to protect them (Lovekamp & McMahon, 2011).

## **Chapter Three: Context**

### **Introduction**

This section gives background on Evergreen and Evergreen's plan. All of the hazards in the region are explored from a geological and geographical lens. The risks that these hazards pose to Evergreen are highlighted and historical disasters are highlighted. The laws that have led to better disaster mitigation practices in public institutions are discussed. Evergreen is required to have a Comprehensive Emergency Management Plan (CEMP) under state and federal mandates. The CEMP is unpacked and focuses on the college's role in protecting its community. There is very little ability for students to engage in disaster response because they do not have access to the CEMP. However, it is the students' responsibilities to follow safety and security protocols and to prepare themselves when possible.

### **The Evergreen State College**

The Evergreen State College (Evergreen) is located in Olympia, WA. Olympia is located in Thurston County. In 1966, Governor Daniel J. Evans tasked the Temporary Advisory Council on Public Higher Education with determining whether there was the need for more colleges and universities in Washington (TESC, 2008). They determined there was a need and under House Bill No. 596, Chapter 47, Laws of 1967, State of Washington, it was decided that a four-year college would be built in Thurston County. Several sites were investigated as potential college campuses. The site on Cooper Point Peninsula was designated as fitting for Evergreen because of its waterfront property, proximity to downtown Olympia, large forest cover, low impact to the surrounding

community, and its affordable price. Furthermore, it was noted that the property had “no known extreme nuisance factors or hazards” (TESC, 2008, p. 19). After this statement, the Campus Master Plan continues to discuss the natural beauty of the Puget Sound and the surrounding mountain ranges, including Mount Rainier, from the campus, which are both hazards to the campus community.

Evergreen is comprised of 1,000 forested and waterfront acres in Thurston County on the southern end of the Puget Sound (see Figure 1 for a map of the campus). A small satellite campus is located in Tacoma, WA. Evergreen was conceived in 1967 as a non-traditional college, in which collaborative, interdisciplinary learning styles are promoted. One of the guiding principles of Evergreen is environmental stewardship and a commitment to sustainability (TESC, 2013). Evergreen’s buildings follow LEED standards and are constructed to reduce environmental hazards, promote energy and water conservation, supports low-impact maintenance, and uses native landscapes. Evergreen has sustainability as a core tenet of the college (TESC, 2013). Evergreen is a public liberal arts and sciences college, which means it is a state level public agency and is required to provide emergency services according to a number of state and federal laws and authorities.

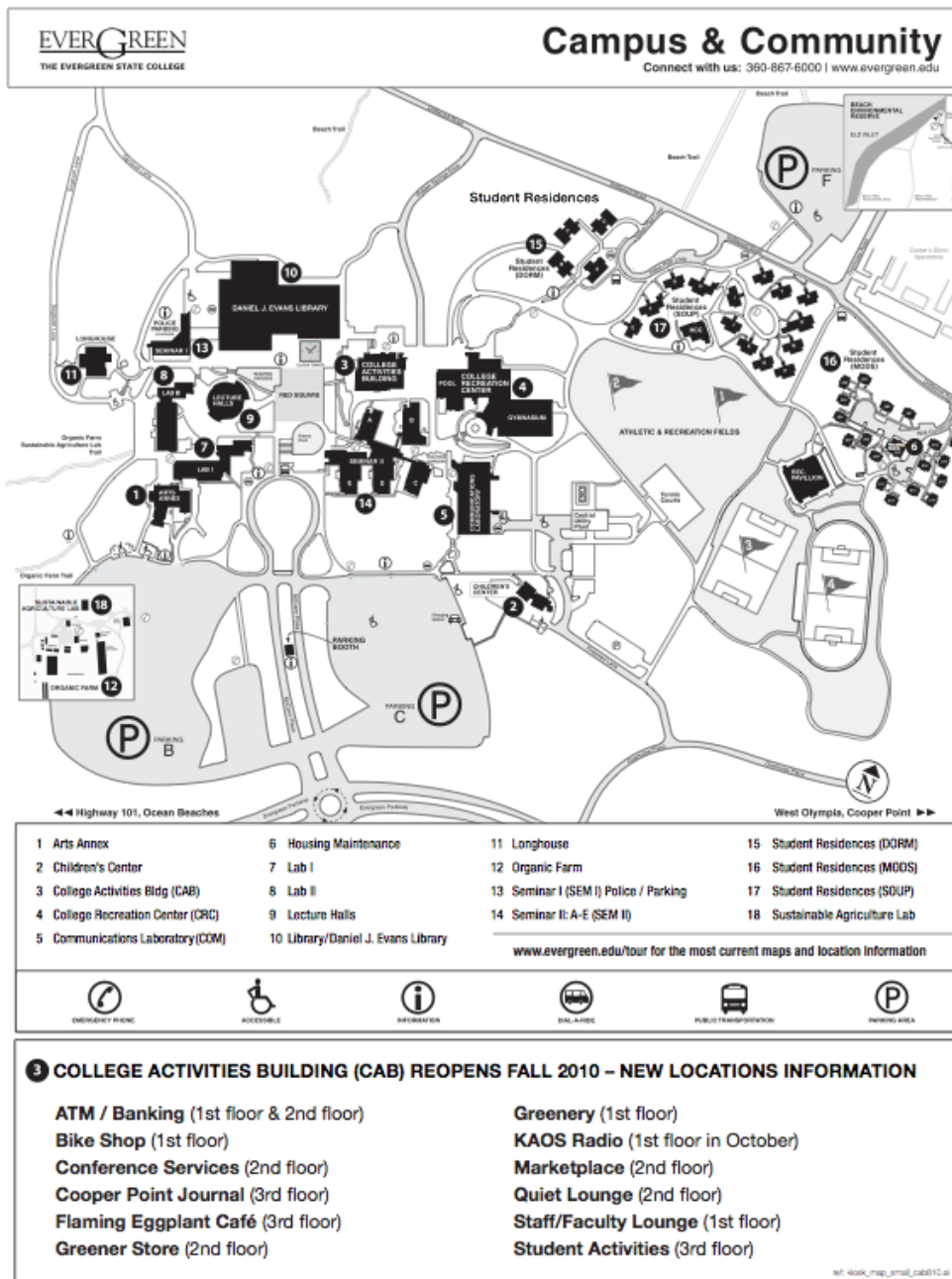


Figure 1. Evergreen Campus Map

There are approximately 4,100 students and 800 instructional and non-instructional staff (TESC, 2013). 76.9 percent of all Evergreen students are Washington residents; however, this does not mean these students are native Washingtonians, as individuals may move to the area and apply for residency to cut down on tuition costs. There is a satellite campus in Tacoma, WA. However, only 4 percent of Evergreen students attend the Tacoma campus. There are students who have a reported disability (6.6 percent) and students with a documented disability (5.1 percent). 45 percent of students report living below the poverty level, while 52 percent reported a low income, which is 150 percent less than the federal poverty level. With regards to age distribution, Evergreen polls for non-traditional age, which is 22 and older for undergraduates and 30 and over for graduate students. At Evergreen, 39 percent of undergraduates are a non-traditional age, while 57 percent of graduate students are considered a non-traditional age (TESC, 2013).

There are a variety of ethnicities represented at Evergreen. While the majority of students identify as white, nonhispanic (66 percent), there are students who identify as Hispanic, of any race (7 percent); Black/African American, nonhispanic (5 percent); Asian (5.5 percent); American Indian, Alaskan Native, nonhispanic (2.5 percent); Pacific Islander, nonhispanic (0.3 percent); and multiple races, nonhispanic (7 percent). Less than one percent of students are international (TESC, 2013). All students regardless of race are considered a priority when a disaster strikes. However, Evergreen may benefit from conducting informational research to determine the needs of specific groups and how they will best respond to preparedness efforts.

In the Campus Master Plan, it is stated that the layout of Evergreen is not very

conducive to a sense of place (TESC, 2008). The concrete and glass facade of most buildings on campus limits visibility to the activities that occur inside. It creates an atmosphere that there are not many students present on campus. The campus planners have a goal of upgrading the college's layout to improve sense of place and connecting the different buildings on campus (TESC, 2008). These changes will reflect the core tenets of Evergreen and create an open atmosphere.

Almost 80 percent of students live off-campus even though there are dormitory buildings for student housing (TESC, 2008). These students commute to campus for classes and events. Evergreen is only five miles from central Olympia, however, it is isolated from the town in that it is surrounded by forests. Also, public transportation to Evergreen is not the most efficient because of its secluded location. If student housing and public transportation was improved to the point where students preferred to live on campus, then it would make creating a sense of place on campus a much smoother and natural process. Students would potentially feel more connected to their peers and to their campus community.

### **Hazards in the Pacific Northwest - Puget Sound Region, North America**

The Puget Sound region of the Pacific Northwest is populated by diverse ecosystems and major metropolitan areas. Many times in Earth's history, the geologic processes of this area have become threatening to its inhabitants. The hazards are abundant (Saunders et al., 2000; Abbott, 2013; Malcone, 2010; Satake, Wang & Atwater, 2003). Communities are situated atop fault lines, along retreating coastlines, within lahar and tsunami zones, and nearby volcanoes. When these hazards affect the population, they become disasters. Without damage to humans or their constructions, these occurrences

are simply considered natural processes. Hazards and disasters are referred to as natural to distinguish them from human-induced destruction, such as terrorist attacks or biochemical contamination of a water supply.

This paper research focuses on hazards and disasters attributed to Earth's biogeochemical cycles and, therefore, will avoid the term "natural." It should also be noted that humans migrate and reside in hazardous zones and alter their environments to be more susceptible to disasters in the form of physical modifications (i.e. removing wetlands from coastlines) and climate change. Communities can strategically respond to the existence of hazards through the creation and dissemination of disaster mitigation plans, as well as frequent training procedures to mentally prepare for these events (Ripley, 2009).

### **Earthquakes**

Earthquakes occur when two bodies of rock move along a fault, which are fractures in Earth's surface (Abbott, 2013). Pressure builds up in the rocks along the faults, but friction holds the two sides together. When enough stress combines, the rocks give way creating movement, or a release of energy, that culminates as an earthquake (Abbott, 2013). The Cascadia subduction zone is a 1,100 kilometer long fault line that runs along the coast from Vancouver Island to northern California (Abbott, 2013). It separates the Juan de Fuca Plate from the North America Plate. The Juan de Fuca Plate is subducting under North America at the Cascadia subduction zone.

There are four types of earthquakes in the Cascadia region: Cascadia Megathrust, Deep Intraplate, Crustal Faulting, and Volcanic earthquakes (Pacific Northwest Seismic Network [PNSN], 2012). While volcanic earthquakes are the least likely, the proximity of



the Cascade Volcanic Arc to major metropolitan areas should be considered as a potential hazard. A Cascadia Megathrust occurs when one of the three tectonic plates (the Pacific Plate, the Juan de Fuca Plate, and the North America Plate) subducts or shifts due to built up energy. This results in a megathrust earthquake, which is capable of producing the most violent shaking and damage, and may create a magnitude 8.5 or higher earthquake (PNSN, 2012; Abbott, 2013). Crustal faulting occurs along faults of the North America Plate, but do not pose a significant threat to Washington as much as it does to Oregon and Northern California. These earthquakes happen closer to the surface of Earth and can alter the exposed ground (PNSN, 2012). The most common earthquakes in Washington are caused by deep intraplate movements. Intraplate movements are shifts in faults within a plate. In Washington, the ruptures happen in the subducting Juan de Fuca Plate.

