

South Puget Sound Community College’s Annex to the Natural Hazards Mitigation Plan for the Thurston Region

Table of Contents

Title Page and Table of Contents.....	1
Adopting Resolution	3
College Profile	5
South Puget Sound Community College Plan Development Process	7
South Puget Sound Community College Risk Assessment.....	9
South Puget Sound Community College Mitigation Initiatives	29

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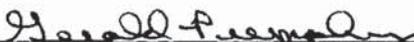


“The Natural Hazards Mitigation Plan for the Thurston Region is a multi-jurisdictional plan that addresses the most destructive natural hazards that threaten Thurston County and its communities. The primary function of this Plan is to explain the risks posed by natural hazards and to identify actions that can create more disaster resilient communities in Thurston County.

Hazard mitigation planning identifies and prioritizes sustained measures that if enacted, will reduce or eliminate long-term risk to people and property from natural hazards and their effects. In the long term, mitigation measures reduce personal loss, save lives, and reduce the cost to local, state, and federal governments for responding to and recovering from recurrent or unusual natural hazard events.”

South Puget Sound Community College is one of the twenty-six jurisdictions that participates in the partnership plan. As such, the South Puget Sound Community College Board of Trustees, District 24, adopted the *South Puget Sound Community College’s Annex to the Natural Hazards Mitigation Plan for the Thurston Region* on April 8, 2010. The Board’s adoption of the Plan ensures that the College would be eligible to apply for and/or to receive federal mitigation assistance program grants for mitigation, response, or recovery.

The College’s section of the Plan lists the individuals who serve as SPSCC’s hazards mitigation plan workgroup, the activities that supported the development of SPSCC’s local hazard mitigation planning process, risk assessment about the hazards that threaten SPSCC, and SPSCC’s mitigation initiatives. The College’s Hazard Mitigation Plans must be revised or updated every five years.



Gerald Pumphrey, Ed.D.
President
South Puget Sound Community College

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College Profile

South Puget Sound Community College

(360) 754-7711

www.spscc.ctc.edu

Background

About: South Puget Sound Community College is a public, two-year college located in Olympia, Washington. The college is accredited by the Northwest Commission on Colleges and Universities, an institutional accrediting body recognized by the Council on Higher Education Accreditation and the Secretary of the United States Department of Education.

Governance: The Board of Trustees is a five-member governing board appointed by the Governor of Washington to provide South Puget Sound Community College leadership by establishing and giving visibility to the mission of the college, employing a chief executive officer, establishing appropriate policies of governance and operation, assessing outcomes and serving as advocates of the institution.

South Puget Sound Olympia Campus (acres): 102

Faculty (2008-09)

Full-time Faculty	99
Part-time Faculty	264

Staff (2008-09)

Classified	134
Admin/Exempt	48

Fall 2008 Total Headcount 8,361

Fall 2008 State Supported Headcount 5,486

Gender:

Female	60.2%
Male	39.7%

Median age

24

Ethnicity

Caucasian	59.2%
Asian/Pacific Islander	8.6%
Hispanic	7.0%
African American	2.7%
American Indian/Alaska Native	1.6%
Multi-racial	6.2%
Undeclared	14.2%

Residence

Thurston County	85.8%
Mason County	5.5%
Grays Harbor County	2.9%
Pierce County	2.3%
Lewis County	1.4%
International	2.2%

Faculty/Staff

Student Enrollment

Financial

South Puget Sound Community College's Mission

We engage our community in learning . . . for life.

Values

South Puget Sound Community College . . .

Pursues Excellence.

We are innovative and we continuously search for ways to improve our programs, services, and operations... .

Operates in an Atmosphere of Accountability and Respect.

We are invested in our college's overall success. In turn, the college respects and acknowledges our commitment and empowers us to maximize our contributions... .

Accepts Responsibilities to the Communities We Serve.

As part of a diverse community, we continually monitor the community's changing needs... We foster global citizens who build rich and effective partnerships ... We are stewards of our land and our environment.

Fosters Inclusiveness at Our Campuses.

We celebrate diverse cultures, individuality, and common ground. Those who work for, attend classes at, or visit our college, find a safe, accessible place where differences are embraced.

Provides Student-Centered Education.

We facilitate seamless transitions by maximizing learning opportunities and eliminating barriers to success. Our students are prepared for life choices that enable them to adapt to a changing world.

Revenues	2007-2008	Expenditures	2007-2008
Tuition and Fees	\$9,146,694	Instruction	\$19,256,464
State Appropriations	\$17,282,345	Academic Support	\$1,529,454
Federal Grants and Contracts	\$3,198,325	Student Services	\$3,653,879
State Grants and Contracts	\$5,948,699	Institutional Support	\$4,647,518
Local Grants and Contracts	\$3,017,413	Operation and Maintenance of Plant	\$3,555,054
Private gifts, grants and contracts	\$769,756	Scholarships and Fellowships	\$7,320,821
Auxiliary Enterprises	\$3,411,134	Auxiliary Enterprises	\$4,178,708
Other	\$4,591,433	Other	\$2,043,097
Total Revenue	\$47,365,799	Total Expenditures	\$46,184,995

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South Puget Sound Community College Plan Development Process

Hazard Mitigation Plan Workgroup

The following individuals served as SPSCC's hazards mitigation plan workgroup:

Department/Title	Representative(s)
Dean of Capital Facilities	Ed Roque
Director of Security	Lonnie Hatman
Security, Emergency Operations Lt.	Doug Swift
Dean of College Relations	Kellie Braseth
VP of Administrative Services	Nancy McKinney
Director of Buildings and Grounds	Joe SueWing
Dean of Information Technology	Julian Pietras

Hazard Mitigation Plan Development

The following activities supported the development of the SPSCC local hazard mitigation planning process:

Date	Location	Activity	Subject
January, 2008	SPSCC Security Dept.	Meeting	State Mitigation Update Development
February 2008	SPSCC Security Dept.	Report	Mitigation update report to State
May 2008	TRPC	Meeting	Hazard Mitigation Plan for Thurston Region
June 2008	SPSCC	Meeting	Briefing for VP of Admin Services on Planning
June 25, 2008	TRPC	Meeting	Hazard Mitigation Plan for Thurston Region
July 2008	TRPC	Meeting	Hazard Mitigation Plan for Thurston Region
May 2009	TRPC	Meeting	Hazard Mitigation Plan for Thurston Region
May 2009	TRPC	Consultation with State EMD	SPSCC participation in Thurston Region instead of State Plan
June 2009	SPSCC Security Dept.	Meeting	Risk Assessment
June 2009	SPSCC Capital Facilities	Meeting	Hazard Mitigation Plan for Thurston Region, Risk Assessment, Form Review
June 2009	TRPC	Reporting	SPSCC Risk Assessment
July 2009	SPSCC Capital Facilities	Meeting	Mitigation Initiatives Form Review
July 2009	SPSCC Capital Facilities	Report	Mitigation Initiatives
July 2009	SPSCC College Relations	Meeting	College Profile Form Review
July 2009	TRPC	Report	College Profile submission
August 2009	SPSCC Security Dept.	Meeting	Mitigation Initiatives
August 2009	TRPC	Report	Mitigation Initiatives Report

Mitigation Initiative Prioritization Process

Prior to the 2008-09 Hazard Mitigation planning process South Puget Sound Community College participated in the State of Washington Natural Hazard Mitigation Plan.

In May of 2008 Paul Brewster from Thurston Regional Planning Council invited SPSCC to participate in the update to the Natural Hazards Mitigation Plan for the Thurston Region. Lonnie Hatman, SPSCC Director of Security, began attending planning workgroup meetings at TRPC.

As a part of the 2008-09 Hazard Mitigation planning process, Lonnie Hatman, SPSCC Director of Security met informally with Nancy McKinney, SPSCC Vice President of Administrative Services on the Natural Hazards Mitigation Plan for the Thurston Region and what SPSCC participation in that plan would mean for the College in terms of effort, reporting, and resources.