Historically, deep earthquakes happen approximately every 30 years. Most of the deep intraplate earthquakes occur 30 to 70 kilometers beneath the Puget Sound (PNSN, 2012).

The last major earthquake to occur in this region was in 1700 and was estimated to be a magnitude 9 on the Richter Magnitude Scale. There were no Anglo-Americans in the region at the time to record the event. However, there is evidence in drowned forest tree rings on a marsh that was swamped by a tsunami after the earthquake, detailed historical accounts of “orphan tsunamis” in Japan, and Native American narrative history (Satake, Wang & Atwater, 2003; Jacoby, Bunker & Benson, 1993; Ludwin et al., 2005). The devastation of a magnitude 9 or larger earthquake in this region is not fully understood because there is no precedent for how buildings in metropolitan areas would react to such intense movement (Atkinson & Macias, 2009).

Building codes have been put into place to protect against seismic activity;

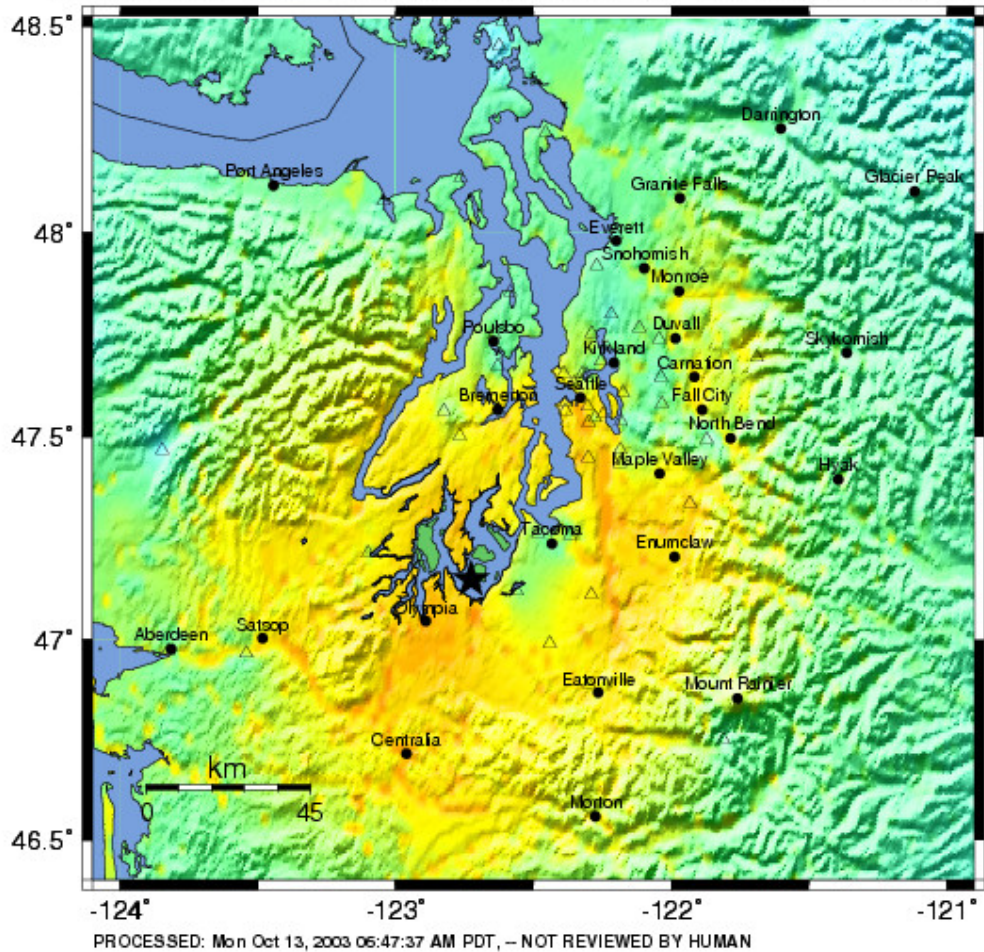
however, these regulations have not been tested against mega earthquakes (Atkinson & Macias, 2009). Furthermore, Seattle's distance from the subduction zone will allow time for the different types of seismic waves to separate, which will not only prolong the shaking, but will cause the ground to shake vertically as well as horizontally (Gregor, Silva, Wong, & Youngs, 2002). The earthquake will most likely be accompanied by aftershocks. This is dangerous because people may leave their shelter after the first initial shaking ends and expose themselves to falling objects and other hazards (Bruneau, 2003). Additionally, tsunamis are likely to be triggered and landslides may occur up to hundreds of kilometers away (Abbott, 2013).

There have been many earthquakes in the PNW that caused extensive damage to human-created infrastructures and the surrounding environment (USGS, 2014). Three earthquakes in particular, in the region surrounding Olympia, have led geologists and emergency managers to believe there is a high probability of occurrence and a high risk for earthquakes to disturb Evergreen and Olympia. The 1949 earthquake was a 7.0 and it happened near Olympia. It caused \$25 million worth of property damage. Many people were injured, eight people died, large buildings were devastated, and gas and water lines were disrupted (USGS, 2014). Landslides occurred in Tacoma and railroad transportation was interrupted for several days. In 1965, a magnitude 6.5 earthquake struck near the same spot as the 1949 earthquake. This earthquake caused \$12.5 million in damage and seven people died. The earthquake was reportedly felt over 340,000 square kilometers throughout Washington, Oregon, British Columbia, Idaho, and Montana (USGS, 2014).

The 2001 Nisqually River Delta Earthquake damaged Evergreen's building structures and natural environment. The earthquake was a magnitude 6.8 on the moment

magnitude scale (TESC, 2009). The epicenter was 17 kilometers northeast of Olympia, on Anderson Island (see Figure 2). It was one of the largest recorded earthquakes in Washington's history. The Nisqually earthquake was caused by intraplate movement in the Juan de Fuca Plate. There were 400 injuries and one death associated with the earthquake. Landslides were reported all the way from Seattle to Olympia, as well as the cliffs above the Puget Sound (Highland, 2003). Considerable damage was reported in Seattle, Tacoma, and Olympia, including Sea-Tac Airport, Olympia's capitol building, and Joint-Base Lewis McChord's Air Force Base. Olympia's Fourth Avenue Bridge was destroyed and was later torn down and replaced (City of Olympia, 2012). The earthquake caused \$2 billion worth of damage in Washington and was considered a federal disaster by George W. Bush. No federal aid was given to businesses for their losses (Meszaros & Fiegner, 2002). During the Nisqually earthquake at Evergreen a water line broke, library windows broke, shelves toppled over in the library, and there were hairline cracks in the library and the Laboratory buildings. The campus was closed for two days of classes and a weekend (TESC, 2009).

PNSN Rapid Instrumental Intensity Map Epicenter: 17.0 km NE of Olympia, WA  
 Wed Feb 28, 2001 10:54:00 AM PST M 6.8 N47.15 W122.73 Depth: 51.9km ID:0102281854



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC (%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

**Figure 2.** USGS Map of 2001 Nisqually River Delta Earthquake

These earthquakes were deep quakes, which were caused by movement on subduction zones of the Cascadia Subduction Zone. Some scientists believe the Cascadia plate is subducting under North America in an aseismic fashion and will not cause

massive earthquakes. This hypothesis stems from the fact that there have been no extreme earthquakes in the past 140 years (Ando & Balazs, 1979). However, there have been earthquakes caused by the movement of the Juan de Fuca Plate. Also, the University of Washington (UW) received a four million dollar grant from the National Science Foundation to create an interdisciplinary team on a project called M9 (as in, magnitude 9). M9 seeks to improve earthquake resilience on all levels - social, built, and natural environments - in anticipation of a mega-earthquake in the area in the near future (UW, 2014).

Evergreen must be prepared for earthquakes and mega-quakes. Thurston County Risk Assessment reports that only 10 of Evergreen's 1,000 acres is at risk of earthquake damage (TESC, 2009). There are no buildings located in this area. However, earthquakes pose the greatest threat to Evergreen. There are approximately 1,000 students living on campus. Some of these students reside in high-rise dorm buildings, which have been seismically retrofitted, yet they may be damaged by earthquakes (TESC, 2009). An earthquake may disrupt normal campus activities. The college may have to shut down if damage takes out critical infrastructure, such as power, transportation, and communication. This would mean the students would need to be moved to another living area. Research would be halted and time-sensitive research would be ruined. It is very likely that there will be another large-magnitude earthquake in the area in the near future. Evergreen students must be prepared to respond to campus closures.

### **Mount Rainier, Cascade Range**

Mount Rainier is a stratovolcano located approximately 115 kilometers southeast of Evergreen in the Cascade Range. It is the tallest mountain in the contiguous United

States at 4,392 meters and is considered one of the most dangerous volcanoes in the world (Scott, Vallance, & Pringle, 1995; USGS, 2013). Mt. Rainier is topped with extensive glacial ice and permanent snowfields. It has the largest glacier system on any mountain in the lower 49 states (Abbott, 2014). Approximately 5,600 years ago, Mt. Rainier erupted and formed a crater on the northeast edifice (Scott et al., 1995; USGS, 2013). The most recent magmatic eruption was around 1,000 years ago (Abbott, 2014). Subsequent eruptions and collapses have rebuilt and transformed the top of the mountain, leaving it structurally weak. Furthermore, Mt. Rainier has active hot-water spring systems, which contributes to its physical instability (Abbott, 2014). The unsound structure, frequent earthquakes, massive glacial icecap, large size, and close proximity to major metropolitan areas make it one of the world's most threatening volcanoes.

The eruption that occurred 5,600 years ago was accompanied by the Osceola mudflow (Scott et al., 1995; USGS, 2013; Abbott, 2014). It began with a summit eruption as an avalanche and became a clay-rich lahar after 2 kilometers of travel carrying 3.8 cubic kilometers of material at a rate of 75 kilometers per hour (Abbott, 2014). It went down the White River valley and then as far as the Puget Sound covering an area of 260 square kilometers to depths of over 20 meters (USGS, 2013; Walder, 1995). This area is now populated by over 150,000 people.

The most recent lahar flow was the Electron mudflow, which occurred 500 years ago (Abbott, 2014). It went down the Puyallup River into the Puget Sound lowlands (Scott et al., 1995; USGS, 2013). In the valleys close to Mt. Rainier, there is a warning system in place. Acoustic flow monitors (AFMs) are seismometers that detect vibrations on a scale different than volcanoes and earthquakes (Abbott, 2014). These AFMs may be

able to warn inhabitants of incoming avalanches or lahars.

If Mt. Rainier exploded, there is the possibility of lahar flows from the glaciers that could extend into the densely populated Tacoma-Seattle areas (USGS, 2013). A lahar or flooding could result without an eruption, but simply from magma moving up inside the mountain making it hot enough to melt the ice (Abbott, 2014). The lahar would not reach Evergreen, but it may cut off access to the college from the north, as the lahar zone reaches into the Nisqually River basin. Students in the Tacoma and Seattle areas would be unable to reach Evergreen, or if these students were on campus, they may not be able to make it back to their homes or families.

Another threat that Mt. Rainier poses is pyroclastic eruptions. Pyroclastic material is rock made from magma. When it is in a viscous form, gas may build up and result in a pyroclastic eruption (Abbott, 2014). This explosion sends pyroclasts into the air in the size range of ash to huge blocks. This is known as a pyroclastic fall. Also, there may be a pyroclastic flow, which is an extremely hot cloud of ash, gas, and air that moves at a high speed (Scott et al., 1995; Abbott, 2014). Because of the glacial ice on Mt. Rainier, it is more likely that a pyroclastic flow would turn into a lahar as the ice and snow melted (USGS, 2013; Walder, 1995). Evergreen is outside of the range of a pyroclastic eruption; however, there is the possibility of the wind shifting and carrying the cloud toward the college, and debris entering into waterways that the college and surrounding towns use. Furthermore, the ash could cause respiratory problems to those who are exposed to it. An ash layer of more than a few centimeters could overwhelm the load capacity of roofs and cause the collapse of these buildings (TESC, 2009). According to the USGS, there is an annual chance of 0.02 percent of significant ash deposits to reach Evergreen (TESC,

2009). Mt. Rainier has not presented any signs of eruption recently and, therefore, its threat level low. It is, however, a major danger to Evergreen should it become active again.

### **Tsunami**

Tsunami occur when ocean water is displaced. Large waves are pulled by gravity away from the disturbed area. This may occur because of shifting tectonic plates, seafloor volcanoes, comet impacts, or caldera collapse (Abbott, 2013). Tsunami differ from regular waves in that waves hit the shore and retreat, whereas tsunami are columns of water that move at great velocities and flood inland (Mittal, 2006). The force with which tsunami flood inland has the capacity to drag debris to great distances (Kanamori, 1977). A tsunami of one meter can knock down humans, pull them against debris and drown them (Abbott, 2013).

Pacific Northwest coastlines are at risk of tsunami strikes. There are evacuation routes and warning systems for many of these coastal communities (Malcone, 2010; Wood, 2010). An earthquake in the Pacific Northwest would spur a tsunami that would reach the coast in less than an hour and inundate the Puget Sound (Malcone, 2010). Development of coastlines has removed natural barriers to tsunami impacts and placed communities in hazard zones (Abbott, 2013; Hess, 2008).

Evergreen does not consider tsunami a hazard at this point in time (TESC, 2009). If there was a tsunami in the Puget Sound, it may not be very powerful once it reached Eld Inlet, which is located at the southernmost tip of the Puget Sound. There are no buildings or structures on the Evergreen coastline that would be significantly damaged. However, the Evergreen beach is a popular place for students to frequent and they may be



impacted if a tsunami were to occur.

## **Floods**

Floods occur in Washington for a variety of reasons. Floods may be caused by persistent, rapid rainfall, by warm rainfall that melts a snowpack, or a hot period that quickly melts snow. In Thurston County, where Evergreen is located, there are 5 rivers - the Deschutes River, Black River, Skookumchuck River, Nisqually River, and Chehalis River. The Deschutes River is the fastest rising river in Thurston County (Thurston County Planning Department [TCPD], 2013). Flooding is the most prevalent hazard in Thurston County. From 1962 to 2009, there were 18 Federal Disaster Declarations related to flooding in the region (TESC, 2009).

FEMA maps flood risks through its Flood Hazard Mapping Program, which partners with states and communities to provide them with mitigation materials (FEMA, 2014). Flood Hazard Mapping is the basis for the National Flood Insurance Program (NFIP), which highlights one percent annual chance floods (100-year floods) and 0.2 percent annual chance floods (500-year floods). These floodplains are shown on Flood Insurance Rate Maps (FIRM). FIRMs are used by communities to identify flood hazard areas and to determine insurance rates (FEMA, 2014; TCPD, 2013). Thurston County has participated in the NFIP since 1982. Under NFIP, development in floodplains must be regulated to avoid distressing existing flood risks or impact surrounding properties, must be elevated enough to avoid damage by 100-year floods, and must attempt to avoid disrupting threatened salmonid species (FEMA, 2014; TRPD, 2013).

Evergreen has a moderate probability of flooding, which means there is little chance a flood will occur within the next 25 years (TESC, 2009). This rating is subjective

and is a combination of the potential for a hazard to occur and vulnerability.

Vulnerability is based on the hazard's impact to the community, infrastructure, property, and services. Evergreen sits in a floodplain with a one percent annual chance of flooding. Evergreen is only susceptible to groundwater flooding on less than one percent of the campus' property. There have been no significant historical occurrences of flooding at Evergreen. The southeast corner of the campus has a small likelihood of flooding, but because there are no structures in that area, it is not considered a threat (TESC, 2009).

### **Landslides**

Landslides are the movement of the ground down a slope. Gravity is the driving force, although there are other factors that influence slope stability. A landslide includes rock falls, slope failures, and debris flows. Landslides are geological phenomena, but they are also accentuated by human activity, such as construction and mining. The landslide in Oso, Washington in 2014 is an example of human activity and error combining with geological processes to produce a massive localized impact. Oso has a history of landslides and was warned by geologists that it was in an area that had a high probability of occurrence. A 1999 report by the U.S. Army Corps of Engineers states that the area was at risk for a catastrophic disaster (Miller and Miller, 1999). Using out-of-date maps, the hillsides surrounding the town were deforested. This coupled with heavy rains led to a landslide of mud and debris that killed 41 people. The Oso landslide is the deadliest in the United States, excluding landslides caused by volcanic eruptions, earthquakes, or collapsed dams. Government commissioned reports and warnings were not enough to dissuade individuals from remaining in the landslide hazard area. Even after a 2006 landslide in the area caused much damage, homes were built and people

moved to the area. Individuals were offered a buyout to leave the area, but the offer was not taken (Armstrong, Carter, & Baker, 2014). It appears that sense of place and a denial of nature as a destructive force led many people of Oso to choose their home over safety. Furthermore, this is an example of when mitigation design and planning among different agencies fails to protect the environment, people, and property.

Evergreen has a moderate probability of occurrence for landslide, but a low risk and low vulnerability. Only one percent of the campus has areas subject to landslides. This area is a cliff on Eld Inlet. There are no structures in the landslide zone. However, there are hiking trails and beach access surrounding the cliffs and may pose potential harm to students and other individuals in this area (TESC, 2009). There have been no historical records of landslides severely impacting Evergreen.

## **Fire**

Fire is the combination of oxygen, carbon, hydrogen, and organic material that produces heat, flame, and light (Abbott, 2014). Wildfire is uncontrollable fire that is dependent upon four factors: fuel, weather, topography, and fire behavior. In 2000, 15 percent of wildland fires were caused by natural causes, such as lightning, whereas 85 percent of wildland fires were human caused, including arson, campfires, and smoking (Abbott, 2014). Most deaths in the U.S. fires occur in residences, especially one- and two-family homes (Abbott, 2014; National Fire Data Center [NFDC], 2009). The U.S. has one of the worst fire problems in the industrial world (NFDC, 2009).

Evergreen is located in a zone that is 100 percent susceptible to fires. The risk of wildland fire damage to the campus is low (TESC, 2009). Most of the buildings on campus have concrete facades and have a sizable defense space that would be difficult for

a wildland fire to jump. The McLain Fire Department is a short-distance from campus and can respond rapidly if called. There are accessible road networks on campus for firefighters to access. Because the campus is highly populated and possesses its own police department, there is constant vigilance and reporting fires may be fast (TESC, 2009). However, Evergreen's forested areas are an invaluable resource to the college, especially as a living classroom, and if a wildland fire were to occur there would be extensive damage to the environment. Firefighters may be able to respond to fires on building structures, but they may not be able to adequately access forested areas. There is a high probability of occurrence of fire within the next 25 years, especially with a warmer and drier future climate (TESC, 2009). There is no history of significant fires at Evergreen.

### **Severe Storms**

Severe storms occur regularly at Evergreen. Storms are the most prevalent disaster in Thurston County (TESC, 2009). The high rate of storms causes property damage, injuries, and disrupt daily life. Storms affecting Thurston County include high wind, heavy rain, heavy snow, freezing rain, lightning, and tornadoes (TESC, 2009; Thurston Regional Planning Council [TRPC], 2009). November through April is the time of the year when most storms happen in Thurston County.

From 1950 until 2007 there were 59 high windstorms that affected Evergreen (TESC, 2009). More than 50 percent of Evergreen's campus is covered by forests. This poses a significant problem as downed trees can knock out power lines, harm individuals, damage buildings, and block roadways (TESC, 2009). There is a high probability of occurrence and risk of high winds at Evergreen.

Rain is a common feature of Evergreen's environment. Heavy rain has a high probability of occurrence at Evergreen, but the chance of flooding in highly populated areas of the campus is low (TESC, 2009). Freezing rain is not as common as heavy rain at Evergreen. However, if there was freezing rain, it would have similar results as heavy winds because of the forest cover. Campus may need to close due to freezing rain (TESC, 2009). In December 1996, there was an ice storm that resulted in the accumulation of almost one inch of ice (TESC, 2009; TRPC, 2009).

Snowfall in Thurston County averages 45 centimeters annually (TESC, 2009; TRPC, 2009). There have been six events in the period from 1948 to 2007 in which more than one foot of snow has accumulated (TESC, 2009). Heavy snow can result in fallen trees and their limbs, power outages, and road closures. Classes and normal campus activities may be suspended due to heavy snowstorms (TESC, 2009).

In 2012, there was an extratropical cyclone that brought record snowfall to the PNW region. The snowstorm was followed by freezing rain. The storm was called "Snowpocalypse" by the media and was adopted by people in the region. Olympia experienced over 11 inches of snow in just one day (Office of the Washington State Climatologist [OWSC], 2012). Evergreen was closed for almost a week. Power went out in some of the dorm buildings. A storm of such caliber is very likely to occur again (TESC, 2009; CEMP, 2011).

Since 1994, there have been four tornadoes in Thurston County (TRPC, 2009). The tornadoes occurred in 1994, 2003, 2004, and 2006. None of them happened in populated regions and there were no injuries or deaths. The records suggest that a tornado could touchdown in any lowland area of Thurston County, but would not exceed a Fujita

scale 1 (TRPC, 2009). The likelihood of a tornado affecting Evergreen is very low, but if one did touchdown on or near Evergreen the impacts would be devastating (TESC, 2009).

Hail is precipitation that takes the form of ice clumps (TRPC, 2009; Abbott, 2013). Hail storms in Thurston County usually only produce small hail, which is not very threatening to human beings or property (TESC, 2009; TRPC, 2009). The probability of hail is low at Evergreen, but if there was a hail storm the effects could be damaging to the campus community and the building structures (TESC, 2009).

Lightning storms have a moderate chance of affecting Evergreen (TESC, 2009). Based on historical records, most lightning storms in Thurston County do not last very long (TRPC, 2009). Lightning has the possibility of striking Evergreen's forest and creating a devastating fire. A fire would most likely lead to the closure of the campus and a suspension of classes (CEMP, 2011).