Lonnie Hatman also met with Doug Swift, SPSCC Campus Security Emergency Operations Lieutenant, who served as the point of contact for the State Hazard Mitigation Plan. Together and separately they both met consulted informally with Joe SueWing, SPSCC Director of Buildings and Grounds, Ed Roque, SPSCC Dean of Capital Facilities, and Julian Pietras, SPSCC Dean of Information Technology, to review the status of the previous initiatives and to develop an outline of how to proceed with the current process.

Those meetings resulted in a re-prioritization of projects, an update on their status, and the addition of one new initiative. The re-prioritization process was based primarily on removing completed projects from the list and moving or reformatting the methods of reporting the remaining projects.

Lonnie Hatman, SPSCC Director of Security also met with Kellie Braseth, SPSCC Dean of College Relations, who updated the College Profile and adapted the information provided under the state plan in accordance with the format and content of the Thurston Regional Plan.

SPSCC will continue to proceed on all these projects as resources allow. We are committed to providing a safe and healthy environment for all members of the SPSCC community.

South Puget Sound Community College Risk Assessment

Introduction

The risk assessment provides information about the hazards that threaten South Puget Sound Community College (SPSCC). This information provides the factual basis to identify and support a strategy that can effectively mitigate the effects of the hazards that threaten this jurisdiction's safety and challenge its ability to perform essential functions.

The content and structure of this plan's risk assessment was developed using the Federal Emergency Management Agency's (FEMA) 2008 "Local Multi-Hazard Mitigation Planning Guidance." Table 1 shows the Disaster Mitigation Act (DMA) Risk Assessment Planning Requirements that must be met in order for this plan to receive a "satisfactory" score. Each of these planning requirements is met through the information contained in both the regional risk assessment and in this local annex.

Table 1: Disaster Mitigation Act Risk Assessment Planning Requirements

DMA Section	Requirement
§201.6(c)(2)(i):	[The risk assessment shall include a] description of the type ... of all natural hazards that can affect the jurisdiction ...
§201.6(c)(2)(i):	[The risk assessment shall include a] description of the ... location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
§201.6(c)(2)(ii):	[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
§201.6(c)(2)(ii):	[The risk assessment in all] plans approved after October 1, 2008 must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.
§201.6(c)(2)(ii)(A):	The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas ...
§201.6(c)(2)(ii)(B):	[The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate ...
§201.6(c)(2)(ii)(C):	[The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.
§201.6(c)(2)(iii):	For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

In general the Federal DMA planning requirements with the words "**shall**" and "**must**" indicate that the item is mandatory and must be included in the plan, otherwise it will not be approved by FEMA. Regulations with the word "**should**" indicate that the item is strongly recommended to be included in the plan, but its absence will not cause FEMA to disapprove the plan.

Hazard Analysis Definitions

The adjective descriptors (High, Moderate, and Low) for each hazard's probability of occurrence, vulnerability, and risk rating are consistent with the terms used in the regional assessment.

The following terms are used in this plan to analyze and summarize the risk of the hazards that threaten this jurisdiction:

Risk Rating:

An adjective description (High, Moderate, or Low) of the overall threat posed by a hazard is assessed for the next 25 years. Risk is the subjective estimate of the combination of any given hazard's probability of occurrence and vulnerability.

- High: There is strong potential for a disaster of major proportions during the next 25 years; or History suggests the occurrence of multiple disasters of moderate proportions during the next 25 years.
- Moderate: There is medium potential for a disaster of less than major proportions during the next 25 years.
- Low: There is little potential for a disaster during the next 25 years.

Probability of Occurrence:

An adjective description (High, Medium, or Low) of the probability of a hazard impacting the jurisdiction within the next 25 years.

- High: There is great likelihood that a hazardous event will occur within the next 25 years.
- Moderate: There is medium likelihood that a hazardous event will occur within the next 25 years.
- Low: There is little likelihood that a hazardous event will occur within the next 25 years.

Vulnerability:

Vulnerability can be expressed as combination of the severity of a natural hazard's effect and its consequential impacts to the community. An adjective description (High, Medium, or Low) of the potential impact a hazard could have on the community. It considers the population, property, commerce, infrastructure and services at risk relative to the entire jurisdiction.

- High: The total population, property, commerce, infrastructure and services of the community are uniformly exposed to the effects of a hazard of potentially great magnitude. In a worse case scenario, there could be a disaster of major to catastrophic proportions.
- Moderate: The total population, property, commerce, infrastructure, and services of the

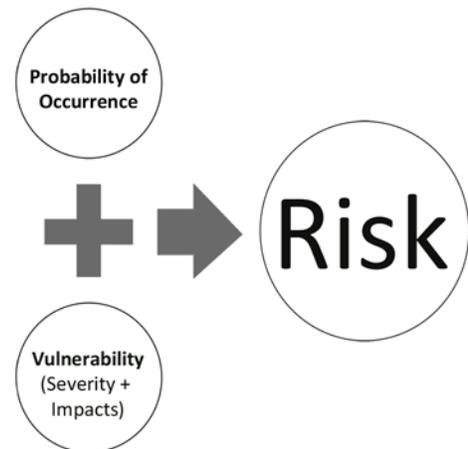


Figure 1: Risk is a subjective estimate of the combination of a hazard's probability of occurrence and a community's vulnerability.

community are exposed to the effects of a hazard of moderate influence; or the total population, property, commerce, infrastructure, and services of the community are exposed to the effects of a hazard of moderate influence, but not all to the same degree; or an important segment of population, property, commerce, infrastructure and services of the community are exposed to the effects of a hazard. In a worst case scenario there could be a disaster of moderate to major, though not catastrophic, proportions.

- Low: A limited area or segment of population, property, commerce, infrastructure, or service is exposed to the effects of a hazard. In a worst case scenario, there could be a disaster of minor to moderate proportions.

Summary Risk Assessment

Based on the regional risk assessment and the local risk assessment in the subsequent section, the following hazards pose the greatest threat to South Puget Sound Community College.

Hazard	Probability of Occurrence	Vulnerability	Risk
Earthquake	High	High	High
Storm	High	High	High
Flood	High	Moderate	High
Landslide	Moderate	Low	Moderate
Wildland Fire	Moderate	Low	Low
Volcanic Event	Low	Moderate	Low

Local Risk Assessment

A comprehensive risk assessment of the major natural hazards that threaten South Puget Sound Community College was developed for this plan through the regional risk assessment process described in Chapter 4.0. The regional risk assessment and its hazard profiles serve as the foundation for this jurisdiction's risk assessment. A list of all of the potential natural hazards that could impact this jurisdiction is located in Chapter 4. Chapter 4 includes six natural hazard profiles for earthquake, storm, flood, landslide, wildland fire, and volcanic events. Each profile defines the hazard and describes its effects, severity, impacts, probability of occurrence, and historical occurrences. The regional profiles describe this jurisdiction's local vulnerabilities in terms of the portion of the jurisdictions land base or service area, population, employment, dwelling units, jurisdiction-owned assets, and critical facilities that are within each hazard zone.

This section of the plan provides additional details or explains differences where this jurisdiction's risks for each hazard vary from the risks facing the entire planning area. Maps of the hazards that affect South Puget Sound Community College are scaled to local boundaries and are included in this section.

Earthquake

Severity

There are several common measures of earthquakes. The Richter Magnitude Scale (used in this hazard profile) is a mathematical scale which measures the intensity of ground motion. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a ten-fold increase in measured amplitude, and 31 times more energy released. The Modified Mercalli Intensity Scale measures the earthquake intensity by the damage it causes. Peak ground acceleration (PGA) is a measure of the strength of ground movements. It expresses an earthquake's severity by comparing its acceleration to the normal acceleration due to gravity.

The severity of an earthquake is also dependent upon the source of the quake. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Three kinds of earthquakes are recognized in the Pacific Northwest: crustal earthquakes, subduction zone earthquakes, and deep earthquakes.