### **Disaster Relief Laws**

In 1974, President Richard Nixon passed into law the Disaster Relief Act of 1974. This allowed for presidential declarations of disaster, which helped consolidate disaster declarations throughout the 50 states. Later, President Jimmy Carter created the Federal Emergency Management Agency (FEMA) through Executive Order 12127, which placed many disaster agencies within the same department. The Act was changed again by Congress in 1988 into the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

The Stafford Act is the main document with which the federal government handles disasters. It states how disasters are declared, how cost-sharing is arranged

among federal, state, and local governments, and what types of assistance the federal government will provide (FEMA, Stafford). Congress created the Stafford Act because of the escalating costs of providing relief under the Act for non-natural disasters in the 1980s, such as the Three Mile Island incident (Moss, Schellhamer, and Berman, 2009). The President's power is limited to declaring disasters caused by natural occurrences, such as floods, fires, earthquakes, tsunamis, etc. Furthermore, the Stafford Act defined a 75 percent federal to 25 percent state and local cost-sharing program, provided emergency public assistance for repairs and clean-up, and hazard mitigation grants (FEMA, Stafford).

There are two levels of recognized occurrences within the Stafford Act - emergencies and major disasters. When an emergency is declared the federal government can provide state and local governments with basic assistance, such as broadcasting information, offering technical advice, clearing debris, and giving supplies (FEMA, Stafford). No more than \$5 million dollars can be spent on an emergency, unless the president says otherwise. In the case of a major disaster, in which an area is damaged, the federal government offers its full services, including the resources of the Department of Defense. Congress created the Disaster Relief Fund to support the Stafford Act. Each year FEMA distributes approximately \$2 billion through the Stafford Act (Moss, Schellhamer, and Berman, 2009). This money can be given with caps to homeowners for repairs and as loans to businesses, local governments, and utility companies. There are extreme cases where Congress may pass emergency appropriations to provide more assistance and to establish services that extend beyond the normal reach of the Stafford Act.

The creation of the Homeland Security Act (HSA) in 2002 was in reaction to the September 11 attacks. FEMA reported directly to the president under the Stafford Act. Under the HSA, FEMA must seek approval from the Secretary of the Department of Homeland Security (DHS) and function within the boundaries of the DHS (Moss, Schellhamer, and Berman, 2009). The HSA also changed the focus of disaster spending from pre-disaster mitigation to homeland defense. During this transition, DHS missed an opportunity to revisit and revise FEMA's rules and regulations. Instead, cutbacks were made to disaster mitigation programs and it became apparent that the administration under President George W. Bush were in favor of scaling back federal support during natural disasters (Moss, Schellhamer, and Berman, 2009; FEMA, Director Testimony). The consequences of this scaled-down, hands-off approach were realized during Hurricane Katrina when assistance was severely botched on federal and state levels.

FEMA was reorganized under the Post-Katrina Emergency Management Reform Act of 2006. A new level was created for catastrophic incidents, in which the definition of disasters was extended to include man-made disasters, terrorist attacks, natural disasters, and any other occurrence that caused large amounts of casualties, harm, or evacuations (Moss, Schellhamer, and Berman, 2009; Bea et. al., 2006). Furthermore, the Post-Katrina Act enacted rules to ensure that FEMA's director has a background in disaster management with at least 5 years of professional experience.

The Code of Federal Regulations (CFR) Title 44 is titled Emergency Management and Assistance. CFR's are administrative laws that explain how the United States Code will be interpreted. Title 44 encompasses a wide array of rules and regulations regarding emergency management, which FEMA and other public organizations (including state



institutions, such as Evergreen) must follow. Title 44 covers many areas, including floodplain management and wetland protection, flood prevention, hazard mitigation, disaster response, urban search and rescue, firefighter compensation, and urban search and rescue teams (Federal Register).

CFR Title 34 covers education and Part 668.46 is titled “Institutional security policies and crime statistics,” and is found under the heading “Student Assistance General Provisions” (Federal Register). It calls for regularly scheduled tests (which include drills and training exercises), information on how students can report emergencies, how campus services will respond to emergencies, how campus facilities are designed to respond to emergencies, timely warning systems for emergencies, and an outline of procedures for evacuation should an emergency occur (Federal Register).

The Homeland Security Presidential Directive-5 states that all state agencies must adopt the National Incident Management System (NIMS). In other words, all state institutions must have a plan in place to adequately prepare for and respond to emergencies and disasters. NIMS, as outlined in the Presidential Directive, was created to provide unity and operability across federal, State, and local agencies in preparing for, responding to, and recovering from incidents of any cause. Terminology was standardized. Plans were to be the same for any type of incident so that all parties would be on the same page (Office of the Press Secretary, 2003). Furthermore, federal assistance is only offered to entities who adopt NIMS standards and protocols (CEMP, 2011).

Evergreen’s CEMP is also based on Washington State laws. The Washington Administrative Code (WAC) 118-30-060 calls for a plan based on hazard analysis and

vulnerability predictions. The document should state how the plan will be enacted, who will be in charge of enacting the plan, different scenarios for enacting the plan, and the chain of command for the maintaining the political sector (Washington State Senate, 2003). Revised Code Washington (RCW) 38.52.070(1) states that all political subdivisions within Washington are required to create or join a local organization, which produces a comprehensive emergency management plan that follows the mission and guidelines of Washington State's comprehensive emergency management plan (Washington State Senate). In 2004, Governor Gary Locke proclaimed the adoption of NIMS by all state and local organizations (Washington Government).

The Washington State Comprehensive Plan dated October 2, 2003, Edition II, Change 1, Section 3 calls for all baccalaureate institutions to provide a comprehensive plan. This emergency plan must create a safe workplace, practice individual preparedness trainings, protect essential documents and technology, identifying key staff to enact emergency procedures and establishing a notification for these individuals for emergencies, outlining emergency operating procedures, and practicing the comprehensive emergency management plan in order to ensure continuity of plan within and across agencies (Washington CEMP, 2003).

### **The Evergreen State College's Comprehensive Emergency Management Plan**

The Comprehensive Emergency Management Plan was first completed at Evergreen in 2003. An update occurred in 2011. The laws and organizations of the CEMP are created under state and federal mandates. The plan was compiled by the college's Emergency Response Planning Coordinator, Bruce Sutherland. Because Evergreen is a state-level public agency, the emergency management is required to

coordinate with local, county, state, and federal agencies (CEMP, 2011). The command chain is as follows: Evergreen establishes its own Emergency Operation Center (EOC), it then communicates needs with the McLane Fire and Life Safety, which is located near the college. McLane will provide Evergreen with support and supplies as needed and if able. Evergreen also works with Thurston County in a similar manner. If the incident is severe enough, Evergreen's EOC connects with the State of Washington's EOC at Camp Murray, Washington. If the emergency requires resources above and beyond what the State of Washington can offer, FEMA's services are requested, in which case authority is tasked between the state and federal command centers (CEMP, 2011).

The CEMP is based on the Incident Command System (ICS), which is a requirement of the State of Washington's Emergency Planning Guidance. The organization of the ICS is recognized internationally and follows a top-down command system (CEMP, 2011). Therefore, the ICS should be able to adequately respond to all types of situations and levels of disasters. The CEMP is designed to promote a calculated transition back to normal operations. The plan is implemented by the Incident Commander. The Incident Commander activates the plan when there is an immediate need to save lives, provide safety, coordinate communications, assign staff to perform emergency work, activate the EOC, and claim authority to procure and distribute resources (CEMP, 2011).

There are three levels of emergency outlined in the CEMP. The first level is an incident that can be handled by Evergreen police services or McLane Fire. Level 2 is an event that disrupts the normal functions of the college in such a severe manner that Thurston County Emergency Management and Washington State Emergency

Management are notified (CEMP, 2011). EOC may only be partially activated in this scenario. In the third level, the full EOC is activated and assistance may be requested from Thurston County and other state agencies. Federal help may also be requested through the State of Washington EOC (CEMP, 2011).

The CEMP is designed to “save and protect lives, coordinate resources and communications, prevent damage to the environment, systems and property, provide essential services and restore normal operations” (CEMP, 2011, p. V). It is also important to note that in the beginning of the CEMP a letter from the college’s president, Thomas Purce, is included, in which Purce states, “The plan relies on an active training and exercise program and a process for continuously updating the emergency systems and information” (CEMP, 2011, p. V). The CEMP is focused on immediate response and the early aspects of recovery. Even though the title does not imply the exclusion of preparedness the document does not specifically set out guidelines to engage and prepare the Evergreen community.

The CEMP serves several purposes. The main purpose is to save and protect the lives of the campus community. Another important purpose is to provide information and to communicate with responders. The last-listed purpose of the document is to prevent damage to the property and environment at Evergreen. It seems necessary to want to avoid damage to infrastructure, but it is not usual to mention the environment. Evergreen’s commitment to sustainability and environmental awareness shines through in this aspect of the plan. The CEMP is grounded in the belief that those tasked with emergency response will be willing and able to provide relief to the campus. The goal is to return the campus to its normal operations as quickly as possible (CEMP, 2011). It is

odd, then, that there is no mention of mitigation tactics in the purpose. There is no mention of taking proper steps to prepare the community for disasters. This would equip them with the tools needed to react in a manner that may reduce the stress on the emergency operations center, who has to account for the community.

## **Chapter Four: Data**

### **Introduction**

I chose a mixed-methods approach to gather data about Evergreen students' attitudes of preparedness. I created a 21-question survey to acquire descriptive statistics of the Evergreen student population's attitudes. Individual interviews, comprised of five predetermined questions, were conducted with 30 students. Over 110 Evergreen students responded to the survey and 30 students participated in the interviews. The results show the levels of preparedness at Evergreen are low. Many students were not aware that Evergreen has an all-encompassing emergency plan. Overall, students are interested in receiving more information from Evergreen in regards to local hazards and how to better prepare themselves because they associate knowledge with preparedness.

### **Survey**

I created a survey comprised of 21 questions. The questions consisted of demographic information, hazard awareness, sense of place, level of preparedness, and personal responsibility. The survey questions were designed based on research I compiled during my literature review regarding these topics. I did not include demographic identifiers such as age or gender because I did not find them relevant to this research. Age and gender take away from the main identifier of these individuals as a population of students. Furthermore, these types of identifiers are outdated, socially constructed, marginalizing, and may be discriminatory (Williams, 2010).

I received Human Subjects Review approval for the survey and the interviews. I used SurveyMonkey as my medium for compiling survey responses. I did not offer any

incentives to participate in the survey. I sent out an email message via TESC-Crier, which is Evergreen's forum for communication among faculty, student, and staff, alerting students about my survey and asking for participation. The email was addressed to undergraduate and graduate students and contained a brief description of my thesis research and the purpose of the survey. I sent the email to TESC-Crier on two separate days. The first email was sent out on February 18, 2014 and the second email was on February 27, 2014. TESC-Crier is a campus-wide forum, which means the college community uses it many times each day to spread information. Sometimes students will not open emails from TESC-Crier because the amount they receive is overwhelming. I sent out my survey twice in order to ensure it had not been buried under other emails and to remind those students who had seen it, but had not yet participated to please participate. To obtain student participating beyond email contact, I also put up flyers around campus that explained the survey and my research and included the SurveyMonkey URL. Furthermore, I sent out an email to the Master of Environmental Studies program ListServ with a similar message as the TESC-Crier email. Overall, I had 113 participants.

### **Interviews**

The interviews were conducted over six days from February to May 2014. Before the interviews were conducted, I determined that 30 students was an adequate representation of the Evergreen community. All interviews were approximately five minutes in duration, with a total of nine hours spent seeking out and conducting interviews. On the third day, I was unable to find any students willing to be interviewed. Participants were asked 5 open-ended questions.

All interviews were conducted on campus during the school week. Faculty and staff were excluded from the interviews because my focus is specifically tailored to students' concepts of preparedness. Although I sought out students both inside and outside of buildings, all interviews ended up taking place outside. I walked around upper campus and lower campus and chose participants randomly. Most participants were either alone or not engaged in an activity that I would potentially disrupt. On one occasion, a participant approached me after I completed an interview to ask what I was doing. After explaining my research, he/she asked to participate. On several occasions, I interviewed a group of people together because students tend to congregate in groups and I did not want to disclude potential participants simply because they were not alone. In the case of group interviews, all students in the group agreed to participate.

Time and location of the interview were recorded while participants read the Letter to Participants form and signed the Informed Consent. Once the forms were signed, I asked participants if I could audio record the interview. All participants consented. I used the application titled Voice Memos on an iPhone to record the interviews. I asked the five questions in the same order for every interview. Often, I would ask a clarifying question to the participant. If it was not clear from what the participant shared during the interview, I would ask them after the interview whether or not they lived on campus. Overall, 21 participants lived on campus and 9 participants lived off campus, but had lived on campus during their time as students. Notes and reflections were recorded in a notebook after an interview was completed in order to capture as much information as possible.

I asked the following questions to participants:



1. What does being prepared mean to you?
2. How does being a college student impact your understanding of local hazards?
3. What would you do if there were a disaster at Evergreen?
4. How can Evergreen help students prepare for disasters?
5. What is the most effective form of communication Evergreen can use to provide information to you?

These questions were developed to further understand whether students felt prepared for disasters and if they knew much about Evergreen's emergency plans and protocols. The open-endedness of the questions allowed for delving into students' level of understanding of preparedness. For example, in the second question, being a college student could be interpreted as having access to information in class or coming from a different place, which may mean less of an awareness of local hazards. The question was meant to unearth a sense of place and whether participants would acknowledge that being a college student usually requires a change in residence. It was also designed to reflect whether they were exposed to environmental, cultural, or geographic information relating to local hazards during their time as a student. The last question was open to how Evergreen can provide students with information during a disaster or as a mitigation strategy. The answers to this question shed light on the competence of the current system and how future communication could best be utilized.

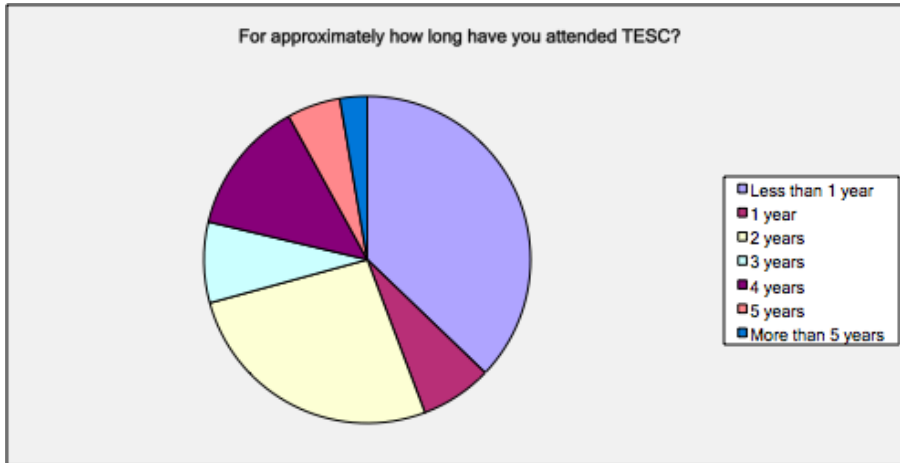
## **Analysis**

### **Survey**

#### **Demographics**

Out of 113 participants, 51.3 percent were undergraduate students and 48.7 percent were graduate students. 37.2 percent of participants had attended Evergreen for less than a year, while 26.5 percent had attended for 2 years, 13.3 percent had attended for 4 years, and 2.7 percent had attended for longer than 5 years (see Figure 3). It may be

the case that the students who have been at Evergreen for less than a year do not have as much of an awareness of the area or of the campus' role in emergency management. However, it could also be argued that these individuals have a desire to learn about their campus and their residence. Furthermore, 10 out of the 113 participants had lived in Olympia prior to attending Evergreen and may have built a strong sense of place.



**Figure 3.** Amount of time students have attended Evergreen.

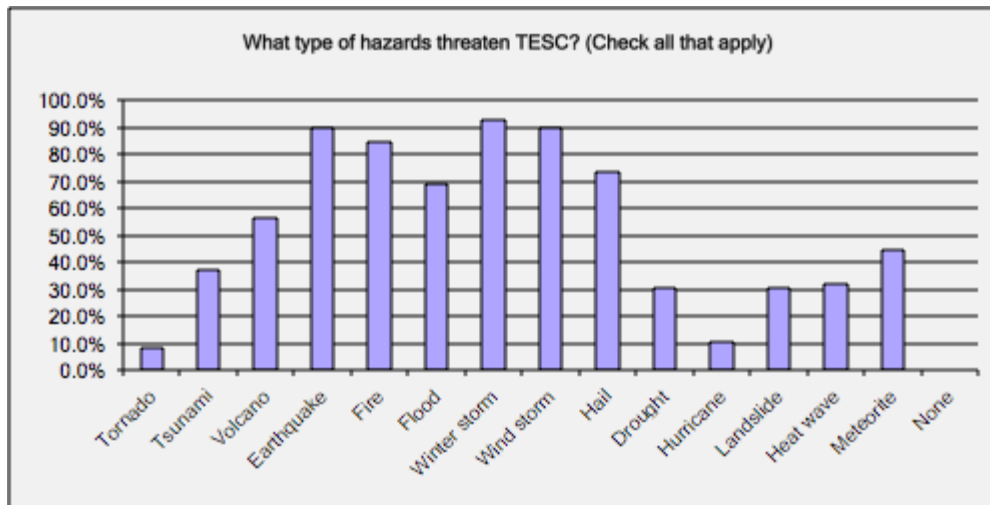
Most participants lived off campus (86.7 percent), while 14.2 percent lived on campus and 5.3 percent had previously lived on campus. 35.4 percent of participants had lived in more than 5 places prior to attending Evergreen. This number may reflect the mobility of the student population, a trend that may lessen an individual's understanding of local hazards. For example, an individual who experiences an earthquake in Southern California may not necessarily understand how to react to an earthquake at Evergreen. Even if the magnitude of the earthquake is the same, the environments are completely different and require distinctive reactions. On the other hand, these individuals may be more inclined to learn about their environment as a routine aspect of moving so often.

Most respondents spend on average three, four, or five days on campus a week. A majority of them spend close to half the day (4-12 hours) at Evergreen. While individuals

may not live on campus or may not have attended Evergreen for longer than a year, they may spend time getting to know the area and building a sense of place through their daily interactions on the campus as part of the student community. Furthermore, it makes sense that these individuals will also be part of a group of people who may have resources in the area that they can rely upon should a disaster strike. Although, there was close to an even split among participants regarding whether or not they participate in activities on campus outside of class (47 percent do versus 53 percent do not). This is not to belittle the connections made in a classroom setting; however, participating in a function other than class may increase an individual's social capital.

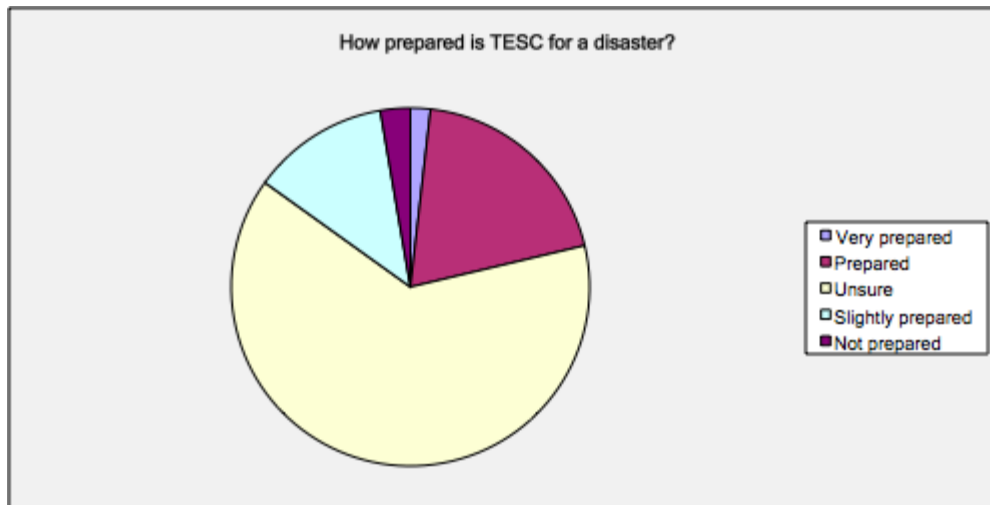
### **Hazard Awareness**

When asked what types of hazards threaten Evergreen, there was not complete consensus on any one hazard option (see Figure 4). Almost all participants agreed that a winter storm was a threat (93 percent), while 89 percent believe windstorms and earthquakes threaten Evergreen. Fire, flood, hail, volcano, and meteorite were also considered a significant hazard. All presented hazards were considered a threat, including tornadoes, which are extremely unlikely in the South Puget Sound region.



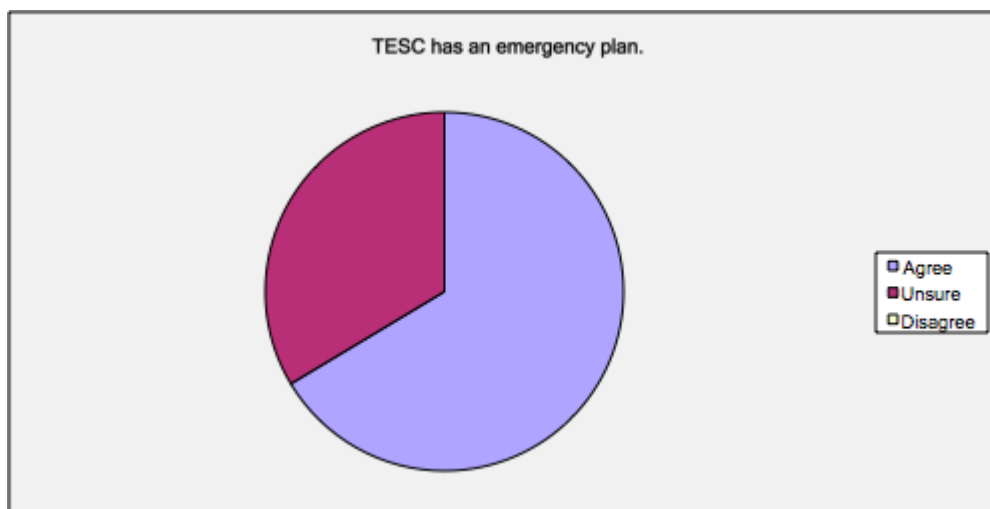
**Figure 4.** Student responses to the types of hazards that threaten Evergreen.