1. Crustal (shallow) earthquakes occur along faults close to the surface of the North American plate. They have a maximum depth of about 19 miles, though most occur much closer to the surface. The majority of earthquakes in the Pacific Northwest are of the shallow type. They could potentially produce magnitudes as high as 7.5, though most are less than 3.0. Scientists are locating and studying active faults that are located within the Puget Sound lowlands. The Seattle fault is perhaps the most infamous as it lies under the most densely populated area of the state. Evidence suggests that an Olympia fault structure may exist in the north end of Thurston County. A strong earthquake is estimated to have occurred nearly 1100 years ago which caused one to three meter subsidence in lowland forests near present day McAllister Creek, the Nisqually River, and at Little Skookum Inlet. A magnitude 6.0 or greater earthquake originating from a surface fault could render incredible destruction. More research is necessary to verify the existence of the Olympia fault structure and its probability of rupturing.
2. Subduction zone or interplate earthquakes emanate from the boundary where the Juan de Fuca plate subducts eastward into the North American Plate. The width of the Cascadia Subduction Zone fault varies along its length, depending on the temperature of the subducted oceanic slab, which heats up as it is pushed deeper beneath the continent. As it becomes hotter and more molten it eventually loses the ability to store mechanical stress and generate earthquakes. An earthquake from this zone would be considered "the Big One," as it could travel over hundreds of miles and last for several minutes. Subduction zone earthquakes are considered to be the most destructive with potential magnitudes of 9.0 or greater. The last subduction zone earthquake is believed to have occurred in 1700.

3. Deep earthquakes occur along faults in the Juan de Fuca plate as it sinks beneath the North American plate. These earthquakes are located under the North American Plate, therefore their energy translation to the surface is buffered by their depth. Their depths generally range from 16-62 miles. Magnitudes of 7.5 have been recorded. The 1949, 1965, and 2001 earthquakes all emanated from this zone. The 2001 Nisqually earthquake's focus was located about 32 miles deep below its epicenter on Anderson Island.

Impacts

The impact to South Puget Sound Community College from an earthquake doesn't vary from the impacts on a regional basis.

Probability of Occurrence

Earthquakes are certain to impact the Thurston Region in the future. The following probabilities of occurrence for the three earth quake sources are offered by the Washington State Hazard Mitigation Plan:

- Crustal Earthquake - A magnitude 6.5 or greater earthquake is estimated to occur once about every 333 years in the Puget Sound Lowlands
- Subduction Zone Earthquake - A magnitude 9.0 earthquake is estimated to recur every 350 to 500 years.
- Deep Earthquakes - Five magnitude 6 or greater earthquakes have occurred in the Puget Sound basin since 1900. Since 2001, the Thurston region has been rocked by three deep earthquakes; spaced 16 and 36 years apart since 1949 and 1965 respectively (about every 26 years). It is estimated that a magnitude 7.1 earthquake (1949 type event) will occur every 110 years. Regardless the source of earthquake, past events suggest that a destructive event reoccurs about every 26 years. Therefore, the overall probability of occurrence of a damaging earthquake is high.

Historical Occurrences and Impacts Specific to this Jurisdiction

February 28, 2001, Federal Disaster 1361: Nisqually Earthquake

At 10:54 a.m. a magnitude 6.8 earthquake produced strong ground shaking across Washington State. The epicenter was located near Anderson Island, approximately 11 miles north of Olympia near the Nisqually River Delta. The focus was located nearly 33 miles underground. The depth of the earthquake minimized the intensity of the shaking and limited the impact to the built environment. In addition, drought conditions in the Puget Sound region reduced the number of landslides and amount of liquefaction that would have otherwise been caused by a quake of that magnitude with saturated soils. Nevertheless, the observations of geotechnical engineers indicate that liquefaction was widespread in parts of Olympia and South Seattle. Several significant lateral spreads, embankment slides, and landslides also occurred. The relatively long duration of the event and the relatively low cyclic resistances of some of the fills in the area are likely causes for the significant liquefaction and ground failure which occurred. Thurston County was among the hardest hit counties in the State.

A federal disaster declaration was issued only one day after the event. Statewide, the Nisqually earthquake resulted in 700 injuries (a dozen of them serious) and one confirmed death (a trauma-induced heart attack).

South Puget Sound Community College experienced moderate damage to most buildings on campus. The damage consisted primarily of suspended ceiling failures and overturned bookcases. Two buildings (Buildings 34 and 22) sustained cosmetic structural damage. The elevator in Bldg. 34 became wedged in its shaft and required extensive repairs. The two vehicle bridges on campus did not sustain any noticeable damage. Total damage to South Puget Sound Community College owned property was \$74,000.

Summary Assessment

History suggests a high probability of occurrence of another damaging earthquake sometime in the next 25 years. With the 2001 Nisqually earthquake still fresh in the region's memory, it is important to note that it was not the largest earthquake event possible in the Puget Sound region. It is conceivable that a similar magnitude earthquake could emanate from a shallow crustal fault which would result in much greater damages. Damage from the 1949, 1965, and 2001 earthquakes indicate that an earthquake of a greater magnitude would have a catastrophic impact on Thurston County. Considering that a large population lives and works in higher risk earthquake hazard areas, the entire region has a high vulnerability rating. Accordingly, a high risk rating is assigned.

Summary Risk Assessment for Earthquake in South Puget Sound Community College

Probability of Occurrence	Vulnerability	Risk
High	High	High

Storm

Severity

Wind Storms:

The coastal mountains afford Thurston County some protection from severe southerly and westerly winds. The coastal mountain range acts as a buffer and shields the region from extreme winds in excess of 80 mph. Thurston County does not encounter the 100 mph or greater winds that sometimes wreak havoc on Washington's Pacific coast communities. Nevertheless, the entire region is directly or indirectly susceptible to the effects of high winds. Neighborhoods with stands of tall conifer trees are the most vulnerable to property damage. All communities can suffer power outages and be left in the cold and dark for extended periods. The average monthly wind speed at the Olympia Airport, as recorded over a 49 year period, is between 6 and 7 mph. Fifty-nine winter windstorm events have buffeted the Pacific Northwest from October 1950 to December 2007.⁴ Nine of these events produced peak gusts over 58 mph at the Olympia Airport weather station. The most powerful windstorm in the last 100 years occurred on Columbus Day, October 12, 1962. This storm tracked northeast along the Washington coast and produced record peak wind gusts of 78 mph at the Olympia Airport.

Heavy Rains:

Prolonged heavy rains typically occur from November through February. The entire region is directly or indirectly affected by heavy rainfall. Properties are at greater risk if they are located in flood plains, areas with high ground water, areas with stormwater drainage problems, or are on or closely adjacent to steep slopes. The region overall is moderately vulnerable to flood.

Freezing Rain:

The entire County is susceptible to the effects of an ice storm of the magnitude experienced on December 26, 1996. This storm resulted in ice accumulations of one-quarter to three-quarter inch thick. Ice accumulates on nearly every surface including tree branches, power lines, roof tops, motor vehicles, streets, sidewalks, and traffic signals and signs. Transportation networks are especially vulnerable to freezing rain as it coats nearly every exposed paved surface.

Heavy Snow:

The Washington State Hazard Mitigation Plan defines heavy snow as four inches of snowfall in 12 hours or six inches in 24 hours for non-mountainous areas. This amount is sufficient to disrupt activities in Thurston County. In general, heavy snow is any amount of snowfall that exceeds the ability of communities to maintain relatively normal levels of public and private sector services. Falling snow mixed with high winds produces a blizzard. According to the National Weather Service, a blizzard occurs with the following conditions "... [Three hours or more of] sustained wind or frequent gusts to 35 miles an hour or greater; and considerable falling and/or blowing snow (i.e., reducing visibility frequently to less than ¼ mile)."

Tornado, Hail, and Lightning:

Severity does not vary from the regional assessment.