The topic of Evergreen’s preparedness level was met with uncertainty. When asked how prepared Evergreen is for a disaster, the majority of respondents answered “Unsure” (64 percent). 19 percent considered Evergreen “Prepared”, 12 percent said “Slightly prepared”, and 2 percent answered “Not prepared” (see Figure 5). Five participants added additional comments that stated they did not know if Evergreen was prepared. It was assumed that students may participate in the survey because of a previous interest in or awareness of hazards. The responses suggest that they are unaware of their college’s ability to respond to disasters. It is the responsibility of the college to provide proper instructions and protocols to its community for disaster response. It may be that the current methods of reaching out to the community are not succeeding in garnering attention.



**Figure 5.** When asked how prepared Evergreen is for a disaster, it does not appear that students are very aware of emergency management levels.

When asked if Evergreen has an emergency plan, most respondents said they “Agree” (66 percent). No one answered that Evergreen does not have an emergency plan. However, 34 percent of participants stated that they were unsure if Evergreen had a plan (see Figure 6). Again, it is federally and state mandated that Evergreen has a responsibility to provide a plan to its community and, yet, there is still a percentage of the population that is unaware of how Evergreen plans to respond in the case of a disaster.



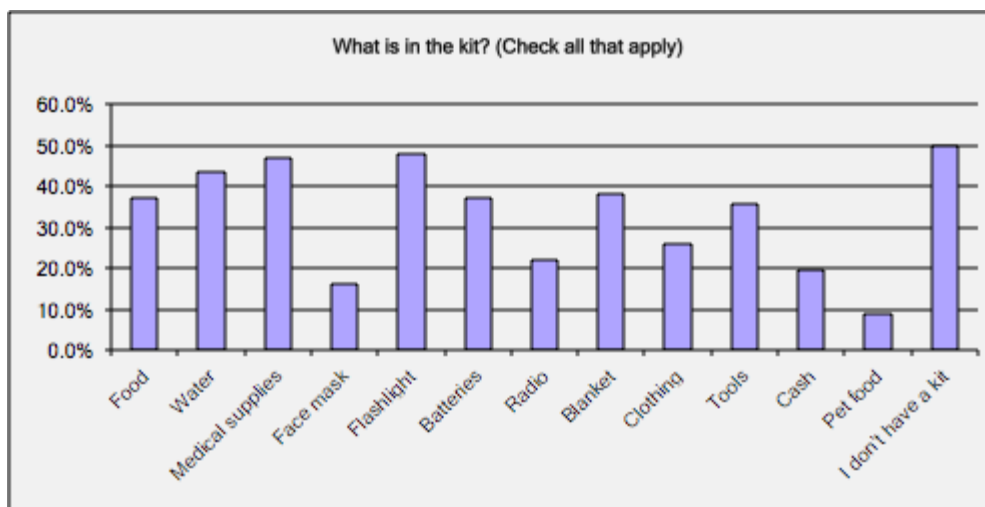
**Figure 6.** Many students at Evergreen are unaware of an emergency plan.

Most participants (75 percent) believe Evergreen will receive some form of help

from the government in the event of a disaster. There was close to an even split on the question of whether Evergreen can provide help to the respondent. 47 percent answered “Agree”, 44 percent answered “Neutral”, and 10 percent answered “Disagree.” Results were similar when respondents were asked if Evergreen would provide them with adequate information and direction after the disaster.

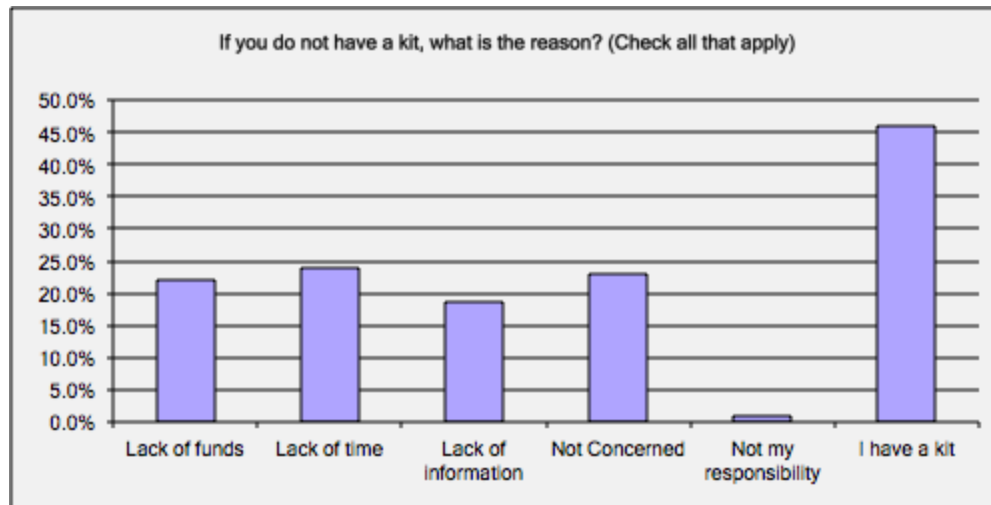
### **Personal Preparedness**

The next section of the survey focused on personal preparedness. Almost all of the participants had a point-of-contact outside of the area who they could call during a disaster (85 percent). When asked whether they had a preparedness kit, 49 percent said “No”, 47 percent said “Yes”, and 4 percent answered “Unsure.” Those participants who were uncertain might not have been familiar with the concept of a preparedness kit. When asked what their kit was comprised of, of the respondents who said they had a kit, almost all of the basic necessities were included (see Figure 7). Many participants commented that they had the supplies, but they were not compiled into a kit. Other respondents expanded upon their supplies, adding such items as water purifiers, rope, fishing gear, GPS, knives, solar battery charger, etc.



**Figure 7.** Participants' who had preparedness kits appeared to mostly have all of the basic necessities included.

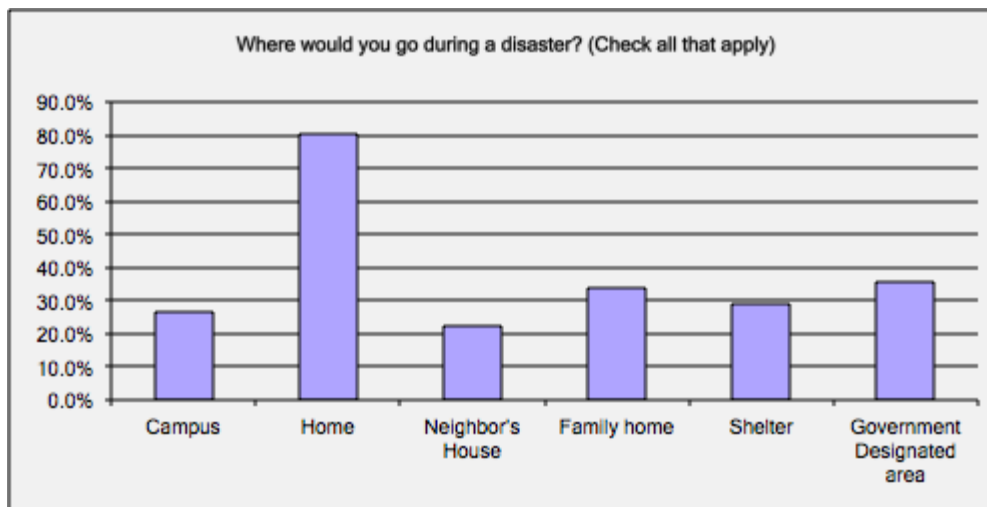
When asked why respondents did not have a kit, the three top responses were lack of time, lack of funding, and lack of concern (see Figure 8). Lack of information was also a substantive reason. One respondent answered that it was not a personal responsibility. Lack of funding is understandable when many people are focused on daily needs. There is a lack of urgency in all of these answers. This mindset is a reactive rather than a proactive perspective on the reality of hazards. Individuals may not fear their landscape as they might if they did not live in the comforts of a capitalist society where nature has been tamed. There may also be the belief that an institution will support individuals should a disaster occur. As a student there may be less of a drive to prepare because they are part of a community that fosters growth. However, it seems ironic that individuals would place their faith in an institution to provide for them when a majority were unsure whether Evergreen was capable of helping them.



**Figure 8.** Students’ responses to why they did not have a kit.

Participants reported that they could sustain themselves for a period of 3 days. This is the standard time frame suggested by FEMA. About 11 percent responded that they could sustain themselves for longer than a month. When asked where they would go during a disaster, the majority of participants stated that they would go home (see Figure 9). 27 percent said they would stay on campus. This suggests faith in Evergreen’s ability to provide for its community during a disaster. It could also mean respondents were unsure they would be able to leave campus should a disaster strike while they were on campus. More respondents answered that they would go to a shelter or government designated area over a neighbor’s house. This may mean there is a lack of social capital in the participants’ neighborhoods or that they expect more from institutional support than they do from their neighborhood. One of FEMA’s guidelines to preparedness is mapping one’s neighborhood and creating a plan with neighbors. This would mean getting to know who lives where and what they need and what they can offer. Their may be a disconnected mentality with the student population if they are not homeowners or families. They may not feel the need to invest their energy and time in their communities, places where there may be a large amount of support.





**Figure 9.** Respondents' would mostly choose to go home over other locations during a disaster.

### **Interviews**

Interviews were coded and themed after reviewing the recordings. The themes identified are preparedness, sense of place, college student status, personal and community responsibility, and Evergreen plan. These themes overlapped on several occasions, but I separated them to focus on their individual significance.

### **Evergreen Plan**

The majority of students I interviewed were unaware of any Evergreen emergency management plan. They expressed their interest in knowing what to do during a disaster, but claimed they had no access to a plan of action. While Evergreen's CEMP is unavailable to the public, there is information posted on the Evergreen emergency website on what to do during disasters. This lack of available resources may have more to do with a lack of interest in disasters than an accessibility issue. Furthermore, campus-wide emails on the community forum TESC-Crier are sent out periodically reminding students of where to find such information, as well as reminders about drills and sound checks on the speaker system. This does not discredit those students who believe they are

uninformed. Rather, it points to a larger issue of denial. When asked how Evergreen could help prepare students for disasters, a student responded, “I’m not really aware of it [hazards] until right now. And now I’m starting to think about it.” There is a tendency for individuals to ignore the need for preparedness until a disaster occurs. Then, interest in the subject peaks for quite some time until it is overshadowed by other everyday concerns. A good solution to this issue may be having a pre-planned seminar on preparedness that can be initiated after a disaster occurs. When disasters become a popular topic, it would be wise to offer the seminar to the campus to remind people to be aware and engaged.

Another issue with Evergreen student preparedness is that Evergreen is a commuter campus. For off-campus students, it may not be as apparent what to do during an emergency as it is for students who live on campus. This may be due to several reasons. First, students who live off-campus may have never lived on campus and, therefore, may not be as familiar with the larger campus. For example, they may not know the names of all the buildings or areas, which would make a speaker announcement or text message alert of where to go useless.

One student who works as a Resident Adviser (RA) on campus said, “I think we’ve been taught things as RA’s that we don’t know as students here. Like the HCC [Housing Community Center] is a place that always has generators and outlets and it’s the safe place to go. Red-Cross proofed and people don’t know that like we know that.” The participant, who has a job in campus housing, claims that even students who live on campus are unaware of emergency meeting locations. If the students who live on campus and access this building on a weekly basis are unaware of this resource, then it is very

likely that students who live off campus would also be oblivious.

Second, students who spend less time on campus may not pass posted evacuation signs and protocols very often. This may prevent them from becoming familiar with what to do during an emergency. Furthermore, students who have not experienced drills inside a dorm or classroom will be unfamiliar with what to do during a disaster. They may also not have as strong a tie with their peers and may be less likely to follow them to designated areas and may be more likely to try and leave Evergreen, which could prove even more dangerous in certain situations (i.e. damaged roads due to an earthquake). Of course, these are presumptuous scenarios - a student living on-campus could be just as unaware as a commuter - but possible nonetheless.

When asked how Evergreen could better prepare students, an overwhelming majority of participants expressed a desire for information and access to Evergreen's plan and protocols. One student suggested that the college provide the history of disasters in the region to students, "I'm not even sure how or if Evergreen was affected at all when Mt. St. Helens erupted back in ... it was 1980. So um, maybe, just provide like a history and just provide more information about how the disasters can affect you." This may help students understand not only the hazards of the area, but the cultural history of their geographic region, which would inspire a better sense of place.

Participants who had spent time living on campus suggested more information should be given about what to do during disasters when they are in their dorms. One student said, "I think, for specifically people that live on campus, like either in the dorms or in the apartments, that the housing people should go through safety measures with everyone that's here. Yeah, provide more information about it." While another stated,

“When I lived in the dorms, they’d be like, ‘Wind warning close your window or it might break.’ But that’s about it. More awareness about what to do in case of disaster.” One student was optimistic about the ability of information to better prepare students, “Helping students be aware of emergency procedures. The policies on campus about that, so we’re not all running around like chickens with our heads cut off. Living in the dorms one year, they had a fire drill and half of the students got up and left and the other half were still in bed.” This statement suggests that these students were not given adequate preparation regarding fire alarms and, therefore, remained in their dorms. This certainly may be the case. However, fire drills are designed to be so unpleasantly loud and disruptive as to encourage the evacuation of buildings. If students stayed behind, then they may have decided the drill was not real and not worth their effort. It is the individual’s choice to participate in preparedness activities. Providing students with emergency protocols does not ensure they will follow instructions or take care of themselves.

Some students who worked on campus expressed a better sense of preparedness. They expressed their understanding of safety procedures, but also mentioned that their fellow students may not be as aware. One participant said, “Maybe having like available plans. I don’t know what they, I know in the case of, I work at the Computer Center, and in case of a fire we have this whole procedure of what to do, but I don’t think that anyone else knows about it except for the people that work there. Maybe just like having it [plans] publicly displayed.” While there are evacuation signs posted in buildings throughout campus, they are often in inconvenient locations and may not be practical in case of an actual emergency. The students suggestion of offering available plans would

need to be posted in visible, highly-frequented areas. Furthermore, it would be up to individuals to take the time to read them and ingrain them into their memory. Publicly displayed signs are only useful when people take the time to look them over and incorporate them into their sense of place. According to interviewees, it does not appear that the currently posted signs are part of their normal routine. In the case of a disaster, these signs may be hidden by debris, smoke, darkness, or any other interruption. Emergency protocol signs, then, are a preventative measure more than a reactive tool and will be most practical when viewed upon entering a new building.

The participant visits another important point in her statement - the need for students to be aware of emergency protocols, not just faculty and staff. Individuals who are unprepared during a disaster are more susceptible to become a part of the disaster. Also, there may be a situation in which the designated safety person is not available to provide assistance. One student suggested a way to improve student preparedness would be, "Letting us know what to do and where to go. Having teams or something like that, where you would have a group of people that you would have to keep track of together because I think it's important to work as a community on those sorts of things." By providing individuals with access to information on how to react during a disaster, they are given a better chance of being able to care for themselves and those around them who are in need.

The majority of students claimed that the best way to receive information from Evergreen is through technology. This was either in the form of a text message through e2campus text alerts, emails through TESC-Crier, social media, or via Evergreen's website. Other individuals recognized that not all students have access to a phone or

internet and that in the case of a disaster, these systems would not be effective as the power may shut off. They suggested having plans and protocols posted throughout the campus. For those individuals who live off of campus, it was claimed that word of mouth would work well if there was an emergency because the community is tight knit. All of these suggestions are valid and will be shared with the college's emergency management planner.

### **Sense of Place**

Sense of place was mentioned by a third of participants. This was either in overt relation to where they had travelled from or implied in reference to their status as a college student. Individuals who are from the Pacific Northwest (PNW) or have lived in the area for some time had a better understanding of local hazards. One participant stated: "I guess since I live in this area, well I live a little bit further up north, but since I lived here my whole life, I understand pretty well about the hazards of this area, I think. Right over there, there's a lahar siren. And that's something that's not really in my area, but living in the Northwest I know about them." Even uncommon hazards and warning systems are familiar to individuals who grew up in the PNW. Not all people may understand how to react to local disasters, but they have a higher likelihood of knowing what hazards threaten them.

Even individuals with a broader regional identity - those who identified as growing up on the west coast - expressed an awareness of hazards in that larger region: "I grew up in California, so I was aware of fires and earthquakes and those are things you need to be careful of, but if you're not from here getting some resource to educate you on things that are potential threats that happen relatively often." The participant illustrates

his/her connection with the region and identifies as a member of this location, even though he/she is from a state that is hundreds of kilometers away. California and Washington do share earthquakes and fire in common, as well as many other hazards. An earthquake in California may have a completely different impact than an earthquake at Evergreen, but the awareness that these different locations have similar geologic and environmental risks illustrates how sense of place is informative.

Participants who were from a different region expressed concern about disasters at Evergreen. When I spoke with a group of participants from the East Coast, they had a resounding claim of ineptitude, “I’ve only been here for less than a year and I don’t know as much about this area as I know about New Jersey.” When I asked about what they would do during an earthquake, they all nervously laughed and responded, “If there was an earthquake I would have no idea what to do. I’m from the East Coast.” Another participant said, “There’s no earthquakes in Jersey so I don’t know.” It is understandable to not know what to do during a disaster that is foreign to your region. However, the students have been at Evergreen for almost a year. It is the college’s responsibility to account for their safety, but it is their personal responsibility to be aware of their surroundings. The college does attempt to offer information regarding emergency procedures, but it is possible that these students somehow missed these resources. It is also interesting that during their time in the PNW they have not encountered any public announcements regarding earthquake safety.

### **Preparedness**

All participants expressed either a knowledge-based or resource-based definition of preparedness. A knowledge-based approach includes mental preparation. For example,

many individuals responded that being aware of local hazards would be helpful. A resource-based approach focuses on having supplies and tools or taking physical precautions against hazards. This includes a kit and foodstuffs.

Disaster experience was mentioned as an important preventative tool. Many individuals stated that preparedness meant an awareness of local hazards. Not many participants included the importance of knowing how to react to potential disasters, but this may have been implied in being aware of local hazards. However, multiple individuals did mention that researching and thinking about hazards in advance meant being prepared. This type of mental preparation includes having a plan of action. One individual went further in stating the relevance of knowing local hazards: “Maybe having experienced something before so having a knowledge of what it would be like.” Previous experience of a disaster does give a certain knowledge that cannot be obtained through research. Experience provides individuals with the knowledge not only of the physicality of a disaster, but also of the mental requirements for survival. People can research and drill until they feel confident in their preparation. However, when a disaster strikes many people experience cognitive side-effects that they were not expecting and that alter their ability to react. One individual picked up on this and claimed, “I don’t really think there is like any [sic] being prepared. I guess it depends on what type of disaster, but like for something like a volcano or tsunami, there’s really no way I feel like you could be prepared for that, except for you know maybe getting, you know, hoarding water and stuff like that and like essential foods and like non-perishable stuff like that and I guess just having some sort of contingency plan for whatever disaster it is. So, just to, I feel like having thought about it in advance is preparedness enough. Just so it doesn’t catch you



totally off-guard.”

Several individuals referenced their experiences with the winter storm of January 2012, known to many residents as “Snowpocalypse.” Many admitted that they were unprepared for the storm and had to rely on outside help to make it through. There was an expression of camaraderie when individuals described how they made it through the event: “A time when I wasn’t prepared was that snowstorm two or three years ago. Didn’t have enough food in the house. It was hard to get around. So I ended up going to a friend’s house and they were actually prepared. So we ordered a pizza and they had extra food and stuff and like all the lanterns and stuff.” Because the individual was able to make it through the storm with assistance from friends, it is unclear whether or not he/she decided it is necessary to create a kit and a plan for future storms. Nevertheless, the occurrence of the winter storm must have made individuals aware that disasters happen in this region and they have the biggest affect on those who are unprepared.

Not many participants mentioned the importance of having a preparedness kit. There were indirect references to kits, such as the importance of having the proper resources to be self-sufficient. However, preparedness kits are crucial because they are designed to ensure all supplies are in one place, which makes it easier to find during times of distress and when people are forced to leave their current location. Furthermore, FEMA and other disaster organizations suggest that individuals have multiple kits or go-bags in the different places they spend their time, whether it is at home, in their vehicle, or at work, so that they are prepared in all the locations they frequent. As was covered in the survey, only half of the students who responded said they possessed a preparedness kit. However, many people have the supplies that comprise a preparedness kit and they

do not realize they have everything besides the bag. It may be useful to explain to students the necessity of the centralized location of the supplies to better prepare them.

During several interviews, I experienced a sense of derision when discussing preparedness. There was a specification of the level of preparedness that was acceptable. This was accompanied by defensiveness against being overly prepared as it was equated with paranoia and an obsession with the collapse of civilization. One participant said, “I don’t see a point in dedicating your entire life for that disaster because there are some people who become very paranoid and obsessed with a disaster happening.” This is understandable, as a fixation with disaster can be taken too far as portrayed in popular television shows that highlight individuals who hoard supplies and strive to guard themselves against their potentially ravenous and distrustful community. However, it also illuminates a sense of denial about the reality of disasters and a reliance on the stability of nature. Disasters do not occur very often in the South Puget Sound region. This may increase the belief in a status quo of a non-threatening natural environment. This attitude of scorn towards the acceptance of nature’s volatility and the accompanying preparedness does not fit with Evergreen’s self-proclaimed atmosphere of liberal, critical thought.

### **College Student Status**

When asked about their status as college students, participants either responded about their sense of place as a transitory population (see section above) or in regards to their learning experience. Some respondents did not see a connection between being a student and being aware of local hazards. Others thought of school as a distraction from hazards: “Being a student, being in school all the time I may not know anything besides school.” Another individual made the connection between being a student and sense of

place, “I guess it hasn’t changed it because I was here for 5 years before I started school. And so, that’s probably more important just knowing about the weather and other things that might happen.”

The connection between learning about one’s community and hazards was strong for certain participants. Having access to information regarding local history, geography, geology, climate, environment, and social issues is useful to understanding disasters. As stated previously, knowledge about local hazards was a big aspect of preparedness to respondents and, therefore, existing in a learning community is a valuable tool. One participant summed up several other participants viewpoints: “I’ve been in a couple of classes that have to do with geology and sedimentology and just being aware of the types of hazards related with that. I’ve learned through classes that I wouldn’t have otherwise learned about had I not been in college. That’s a big one for me.” Learning about one’s physical and cultural community enables a deeper awareness of its hazards.