Impacts**Wind Storms:**

The Thurston Region, like most of western Washington, is vulnerable to high winds because of the climatic conditions and the prevalence of 100 to 150 foot tall conifer trees. High winds weaken standing trees and structures that are weighted with snow or ice. Douglas fir and western hemlock tree species have shallow lateral root systems with top heavy crowns and entire trees are vulnerable to falling when soils are soaked from previous rainfall. Regular autumn rains saturate soils and decrease tree roots' ability to adhere to soil. Sustained high winds and gusts cause trees to sway significantly. Repetitive swaying motion can eventually weaken a tree's root hold in the saturated ground and force it to topple. These tall columnar trees and their massive branches act like giant hammers and sever electrical transmission lines, crush vehicles, damage homes and buildings, and block transportation routes. Falling tree limbs and other flying debris can injure or cause the death of people and animals. Downed power lines have caused electrocutions elsewhere in the greater Puget Sound Region. Widespread power outages can take several days to restore. The total mass of downed debris on the transportation network impedes the response capabilities of emergency personnel and utility crews. Electrical blackouts force the closure of government offices, businesses, and schools. Power outages can disrupt traffic operations due to debris road blocks, unpowered traffic signals, and traffic snarls resulting in thousands of motorists seeking few available alternate routes on local arterials and collectors. When power outages occur simultaneously with heavy stormwater flows, public works crews may struggle to provide auxiliary power to sewer lift stations to prevent backups or flooding in suburban and urbanized areas. South Puget Sound Community College has one sewer lift station operated by the City of Olympia on campus. During power outages it takes approximately 30 minutes before the lift station over flows.

Heavy Rains:

Percival Creek runs through the middle of South Puget Sound Community College and overflows its banks several times a year. The effects from Percival Creek are limited to its low lying flow relative to the campus infrastructure. More notably the campus storm water system frequently becomes overwhelmed by heavy and prolonged rainfall. The college has several retention/settlement ponds on campus. The majority of these ponds require dredging that has not been done for several years and compounds the issue. South Puget Sound Community College lies at the base of Tumwater Hill which in large part is composed of impervious rock. Overflow off the hill frequently overruns one of the main campus entrances and undermines the roadway and erodes the shoulders. When this occurs traffic is rerouted to another entrance. The campus also serves as a main drainage area for the surrounding neighborhoods. In time of heavy rainfall the storm water system is overwhelmed and can result in minor flooding to roadways and buildings. Buildings that have flooded previously are buildings 25, 26, 22 and the Maintenance Compound.

Freezing Rain:

The weight of thick ice accumulations can stress structures causing trees and power lines to snap. Downed live power lines can ignite fires. Dangerous driving conditions and power outages almost guarantee the closure of government offices, businesses, and schools. Despite the issuance of sound advice in travel alerts to avoid travel, the demand for emergency assistance to respond to traffic accidents can quickly overwhelm the capacity of local fire and law enforcement personnel.

Heavy Snow:

Heavy snowfall affects all of Thurston County. Snowfall in the Puget Sound lowlands typically occurs from mid-November through early March, with most accumulations occurring from December through February. Light snow, less than four inches deep, can temporarily disrupt normal traffic operations on roads and streets until public works departments clear priority routes. In general, snow hazards and road clearing abilities become more problematic with decreasing temperatures, increasing snow depth, and increasing length of time that snow remains on the ground. Even when priority routes are clear, numerous neighborhood streets and local collectors can remain impassable for many motorists when snow depths exceed one foot.

The average annual snowfall for Thurston County is 18 inches (Olympia Airport Weather Station 1948-2007). Most periods of snow fall generally do not exceed four to six inches within a 24 hour period. However, accumulations that exceed one foot do occur with the right combination of Pacific moisture and cold arctic air. Weather station records indicate that this has happened at least six times in Thurston County since 1948. December 1968 to January 1969 is the period of record. A total of 81.5 inches of snow fell during the two month period resulting in snow depths likely exceeding the 24 inches officially recorded at the Olympia Airport weather station. Snow remained at least one foot deep through the first two weeks of February. It should be noted that data from the Olympia Airport weather station is limited and more extreme snow conditions are likely to occur elsewhere in the County. Larger snowfalls and greater depths typically occur at higher elevations and distances further away from the Puget Sound.

Tornado, Hail, and Lightning:

Impact does not vary from the regional assessment.

Probability of Occurrence**Wind Storms:**

The Washington State Natural Hazard Mitigation Plan identified Thurston County and 22 other counties as susceptible to high winds. Counties that were considered most vulnerable to high winds are those with an annual high wind recurrence rate of 100 percent. The State plan indicated that Thurston County's annual high wind recurrence rate is 175 percent. At least 18 notable Pacific Northwest cyclones have impacted the Thurston Region in the last 25 years, thus probability of occurrence is high.

Heavy Rains:

Considering that 18 of 23 federal disaster declarations, for the period of 1962 to 2009, resulted in major flooding, damaging heavy rain has a 38 percent annual probability of occurrence. Damaging heavy rains have a high probability of occurring.

Freezing Rain:

Although trace freezing rain events occasionally occur, the December 26, 1996 event was the most damaging Pacific Northwest ice storm in the last 50 years. The scarcity of an event of this magnitude suggests that the annual recurrence rate may be one to two percent or occur every 50 to 100 years. Therefore the probability of a major destructive freezing rain event in the next 25 years is low.

Heavy Snow:

Between the period of 1948-1994, 23 snow events with depths greater than four inches and five snow events with depths greater than one foot were recorded at the Olympia Airport weather station (snow data not collected at this station from 1996 to present). The annual recurrence rate for depths greater than four inches is 50 percent and 11 percent for depths greater than one foot. There is a high probability that a heavy snow event will occur in the next 25 years.

Tornado, Hail, and Lightning:

Probability of occurrence does not vary from the regional assessment.

Historical Occurrences and Impacts Specific to this Jurisdiction**Wind Storms:**

The January 1993 storm caused significant disruption to South Puget Sound Community College. The campus has large areas of dense wooded areas which were even more pronounced in 1993. The college lost power for 4 days which adversely affect the day to day operations and instruction. Although there was no major damage to infrastructure many trees were downed and at the peak of the storm only one of the three entrances to the college was passable.

Heavy Rains:

In December 2007 South Puget Sound Community College experienced localized flooding due to heavy rains. In several areas roadways were covered disabling vehicles attempting to drive through the deep water. Several buildings sustained water damage either from high ground water or leaking roofs. In December of 2008 the college again experienced flooding due to heavy rains. This storm caused similar damage to the 2007 storm but also came within a couple of inches of inundating the colleges computer network room requiring sandbagging. Carpets and drywall damages totaled approximately \$25,000.

Freezing Rain:

The freezing rain storm of December 1996 caused wide spread damage to South Puget Sound Community College. Although the timing of this event fell during a time when no students were present on campus the effects lingered until the summer of 1997. During the storm, and several days afterward, it was simply too dangerous for maintenance and grounds personnel to begin clearing damage. The sheer volume of trees and branches broken by the ice required the college to utilize outside contractors for removal.

Heavy Snow:

The most significant snow event in the college's history was the snows from December 2008 through January 2009. South Puget Sound Community College received nearly two feet of accumulated snow and more than that in subsequent events. The nature of construction of the college buildings increased the risk and severity of this event. The college buildings have metal roofs which during times of heavy snowfall and borderline temperatures will release large slabs of accumulated snow damaging gutters and facia. This also poses a severe risk to people who are trying to enter these buildings. This single event caused approximately \$216,000 damages. South Puget Sound Community College also has three buildings with flat roofs which can be susceptible to failure under heavy snow loads. The college experiences disruption of services for snowfall amounts beginning at about one inch. Any snowfall amount requires additional staffing and could leading to potential delays or closures.

Tornado, Hail, and Lightning:

Impact does not vary from the regional assessment.

Summary Assessment

Of all the hazards facing South Puget Sound Community College winter storms have been the most frequent and most costly. Even just a light snowfall impacts our daily business of instruction and causes increased overtime for grounds and maintenance staff. Although other hazards have a greater potential to disrupt the operations of the college the frequency of winter storms continue to be of great concern.