There were several students I spoke with who were employed at the college. This was valuable to them because they felt it gave them more of an in-depth grasp of emergency procedures. One student said, “If I wasn’t an RA I would not have as much knowledge as I do, but that’s only because I was trained to have a little bit more knowledge than other people on campus, which is a little unfortunate.” RA’s are tasked with ensuring a safe living space in the dorms, so it is not unusual that they are trained to know more than the average student. It would be useful for them to share this knowledge with their fellow students, rather than harboring it until there is an emergency. Other student staff discussed their training as mostly consisting of guiding people towards the proper exits during an emergency. This is important because not all students are aware of

evacuation protocols and possibly would not leave an area unless someone was there to prompt them.

Another possibly underrepresented population is English as a Foreign Language (EF) students. During my interviews, I came across two different groups of students who I asked to participate. One group chose not to take part in the study. The other group attempted to answer my questions, but chose to stop because of the language barrier. It was disappointing to not have their experience in this study, as their sense of place and status as a college student in a place far from their home region would have been invaluable. It would also be interesting to explore EF students' perceptions of emergency signs posted only in English and the difference between American emergency symbols and those from other countries. Future studies on college students and disaster preparedness would be wise to include individuals from different countries in their population.

### **Personal and Community Responsibility**

Many students acknowledged the need to care for themselves during a disaster. They recognized the usefulness of Evergreen providing them with preparedness information, but admitted that it is their responsibility to access and use that knowledge to protect themselves. Evergreen is required to provide students with emergency protocols and assistance. However, as adults, students must account for themselves. One student claimed, "It's hard because it's kind of between giving students the information they need in order to prepare themselves because the college can only do so much to prepare someone for something that might happen. [...] but then its up to the students themselves whether they're open to it and whether they can actually be receptive of this

college in that way.”

Not all interviewees expressed competence in preparing themselves. Several students mentioned not having a plan for disasters. One interviewee said, “I don’t think I would really know what to do,” to which another student in the group replied, “I guess me neither.” The students told me that they had not really thought about disasters before, but that they planned on putting more effort into preparing now that it had been brought to their attention.

Other students mentioned a commitment to helping their community during a disaster. An overwhelming amount of students said they would check to make sure the people around them were safe. Others stated that they felt safe at Evergreen because it is a community and they thought they would receive assistance from the college. However, many students also claimed that if there was a disaster at Evergreen, they would leave the area. This desire to leave suggests these students do not have much of a place attachment. This may be due to the fact that they live on campus and do not have a reason to stay and rebuild since they do not have ownership of their residence. They may not have a sense of place at Evergreen because they are in a transitional period in their lives.

The distance from Evergreen to Olympia (the closest town) was mentioned as a possible deterrent to recovery. Some students expressed concern that as a college community they may be overlooked. Evergreen does have many resources that other places in the region may not (generators, a police force, an emergency command operations center, etc.), but its isolation makes it vulnerable if help was needed. Another group of students illustrated the lack of rootedness to the region beyond Evergreen, “I say we’re pretty far removed from them because the community of Olympia and Evergreen

are kind of separate entities. If something happens to Olympia I feel like I won't be really that affected by it living on campus." Again, Evergreen does have measures in place to care for its students. However, Evergreen relies on the functionality of Olympia in order to maintain itself. Furthermore, as a resident of the South Puget Sound region and a member of a college that prides itself on public service, it is alarming that students do not think they would be impacted by a disaster in Olympia, especially if the impact was by offering their services to those in need.

The importance of keeping recovery local may not be apparent to students. It may also be the case that students do not think they have the ability to contribute to recovery because their community is isolated from the larger Thurston County region and that Evergreen as a public institution will rely on state or federal help over that of the student body. It may also be the case that an individual's college years are more focused on personal growth and less on the world outside of the college community. College is a place to explore theories and to put those theories into practice. There may be less of a focus on bigger picture ideas, such as disaster preparedness, which are not necessarily a pressing matter in certain areas of study or daily activities. One participant stated that if there was a disaster at Evergreen, students would be guided to specific emergency locations and "then afterwards [they] go about [their] life like nothing happened." This idea of disregarding the threat of hazards until one occurs and then continuing to deny the possible risks does not only apply to college students or transitory populations. People all over the world are in denial about the imminence of disasters (FEMA, 2013).

## **Discussion**

### **Disaster Capitalism and Students**

Questioning social structures such as capitalism is a consistent theme in current social sciences (Klein, 2008). Students would be wise to make the connection between disasters and capitalism. By investing in personal preparedness, they stand a chance to avoid being taken advantage of by businesses and the private sector when the state is unable to offer proper resources (Klein, 2008; Aldrich 2012). Of course, it is often unaffordable for an individual to be completely prepared, as is shown through the cycle of disaster capitalism (Klein, 2008; Aldrich, 2012). However, by taking certain steps towards a sustainable lifestyle, individuals may be able to avoid the trap of disaster capitalism (Klein, 2008; Aldrich, 2012; Godschalk, 2003). By asking the question of where does help come from during a disaster and who pays for it, students have the opportunity to create change. Offering help in one's community during a disaster may lessen the need for businesses to come in and make money off of the unprepared (Klein, 2008; Aldrich, 2012).

Most students at Evergreen would probably be more prepared than they think if a disaster occurred. The Five Foci ensure an interdisciplinary individual with the ability to critically engage different situations in a sustainable fashion (TESC, 2013). Students with different backgrounds and areas of focus would surely be able to band together to help their fellow students and larger community. Students armed with the proper information on how to respond and why it is important to keep big businesses away from taking advantage of post-disaster towns are valuable not only to the college, but to the places they inhabit post-graduation.

By ignoring warnings of hazards, students are ignoring their geography. This denial of their environment is counter to the Evergreen spirit of living consciously and sustainably (TESC, 2013). Because these occurrences are considered outside the status quo of our environment in the South Puget Sound, there is a denial of their existence. When a disaster strikes, it will be easier to manipulate those individuals who are focused on the immediate needs of recovery (Klein, 2008). Preparing oneself and one's community gives students the opportunity to be involved in the rebuilding process, rather than allowing outside organizations to come in and determine the how their campus community should be reimaged. Future research will benefit from exploring students' perceptions of the economic, social, and cultural aspects of disasters.

### **Student Preparedness**

Future research should focus on furthering the relationship of sense of place to student preparedness. Studies should attempt to discuss college preparedness with a portion of the many different populations within a college. For instance, students from different countries should be asked about their change in sense of place and their connection to their new community. They should be surveyed about how information is communicated to them and whether it is suitable.

Evergreen students are unprepared for disasters. It would benefit Evergreen and education institutions to focus on building their students' place identities and relationships to their environment. By helping students take notice of the hazards in their area, they are given a chance to recognize the dangers of being unprepared. If students are engaged in a manner that sparks their attention, they may change their actions. At Evergreen, it would be wise for the administration to foster students' place identities, as



the interdisciplinary culture of the college is important to its students. When students acknowledge all of the many fields involved in building preparedness and a sense of place, they may pay attention. It may be important to teach students about the social justice issues involved in disaster mitigation and recovery because of Evergreen's emphasis on equal rights and radical social reforms. Student engagement is the best chance Evergreen has for creating a sustainable, safe educational institution.

## **Chapter Five: Conclusion**

Disaster preparedness on college campuses is a high priority among college administrators, but there is not much research on the subject. It may be difficult to reach out to a community that is constantly changing. College students are a transitory population because most of them are independent for the first time in their lives and move to a new location. This transition signifies a new sense of place and place identity (Tuan, 1977). Home becomes an anchor of memory and college symbolizes a building block for new meaning (Chow & Healey, 2008). There is very little research on students' sense of place and natural disaster management. This research seeks to create a new theory regarding how to incorporate sense of place into disaster management engagement.

Evergreen is located in Olympia, WA on the Puget Sound. Evergreen is a public college and it is the responsibility of public institutions to provide their communities with adequate hazard awareness information. Evergreen has a CEMP that follows a top-down model in order to account for all types of emergency situations. It was created under the Washington State Comprehensive Plan of 2003 (Washington State Senate, 2003). The CEMP is designed to be in accordance with state and federal mandates. The CEMP is not available to the public, but there are safety protocols and procedures located on their website for staff, faculty, and students. There are a variety of hazards in the area, including earthquakes, volcanoes, severe storms, floods, landslides, and fires (TESC, 2009). The biggest threats are earthquakes and volcanoes (TESC, 2009).

This research's literature review focused on themes of resiliency, social capital, sense of place, disaster capitalism, and college student preparedness. Disaster capitalism

is the term for when businesses and governments take advantage of communities that have been shocked by war or disaster (Klein, 2008). Instead of the community being able to process the upset and take part in rebuilding, private companies take advantage of community members while they are mourning (Klein, 2008). It becomes imperative for communities to build supportive networks in order to protect themselves and their communal interests should they experience a disaster (Klein, 2008; Aldrich, 2012).

Resiliency has been equated with sustainable practices (Godschalk, 2003). Resilient communities are bolstered by strong community networks (Mileti, 1999). An engaged community suggests strong social capital among its members (Aldrich, 2012). Social capital is created through interactions with an individual's physical, social, and cultural community. This ties in with sense of place, which is an individual's connection to her social and physical environment (Tuan, 1977). People have a better chance of being aware of local hazards if they are aware of their geography and have a sense of place (Norris, 2008; Cutter, 2008). There is not much research on how students incorporate hazard awareness into their sense of place, which may be vital to engaging them in disaster preparedness.

This research is grounded in a pragmatic worldview. It seeks to pose solutions to the issue of college student preparedness. My research question was how well are Evergreen students prepared for disasters? I used a mixed-methods approach in order to address the problem from several angles. I interviewed and survey Evergreen students. I had 113 participants on a 21-question survey that focused on demographic information and students' perceptions of local hazards, disaster preparedness, and sense of place. I found that most students are unprepared and unaware of Evergreen's responsibility to

protect them. There seems to be a lack of interest in the subject matter and a lack of urgency regarding the reality of disasters.

I interviewed 30 participants and found similar results. Students are unprepared. They claimed they would be more prepared if they had better access to information. However, it may be the case that the issue is a lack of interest and not a lack of access because there are quarterly reminders about emergency procedures and there is adequate information available on Evergreen's website. This signifies a denial about the reality of disasters and a belief in the status quo of nature being a stable entity. Disasters do not damage Evergreen on a regular basis and this may inspire students to believe they are safe. Furthermore, the transitional status of college students suggests they would not worry about investing their time and energy into learning about their local environment and readying themselves if they are unsure if they will live in the area after they leave college.

It is of the utmost importance for the safety and stability of Evergreen students, faculty, and staff to prepare themselves for disasters. Preparedness begins at the individual level. Once students prepare themselves, they will have the tools to help their community. If individuals protect their communities, then have the chance to protect their interests. Evergreen emergency managers and future researchers should focus on engaging students by including sense of place in hazard awareness and disaster preparedness outreach. This may result in a more realistic and captivating communications plan because sense of place speaks to students' identities at a time when they are focused on personal growth and belief building.

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