Summary Risk Assessment for Storm in South Puget Sound Community College

Probability of Occurrence	Vulnerability	Risk
High	High	High

Flood

Severity

The severity of flooding at South Puget Sound Community College does not vary from that discussed earlier for heavy rains. The college is not exposed to the more typical spring melt type of river flooding. Flooding does not present a life threatening event at the college. Exposure is limited to minor structural damage due to urban flooding.

Impacts

Refer to impacts for heavy rains.

Probability of Occurrence

Refer to probability of occurrence for heavy rains.

Historical Occurrences and Impacts Specific to this Jurisdiction

Refer to historical occurrences for heavy rains.

Summary Assessment

South Puget Sound Community College is exposed to urban flooding not major river flooding. Many of our staff and students who live in unincorporated Thurston County are at risk. Urban flooding has caused damage to the college in the past and is likely to occur again.

Summary Risk Assessment for Flood in South Puget Sound Community College

Probability of Occurrence	Vulnerability	Risk
High	Moderate	Moderate

Landslide

Severity

South Puget Sound Community College has minimal exposure to landslides. Of the landslides that may occur, none pose an immediate risk to life safety. Four areas of subsidence do pose a minimal threat to campus roadways, sidewalks or buildings.

Impacts

Due to the expected minimal size of a landslide on campus the impacts will be minimal. Currently, two roadways, one sidewalk and one building are susceptible to landslides. In all cases the damage would be minimal and advanced warning would be likely.

Probability of Occurrence

South Puget Sound Community college is frequently inundated with heavy rains, the likely cause of a landslide.

Historical Occurrences and Impacts Specific to this Jurisdiction

There are currently four areas of subsidence on the campus of South Puget Sound Community College. To date, the impacts have been minimal. Future impacts are also expected to be minimal. After the winter storms of 2008-2009 a small sinkhole was identified on the shoulder of one of the campus roads. Monitoring of this area has not shown any future subsidence or damage.

Summary Assessment

South Puget Sound Community College has minimal exposure to landslides. Of the areas at risk they mainly pose a risk to roadways or sidewalks which could be readily repaired.

Summary Risk Assessment for Landslide in South Puget Sound Community College

Probability of Occurrence	Vulnerability	Risk
Moderate	Low	Moderate

Wildland Fire

Severity

Does not vary from regional assessment.

Impacts

Does not vary from regional assessment.

Probability of Occurrence

Does not vary from regional assessment.

Historical Occurrences and Impacts Specific to this Jurisdiction

Does not vary from regional assessment.

Summary Assessment

Does not vary from regional assessment.

Summary Risk Assessment for Wildland Fire in South Puget Sound Community College

Probability of Occurrence	Vulnerability	Risk
Moderate	Low	Low

Volcanic Hazards

Severity

Does not vary from regional assessment.

Impacts

Does not vary from regional assessment.

Probability of Occurrence

Does not vary from regional assessment.

Historical Occurrences and Impacts Specific to this Jurisdiction

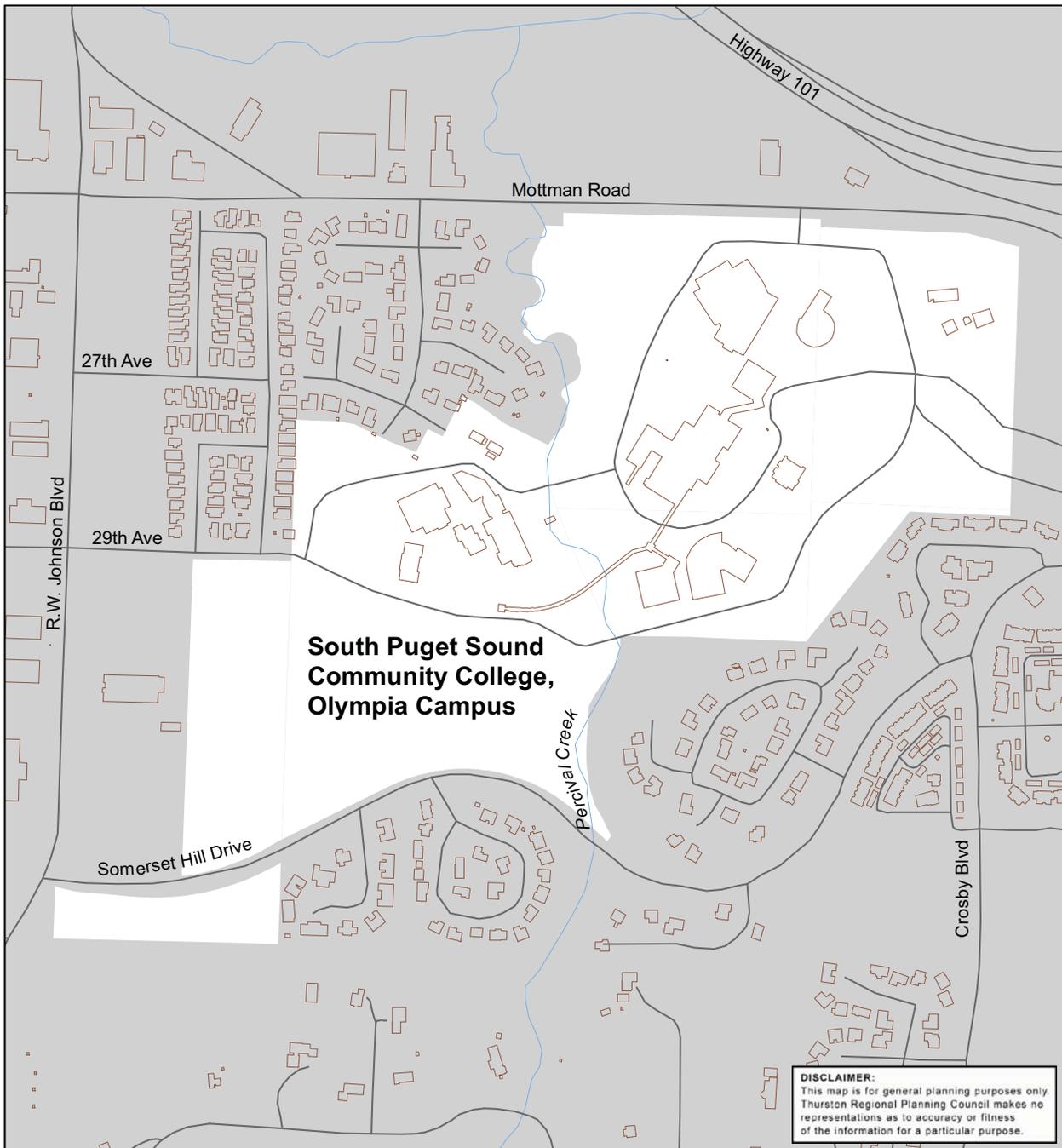
Does not vary from regional assessment.

Summary Assessment

Does not vary from regional assessment.

Summary Risk Assessment for Volcanic Events in South Puget Sound Community College

Probability of Occurrence	Vulnerability	Risk
Low	Moderate	Low

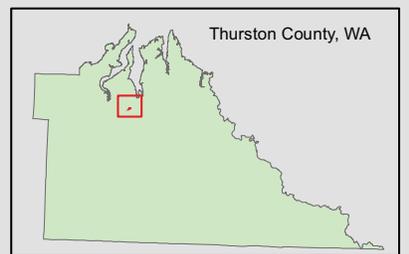


South Puget Sound Community College

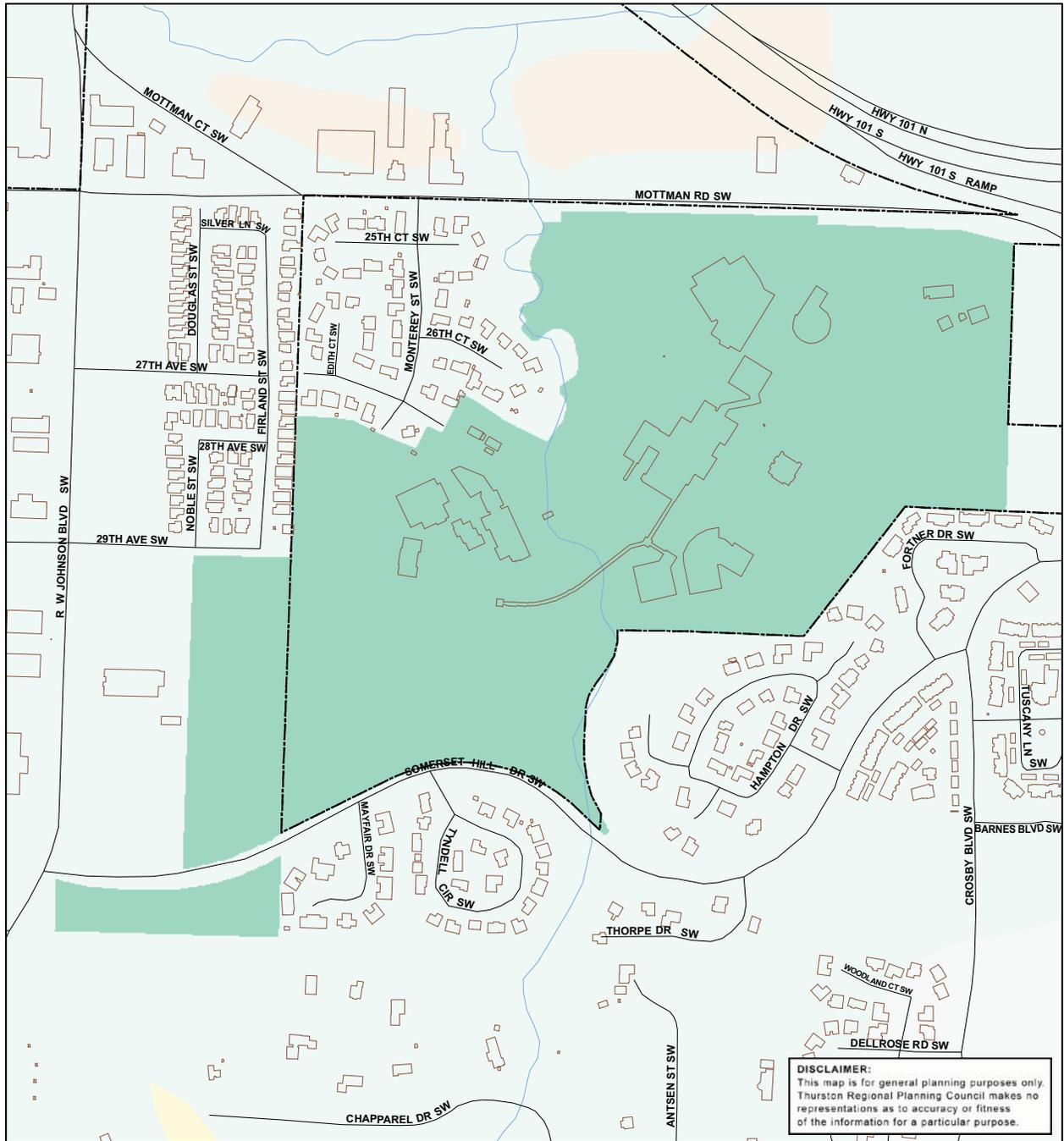


- Main Olympia Campus Boundary
- Building Foot Prints (limited)

500 250 0 500 Feet



Printing Date: April 24, 2009
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South Puget Sound Community College Liquefaction Hazards

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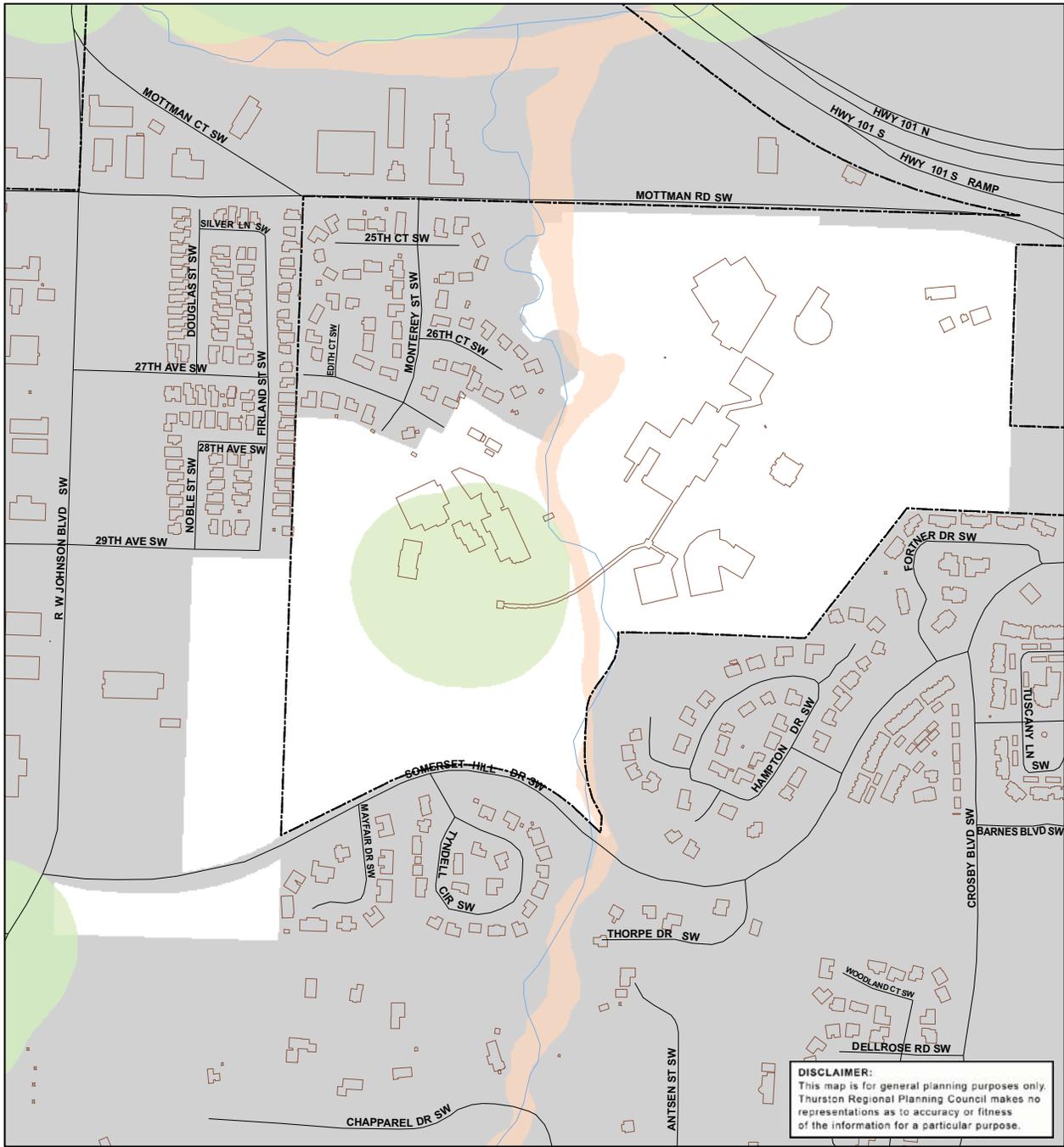
City Limits

	high		low		bedrock
	moderate to high		very low to low		peat
	low to moderate		very low		water

TRPC
Thurston Regional Planning Council

500 250 0 500 Feet

Printing Date: February 18, 2009
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South Puget Sound Community College Flood Hazards

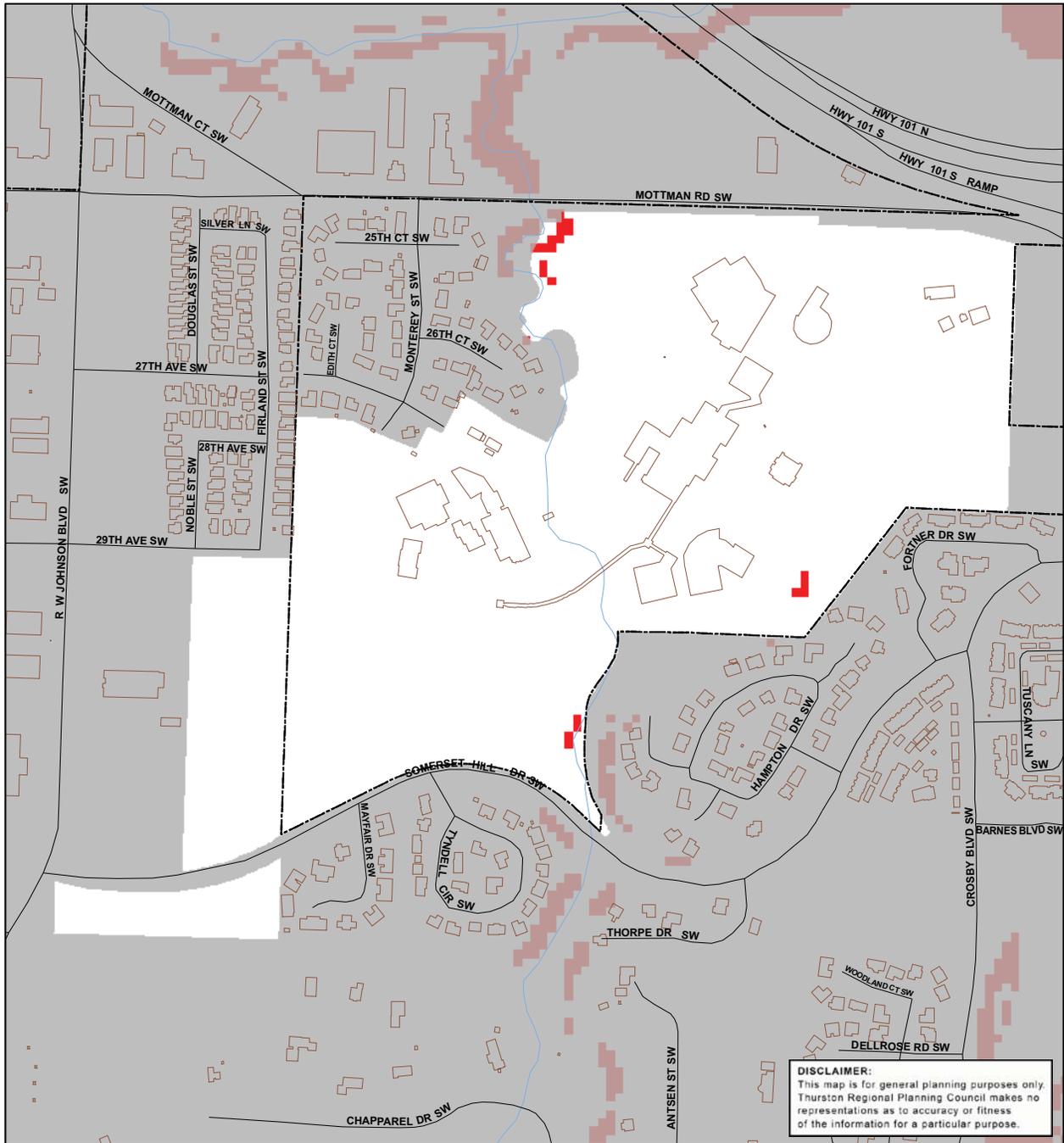


- High Groundwater Flooding
- 100 Year Floodplain
- 500 Year Floodplain
- Campus Boundary
- City Limits



500 250 0 500 Feet

Printing Date: February 18, 2009
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South Puget Sound Community College Steep Slopes



- Slopes Over 40%
- City Limits



500 250 0 500 Feet

Printing Date: March 19, 2009
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South Puget Sound Community College Mitigation Initiatives

Current Adopted Mitigation Initiatives

Current Mitigation Initiatives consist of actions that have not yet begun or require additional work. They consist of new initiatives identified by South Puget Sound Community College (SPSCC) during the plan update process. The initiatives also consist of existing initiatives that were carried over in their original form from the *Washington State Hazard Mitigation Plan* or other plans, or modified from their original form to reflect present needs.

Priority	I.D. Number	Category	Action	Status
1 of 7	SPSCC-MH 1	Hazard Preparedness	Training for college staff	Existing
2 of 7	SPSCC-MH 2	Hazard Preparedness	Upgrade campus two-way radio communication system	Existing
3 of 7	SPSCC-SH 2	Hazard Damage Reduction	Retrofit existing roofs with specialized gutters and snow blocks	New
4 of 7	SPSCC-MH 3	Hazard Preparedness	Retrofit existing leased Hawks Prairie campus with emergency lighting	Existing
5 of 7	SPSCC-MH 5	Public Information	Provide training and information for college community on emergency preparedness	Existing
6 of 7	SPSCC-MH 6	Hazard Damage Reduction	Implement redundant critical IT infrastructure	Existing
7 of 7	SPSCC-MH 7	Data Collection and Mapping	Develop campus GIS database	Existing

Hazard Category Codes are as follows: EH=Earthquake Hazard; FH=Flood Hazard; LH=Landslide Hazard; MH=Multi Hazard; SH=Storm Hazard; WH=Wildland Fire Hazard; and VH=Volcanic Hazard.

Completed or Removed Mitigation Initiatives

Initiatives that were completed in the last five years are included in this plan to provide evidence of progress made. These initiatives are no longer relevant and no longer part of SPSCC's adopted mitigation strategy. These initiatives are not ranked as they are no longer relevant.

I.D. Number	Category	Action	Status
SPSCC-MH 4	Public Information	Purchase and implement E2 Campus ReachPlus Alerts	Completed
SPSCC-MH 8	Plan Coordination and Implementation	Implement PIERS COOP system	Removed

Hazard Category Codes are as follows: EH=Earthquake Hazard; FH=Flood Hazard; LH=Landslide Hazard; MH=Multi Hazard; SH=Storm Hazard; WH=Wildland Fire Hazard; and VH=Volcanic Hazard.

Priority: 1 of 7**Status: Existing****Hazard Addressed: Multi Hazard**
Category: Hazard Preparedness**SPSCC-MH 1: Training for college staff**

Rationale: This initiative will provide the college with an effectively trained response staff. By ensuring that our staff are trained and prepared to respond appropriately to various emergencies and disasters the potential effect of these incidents should be reduced. Staff have been encouraged to take their training home with them and ensure their households are prepared as well. This initiative should allow the college effectively manage incidents that may occur locally.

Relates to Plan Goal(s) and Objectives: 8A, 8B, 8C

Implementer: Campus Security, Lonnie Hatman, Director.

Estimated Cost: \$5,000. The estimated cost generally refers to the cost of hiring a trainer for ICS300/400. This initial cost should be a onetime expenditure dependant on course updates. Most others training session are provided by local trainers and are free of charge.

Time Period: This initiative is on-going. Even as individual staff members complete required training it is necessary to refresh and retrain.

Funding Source: Local funding.

Source and Date: NIMS Implementation Plan, 2006.

Adopted Plan Number: N/A

Reference Page: Section III, Annex A.

Initiative and Implementation Status: This initiative is on-going. As new staff arrive, training is provided. 22 of 27 completed IS-100, 11 of 12 completed IS-200, 5 of 8 completed ICS-300/400, 17 of 17 completed G-402, 56 of 63 completed IS-700, 7 of 10 completed IS-800.

Priority: 2 of 7**Status: Existing****Hazard Addressed: Multi Hazard**
Category: Hazard Preparedness**SPSCC-MH 2: Upgrade campus two-way radio communication system**

Rationale: Communications during emergencies is critical. As the college continues to grow in numbers and locations, communications have grown increasingly difficult. The importance of different departments being able to communicate in an emergency is paramount. New federal regulations regarding Project 25 and narrow band programming have found some of our legacy systems needing upgrades. As one system is upgraded or replaced the others typically require some type of enhancements or programming. By having more inter-operable radios with sufficient channels allows for smooth response and recovery efforts as well as backup communications. Current analog repeater systems don't penetrate all buildings on the main campus. There is no direct radio communication link to the Hawks Prairie campus.

Relates to Plan Goal(s) and Objectives: 3A, 3C**Implementer:** Campus Security, Lonnie Hatman, Director.**Estimated Cost:** \$35,000.**Time Period:** Part of this project is complete. Reprogramming of Security radios to be completed September 2009. New radios for Hawks Prairie 2011-13 depending of funding**Funding Source:** Local funds.**Source and Date:** SPSCC Emergency Operations Plan, Annex B, Communications.**Adopted Plan Number:** N/A**Reference Page:** N/A

Initiative and Implementation Status: Approximately \$25,000 has been spent to implement and upgrade ITS radio communications with the purchase and installation of 16 digital VHR radios with repeater. Additional programming necessary for Security radios to be completed September 2009.

Priority: 3 of 7**Status: New****Hazard Addressed: Severe Storm Hazard**
Category: Hazard Damage Reduction**SPSCC-SH 2: Retrofit existing roofs with specialized gutters and snow blocks.**

Rationale: Due to the extreme winter storms and snow accumulation or 2008/2009, a number of college facilities incurred serious damage to roofs, flashings, gutters, and building fascia. This provoked leakage that also impacted the interior of four buildings with additional significant damage. These problems resulted in loss of program production as well as facilities use. The damages also caused a potential risk to public safety. Due to the emergency funding requirement through FEMA, these damages did not exceed that level and there was no other hazard insurance available to cover the expenses. After a thorough inspection of the buildings, a mitigation plan has been formed for the installation of specialized guttering on most of the buildings. This effective gutter system will help assure future reduction of the same hazard damages.

Relates to Plan Goal(s) and Objectives: 4C**Implementer:** Capital Facilities, Ed Roque, Dean.**Estimated Cost:** \$107,000.**Time Period:** 2011-2013**Funding Source:** TBD**Source and Date:** 2009 FEMA Damage Assessment.**Adopted Plan Number:****Reference Page:** N/A**Initiative and Implementation Status:** New

Priority: 4 of 7

Status: Existing

Hazard Addressed: Multi Hazard

Category: Hazard Preparedness

SPSCC-MH 3: Retrofit existing leased Hawks Prairie campus with emergency lighting.

Rationale: During power outages the existing emergency lighting is ineffective for safe exit.

Relates to Plan Goal(s) and Objectives: 3D

Implementer: Capital Facilities, Ed Roque, Dean.

Estimated Cost: \$2500.

Time Period: 2010

Funding Source: Local funds

Source and Date: N/A

Adopted Plan Number: N/A

Reference Page: N/A

Initiative and Implementation Status: Facility survey completed with members of Buildings and Grounds department and Security Office. Location and type of fixtures determined.

Priority: 5 of 7**Status: Existing****Hazard Addressed: Multi Hazard**
Category: Public Information**SPSCC-MH 5: Provide training and information for college community on emergency preparedness.****Rationale:** A well educated community is a safer community. By providing training to the college public we hope to make everyone a stakeholder. The more prepared individuals are to deal with emergencies enhances our ability to respond. If local resources become overwhelmed the public will be able to cope without immediate assistance.**Relates to Plan Goal(s) and Objectives:** 1D, 1E, 8A, 8B, 8C**Implementer:** Campus Security, Lonnie Hatman, Director**Estimated Cost:** \$1000**Time Period:** On-going.**Funding Source:** Local funds**Source and Date:** N/A**Adopted Plan Number:** N/A**Reference Page:** N/A**Initiative and Implementation Status:** Numerous training sessions have been held on; Armed Intruder, ICS for executives, PSE emergency Responder, heat emergencies, evacuation, personal safety, new staff and faculty orientation, defensive tactics, first aid/CPR AED, and fire extinguisher use.

Priority: 6 of 7**Status: Existing****Hazard Addressed: Multi Hazard**
Category: Hazard Damage Reduction**SPSCC-MH 6: Implement redundant critical IT infrastructure.**

Rationale: Even a minor incident could have a great impact on our ability to function if the IT infrastructure was interrupted. For a long time all voice and data were reliant on a single “backbone”. The dependence on access to email, network drives, telephones, and multimedia is necessary for the day-to-day instruction of our students and the business of our employees. The loss of vital educational and business records would be disastrous.

Relates to Plan Goal(s) and Objectives: 3B, 3C, 4B, 4C, 5B, 6F**Implementer:** Information Technology Services, Julian Pietras, Dean.

Estimated Cost: Unknown. The specific cost is built in to campus infrastructure standards. Anytime a building is built or remodeled redundant infrastructure is implemented.

Time Period: On-going.**Funding Source:** Capital funds, SBCTC.**Source and Date:** N/A**Adopted Plan Number:** N/A**Reference Page:** N/A

Initiative and Implementation Status: As new buildings are built or old buildings remodeled the telecom/data infrastructure is built with redundancy. This is a continuing initiative.

Priority: 7 of 7**Status: Existing****Hazard Addressed: Multi Hazard**
Category: Data Collection and Mapping**SPSCC-MH 7: Develop campus GIS database.**

Rationale: Most campus plans and maps are contained in a central location which makes them vulnerable. A centralized, networked, GIS database would allow those responsible for certain aspects of campus infrastructure or mapping to develop personalized maps for their use. The database could include utility shutoffs, location of emergency equipment, etc.

Relates to Plan Goal(s) and Objectives: 2A, 3D, 3E**Implementer:** Capital Facilities, Ed Roque, Dean.**Estimated Cost:** \$2000**Time Period:** 2011-2013**Funding Source:** Local funds**Source and Date:** N/A**Adopted Plan Number:** N/A**Reference Page:** N/A

Initiative and Implementation Status: Preliminary meeting held with stakeholders on the importance of this initiative. Current budget constraints have stalled this project.

Priority: N/A**Status: Completed****Hazard Addressed: Multi Hazard**
Category: Public Information**SPSCC-MH 4: Purchase and implement E2Campus and ReachPlus Alerts.**

Rationale: Rapid notification of emergency is necessary for the public safety. The Clery Act of 1990 also requires “timely notification” of certain situations. The absence of a centralized PA system makes communicating with the college community as a whole immediately, next to impossible. The two systems identified utilize existing infrastructure for notification. E2Campus is a voluntary cellular phone text messaging system and ReachPlus is a computer-based instant messaging system.

Relates to Plan Goal(s) and Objectives: 5B**Implementer:** Campus Security, Lonnie Hatman, Director.**Estimated Cost:** \$5000**Time Period:** N/A**Funding Source:** Local funds**Source and Date:** SPSCC emergency Operations Plan, Annex A, Communications.**Adopted Plan Number:** N/A**Reference Page:** N/A

Initiative and Implementation Status: Both systems have been implemented. Each system has recurring costs that require funding each year. The ongoing cost for E2Campus is approximately \$2000/yr. and ReachPlus Alerts is approximately \$600/yr.

Priority: N/A**Status: Removed****Hazard Addressed: Multi Hazard****Category: Plan Coordination and Implementation****SPSCC-MH 8: Implement PIERS COOP system.**

Rationale: The purpose of PIERS was a computerized ICS management system that allowed incident command to respond and track an incident locally or remotely. Planning meetings could be held with members in different locations.

Relates to Plan Goal(s) and Objectives: 3A**Implementer:** Information Technology Services, Julian Pietras, Dean.**Estimated Cost:** \$10,000**Time Period:** August 2009**Funding Source:** Local funds**Source and Date:** Washington State Hazard Mitigation Plan, SPSCC**Adopted Plan Number:** N/A**Reference Page:** N/A**Initiative and Implementation Status:** Due to funding shortages this project has been dropped.

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